

Off-Grid Light Sources



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Sperans optimum ad pessimum praepara

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Light is needed for a lot of things more important than walking down the hall and having a plan for light if you lose power is another important step in becoming prepared for any emergency. If you don't already, you need to have back-up lighting for your home, bug out vehicle and person so that you won't be hampered in a low or no light situation. There are several low-cost options that we will be discussing that can allow you to see through the darkness when you need it most. Remember: even a small amount of light can make a significant morale difference in one of those situations where the power is out for even a few hours. Of course, if you have an effective off-the-grid power supply, your need for these solutions is diminished.

Flashlights

Hands free lighting with headlamps.

If you are going to be moving around we have to recommend that you obtain a headlight. We have Petzyl headlamps in our 'go bags', our Bug-Out Bags, and in most of our Every Day Carry bags. There are several other useful brands and these are available at Amazon, Cabela's, Bass Pro, and many other sporting goods or hardware shops. Most use AAA, AA, or 123 batteries so you aren't stuck with hard to find battery types and can easily use rechargeable batteries. Get the ones that you can adjust the tilt so you can easily shine the light on your lap if you want to see what you are eating or out ahead to light up the trail as you walk. They are held on your head by a comfortable elastic type of band that isn't too tight and is easily adjustable. They are useful for every task that you need both hands for from changing a tire to performing minor surgery at the camp site. When you aren't using them, just pull them down around your neck. Some lights have a strobe function... I have yet to find a use for this, but I suppose that it could be useful to pinpoint your location to a searching aircraft. An alternative to the headlamp is the USB light discussed below. This allows a point light on the work area.



Standard flashlights



Standard hand-held flashlights certainly have their place as well and we have several different types and styles of these. Our usual choice is Maglight because of their robust construction, interchangeable parts and bulbs and availability in both halogen and LED (both aftermarket and direct) bulbs. We have often found them on sale at hardware stores with significant discounts. Both of us like the size of the C cell varieties, but Maglight seems to be phasing these out in favor of the larger D-cell. Multiple other brands exist that are comparable and range from cheaper to far more expensive, we just like Maglight. Avoid the dirt cheap flashlights that will fail when dropped and have flimsy construction.

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We also have multiple Stream-light stylus pro pocket lights and these robust and long-lasting lights are in every kit. They have the shape and size of a large pen, take AAA batteries, have an on/off switch that functions for both momentary and continuous light and are readily available for as little as \$20 each. For the size they are quite bright. We also add to most kits one or two of the flat 'disposable' LED lights that are give-aways at many conferences.



Hand crank lights

We have a couple of the crank-driven lights that are built into an emergency weather radio. We don't plan to use these for our lighting needs, but the availability of a crank-powered disaster radio seemed useful. When it counts, I want bright light that can help me see what I am looking for, or illuminate what I am trying to do. The hand-crank lights on these radios just aren't the best solution.

Batteries

Batteries are an important consideration with flashlights. Get both rechargeable batteries and a solar recharger to keep your lights supplied with plenty of power for a long time. Remember that we keep most of our larger flashlights with batteries removed and taped in a plastic bag to the light. This keeps the batteries from leaking and destroying the light, yet has them readily available. We usually have 4 batteries packed with each two cell light. We also have adaptors that allow us to use one or two AA cells to replace D cells or 1 AA cell to substitute for a C cell. These AA adaptors have significantly shorter life-span than the C or D cells, but have the advantage of a more common battery and one for which rechargeable are easy to find and recharge.. We have discussed recharging solutions in our alternative power supply monograph. There are multiple manufacturers of quality solar chargers. Brunton and Goal Zero make good products, but we haven't conducted an extensive review of solar charging devices, so your mileage may vary.

Candles

Candles are probably one of the oldest forms of light. They are simple to use, require no electricity, but they do have drawbacks as well. Candles do not put off much light. A single candle can light things up enough for simple tasks, but reading with a single candle is difficult. A candle lantern with reflector will help obtain more useable light from this source and make it safer.

Candles also are an open and exposed flame. Candles should be carefully considered for your primary lighting needs and great care should be taken in their use and position in relation to everything else. With any type of flame based lighting it is important to have proper fire extinguishing equipment close by in case of any accidents and we would never recommend leaving candles lit when all parties are sleeping.



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You can also cook or warm up food with candles and they do put off a good bit of heat so in a colder situation this can have a double benefit. Catholic votive candles or large decorative candles can be used for inexpensive survival candles. <http://www.candles4less.com/> provides these and other useful candles at reasonable cost.

Candle Lantern with reflector

Or... Make your own!



Plans available at: <http://inmyownstyle.com/2011/06/trash-and-thrift-store-treasure-outdoor-candle-lantern.html>

Lanterns

There are a few different types of lanterns that I have or have considered for light if the power goes out. Lanterns are commonly used in areas where grid power is not available and robust design and safety features are available at reasonable cost. Lantern light is inherently EMP-proof. Lanterns are HOT. Don't use them where knocking it over is a possibility or in locations where something flammable is within three feet of the top of the lamp chimney - if you do, they will start a fire.

Propane Lanterns

Propane lanterns are superb sources of light and we have several that we use for camping and as a backup for power outages. The lights are a potent source of heat and can readily warm a tent or room. The mantle in a propane lantern typically contains thorium or other rare-earth salts; on first use the cloth burns away and the rare-earth salts are converted to oxides, leaving a very fragile structure which incandesces (glows brightly) upon exposure to the heat of the burner flame. Mantle lamps are quite bright.

Unfortunately, the mantle is quite fragile. You can move the lamp, but don't jar or move it suddenly or the mantle will break. The mantle is easy to change and get going again, but ensure that you know how and have plenty of spare mantles. The lamp also makes a hissing noise.



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Burning propane needs to be vented though so you don't want to use one of these in your house without adequate ventilation. We purchased many disposable cylinders and have adaptors for our bulk propane (20 pound tanks) cylinders and spare mantle wicks so that I can use these lamps for a long time if needed. Although not expressly recommended, there are adaptors that allow you to fill a disposable cylinder from a non-disposable tank. This lamp is my ideal dual-purpose light that is safe enough (with those exceptions I mentioned) if your power goes out or if you are out in the woods. In a widespread SHTF situation, propane availability may be somewhat limited.



Propane lantern with distribution tree and non-disposable cylinder.

We also recommend a distribution tree so that you can use refillable cylinders with both your light and with your camp stove. This partially solves the propane availability, since propane 20# cylinders are readily refillable.



Kerosene lanterns

Kerosene lanterns come in two major varieties: Wicked lamps (also called Hurricane Lamps) and pressurized (or mantle) lamps.

Kerosene wicked lamps have a wick as light source, protected by a glass chimney or globe; lamps may be used on a table, or hand-held lanterns may be used for portable lighting. There are three types of kerosene lamp: flat wick, central draught (tubular round wick), and mantle lamp. Kerosene lanterns meant for portable use use a flat wick. One good thing about propane is that you can use the same fuel you have stored already for your Kerosene heater. Amazon has these on sale at 4 for ~\$20

http://www.amazon.com/4-Guide-Gear-Hurricane-Lanterns/dp/B00B4W8186/ref=sr_1_9?ie=UTF8&qid=1409000270&sr=8-9&keywords=kerosene+lantern

Pressurized kerosene lamps have a gas generator and gas mantle. They produce more light per unit of fuel than wick-type lamps, but are more complex and expensive in construction, and more complex to start. A hand-pump pushes air under pressure into the fuel reservoir which initially forces liquid fuel from a reservoir into a vaporizer. Vapor from the gas generator burns, heating the mantle to incandescence and also providing heat to the fuel reservoir to get more fuel vaporized so that additional pumping is not needed. (Propane lamps use similar mantles and construction noted above.) Probably the most common brand in the United States is the Coleman lantern. Petromax and Tilley are other commonly



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found manufacturers.

Some kerosene lamps can use alternative fuels such as gasoline, diesel fuel or aviation jet fuel. Eventually these fuels may be exhausted in a SHTF situation, but this could take a while. The illustrated dual fuel lantern can burn unleaded gasoline or Coleman fuel. You can switch this lantern over to a 'regular' kerosene lantern by using an alternative gas generator if desired. Hurricane lamps can also burn diesel fuel although it tends to leave a bit more carbon. A YouTube video shows the use of kerosene vs diesel in these lamps: <https://www.youtube.com/watch?v=7c1ecUEzBpQ#t=399>

Kerosene lanterns are clearly a good option, but they like propane need to be vented indoors. Kerosene wick lamps have the same potential problems as oil lamps and candles with spill if dropped and broken. Generally pressurized kerosene lamps have robust construction and don't spill kerosene when dropped. All kerosene lamps represent an open flame hazard.

Oil lamps



Oil lamps can put off much more light than a candle and have a sturdier base. If you have a reflector, the light is magnified slightly and makes a better choice for a whole room light. Also, with oil lamps, you can walk around a little easier with them since most have a guard over the flame to prevent wind from blowing directly on the light. Multiple types of oil have been used to power oil lamps and substitute oils may be procured even when the SHTF. Olive oil has been used in these lamps and you can burn used cooking oil in an oil lamp, if you need to.

Oil lamps and wicked kerosene lamps are dangerous potentially if they are dropped or the flame touches something else. I would recommend that you ensure a great deal of care is taken using them.

<https://www.youtube.com/watch?v=tvWrzb8iuNw#t=35> has a tutorial on oil and kerosene wick lamps.

Another type of oil lamp that 'sort of' combines the utility of the oil lamp and the pressurized mantle is the Aladdin mantle lamp, an unpressurized mantle lamp. The Aladdin Mantle Lamp Company is the only current manufacturer. The principle of the Aladdin lamp burner is to produce a blue flame (virtually 100 % combustion) for maximum heat output. This heat causes the mantle to incandesce. The Aladdin emits approximately 2500 BTUs of heat per hour - a hot lamp. The Aladdin lamp emits 60 candlepower of white light without the need for pumping or constant hissing noise. They are available on Amazon for about \$100.



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Battery powered lanterns (and solar lamps)

LED battery powered lanterns can softly illuminate an entire room without consuming a case or two of batteries or requiring you to store flammable liquid fuels. These battery powered lanterns can also have small fluorescent bulbs that are less efficient than LED's but significantly better than incandescent light bulbs on the battery budget.

Since they use common batteries, rechargeable batteries are a good option. With appropriate recharging capacity, LED battery power can last a long time, are quite safe, and are readily portable. The ability of LED lights to survive EMP is simply not known.



We also find that LED USB powered lights are a useful addition to your lighting repertoire. They can be powered by any USB power source and placed to help light a work area or project. Goal Zero makes a very good USB LED light that we carry in our go bags.

Please note that the only difference between these battery powered lanterns and lights provided by solar power (such as solar path lights) is the size of the battery being charged by the solar power cells and the intermediate use of common AA or similar batteries. You could charge solar path lights during the day and bring them into the house at night. We have several Goal Zero AA/AAA solar battery chargers that we use to charge our AA cells. More suggestions for solar lamps and potential uses of the lighting and charging capabilities of solar lamps can be found at <http://prephappy.com/prepping/6-ways-to-hack-outdoor-solar-lights-for-survival/>. These lights are often available on special sales for quite reasonable prices. We found some ideal LED work lights as 'fence post lights' from Harbor Freight. The buyer should beware that solar path lights often use the least expensive batteries and improvement in duration and brightness can be made with installation of better rechargeable batteries. The spotlight versions of solar path lights tend to have larger batteries and solar cells.



Chemical Light Sticks

Light sticks are waterproof, do not need batteries, are inexpensive, and are disposable. They can tolerate high pressures, such as those found underwater. They are used as light sources and light markers by military forces, campers, and recreational divers doing night diving. Light sticks are considered safe for use in explosive environments. They have a 4-5 year storage life. They give off less light in colder temperatures. You're better off sticking with the yellow or green chemical light sticks, as they apparently last longer and are brighter than other colors.

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Because they're sealed and basically unbreakable, and they don't get hot, they are safe for kids to use unsupervised. From a power outage standpoint, they're safer than a candle or a lantern for getting around a dark house. An added bonus is the hole at the end, which allows the user to attach a lanyard and free up their hands.

We keep a 'few' light sticks around the house and in the vehicles because they are safe around spilled gasoline and both of us are emergency responders. We don't consider light sticks to be a long term SHTF power out light solution. They are consumables. They can't be reused/recharged.

Conclusion

Hopefully, this gives you some ideas on lighting options for emergency situations and how you can be prepared to keep the lights on even when the power is out. Our best advice is to prepare with multiple sources, using different fuels/power sources and ensure that you have abundant spares of parts such as mantles that can burn out/break/die. Ensure that you have spare parts for all of your light sources.