Backup Power: Keeping the Lights (and Other Stuff) On

Why Backup Power
- High winds in Northern Utah – September 2020
- Polar Vortex in Texas and the South
- Rolling Blackouts in California
- Other weather events – heat wave
- Earthquake – Something we are very prone to
- Cyber-attacks…hitting the news lately
- EMP – Natural or man-produced. Solar storm, High Altitude Nuclear Detonation
- Severe pandemic
- War, terrorism, sabotage – Metcalfe substation

Where Do I Begin?
Decide how much energy you need to run critical loads.
- Medical equipment?
- Fridge?
- Freezer?
- Lights?
- Communications?

Calculate energy consumption.
- Labels on appliances/devices
- Online resources
- Power consumption meters
Remember to factor in start-up demand in addition to running demand
What are my Options?

1. **Fuel based** (gasoline, diesel, propane, natural gas)

2. **Solar/Battery**

Each has advantages and disadvantages and come in a variety of sizes.

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**Fuel Based Generators**

- **Gasoline** – most common, can get from cars, more dangerous to store
- **Diesel** – more energy per gallon, stores better, safer, but can gel
- **Propane** – less energy per gallon, generally safer to store
1. Standard Generator
- Generally larger
- More powerful
- Don’t adjust to load
- More noise
- Power not as clean

2. Inverter Generator
- Newer technology
- More efficient
- Easy to maintain
- Quiet
- Clean wave form
- Very portable
- Scalable
- Add other units in parallel
- More expensive
- Lower outputs
Fuel Based Generators

**Advantages**
- Portable
- Great Power

**Disadvantages**
- Safe, legal fuel storage
- Carbon monoxide issues
- Noisy

**Maintenance**
- Require maintenance
- Run at least quarterly
- Use fuel stabilizer
- Spare parts

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Solar/Battery Based Systems

1. Roof Top Solar
2. Solar Power System
3. Portable Power Stations

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19 20 21 22 23 24
Solar/Battery Based Systems

Advantages
- No fuel to store
- No carbon monoxide
- Silent

Disadvantages
- Less powerful
- Batteries are weak point

Maintenance
- Lead-acid batteries require "irrigating" and equalizing charges
- Spare parts