The Case for:
12 Volt DC Home Solar Systems

By T. M. Lamb

As an Alternative, Back-Up or Hybrid Power System for your home.

And against the $90,000 + solar systems your local Solar Contractor will try to sell you

by T. M. Lamb

So you got a huge income tax return and you want to do something solar and green to help save the planet. It's a noble thought and now days a lot of people are thinking along those lines. Here is the problem with it.

When you contact the "local Solar Contractor" they will start throwing a bunch of numbers at you like how much you can save, how much you can make by selling power back to your local power company. But they seem to gloss over one important part and that is the cost to you. They seem to have a feel or a nack for glossing over numbers like $20,000, $30,000 even $40,000 but you will not hear much about the $7,000 system. And if you do opt for the $7,000 system it will be all about how you don't want that system as you will NOT be producing hardly any power. And you will NOT be getting a CHECK from your local power utility company for the power you are selling back to them, because frankly you will not be making that much power to sell back to them.

But Here they come to the rescue and they magically have a $90,000 system that produces tons of power for you to use and tons of power you can sell back to your local utility and like magic everyone is happy.

But you say "hold the phone" I am now spending $90,000 and what can I realistically expect from the local utility for my excess power sold back to them. NOW you got them in a quandary, they may stammer, stutter and IF they are 'bald face liars' they will show you some fancy slick graphs showing how "someone somewhere" gets paid $400 to $500 a month. And IF your smart your thinking "IF I bought a $90,000 home I could rent it out for $900 to $1,200 a month". Now that GREEN thinking starts slipping away when the cold hard price you have to pay and keep paying for this expensive power system.

But you still have thoughts and visions of saving the planet, saving some whales somewhere, saving something somewhere, so you still consider it. And IF they are real good liars they will tell you how you can make $1,000 to $1,500 a month, 'hog wash'.

How much is your power bill now? If you live in a all electric 4 bedroom home with a couple kids, electric heat, air conditioning, hot water, cooking etc. your bill can run from a low of about $250 the lowest to $450 even bumping near the $500 mark on hot peak summer months. WOW you think how much you would love to save on that peak hot summer bill.

Now comes the slap in the face, you will NEVER EVER earn a check for $1200 not even $600 and here's why. First of all, the sun only shines part of the day leaving your nights where you are exclusively using utility power for everything. Now throw in cloudy and stormy days and again you are not making any power and exclusively using utility power. And you can also bet any figures they show you on how much money you can earn from your utility company are grossly exaggerated numbers.
Also keep in mind winter months have shorter days, that equals less power being made. But wait if you live in an all electric home I thought I would be making the power I needed to heat my home, think again… You might make a little to offset what they charge for your power but to replace it totally, think again. Remember the days are shorter so it's stone cold dark by 5PM and you probably stopped making power about 3:30PM the truth be told. Now you have long cold nights.

You think, at least I can make extra power to sell to the utilities in the summer. Remember that expensive electric bill you got in the summer for running your air conditioner? Yes, the days are longer, you make more power but you use lots and lots of power running your home air conditioner, so NO you are not making hardly any extra to sell back to your local utility for a profit. And remember after the sun goes down you are back on the grid using expensive grid power again. Think about it, just because the sun goes down your home outside is still hot and your air conditioner still runs and runs trying desperately to cool your home. And at the same time running your bill up and up and up.

Now for some truth, I have talked to a lot of people who have had very expensive solar systems installed with the promise of getting a big check back from the local power utility for selling their excess power back to them. So a system costing up to $10,000 you can figure on getting NOTHING for your investment, other than a reduced electric bill. If you spend say $40,000 you can expect to get back LESS than $500 a year. And if your opted for that $90,000 system you can expect to get back about $3,000 a year (YES you heard that correct about $250.00 a month and that is averaged) Winter and Summer months you probably will earn Nothing or next to NOTHING!

BUT WAIT THERE'S MORE!!! You are probably thinking I have 50 solar panels on my roof so if the power grid goes down I will have lots of power. WRONG – WRONG – WRONG; When you have a "grid tie" system which is what you will get from a 'solar contractor' yes, you get lots of shinny new solar panels on your roof, BUT your local utility controls your power output. They do this through the phone lines, so IF the power goes down they can shut down your system so that way you will NOT be putting power into a downed system. This way the workers can safely work on the downed system to get it back up and running. SO, your expensive system does NOTHING for you when your grid power is down. So you can have a $90,000 solar system installed on your roof and you will still be sitting in the dark just like your neighbor across the street. (Who by the way invested his $90,000 into a tri-plex and is earning $28,800 a year on his investment.)
How much are you making again???

The Solar Contractors will tell you for a little extra money you can install huge battery banks and have battery backup power and this way you can have power when the grid goes down. The problem here is the battery's they sell you are very expensive and the inverter is very expensive, now you have a loss of power from converting your battery power to 110 volt AC power to use in your home. Now most people who opt for this do not go out and replace freezers, refrigerators, lights etc. with low energy appliances so they usually burn through this reserve of power rather quickly (if they are not energy conscious).

There is a better way and the Solar Contractors will NOT tell you about it. Think about your car or truck for a minute. It's a 12 volt system, it

has tons of lights, radio, navigation system, TV, DVD Player, and about anything you can plug into your car charger like cell phones etc.
I know this car 12 volt system is powered by an Alternator which charges a battery and the battery keeps everything up and running, right? Some of the new expensive cars have a solar backup system installed to help keep everything powered when the car is not running.

Consider say a big truck, (an 18 wheeler). It has a huge alternator and usually a bank of batteries. Inside the cab of the truck it will have several 12 volt plugs. Where they can plug in all kinds of devices from 12 volt coolers, 12 volt computer, 12 volt electric blankets, 12 volt coffee pots, 12 volt fans, 12 volt alarm clocks in fact everything electric made for a trucker is made 12 volt. You can expand this to Motor Homes, Sail Boats, House Boat, Remote Cabins and much more.

So the burning question is 'why wont the solar contractors tell you about installing a 12 volt (or 24 volt system?) The big overriding answer is MONEY they make a lot more on a $20,000 solar system vs say a $2,000 12 volt system. Some of it is the schools and the training they just don't teach about 12 volt power. And if you ask them about 12 volt power they might tell you "you can't do that". But remember truckers are doing it every day. All you are doing is replacing their alternator with a few 12 volt solar panels and maybe a wind turbine.

NOW granted you will not be able to power your home's electric heat or air conditioning system with 12 volt power but you can do about everything else. You can make hot water with your wasted 12 volt power, you can build a 12 volt solar powered Evaporative (Swamp) Cooler to help cool your home. As for heat try a wood stove or a LP Gas heater and buy a Propane tank and fill it up. If you look and think there are ways around every problem.

12 VOLT POWER IS THE ANSWER TO A PRAYER.
About 1999 I bought two -75 watt solar panels for $500 each. Some time later I bought two 6 volt Trojan golf cart batteries. I set the batteries in my garage, threw the solar panels on my roof and ran the wires to the batteries and then from the batteries into my living room. There I installed a 12 volt fluorescent light in a table lamp and wired it to the two wires coming into my living room. And "LET THERE BE LIGHT" I was totally amazed to light up my living room using

sunshine. I was hooked and ever since then I have been researching ways to do more with less. Using nature and the natural alternative as much as humanely possible. I only wish I lived on a fast moving stream so I could use Hydro Power to power my home, that would be the ultimate.

110 volt table lamp: note the 12 volt adapter plug wired onto the power cord. With a 12 volt bulb screwed into the socket it's now a 12 volt DC table lamp.

One of the best features about 12 volt DC power, I have never heard of anyone ever being killed or injured with 12 volt DC power. 110 volt AC can not say that. That said, you can still have a short somewhere or be pushing to much current through to small a wire and have it get hot. Yes you can do that, that is why I always recommend you run heavier wire than is required and always, ALWAYS use a fuse on your Positive wire coming right off your Positive terminal from your battery. That way if there is ever a short you will blow a fuse, instead of causing a fire. IF you ever have a question about wiring, electricity, connections etc. please do not hesitate to ask a professional. Many times these people will help you out with a question without charging for their time.

Some Solar Power experts say when you make to much 12 volt DC power it's just to much for almost all charge controllers to handle. Say 1000 watts will equal about 83 amps that is a lot of power pushing into your batteries so you will need to have a huge bank of batteries to charge with that much power. Or you can opt for a 24 volt DC system and then buy a converter to change the power from 24 volt to 12 volt for you to use on everything you need.

The formula for finding Amps from Watts:
Watts (1000) divided by the voltage (12) equals (83 +) amps

Also the formula for finding watts from Amps:
Or Amps (83) times voltage (12) equals watts (996)
(close enough for government work)

(Also these figures are per hour and not per day or week.)

Keep in mind that modern solar panels usually put out about 19 to 21 volts DC so when you run the wires down to your batteries you will have from 18 to 20 volts. That is way to much to charge 12 volt batteries. So you will need a good Charge Controller. If you are going to run a wind turbine you will need a charge controller that is made for wind turbines that will dump excess power into resisters or a water heating element. But if you are NOT running a wind turbine you can have the charge controller just stop or interrupt the power coming into the batteries. Normally batteries can be charged up to 14.5 volts anything higher and the current needs to STOP or be dumped as needed. Over charging your batteries will shorten their life and if you continue to do this and you grossly over charge your batteries you can fry them on the spot. Batteries are expensive the 6 volt 250 amp AGM (Absorbed Glass Matte) batteries I use cost $300 each, a Trojan battery can cost about $150 each, still NOT cheap. (DO NOT OVER CHARGE YOUR BATTERIES)

(Likewise if you opt for a 24 volt DC system, your 24 volt solar panels will be putting out better than 30 volts way to much to charge a 24 volt battery. So you will need a charge controller for the 24 volt system also.)

With all the options in Batteries, I like the AGM batteries because:
They are the ONLY batteries you can store and use indoors safely.

They Do Not vent Hydrogen gas so they are not explosive or fire prone.
They are so safe they are the only batteries you can ship on an airplane.
They will NOT leak if overturned or ruptured.
They have a long life.
No deep scale charging
They never need water as they are a sealed battery
They have good charge and discharge characteristics.
They are a forgiving battery and are not temperamental.
The down side is the price, they are about twice as much as a lead acid battery. But they will last about twice as long. This is one area you should not skimp on, as batteries are the heart of any solar system and with out battery power you are dead in the water…

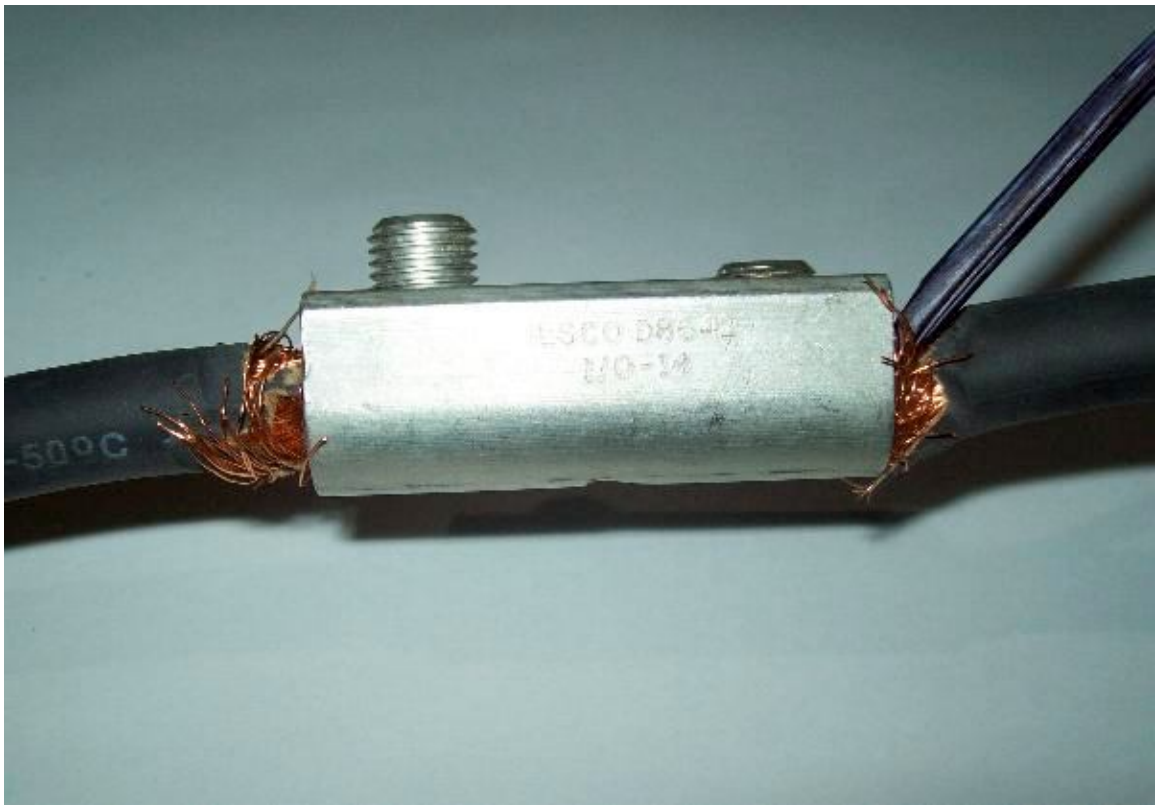
Lead Acid Batteries need to be stored and used outside. You will need to build a battery box outside your home to place your batteries in and run wires into your home to run your 12 volt system.
Also keep in mind that Lead Acid batteries need a deep scale charge every month to "boil" the build up from the bottom of the batteries which is normal from use. Also you will need a good Hydrometer to check the acid in each cell regularly and you will also need to check the water level and add distilled water to each cell as needed. SO yes there is a price to pay for being cheap and with all that your batteries will only last about 2 to 5 years. With proper maintenance and not discharging or over charging them you should be able to make them last 5 years.

See why: I LOVE AGM batteries?

Here are my 10 AGM 250 amp 6 volt batteries, that give me a total of 1,250 amps to draw from. Yes I agree this looks ugly but note (the table lamp in the above photo is sitting on a desk). That desk pushes up over these batteries and they are well hid and only the charge controller peeks above the back of the desk when you get close to it. This way my wife is happy, I'm happy, were all happy. And we love our 12 volt power.

These are the 12 volt DC power lines I have in my basement

I set my AGM batteries in my dining room and place a small desk over them to hide them. This way they are out of the way and for the most part out of sight. I have a basement and I run heavy #4 welding cables through the floor into the basement. The Positive cable has a Monster fuse right off the Positive terminal before it goes more than 6 inches. This way anything that happens accidentally will blow the fuse before it can do any damage. I run that cable all the way to the front of my house in the basement. When I need to run smaller cables to light fixtures, I use a heavy duty lamp cable for shorter runs going up into bedrooms etc. (BEFORE you drill any holes make sure from the top side to the bottom, inside and out that there is nothing else you can accidentally drill into like 110 volt/220 volt power lines, plumbing etc.) If your not sure get the drawings to your house and check them out BEFORE YOU DRILL. And if your still not sure ask a professional about drilling where you want to drill and see what he has to say.



This is the aluminum connector/reducer to attach wires with. Just be sure to spread liberal amounts of Di-Electric grease on the bare wires before inserting them into the connector and be sure to screw them down real tight for a proper connection.

Where you make the connection to your welding cable to a smaller cable you can use an Aluminum Connector/Reducer if you use the type that has a set screw you can always take them apart and re-do them as needed. If you opt for the crimp type just be sure your connection is crimped very tight.

*** Also be sure to use liberal amounts of di-electric grease on the bare wires for every connection, as this will keep the copper from corroding with the aluminum and breaking electrical connection.**

This is the 12 volt adapter plug male and female you will need to plug your new 12 volt lights into to make them work.

When you get the wires up through the floor into say a bedroom you will need to attach a 12 volt adapter plug (formally called a female cigarette lighter plug) You can find these at Walmart, Radio Shack or ebay they usually have from 1 to 4 receptacles. Just keep in mind the real cheap ones use cheaper wiring and will not handle much of a load so don't go to cheap with these. (Also note that most of the 12 volt receptacles have a little LED light, if the light is not lit try reversing the wires, if the light lights up you then know you have the polarity correct). Once you have the female cigarette plug wiring attached to the wires coming up from your basement you are ready to install your light fixture.

You can find an old table lamp about anywhere from yard sales to Walmart. Next take the plug end and cut it off. Now wire on your male cigarette lighter plug by stripping back bare wire on both the plug end and the lamp cord (the cut end). Just twist these wires together and you can use electrical tape to tape the wires. Now for the tricky part, you

will need a 12 volt LED (SMD or a high output) dome light bulb with a Edison (screw in base) and screw this new bulb into the light fixture. Plug the cord into the socket and turn the switch on. IF nothing happens not to worry but you will have to reverse the wires connected to the lamp cord to the male cigarette lighter plug. These should be the wires you just taped together. Un-tape the wires and disconnect them and reverse them and re-twist them together and re-tape the wires, NOW your LED light should work.

WARNING: LED lights, simply will NOT work if the polarity is reversed and will not do any damage to the bulb or the equipment. DO NOT do this with any other (non-LED) light bulb as damage can result to the bulb from reversing polarity.

WARNING: Do not attempt to install a 110 volt AC light bulb into a 12 volt appliance or fixture as damage may result.

DOUBLE WARNING: Never Ever attempt to install a 12 volt DC light bulb into a 110 volt AC socket at the very least the light bulb will be destroyed.

These new High Output LED lights can put out the equivalent light as a 45 watt bulb up to a 60 watt light bulb making them super bright and they typically use from 5 watts to 8 watts to do this. I have a fixture in my living room with 4 bulbs so with 75 watt light bulbs installed I was using 300 watts for that one fixture. After converting it to 12 volt DC LED light bulbs now I am using 4 – 7 watt 12 volt light bulbs and I am only using 28 watts of power and getting practically the same amount of light.
I have a recessed fluorescent light fixture above my kitchen table with 4 long fluorescent bulbs. I installed 7 – (110 volt) light bulb receptacles inside the light housing and wired them for 12 volt DC power. I installed 7 – 8 watt high output LED light bulbs in these bases so now I have 56 watts being used for this but each light is the equivalent light of a 60 watt bulb. I have a total 420 watts of equivalent light above my kitchen table, but I am only using 56 watts. So my kitchen table is well lit and I know we will not be eating in the dark…

There are tons and tons of stuff you can power with 12 volt DC. If you don't believe me take a look in any large truck stop and you will see what I mean.

This is a 110 volt AC fixture with a Y adapter and I have 2 – 12 volt lights bulbs 45 watts equivalent light each but they only use 5 watts of power each – NOT 45 watts each. Note the pull chain for the on/off switch.

I personally have a small 12 volt heater but I don't use that to much. I have a 12 volt refrigerator, 12 volt coffee pot, 12 volt alarm clocks, 12 volt electric blankets (that we use on cold winter nights to keep us toasty warm), 12 volt swamp cooler (to cool my home), 12 volt aquaponics water pumps & air pumps, 12 volt lights, 12 volt fans, 12 volt hot water, 12 volt TV & DVD player. I have all my outside lights converted to 12 volt, all my basement lights are 12 volt, all my yard lights are 12 volt, my garage lights are 12 volt and 95% of all my house lights are 12 volt.

SO DON'T TELL ME 12 VOLT DC WILL NOT WORK FOR YOUR HOME - I KNOW BETTER!!!

I have a 4 bedroom home with 3 baths and we have 3 teenagers that live with us and they are NOT energy savers in the least. They all have video games, big TV's, DVD's and run all kinds of power devices that I don't even know about or care. My smallest power bill was $67 for one month. But typically it runs about $100 a month. How much is your light bill?

Solar Panels: I have people tell me all the time that solar panels are just to expensive well when they were $500 for 75 watts I would say so. But today Ebay sells 100 watt panels for about $100 and if you are not to rushed or shop around you can find factory seconds for $50 each (including shipping) which will cost almost $50. SO no, solar panels are NOT expensive. You can do what I did and start with one or two panels and add each month an extra panel or two. And each month add an extra battery as you can afford it. Before you know it you will have a solar system that will be the envy of the neighborhood.
But be warned if all your neighbors know you have solar power when the lights go out the will be at your door begging to come in and enjoy your lights.

With all the lights and fans and other stuff I have that is 12 volt I literally have NO IDEA when I lose my grid power. Maybe one of my kids will come upstairs complaining about losing his TV or game he was playing. Sometimes I will notice the streetlight across the street has gone out and that is the only way I have of knowing I have lost grid power. With a "little" money and a little work you to can have a system like mine and you too will not know when you have lost grid power except looking at a streetlight to see if it's lit or not.

My wind turbine; we don't get much wind here in Arkansas but I wanted an alternative charging method to my solar panels. And I am ever so happy I choose the Wind Blue Power Low speed PMA (Permanent Magnet Alternator) as it starts producing 12 volts in just 5 MPH wind. And it produces 13.5 volts in just about 6 ½ MPH wind.

My 10 AGM 6 volt batteries charge each day when the sun shines and they are ready each night for use again. I know what you are thinking 'how about when the sun don't shine?' Well if it's only cloudy but still light out I have enough solar panels to make up for the reduced power, so I can still charge my batteries. Now if it's seriously dark out NO - I can not charge my batteries. But I have a wind turbine to charge my batteries so if the sun wont shine but the wind is blowing I am still making power and charging my batteries. I know what you are thinking now what about when it's real dark out and the wind is NOT blowing? Well that is where you half to have a reserve of power in your batteries. IF you think you need 2 batteries or 2 solar panels, BUY 4 and IF you think you need 4 buy 8. You need to keep a reserve in your batteries for such occasions.
Typically on stormy overcast days when the wind doesn't blow after a couple days I will tell everyone to cut back on their power usage.

Typically I run lights on my front porch and extra lights in the living room and kitchen. When my power gets down to about 12.2 volts I will tell everyone to cut their power usage and I can get about 3 more days on that 2/10 of a volt. I never let my batteries get below 12 volts and only on a couple occasions have they ever gotten down to 12 volts. When they do, I do one of two things: I turn off all power items except for a night light that uses 1 watt of power in my basement or I hook up a battery charger to my batteries and charge them (the power grid way). But I have only had to do that twice in 4 years.
Hey, I didn't say I was totally off grid…
I just hate to use the stuff, it's so expensive…

Remember the news shots of Hurricane Sandy hitting New Jersey? Remember seeing long lines at the few gas stations that were open? Men and Women holding gas cans standing in long lines waiting to get gas cans filled? That gas was NOT for their cars, it was for their generators.
And yes you can stockpile gas but gas deteriorates with time and in a year or so you could end up with 500 gallons of separated liquid sludge that will be useless for a generator. And could you really sleep good at night knowing you have 500 gallons of potentially EXPLOSIVE materials stored in your home?
I know some people will think well how about Natural gas to power my generator? They make some very nice commercial units, but they have the same problem. When the power goes out in a wide spread area you could be without fuel (Natural Gas) for your generator.
If you are preparing for a long term power outage than it is useless to prep for any amount of storable fuel because when your fuel runs out you will still be in the dark. Even if you store 1000 gallons of fuel it will eventually run out.
The only viable alternative is solar and wind power. It is totally renewable every day with sun or wind. And IF you DO NOT have a 'grid tie' system then you can control your own power when and where you want to use it.
And yes you can spend thousands of dollars to run an inverter and then power your house with that, but why? You lose control of a precious resource when you start running your whole house off your batteries and an inverter. You will inadvertently use to much power and then be in the dark even with your expensive solar system. Besides to do this properly you would have to change all your lights, fans, refrigerators

everything you plug into your power outlets and convert it to a LOW energy option. Like using a 110 Volt AC – LED light bulb that uses 8 to 12 watts of power. That's the easy part now convert your TV, DVD, Freezer, Refrigerator anything and everything powered by your 110 volt AC house system, that's not easy or cheap.
BUT if you use 12 Volt DC power as a Hybrid System and/or back up power you know what devices are plugged into it and you know to start with low energy devices. You know how many amps your batteries have and you know what amps your devices draw and how much you can use them. This becomes a good Barometer on showing you that you need to ad more solar panels and/or more batteries to your system. With the cost of Electric Grid Power (and it's going up, Thank You Obama for closing over 300 coal fired power plants) the cost of electricity is going to go through the roof. Notice your power bill every month it seems to go up and up and up. You will find that you will open a door and turn a fan on just to keep from turning on the air-conditioning in your home. And it's going to get worse. The elderly, sick, disabled and disadvantaged in our society are being hit with an ugly alternative to eat or to keep the electricity on, it's that serious.

So if you have the means and some mechanical and/or electrical skills why not opt for a solar system? Or you can usually find a friend with some skills to help you. You will be glad you did. Once the system is installed there is no muss no fuss, the solar panels have a life of about 20 years. The batteries, if you opt for lead acid batteries can last up to 5 years if you properly maintain them and do not abuse or discharge them to much. AGM batteries can last 10 years and longer if you do not abuse them or discharge them to low.

I know there is some cost involved and some installation on your part. You can start with about $600 to install a basic back-up system and then add to it as time and finances permit. You can end up with about a $1,000 system and run some lights in the evening, small fans, radios etc. and start using the system as an alternative power source for everyday use. This way when you lose power for real you will have lights, fans, radio, small TV, you probably can run a 12 volt electric blanket for 6 or 7 hours. And that is a whole lot better than sitting in a freezing house with NO heat, no water, no grid power, nothing works except your little 12 volt system. Then your 12 volt solar power system will be a God send.

Now just because I have everything converted to 12 volt does NOT mean EVERYTHING is 12 volt. I have a 110 volt AC sump pump that needs to keep operational to keep my basement dry. Now it only runs if it rains a lot and then it might run off and on several times over a couple days so normally it don't run a lot or very long. But I still need it, what I have done is I installed a 3000 watt inverter in my kitchen near the batteries then I ran a very heavy duty extension cord into the basement. So if I lose power and I need to run my sump-pump all I have to do is plug in my extension cord into the inverter and plug the sump pump into the extension cord and it's ready to roll. Also that way if I ever end up with water on my basement floor I can run a shop vacuum to vacuum up standing water on the floor also. And I can plug in a freezer or refrigerator into the inverter if needed. This way I control what I plug into the inverter and I carefully watch the power drain on my batteries. BUT if I am using this inverter during a bright sunny day I am making almost 1000 watts of power, more than enough to power the inverter and charge my batteries too. So when it comes to solar, extra is a good thing. I wanted to be able to run several power hog devices and have enough left over to charge my batteries too. This was the reason I designed this system this way.

Just an example of some 12 volt solar panels on a roof, making 12 volt power to be used every single day rain or shine

So weather you are looking for Alternative Power, Back-Up Power or a Hybrid Power System, Solar Power has the answer. And by making 12 volt power, storing 12 volt power and using 12 volt power you can do it cheaply, easily and it will last for years. DO NOT let anyone tell you, that you can't do that. Yes Electrical Contractors and Solar Contractors will try to sell you a $90,000 grid tie system that will be TOTALLY useless when your power goes out but that is their job and they are good at it. But DO NOT be fooled, remember truckers use this system with 12 volt devices and appliances every day and all you are doing is replacing an alternator with solar panels and/or a wind turbine to charge your batteries.

You can add 12 volt lighting and wiring to your home to the point where every room has 12 volt lights and 110 volt lights. You will have 12 volt adapter plugs where you can plug in fans, alarm clocks, coffee pots anything and everything 12 volt.

And hopefully one day soon you will be like me asking:
"Did we just lose grid power"!

And have no way of knowing except by looking at the street light across the street to see if it's lit or not.

If you are interested in 12 volt power you need to research articles in your library or on the internet about 12 volt power, application, installation and uses. Though I think you will not find much in relation to home use but if you find articles on remote cabin or boat installation you should be able to relate that to home use. That is what I had to do.

NO you will NOT be able to run your whole house 220 volt air-conditioner on this 12 volt system, or your 220 volt whole house heat system, or your 220 volt, 50 gallon hot water heater or your 220 volt cook stove and oven. SORRY but 12 volt does have it's limitations. But you can find a work-around such as a 12 volt swamp cooler to help cool your home. You could heat your home with renewable wood after all it's all natural. With a little ingenuity you can find many viable alternatives to your 220 volt lifestyle.

NOTE: I know and understand how the MPPT (Maximum Power Point Tracking) charge controller works, and yes I do agree it is the better charge controller over the PWM (Pulse Width Modulation) Controller.
That said: The ONLY reason I do NOT recommend the MPPT charge controller is the cost. I have 10 – 100 watt panels that produce (theoretically over 80 amps of power PLUS I have a wind turbine.) The MPPT controller I would need would cost me from $700 to $1,000 and up to meet my demands. So I opted NOT to use or recommend the MPPT charge controller. If you are NOT using an additional wind turbine and don't mind the extra cost by all means use the MPPT charge controller because it is a much more efficient controller.

Thank You and I hope this was helpful!

God Bless