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PREPPER HANDOUT #10
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Home Power Use Guide

How much power ordinary household things really draw, so you can size a power station or generator for an outage and decide what is worth running.

Every appliance has two numbers. **Running watts** is what it draws while it works. **Starting watts** is the short surge a motor needs to get going. Your power station or generator must cover the running watts of everything that is on, **plus the biggest single surge**.

Read this first. The figures below are typical ranges from generator makers and the Department of Energy. Your own appliance may be higher or lower. The label on the back or bottom tells you its watts, or volts × amps = watts. The best answer of all is a **plug-in watt meter**: plug the appliance into it for a day and read the real number.

WHY A FRIDGE DOES NOT USE ITS FULL WATTS ALL DAY

Fridges, freezers, pumps, furnaces and AC units **cycle**: the motor runs, shuts off, then runs again. So a fridge rated a few hundred watts uses far less than that number × 24 hours. For daily energy, use the yearly kWh on its yellow EnergyGuide label ÷ 365, or measure it with a watt meter. For sizing, still plan for its starting surge every time it kicks on.

1 · KITCHEN

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Microwave	600–1,200	none extra	600–1,200
Electric range, one burner	1,200–2,400	none extra	1,200–2,400
Coffee maker	900–1,200	none extra	900–1,200
Toaster	800–1,400	none extra	800–1,400
Toaster oven	about 1,225	none extra	about 1,225
Dishwasher (drying adds a lot)	1,200–2,400	none extra	1,200–2,400

Champion wattage chart; DOE Energy Saver wattage list. Wh per hour = running watts for heating appliances that stay on; most only run minutes at a time.

Cooking is the hardest load on batteries. A microwave for five minutes is fine; a burner for an hour drains most small power stations. See Handout #9 for no-power cooking.

2 · REFRIGERATION

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Refrigerator	150–400	800–1,200	cycles, see table below
Freezer	100–500	500–1,000	cycles, see table below

Champion wattage chart.

Daily energy: it depends on age, type and size

FRIDGE OR FREEZER	ABOUT KWH PER YEAR	ABOUT KWH PER DAY
ENERGY STAR top-freezer refrigerator	about 360	1.0
ENERGY STAR bottom-freezer refrigerator	about 560	1.5
ENERGY STAR side-by-side refrigerator	about 630	1.7
Older refrigerator (15+ years)	more; check its label	meter it
ENERGY STAR chest freezer	215	0.6
ENERGY STAR upright freezer	395	1.1

ENERGY STAR Freezers page; ENERGY STAR help center averages for certified refrigerators by style. kWh per day = yearly figure ÷ 365, rounded.

- ☐ **Age matters most.** Older fridges generally use more. ENERGY STAR says an old refrigerator uses about 20% more than an ENERGY STAR model on average, and one over 15 years old may cost about $95 a year to run
- ☐ **Type:** a chest freezer uses roughly half the energy of an upright ENERGY STAR model. Manual-defrost freezers use about half the energy of auto-defrost ones (ENERGY STAR)
- ☐ **Size and features:** bigger units generally use more. Top-freezer models tend to use the least. ENERGY STAR's averages put a certified side-by-side at about 630 kWh a year versus about 360 for a top-freezer, roughly 75% more. Through-the-door ice adds more. An automatic ice maker added roughly 8–9% in a DOE field study
- ☐ **Your number:** read the yellow EnergyGuide label (kWh per year) or run it on a watt meter for 24 hours

Hot rooms and garages raise the bill

A fridge works harder when the air around it is warm.

- ☐ DOE metering guidance: roughly **2.25–2.5% more energy for every 1°F** warmer the room is. So a kitchen 10°F warmer means about 25% more
- ☐ In a DOE field study, fridges used **about 26% more** than their label in summer, and about 9% less in spring
- ☐ Lab tests at Texas A&M found units in hot garages could **nearly double** their energy use. The researchers advise against keeping them where it goes **above 90°F or below 55°F**
- ☐ In a summer outage with no AC, expect your fridge to run more often than usual. Keep doors shut and keep it out of direct sun

3 · HEATING AND COOLING

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Window AC, 5,000 BTU	450–600	900–1,200	450–600 (cycles)
Window AC, 10,000 BTU	900–1,200	1,800–2,400	900–1,200 (cycles)
Central AC, 2 ton	2,000–2,500	3,500–4,500	cycles
Central AC, 3 ton	3,000–3,500	5,000–6,000	cycles
Central AC, 4 ton	4,000–5,000	6,500–8,000	cycles
Mini-split, inverter, 9,000 BTU	about 650 (rated test)	low (soft start)	up to 650 (varies)
Mini-split, inverter, 12,000 BTU	about 1,200	about 1,800	up to 1,200 (varies)
Mini-split, inverter, 18,000 BTU	about 1,500	about 2,200	up to 1,500 (varies)
Mini-split, inverter, 24,000 BTU	about 2,000	about 3,000	up to 2,000 (varies)
Gas furnace blower fan, ½ HP	300–800	800–1,600	cycles
Electric space heater	750–1,500	none extra	750–1,500
Window fan	50–200	none extra	50–200
Ceiling fan	15–75	none extra	15–75
Electric blanket, single / double	60 / 100	none extra	60 / 100
Dehumidifier	about 785	not listed	about 785

Champion wattage chart; DOE Energy Saver wattage list. Mini-splits: MRCOOL power requirements (approximate maximums for its units); 9,000 BTU from MRCOOL's spec sheet (9,000 BTU ÷ EER2 14). Your unit's nameplate rules.

- ☐ **Ductless mini-splits** (inverter heat pumps) speed up gently instead of slamming on, so their surge is much smaller than an old fixed-speed AC, which can need several times its running watts to start. MRCOOL's startup figures in the table are conservative planning numbers. ENERGY STAR says certified mini-splits cut cooling costs about **30%** versus room AC, and use **up to 60% less** energy than electric resistance heat
- ☐ **Can backup power run one?** MRCOOL recommends at least a **2,500 W inverter generator** for its 12,000 BTU unit. A 1,000 Wh power station would last well under an hour at full output; it only works if the unit is throttled down and the station is large. Many 18,000+ BTU units run on 240 volts, which small generators and most power stations can't supply
- ☐ **Gas furnace:** the gas makes the heat, but the blower and controls need electricity. This is often the most useful heat to back up, and usually needs a transfer switch installed by an electrician
- ☐ **Electric resistance heat** (baseboard, space heaters, electric furnace) is very heavy. A single 1,500 W space heater can empty a 1,000 Wh power station in well under an hour

- [ ] **Heat pumps** are much more efficient than resistance heat. DOE says today's heat pumps can cut electricity use for heating by about **65%** compared with electric resistance heat such as baseboard heaters. Whole-house heat pumps are still large loads and usually need a large standby generator
- [ ] **Fans before AC.** A fan uses a small fraction of a window AC. In heat, cool one room, not the house

4 · WATER

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Well pump, ½ HP	750–1,000	1,500–2,000	cycles
Well pump, 1 HP	1,000–2,000	2,000–4,000	cycles
Sump pump, ⅓ HP	500–800	1,000–1,600	cycles
Sump pump, ½ HP	800–1,050	1,300–2,150	cycles
Electric water heater	3,000–4,500	none extra	cycles

Champion wattage chart.

- [ ] **On a well?** No power means no water. Many deep well pumps run on 240 volts and are hard-wired, so they cannot plug into most power stations. Ask an electrician what yours needs, and store water either way (Handout #4)
- [ ] **Sump pump:** the surge is the hard part. Check that your power station or generator can handle its starting watts, not just running watts
- [ ] **Electric water heater:** leave it off on backup power. The tank stays warm for a while and is also a store of water

5 · LAUNDRY

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Washing machine	500–1,000	1,000–2,300	500–1,000
Electric dryer	4,000–6,000	none extra	4,000–6,000
Clothes iron	1,000–1,800	none extra	1,000–1,800

Champion wattage chart; DOE Energy Saver wattage list.

6 · ELECTRONICS AND COMMUNICATIONS

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Internet modem / router	10–20	none extra	10–20
Phone or laptop charger	20–100	none extra	20–100
Laptop	about 50	none extra	about 50
Desktop computer (tower)	about 120	none extra	about 120
TV, 32″–55″	80–400	none extra	80–400
Home security system	15–40	none extra	15–40
Clock radio	about 10	none extra	about 10

Champion wattage chart; DOE Energy Saver wattage list.

7 · LIGHTING

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
LED bulb (each)	8–15	none extra	8–15

Champion wattage chart.

LED lighting is the cheapest comfort you can run. Swap any old incandescent bulbs in rooms you will use during an outage.

8 · MEDICAL: CPAP

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
CPAP, no heated humidifier	30–60	none extra	30–60
CPAP, with heated humidifier	60–120	none extra	60–120

Champion wattage chart. Example: ResMed lists its AirSense 11 at about 56 W typical, 73 W peak (user guide).

- ☐ Check **your own machine's** manual for watts, and ask the maker about a DC cable, which avoids inverter losses
- ☐ Turning off the heated humidifier often cuts power use a lot. Ask your doctor first
- ☐ For oxygen concentrators and other powered medical equipment, talk to your doctor and supplier about a backup plan, and tell your power company you depend on it

9 · TOOLS AND OTHER

APPLIANCE	RUNNING WATTS	STARTING (SURGE) WATTS	WH PER HOUR OF USE
Garage door opener, ½ HP	about 500	about 600	brief use
Circular saw, 7¼″	1,200–1,800	2,400–3,600	1,200–1,800
Air compressor, 2 HP	2,500	7,500	2,500
Hair dryer	1,200–1,875	none extra	1,200–1,875
Vacuum cleaner	1,000–1,440	not listed	1,000–1,440

Champion wattage chart and older Champion owner's manual chart; DOE Energy Saver wattage list.

10 · YOUR MUST-RUN LIST

List only what you truly need. Running watts × hours per day = Wh per day. For fridges and freezers, use label kWh per year ÷ 365 × 1,000 instead.

APPLIANCE	RUNNING W	STARTING W	HOURS / DAY	WH / DAY

Total running watts (all on at once) _____ + biggest starting surge _____ = _____ peak watts

Total Wh per day _____

POWER STATION RUNTIME

Battery Wh _____ × 0.85 ÷ watts being used _____ = _____ hours

The 0.85 allows for about 15% lost in the inverter that turns battery power into wall power; EcoFlow uses the same rough guide. DC and USB ports lose less. Example: a 1,000 Wh station running a 60 W CPAP: 1,000 × 0.85 ÷ 60 ≈ 14 hours. Its continuous watts rating must also cover your peak, and its surge rating must cover any motor start.

GENERATOR SIZING EXAMPLE

Add the running watts of everything that will be on, then add the single biggest starting surge (Champion's method):

LOAD	RUNNING W	STARTING W
Refrigerator	400 (high end)	1,200
Gas furnace fan, ½ HP	800 (high end)	1,600
Sump pump, ½ HP	1,050 (high end)	2,150 ← biggest
6 LED bulbs, router, phone chargers	about 210	
Total	**2,460**	2,460 + 2,150 = **4,610 peak**

So this home wants a generator rated for at least about 2,500 running watts and about 4,600 starting watts, with a margin on top. Start the biggest motor first, then add the rest one at a time.

WHAT NOT TO RUN ON BACKUP POWER

- ☐ Electric dryer, electric oven and range, electric water heater, space heaters and central AC, unless your system was sized for them
- ☐ Hair dryers, irons and toasters on a small power station: they drain it fast
- ☐ Never run a generator indoors or in a garage, even with the door open. Keep it at least 20 feet from windows, doors and vents (CDC)
- ☐ Never plug a generator into a wall outlet. Use a transfer switch installed by an electrician

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SOURCES: Champion Power Equipment, "Generator Wattage Chart" and "What Size Generator Do I Need?" (championpowerequipment.com, accessed 2026-10-22); U.S. DOE Energy Saver, former typical appliance wattage list, no longer on energy.gov (as republished by Penn State EGEE 102, courses.ems.psu.edu/egee102, accessed 2026-10-22); ENERGY STAR, "Refrigerators" and help center, "What's more energy efficient… top, bottom or side-by-side?" (energystar.gov, accessed 2026-10-23); ENERGY STAR, "Freezers" (energystar.gov/products/freezers, accessed 2026-10-22); U.S. DOE, Refrigerator Guide / metering toolkit, ambient temperature correction (nascsp.org copy, accessed 2026-10-22); U.S. DOE, "Comparison of Real World Energy Consumption to Models and DOE Test Procedures" (energy.gov, 2014, accessed 2026-10-22); Texas A&M, "Effects of External Temperature on the Energy Consumption of Household Refrigerator-Freezers and Freezers" (hdl.handle.net/1969.1/155467, accessed 2026-10-22); U.S. DOE, "Home Upgrades" (energy.gov/save/home-upgrades, accessed 2026-10-23); ENERGY STAR, "Ductless Heating & Cooling" and 2025 Mini Split factsheet (energystar.gov, accessed 2026-10-22); MRCOOL DIY Direct, "Mini Split Off-Grid & Generator Setup" (mrcooldiydirect.com, accessed 2026-10-22); MRCOOL, 5th Gen DIY specifications, DIY-09-HP-C-115D25-O (support.mrcool.com, accessed 2026-10-23); EcoFlow, "Test Your Power Station Runtime Before an Emergency" (ecoflow.com/us/blog, accessed 2026-10-23); ResMed AirSense 11 user guide, power specifications (accessed 2026-10-22); CDC, "Preventing Carbon Monoxide Poisoning" (cdc.gov/carbon-monoxide). Wattages are typical ranges; your appliance's label or a plug-in watt meter rules.
General preparedness information only. It is not medical, legal or financial advice. Always follow instructions from local officials and your own doctor. Prepared October 2026; agency guidance can change, so check the sources above for updates.