

How to MAKE PV Solar Panels

by **VIRON** on August 12, 2007

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intro: How to MAKE PV Solar Panels

This is not "How to make PV Solar Cells".

It is possible to home-make Copper Oxide and other kinds of materials but that is a whole nother story which I may do in the future.

I may be a little bit ambitious to try to show you how I made PV Solarpanels out of various types of cells I collected and how and where I obtained them rather inexpensively, and some of the differences in the various kinds, but most of all, how to work with them to get free electricity under the light of the sun and other sources of light.

In essence, this involves ways to connect cells, which may produce more or less than one volt, and not only try to increase power output but also decrease the load, that is, efficiently conserve the energy whether it is meager or significant.

For example, even the weakest solar panels can run watches, calculators, radios, charge batteries, and if a computer were specifically designed to, it would be as solar-powerable as a calculator.

Here are some pictures of Solar Panels which I have constructed.



step 1: Supplies and Sources

What you may be able to use to build a useful solar panel:

"Broken" solar cells. They are very cheap and they work, they are just randomly shaped. They are usually crystalline silicon ones, which ALWAYS (ha!) look broken even when they are not.

Surplus solar cells. Amorphous silicon printed on glass (check) are excellent, usually producing more than a volt, and much sturdier than the thin ones that break in bulk quantities. If these break, we can fix them, usually.

Indium Copper Selenide Cells. These are "new" and are conveniently sold as glass tiles with easy to solder tabs.

Any of the above, sold as cells prepared for assembly into panels; in other words, complete and solder - ready or with wires and tabs. (I will explain how to prepare inferior quality cells in this instructable.)

Miscellaneous items:

Wire Glue - There is already another instructable for using wire glue on Broken solar cells. ([link](#))

Brass extrusions, bracket [L] shaped - Convenient for connecting to glass cells.

Solder

Soldering Iron - low wattage

Small flat-head screwdriver

Thin (around 20 AWG or less) stranded copper wire

Lamp cord or Speaker Wire

Alligator clips

Deep Picture Frames or Shadow Boxes (Enclosure)

-look for imported frames at the El Cheapo store and pray a machine made them

Acrylic/Lexan/Plexiglas/Etc clear polymer sheets

<http://www.instructables.com/id/How-to-MAKE-PV-Solar-Panels/>

Router or Dremel to cut out the middle of one out of three sheets
RTV (Silicone Glue) - or :
High Temperature Hot Melt Glue (Caution-you don't want the sun to melt it!)

Rectifier Diode such as 1N4001 or 1N4004

Voltage doubler or multiplier circuits (you can make) to increase voltage output.
-examples: ICL7660, MAX1044, MAX232, etc.

Wide Sticky Tape
Double Sticky Foam Tape

Rechargeable Nickel Batteries
Gel Cells or Car Battery (you got one, might as well use it until it's useless)
-Li Ion not recommended because they are harder to charge

Analog volt meter (only because it doesn't need batteries like a digital one)

AC Inverter - if you are charging a powerful battery and would occasionally run some mains-powered appliance. Some UPS's can be easily modified to be inverters, if they can be turned on after a power failure.

Sources:

Broken Solar Cells:
Herbach and Rademan
Silicon Solar
Electronic Goldmine

Glass (Amorphous) Solar Cells:

Electronic Goldmine
Note:Other links here may also supply Glass Solar Cells

Indium Copper Selenide Cells:

All Electronics
Edmund Scientific
Electronic Goldmine

Other sources:

Cheap weather damaged solar powered outdoor night lights
-(common failures are circuit corrosion and defective batteries, not the solar cells)
Defective solar calculators, solar charged flashlights, etc.

Perhaps a little off topic:

For a reasonably good deal on Complete and Useful Solar Panels I recommend "Solar Car Battery Chargers" that are about 1 or 2 watts and between \$20 and \$30, whenever an opportunity to get some arises. But those are what I am trying to show how to Make an approximate equivalent of.



step 2: How to use "broken" cells

They are the crystalline ones that Always look broken, but if they really are, then they have not been fully prepared for use. It is an extra challenge to solder wires onto them but this is how I do it:

Look for the wide line on the pieces, and sort out ones that only have thin lines. The thin line ones might be useful with Wire Glue but are too hard to solder.

Then sort the pieces with wide lines by how big they are. They will all be about 0.55 volts but the larger pieces make more current than the smaller pieces and it's nice to have a panel with consistent current, especially the one you make with the biggest pieces.

Let's save the big pieces until we learn to do the small pieces.

Strip apart a short length of stranded wire and put the now loose strands in a small box just so you can find them and so they don't wander into another project and cause a short circuit.

ACTUALLY another option may be to use wire-wrap wire instead of bare strands, if you don't mind stripping the end of each piece.

The broken cells have a very thin conductive layer on the blue side and a very rough thicker one on the other. It will be more challenging to solder onto them than on perfect cells but this is how.

First the blue side...



step 3: Preparing Broken Cells

If you can solder onto the cells then they are higher quality than the ones I have so you can skip these preparing steps:

On the blue side, scratch the thick line with a very small flat screwdriver with just a little force so that the cell doesn't break, and the line should turn from white to shiny unless it's already shiny and ready to solder. Try to make a little shiny circle. We will solder there.

Make the flat edge of the screwdriver completely touch the scratched area so it rubs wide.

Mostly push back and forth so that the rubbing removes the thin oxidation.

After scratching the line, turn the cell and scratch the circle back and forth again.

Maybe turn it once more and scratch it once more.

Now flip the cell over and notice the rough stuff on the back. If there appears to be two different roughnesses or shades of grey, we are going to scratch in two places. Again, turn the cell and scratch it in one or two little circles by pushing the edge of the screwdriver up and down to remove the coating that solder won't stick to.

Now back to the blue side. Try to get a solderball to stick.

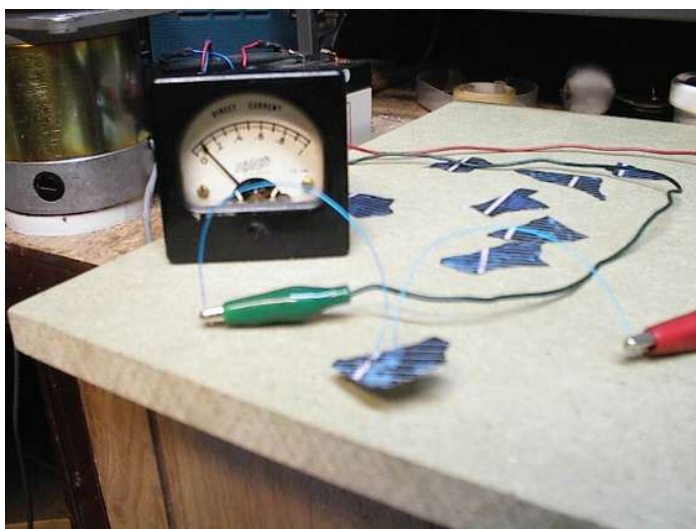
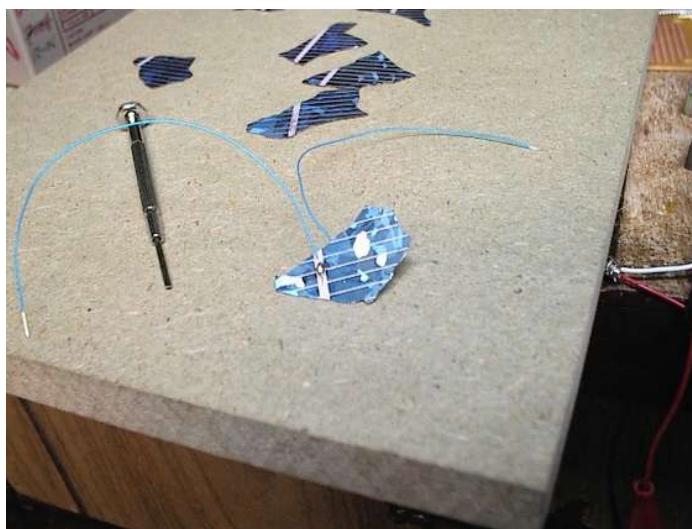
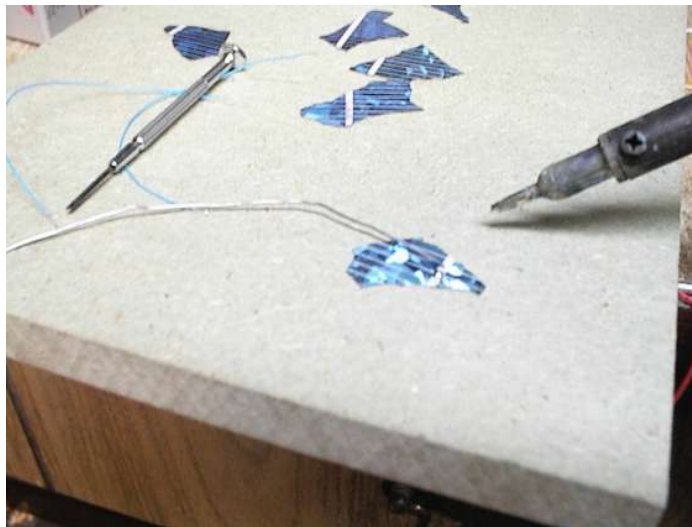
If it does not stick, and rosin gunks up the area, scrape it off and try again, and if it seems hopeless, scrape another part of the wide line on the cell.

I did not have the problem because of practice.

Now try to put a bump of solder in the two places scratched on the bottom of the cell. I was only able to get one bump to stick. There are areas on the bottom where solder just won't stick. But if neither spot sticks, try scraping the rosin off the spots and soldering again, or carefully scratching another spot. If you have a bump on the blue side, it's good but you can't lay the cell flat now. The spot that worked was rougher and thicker than the one that didn't, and that means there's a lot more silver there, and more likely it will solder.

Now that you have two solder bumps, you can attach two thin wires, either strands from stranded wire, or thin wire-wrap wire. What about thicker wire? It can pull the lines off the cell and then you can forget about soldering it. Put it in the "wire glue" bin.

Now that there are two wires on the cell, test it with a meter. The Blue side of the cell will make up to 0.55 Negative volts, so connect the meter PLUS to the wire on the silver-gray bottom of the cell. My cell isn't getting much light but the meter needle is indicating that it is making electricity.



step 4: "Broken" or "crystalline" Cell Panels

In the last step I mentioned that the Blue side is Negative and the silver side is Positive.

Now all you have to do is solder your cells in Series to get more voltage. To do that you only need one more wire for each additional cell you add.

Remember each cell makes up to half a volt, so consider a 12 volt panel to have 24 or more cells. A few extra is good. One reason for that is a diode lowers the voltage just a little bit, and another is that it's nice to have 12 volts for charging batteries when it's not the sunniest time of day. A diode is used when the panel charges batteries, so the batteries don't give any power back to the panel in the dark. That would be a waste of free power.

Because the cells are so fragile, it would be good to install them in a deep picture frame (shadow box) with double stick foam tape or RTV glue. Be careful, this is permanent. You could make it less permanent with hot-melt glue also.

At this point you don't need to think that the cells are "already broken", and you will have a well working panel. You could hide the shard-shapes with fluorescent lighting diffraction plastic over the framed panel if you like. Perhaps you've seen a shard-cell panel just like that being sold before.



step 5: Preparing Glass (Amorphous) Cells

I received a surplus glass cell with instructions on how to use copper mesh to make a connection to the glass cell. The glass cell was pre-scratched in the area where the mesh and wires were supposed to go. But... even with the copper mesh, it didn't stick. It was doable, but hard to do, and not very strong. All the wires pulled off. Some of you may have had success with using copper mesh soldered to scratched areas of glass cells, but there is an easier way.

Perhaps you have a broken / damaged glass cell. You may still be able to use it, unless the damage has made the glass transparent, in which case there is severe damage to the photovoltaic part of the cell.

One interesting thing about the glass cells. Looking at them, you see lines, just as you may on "broken" or "crystalline" cells, but those lines are not current-collecting conductors. They are gaps between areas of the glass cell that each make about half a volt. So, glass cells can be expected to have 2 lines for every volt of output. And they can make 6 or 9 or 12 or 20 volts.

So, we want to connect the wires to places with the most amount of lines between them to get the highest voltage. And out the wires on the silver side, of course.

Scratch the silver (probably aluminum) near the edges and test the voltage and polarity, for your information. I usually use a red wire for Plus and a black or green for Negative.

Easy connection method:

You need two brass extrusions, carefully cut with a dremel (safety goggles!), and wires soldered on this side of the extrusions ---> C

The extrusion must have enough space inside it for the glass cell to fit.

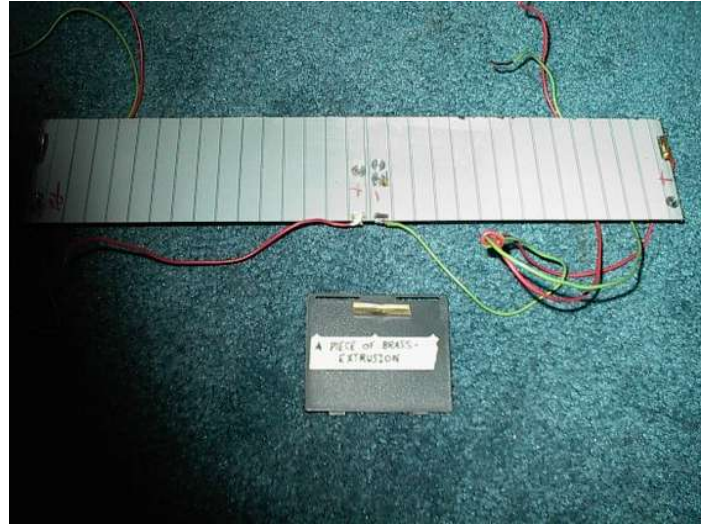
The extrusion is then crushed a little (before putting it on the glass) so that it will bite the glass with some pressure and make contact with the scratched edge.

<http://www.instructables.com/id/How-to-MAKE-PV-Solar-Panels/>

Slide the crushed extrusion onto the glass. If it's too crushed it won't go on, so pry it open. If it's not crushed enough it falls off, so crush it more. When it bites, and there is voltage in the light across the two extrusions, put stickytape or just a little plastic cement over the extrusion to help it stay there.

The Glass cell is now ready to use.

The long one shown is actually two 9-volt ones on one glass, and is the one that I put extruded contacts on because the copper mesh wouldn't stick..



step 6: Preparing Copper Indium Selenide cells.

These are rather well prepared already.

They have easy to solder tabs, and are marked which end is Negative with a dash of a black marker.

The ones I got, I mounted in frames and in an acrylic polymer sheet sandwich.

Three in series ... in parallel with three more in series ... makes nice 12 volts.

I have been advised that these cells undergo some kind of reaction if first exposed to full sun with no load for about 15 minutes, and that the result is good. I'm told that the result generates more output than if they are not treated this way. Just FYI. I didn't notice the difference between the panel that had pre-sunned cells and another that didn't.

The cells are glass tiles that appear to be made similar to the Amorphous glass, but they are more efficient, and produce around 4.5 volts and 100ma each in full sun, approximately. As they say, your mileage may vary. I have no advice for broken CIS cells.

It is very easy to connect CIS cells together. Peel back the tabs a little, which point to each other under the cell, and start to peel back the stickytape that holds it on, just enough so that you can solder them in series.

And watch the polarity! I goofed it up a couple of times.

No damage done, but I had to do it over.

When soldering, wet the ends of the tabs with solder, then press down quickly with a popsickle stick or something to flatten them against the bottom of the cells.

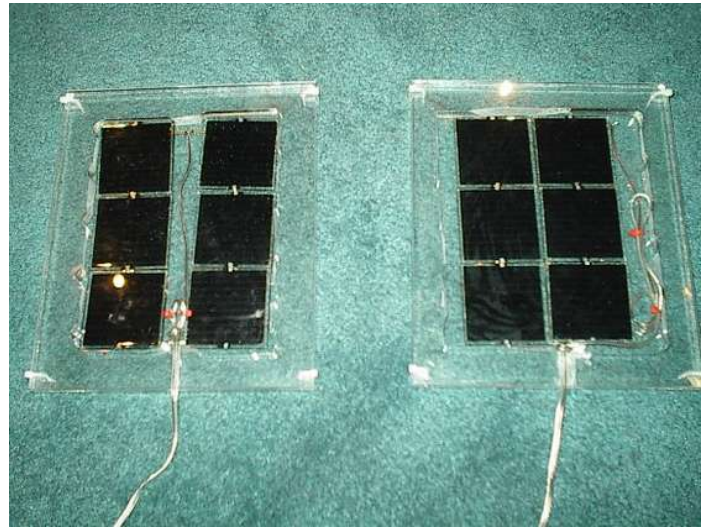
The cells go together nicely like tiles.

With moderate carefulness, you don't need to worry much about ruining them yourself, just don't leave them alone with curious people until your panel is done and safe inside a solid frame. I've fastened them with both RTV Silicone and double-sticky-foam-tape.

I prefer the Silicone glued result, with the cell tiles grouted against the glass from behind. (No silicone between the cells and the frame glass)

DSFT (foam tape) is more likely to (it has, in fact) let go of a couple of the cells.

As mentioned before, although I don't know if it's necessary for CIS cells, use a diode when charging batteries with the panels.



step 7: Applications for small solar panels

The solar panels I made and pictured generate around 1 or 2 watts generally.

These are the applications I use them for:

Charging batteries.

In the blackout of 2003, those batteries ran our blackout party, which included black lights, fans (it was a hot day), radio, small TV, and low voltage lights. And an AC inverter.

(I go to the rechargeable battery recycle bins with a meter and if they are not really dead then I borrow them until they are. I didn't buy any of these batteries.)

Solar night lights - nowadays a very common thing where I live.

Solar powered fans - although my solar panels run computer fans directly when it's hot, (The sun makes it hot, and the sun runs the fans!)

I notice that solar charged battery powered fans are MUCH MORE POWERFUL.

Solar Flashlights

Solar powered radios - including my ham radio shack.

ABOUT SOLAR POWERED COMPUTERS

I guess people don't leave their laptops in the sun...

My approach to designing a solar powered computer, (and my definition of computer is a processor with memory and a keyboard and a screen that runs not-necessarily-an-operating-system) is to use very high resistance CMOS chips which use very little electricity, just like watches and calculators... a computer is also a calculator with lots of memory, and CMOS memory is a common thing!

At night time, the computer has not used up all it's solar power so it uses what is stored in the rechargeable battery.

There is simply no demand for the solar powered computers, nor any obstacle to solar powering a PDA or a laptop with similarly sized panels.

<http://www.instructables.com/id/How-to-MAKE-PV-Solar-Panels/>

DUTY CYCLES:

In simple theory, if you get eight hours of sun and need one hour of power, you can get by with one eighth the solar power by saving it up in batteries. Also, if LED lights should run all night, it's easy to collect more than enough solar power during the day in batteries with the right sized panel.



step 8: Getting more practical power from your panel

It is very easy to get a few solar cells and put them together into a panel, but sometimes it gets expensive to get enough cells to make a useful voltage.

If you obtained one or two large cells, you may have a whole watt or two, but only a volt or less, and that's sad. Not too many things run on less than a volt.

Perhaps you got enough big broken cells to make 6 volts, but wouldn't it be nice to have 12 volts? Then maybe you could keep a battery charged and occasionally run an inverter on it.

In the last step I mentioned how time could be used to save up power for another time when it will be used. And a small panel can make enough power over a long time to run a big load for a short time.

In this step I am talking about matching the voltage of the panel, whatever it may be, to the voltage that you find useful. Or generally, matching supply and demand in a satisfying practical way.

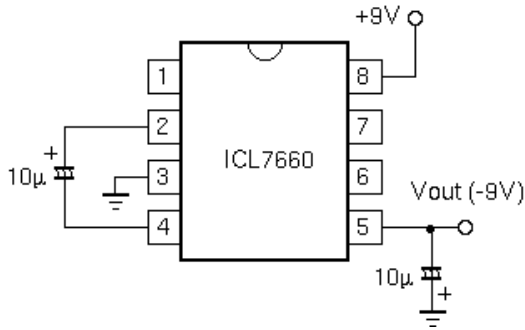
It may be possible to design a 2 volt circuit for a 2 volt panel, but unnecessary.

It is possible, although as far as I know, using obsolete Germanium transistors, to get any voltage out of a big half-volt cell, and I don't know a modern way, so I'll leave that idea alone.

But there are many voltage doubler or multiplier circuits that work at slightly higher voltages, and I see that I've made a few panels around 6 volts which I'd like to get 12 out of. There is a voltage doubler chip still available called ICL7660 or MAX1044 that is very convenient to use. So I will use it as an example, since I'd rather have around a watt at 12 volts than at 6 volts.

There is something else I did that was very obvious in the picture for step 1, where I had 3 "broken cell" panels around 6 volts and put them in series to get around 18 volts... and since the cells were large that array has a lot of current.

But if I use just one 6 volt panel and want 12 volts, I use the voltage doubler and get twice the voltage in exchange for half the current. AC transformers do the same thing... almost the same power goes out as goes in, but at a more useful voltage. Some circuits that do this are called "DC to DC converters".



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Comments


38 comments [Add Comment](#)


 **charlie564** says: May 9, 2009. 5:55 PM [REPLY](#)
Great article.


You might want to take a look at this course if you are serious about building your own solar panels - <http://budurl.com/bnff>.


The illustrations and videos are really helpful for non-techy people like me.


 **Seraph101** says: Mar 3, 2009. 9:38 PM [REPLY](#)
So are there any recommendations on some places to go to find these broken ones for the cheapest?


 **fyrspark** says: Apr 11, 2009. 9:07 AM [REPLY](#)
i've been interested in wind energy as well as solar energy for a while, I want to build my own wnd generator but there are many versions and ideas, can someone point me in the right direction and just tell me how to do it. what type of motor especially, the design portion I have down but getting the motor to produce energy is the confusing part, i.e. what kind of motor is the most effective.

 **junits15** says: Mar 21, 2009. 8:11 AM [REPLY](#)
Is that plexiglass? Where did you buy it? I can't find any place that isn't obnoxiously priced!

 **wibrle** says: Mar 23, 2009. 4:29 PM [REPLY](#)
I found plexiglass at lowes, when I was modding a computer case. Have you tried looking there?

 **junits15** says: Mar 23, 2009. 6:51 PM [REPLY](#)
I've always known lowes to have it I just though it would be pricy because it is an actual store. How moch did you pay? How much did you get?

 **wibrle** says: Mar 24, 2009. 3:29 PM [REPLY](#)
For normal 1/8 inch thick plexiglass (in US currency) \$43.99 for 36"x72", \$6.77 for 18"x24", and \$19.37 for 24"x48"; there where more sizes, but this gives you an idea. For the thick 1/4 inch plexiglass \$13.49 for 16"x24" and \$42.97 for 24"x48". Lows also carried high impact plexiglass, but it was high, so I didn't bother looking at the prices.

 **AlphaTwin** says: Jul 23, 2008. 7:43 AM [REPLY](#)
Pretty Darn cool, I've got a little different angle on this. Let me explain. I live in the Midwest U.S. It's gets pretty darn cold/expensive in the winter. With the price of Corn sky rocketing it's no longer cost effective to heat my house with my corn burner. So I started playing with electrolysis to make Hydrogen to burn in my Natural gas Furnace. The problem is if I do this with the grid I'm burning coal not to mention it would be more efficient to forgo the electrolysis step.

So here's what I want to do. I'd like to keep a battery charged from a solar panel. My output to the electrolyzer from the battery will be about 12 volts at 20 amps. Keep in mind it will only run for about 10 minutes every 20-30 minutes .

That's it, if I can get it to work it will save me about \$2000 a year in heating expenses.



curt41 says:

Alpha twin hey i have been looking into hydrogen for a furnace also. Maybe we can share ideas. please get back to me iamhr12@yahoo.com thanks

Feb 10, 2009. 10:56 PM [REPLY](#)



digitalenigma says:

i have pondered hydrogen heating myself, someone needs to make a instructable on hydrogen fuel cell heating systems powered by solar energy

Mar 16, 2009. 2:34 AM [REPLY](#)



doobiesh says:

hey guys I have a solar panel which is from radioshack but I'm not sure what is the top plastic layer is supposed to be. it looks like a bunch of tiny lenses but I'm not sure what they are.

Mar 31, 2008. 3:18 PM [REPLY](#)



Seraph101 says:

Did you ever burn ants as a kid.... Same principle, just a bunch of magnifying lenses.

Mar 3, 2009. 9:39 PM [REPLY](#)



ElectroFox says:

Doob, they are basically mini-fresnel lenses to focus the sun's energy. They use a similar technique on motion sensor lights to for focusing infrared energy to the sensor.

Jan 12, 2009. 8:57 PM [REPLY](#)



solarpaneltalk says:

thats a great instructable...your knowledge could be beneficial at www.solarpaneltalk.com

Feb 15, 2009. 2:52 PM [REPLY](#)



Donald Nathan says:

A very good project.

Nov 28, 2008. 1:45 PM [REPLY](#)



dasl says:

i want to make solar cell but unfortunatly im not good in electronics and tell me how connect wire with glass

Nov 21, 2008. 11:41 PM [REPLY](#)



MeadowMeeder says:

Thank you!!!!

Nov 6, 2008. 3:44 PM [REPLY](#)



Ausi319 says:

where can i get the solar cells?(broken)

and i can put them together i'm thinking about making a battery/solar powered go kart!

Oct 20, 2008. 1:54 PM [REPLY](#)



melvi says:

Please help spread the word- what the world needs now is a Manhattan type project to manufacture solar cells cheaply to give to everyone free and in the process create public sector jobs. Socialism maybe, but the private sector will take too long. The world needs a silver bullet right now. And this bullet tackles both the economy and the climate change crisis.

1 Trillion not enough, why not get 2 or even 3 from whatever source Bush got his 5. Seems easy enough.

If you agree - please tell your congressmen, senators and anybody who would listen.

Oct 8, 2008. 8:35 AM [REPLY](#)



panstar1 says:

I did buy broken solar cells from goldmine. I thought if this work all right !! but if it didn't it was only \$9.00. What I got though was really quit useless except for really small projects. It would be better to just wait and buy a panel made for charging then it would be to do this even so canadian tire (I am in canada) sells small panels for around 20 to 30 ,even a 15 watt panel goes on sail once and a while. but for me I just don't think would think help me solve my problem. IE. parents have a camp not hydro so they use a generator /battery iron lead I think so I though this instructable could have been useful. But all in all this would be good for cell phones or mp3 ,i-pods though. I hoe tis is usefui

Sep 13, 2008. 12:52 AM [REPLY](#)



rpvanpatt says:

I am wondering how much power you can get from something like this. Also, what you could power or charge with it. And this may sound stupid, but can solar panels receive energy bouncing off a mirror? Thanks

Oct 1, 2007. 11:45 AM [REPLY](#)



VIRON says:

Solar panels do receive energy reflected from a mirror and occasionally they are used with mirrors to collect more light or collect light from a different angle when the sun moves.

In the picture above (IN STEP 1),
, I put in series a 5 volt, 6 volt, and 7.5 volt panels I made from broken cells which were sorted by approximate size. The 5 volt panel made about an amp in full sun so it's 5 watts. The breaking of a solar cell in half generally makes two cells with half the power.

The whole thing with the 3 panels stuck together in series is about 10 watts in full sun, that's over 12 volts and "almost" 1 amp.

It can charge a car battery during times of full sun, and when the car battery is needed, it has stored up enough power to give a LOT of power for a short time (which is the normal use of car batteries anyway). I charge 12V batteries with solar panels to run radios (ham or CB) and lights if, when, and where utility power is not available.

Usually, 15 to 18 volts panels are used to charge a car battery, so there is still extra charging voltage when it's not full sun. Most consumer car-battery charging panels put out about 200 mA at 15 or 18 volts, and are intended for cars not driven often.

A car battery can power small plug-in things (few hundred watts) if they are plugged into an "inverter". This can be scaled up with more cells, panels, and batteries, but then it helps to know a smart electrician. Usually heat needs the most power and is done with water-heating panels, which are plumbing rather than electric.

A solar powered hairdryer may be a particularly troublesome thing.

Oct 1, 2007. 3:29 PM [REPLY](#)



urthlvr says:

My son is going to do a science experiment on solar power for a car. Can you please send me instructions on how you are doing it to: lenorebrunk@sbcglobal.net?

Aug 24, 2008. 1:06 PM [REPLY](#)



viraldalal says:

hi there i jst want some info frm u that i m very much intrested in building my own solar panels and stuff so pls can u suggest me is ther any school or college to learn that or i can make solar cell or panel myself so pls kindly if u can give me some information regarding this thank you

Apr 17, 2008. 8:05 AM [REPLY](#)



rpvanpatt says:

if i were to make some panels like yours, and have a battery, it could run a tv or somethin maybe? or lights? im sorry im just tryin to get a feel on how much power(havent taken physics in a while) i can get when i make my own

Oct 1, 2007. 6:34 PM [REPLY](#)



VIRON says:

I have a 12 volt TV that I think works on the 10 watt panel in full sun even without a battery. Small LCD TV's may be even easier to power.

Oct 1, 2007. 9:18 PM [REPLY](#)



alex-sharetskiy says:

wait, so in the circuit (voltage doubler) ground is positive??

May 17, 2008. 8:26 AM [REPLY](#)

Electronic-goldmine has super cheap solar panels right now, \$1.00 for 0.5v and 0.4-0.5 amps i'd buy them, (If i had a credit card.)



Etitan says:

Quick note:

Watts = volts * amps

so .5 v * .5 amp = 0.25 w for \$1 (the link now says \$1.89), which comes to \$4 (\$7.56) per watt

I mention this more as a warning, I've seen a few places offer solar cells or "cut"/broken down pieces of panels for prices about this, where when all is said and done the price doesn't work out to be a good deal at all.

Jul 23, 2008. 9:35 AM [REPLY](#)



alex-sharetskiy says:

ya, the PV cell's aren't on sale anymore, bummer, got any links to fully functional, non-broken, cells? (which are cheap)?

Jul 23, 2008. 2:14 PM [REPLY](#)



darcylu says:

Jul 18, 2008. 3:39 PM [REPLY](#)

I am just getting interested in solar/renewable energy (thanks to ed!) so please forgive my ignorance. After looking at panel system prices, even w/ the rebates & tax incentives can still be quite costly... this is why I am now researching building our own solar panels. After reading the comments on Oct 1, I take it your instructions are for small scale ? not full house operation ? I have been printing & reading all kinds of info but have no electrical tech background so I am confused... please advise if I am on the right track...



VIRON says:

Jul 18, 2008. 11:02 PM [REPLY](#)

I consider the DIY making of solar panels from broken cells practical for charging 12 volt battery systems. It seems to me and my friends the best market value for ordinary solar panels is currently about 4\$USD per watt. But broken cells can be obtained cheap if people are willing to do a little extra work to make them useful.



John Smith says:

Aug 13, 2007. 10:38 AM [REPLY](#)

Not my kind of thing, but it was VERY well written, and even I understood most of everything. Excellent job.



orange29 says:

May 3, 2008. 5:49 AM [REPLY](#)

You would think that in the 21st century, the price of solar panels would be less.

I plan to add some articles on solar panels to my website 'Ideal Homes'



stantheman1955 says:

Apr 11, 2008. 9:27 PM [REPLY](#)

I would be interested in hearing the feasibility and possible construction design thoughts to buying broken cells and creating a grid that would fit on a roof of a house in central Florida that measured say 25 by 60 feet. How much potential out put could be realized using the step up circuit mentioned in one reply. I would like to explore using clusters of led lights through out my 1000 so ft house from a battery bank and only use the grid for what is absolutely necessary at the moment such as the TV my computer and power tools in my shop. this is a great article and am looking forward to reading about what others are doing and one day contributing my self.
thanks for your advice.



Dr_Acula says:

Aug 27, 2007. 6:52 AM [REPLY](#)

Ok, back from the shed. I have salvaged at least 10 watts of cells that I thought were useless so thanks again to this article. One thing I have found is soldering to solar cells - solder fluid (30% zinc chloride) helps a huge amount. Put a drop on the area to solder and wait 10 seconds for it to etch and then solder.



Dr_Acula says:

Aug 27, 2007. 4:24 AM [REPLY](#)

Great article - I'm off to the shed to recycle some broken cells! One of the problems of building panels with lots of cells (eg 36 for a car battery charger) is the current is limited to the size of the most inefficient cell in the group. So there may be an advantage to building low voltage panels and stepping up the voltage. For example, 4 cells and a diode will charge a single NiMH rechargeable (6 cells if you want a charge under heavy cloud conditions). With some cunning electronics using a latching relay it is also possible to eliminate the diode and associated losses.

I have been inspired by a circuit that steps 1.2V up to 5V <http://www.talkingelectronics.com/projects/PowerSupply5vSolar/PowerSupply5vSolar.html> and have modified it into a circuit that steps 1.2V up to 9V http://www.geocities.com/drvernacula/315_mhz_solar_powered_radio_rptr.htm

Other outputs up to 20V and more can be designed by changing the voltage divider components. Whole solar cells are \$10 a watt and broken ones are as low as \$1.60 a watt so there is a big incentive to use broken ones.



woobily says:

Aug 16, 2007. 1:58 PM [REPLY](#)

Very well written, I agree. Nice idea about recycling.



meddler says:

Aug 13, 2007. 2:07 PM [REPLY](#)

I'm not very good with electronics, but i would like to try this.