

# How To Generate Energy In The Desert

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When people think of deserts, they picture extremely dry terrains with intolerable heat in the day that is quickly changed to extremely cold temperatures at night.

Despite this harsh environment, some energy generating methods may work better than others. Actually, electricity can be generated in these areas regardless of whether there is a crisis or not.

Bear in mind, however, that along with any given crisis situation, you will also have to account for characteristics of the land and its inhabitants.

## Be Aware About the Risks!

Large scale solar power is a key to energy independence here in the United States, and desert areas seem to be the best place for solar panels and equipment. But those with an interest in off gridding and survival also get led the wrong way.

There are many problems you might go into when trying to generate power in the desert:

### High Temperatures Increase Risk of Fire

Motors, gears, engines, and other machines all generate heat as one surface moves against another one, in locations where temperatures are already high, which means they will catch fire much faster. Solar panels in the desert lead to endless numbers of massive fires that kill off habitats and spell immense levels of danger to anyone living near them.

Military bases located near the panels have also complained about how excess heat from large scale solar interferes with planes landing and taking off. At the personal, survivor level, a solar cooker may work really well, but you will also have to keep the temperature from going too high.

Small scale, home based solar panels are also known to come with an increased fire risk, which means more water may be required than you will be able to obtain in a desert setting.

### Not Enough Water

To generate electricity using heat from solar installations will take large amounts of water. In fact, it is estimated that large scale solar installations use almost as much water as refining crude and fracking. Cattle, horses, and all kinds of wild animals die because there is not enough water in the desert for both the use of solar power and sustaining living organisms.

Poisonous snakes are plentiful in desert. No matter whether you use a wind turbine, solar panels, or other devices, rest assured that rattlers and other poisonous snakes will be drawn to your home and power generating facilities. Never forget that many snakes can also burrow underground and pose other hazards as you try to build or maintain both large and small scale power generating equipment.

### Sand and Sandstorms May Ruin Equipment

Sand is a highly abrasive and can easily damage wind turbine blades and just about anything else. In addition, sand particles can easily clog up motors and just about anything else that works best when free of dust and debris. All kinds of equipment (including battery systems and generators) need special protection to work properly in a desert environment.

## High Variance in Temperatures

High variance in temperatures will make it difficult to use body power generation systems. No matter whether it is too hot to move around during the day hours or too cold at night, even a lightweight system will prove virtually useless in a desert setting.

## The Hidden Advantages

As with any other terrain and situation, there are things that can make the desert a kind of place where you may feel that challenges are outweighed by the problems you will encounter. Here are some of them:

- Contrary to popular belief, desert areas do not get more sun than other areas. The terrain and temperatures are so inhospitable, the human population is very low. If you can manage to live comfortably there, you won't be as concerned about defending your power generating equipment from thieves.
- In most scenarios, your first instincts include trying to harness solar or wind power, and unlike other areas, you'll have very few tall objects to compete with. Even though the amount of sun and wind reaching the desert is the same as everywhere else, you will actually have a much easier time accessing it.
- Passive heating and cooling systems can be turned into power generators with less effort. Since temperatures vary extensively in a 24 hour period, you can use the transition points for a number of applications that would not work as well in other settings.
- Overall, you'll need to generate less energy than in other settings. Cooking can easily be accomplished without using electricity or conventional fuels, and you may not need conventional fuel, electricity to heat for cooling the buildings. Outside of medical, communication devices, and refrigeration for foods, there will be very little need for large amounts of electricity in a desert setting, which means that smaller scale DIY based electricity generating systems may work perfectly in this setting.
- Minimal corrosion and rust. When you have motors and other metallic objects, one of your greatest problems will be the development of rust and other forms of corrosion. In a desert setting, motors and other objects of metal will rarely, if ever rust out. Just remember that flying bits of sand can still damage equipment, and that you'll still have maintain your system from being ruined.

## 5 Small Scale Power Systems

Solar panels and wind turbines are primitive at best, cost a lot of money, and may not withstand the test of time let alone be capable of producing electricity after a major crisis. On the other hand, newer devices with fewer moving parts and degradable materials may well work in desert.

While some of these technologies may not yet be available to consumers, keep them in mind and see what becomes available as time goes by.

## Thermocoupling or Heat Junction Systems

Basically, these systems generate electricity when heat moves from a warmer substance to a cooler one. In this case, as the energy moves from one substance to another, it also generates an electrical charge. For example, you can take copper and iron wires and generate electricity when heat transfers from one metal to the other.

## Steam Generators

Since deserts offer higher temperatures, generating steam can be done on small scale levels and be successful. You can use something as simple as a modified solar oven to heat up water, or use more complex systems based on large scale technologies. Your next step will be to use the steam blasts to turn a turbine, which will have magnets attached to it.

As the turbine spins, the magnets will also spin and cause electricity to flow in a nearby coil. Just remember that water is limited in the desert, so you will have to make sure that you can conserve and reuse what you have in the system as much as possible.

## Air Based Generators

Simply heating up air will not work the same way as converting from water to steam. Even though heating up air causes it to expand, the force generated is not as much as you can get with steam because vaporized water is still denser than air.

To take advantage of air pressure, it is much easier to simply take air at lower temperatures, compress it, and then release it through a nozzle. If you are interested in using a pneumatic type of system, combine gravity operated motors to compress the air, and then release it onto a lightweight turbine.

## Aerogels

This is a fairly new technology that relies on nano particles and strands to create ultrathin pieces of matter.

For example, zinc dioxide, can be shaped into very thin hairs that will behave differently than large quantities of the same material. Zinc Oxide at the nano level will push electrons along a nano wire instead of releasing heat when the wires are placed in a silicon aerogel.

While this research is very much in its infancy, there are many other materials, including low viscosity liquids that might be made into sandwich layers that might function like zinc oxide and silicon. Unfortunately, we actually know very little about all of the materials that are available in a desert environment as well as how they may be used in a similar fashion.

## Rubber Band Heat Engine

One of the most fascinating things in a desert terrain is just how much of a temperature difference there is between areas exposed to the sun and those in the shade. With a minimal amount of effort, you can use that temperature difference to drive a rubber band heat engine.

You can generate a bit of extra heat using a solar cooker, or keeping some other heat retainer near the end of the wheel where the rubber band is supposed to contract. As with other power generation methods, you will always seek to convert this spinning energy into electricity using magnets and coils.

<https://www.youtube.com/watch?v=0igUqDg7f98>

Video first seen on [Dan Bruton](#).

## Large Scale Systems You Can Build

### Solar Power

Unless you have a fairly large group of people that require electricity, large scale solar systems would cost more than they are worth in a desert setting. For example, if you choose to try and build or maintain solar panels, the glare from them will easily capture attention for miles around.

This can spell disaster in the post crisis world, as well in the pre-crisis world where there is a constant push to prevent people from living off the grid.

### Wind Power

Aside from [wind turbines](#) that require towers, there are some new turbines that can sit close to the ground. You could learn more about wind turbines that produce power when a pole is shaken. No matter whether sand or wind hits the pole, it will still generate electricity from the motion.

### Hydroelectric Power

If you live in an area where you can get water from the ocean or another large body of water, it may be possible to generate power by transporting that water through underground pipes that house turbines at certain intervals.

This particular system is already being used in Israel, and even at low flow levels, produces about half the power of a hydroelectric dam. Just search for the Leviathan Hydroelectric project and give some thought to how it might work in a desert region closer to home.

If you are planning on building a bug out location in desert terrain, this may be even more incentive to establish yourself near a body of water.

Some desert regions have as much, if not more water flowing beneath the surface than you would find in other areas. Before purchasing land or deciding on any given area, be sure to study the water tables so that you know how deep you would have to drill for water.

If you happen to find a place with plenty of water, it may just be possible to create a pipe system that will generate more power with less problems than you would encounter with wind or solar generation methods.

## Alternatives to Electricity

While generating electricity may be more of a challenge than expected in a desert environment, there

are still many alternatives that will not work as well in other regions. For example, passive heating and cooling systems in a desert setting work well because of the rapid change in temperature between shade and full sun as well as between day and night.

Here are some other things you can use in a desert that may work better here than in other climates:

## Solar Cooking and Cooling Devices

In most areas, your ability to use solar cookers during the day and solar coolers at night will depend on clear skies. Since it rarely rains in the desert, there are also very few cloudy days to worry about. As such, you can build both smaller and larger scale solar cookers to meet your food preparation needs.

You can also achieve good temperature reduction at night by simply aiming the solar collector at a clear area of sky.

## Water Purification

In most settings, you will always be looking for enough fuel to purify water. On the other hand, in a desert setting, full sunlight can easily kill off any bacteria in the water in a minimal amount of time. If you need to distill the water in order to remove heavy metals or other chemical contaminants, you will also have plenty of heat available for this task.

## Evaporative Refrigeration

The ability of [Zeer pots to cool off materials](#) in the inner chamber depends on how much water can be moved from the inner area to the outer one. Since desert air is very hot and dry, you will actually achieve a greater cooling effect than you would in cooler, moister climates.

You can also expand on this design to take advantage of other materials that wick water easily in order to build larger refrigerator units.

## Solar Lenses

When you need to concentrate heat for cooking, purifying water, or some other task, you may not be willing to wait an hour or more for the appropriate temperature to be reached. There are many lenses on the market that are designed to harness sunlight to produce several hundred degrees of heat in a matter of minutes.

Just be sure to operate these lenses in areas where they will not create fires. Even a low-grade magnifying glass can start fires in much cooler temperatures.

## Food Storage Alternatives

The heat of a desert setting is more than enough to cause many different kinds of foods to spoil. On the other hand, there is nothing quite like hot, dry desert air for drying foods. No matter whether you grow fruits and vegetables indoors or hunt for meat, all of these foods can be easily preserved by simply laying them out to dry.

Individuals that use electric food driers and other gadgets are sure to be surprised at how much better the foods taste, as well as how much easier the process is.

## Obtaining Water

You will more than likely need an [electric water pump](#) if you have a well in the desert. Since these wells may go down several hundred to several thousands feet, a hand pump may not be a viable option. You could also have a pond or other nearby source of surface level water to draw water from with a ram pump or Archimedes Screw.

Or you could have a system that can draw water from the air, but it's not likely to draw enough to meet your needs.

Under the circumstances, keep in mind a few things when obtaining water without using electricity:

- making sure that any and all water is used and reused as much as possible, including taking waste water and dumping it into a sand pit during the early morning hours. Next place plastic over the pit with a rock in the center of the plastic. You can capture clean water in a pot or bucket as the moisture evaporates and hits the plastic instead of escaping into the air.
- Setting up rain barrels and cisterns that can be used to capture any rain that does happen to fall. You can also set up large tarps so that you cover as much area as possible. Rains in the desert tend to be very intense, and they will also depart as quickly as they arrive. As such, you will need to capture the water quickly, and then store it in a location where it will not evaporate before you have a chance to use it. You will still need to purify the water before you use it in order to make sure it is as clean as possible.

Generating power in a desert setting will come with many challenges. If you find yourself in the desert and know that you must survive there for some time, there is no reason for your life and well-being to be threatened by lack of electricity.

You can take advantage of many alternatives to using power that may be impractical or far less feasible in other settings.



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This article has been written by Carmela Tyrell for Survivopedia.

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