Expanded Capabilities For 'UPS' Backup Power Systems

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We've written from time to time about what members can do to prepare to ride out the inevitable outages that happen in Co-op country: prepare emergency water and food supplies, flashlights, and battery radios, and network with your neighbors to lend a hand if needed.

Part of an outage strategy may include backup power systems. We believe the Co-op provides objective advice about high-quality products and safe practices for members who want to invest in a backup system. With each Co-op Currents article we have also described an alternative to the typical engine-powered generator many members might think is the only choice for backup power. A properly installed generator may still be a common solution for residential member households. However, there are a number of members who would be physically challenged to move, connect, start up, and maintain an engine-based generator.

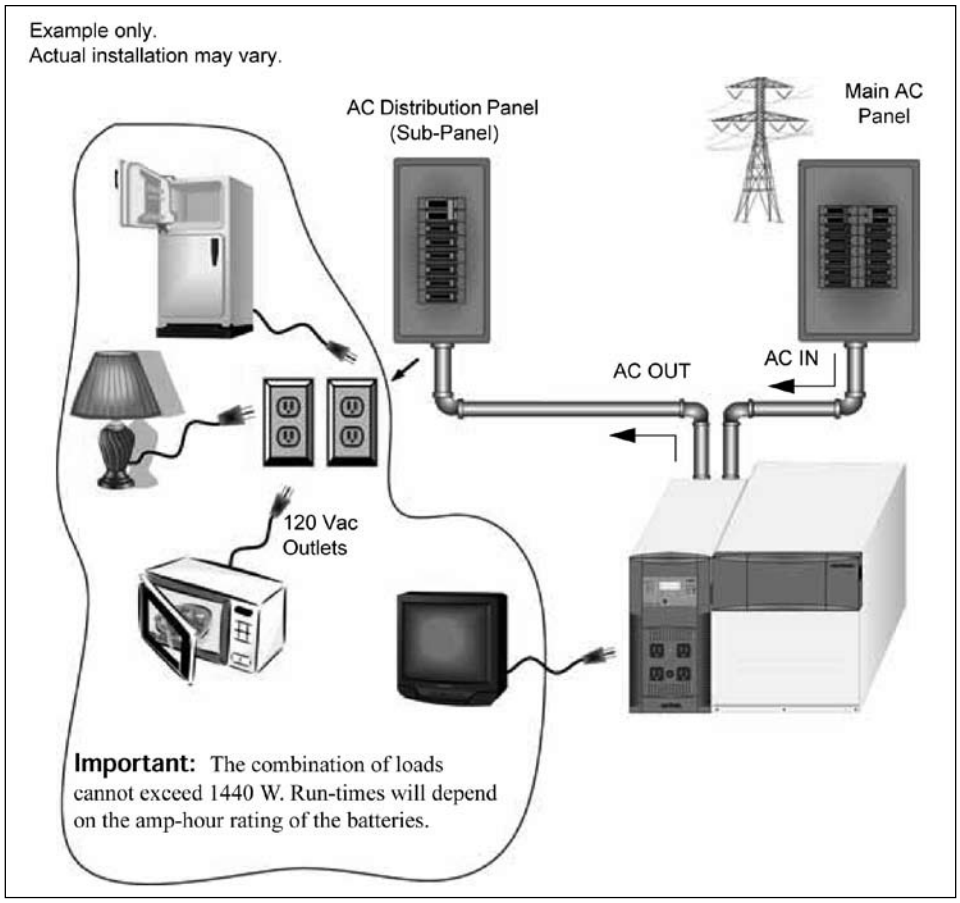
So the Co-op has been promoting the use of a battery-based backup option for members who wish to take on the additional investment. This option is called an uninterruptible power supply (UPS). Typically a UPS would have a cost two to three times higher than a generator of similar capacity. More precise estimates of cost would depend on particulars of each member's situation.

The benefits of having a UPS include: no noise, no need to move the equipment into place to operate it, and no combustion fumes. Plus, it works automatically, whether you are at home or not.

This UPS option evolved out of the growth in computer use in businesses and in homes. Computers don't do well when the power goes out suddenly. A computer UPS combines a battery and a surge-protection device in one box, and has enough battery-stored energy to be able to carry the computer's load for a short period – typically, long enough so the computer can be safely shut off without loss of data or files. Most computer UPS devices now are also able to affect a shutdown of the connected computer, even without an operator doing so.

But the UPS concept is not limited to computers. By increasing the size of the battery, the same device can provide backup to any number of residential electric loads. The Co-op believes that members who are considering installing a means of providing emergency power supply for outages should consider a residential UPS system along with other options.

The UPS concept has roots also in the renewable energy industry, and today the notion of a "whole house" UPS can also embrace on-site generation systems, typically from solar electric



Typical wiring schematic for 1800 watt uninterruptible power supply (UPS).

(photovoltaics, or PV). The Co-op believes this type of home electric system will likely become more common as members seek their own renewable energy sources to complement or partially replace Co-op power, as well as providing a backup when the grid goes "down."

The main differences between the two UPS devices shown here and a "whole house" UPS are in the cost and size of the device, and the amount of energy stored in batteries.

One UPS manufacturer (www.xantrex.com) has an 1,800-watt UPS, which is rated at 80 percent of its full capacity for sizing purposes, or 1,440 watts (see fig. 1-5). This amount of power will operate: (1) the fridge; (2) a boiler or furnace; and (3) some lighting. It will not, without an additional component called a booster transformer, operate a typical 240-volt submersible water pump; it could operate a 120-volt jet pump if this were present. This unit has an uninstalled list price of $900.

Although such a residential UPS can be moved, and appliance loads can be directly "plugged" into the device as needed, the illustration at left shows a permanent, hardwired application. Here, the member has installed a separate "sub-panel" next to her existing main service panel.

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The emergency loads that the member wants to be able to operate during an outage are then re-wired to the UPS sub-panel. The UPS sits between these emergency loads all the time. When the power is lost, the UPS continues to provide the loads connected to the sub-panel with electricity. How long the UPS is able to provide backup power is a function of how much storage is in the batteries. All sizing and installation should be done by a licensed electrician. The Co-op also provides members with technical assistance, sizing, and analysis of possible emergency electric needs and solutions.

Another smaller UPS unit is available on a wheeled dolly. This has a price of $322 on Amazon.com.

Here's an important detail with regard to using a UPS. Most Co-op homes use a water pump, often a submersible pump wired with 240 volts. Although the pump energy usage (measured in kilowatt-hours, or kWh) is not a large load, the UPS is typically a 120-volt device. For emergency use for 240-volt water pump loads, an additional component is required to enable the UPS to provide "artificial" 240-volt service. Assuming that the UPS were sized for 4,000 watts (4 kilowatts), then a buck boost transformer built into an Outback UPS would cost an additional $390 (list price). It is not recommended to consider using a UPS for other 240-volt loads (meaning, no electric hot water, no electric clothes dryer).