SolarRay's "FRONTIER" System: Example uses

| Appliance | Qty. | Run Watts | Hours /Day | Days /Week | W-hours /Day | Percent of Total | NOTES |
|---|---|---|---|---|---|---|---|
| Fluorescent Lights | 4 | 20 | 6 | 7 | 480.0 | 15.9% | |
| Blender | 1 | 350 | 0.1 | 2 | 10.0 | 0.3% | |
| 7 cu. ft. Refrigerator | 1 | 125 | 5 | 7 | 625.0 | 20.7% | Chest style Refrigerator Conversion |
| Microwave Oven | 1 | 900 | 0.25 | 7 | 225.0 | 7.5% | |
| Toaster | 1 | 600 | 0.08 | 7 | 48.0 | 1.6% | |
| Fan (Kitchen, Bed, Bath) | 1 | 50 | 4 | 7 | 200.0 | 6.6% | 4 hrs/ day only |
| Coffee Maker | 1 | 800 | 0.1 | 7 | 80.0 | 2.7% | Carafe style, no hot plate |
| 17" LCD Television | 1 | 40 | 4 | 7 | 160.0 | 5.3% | turned off with powerstrip |
| VCR or DVD player | 1 | 30 | 2 | 1 | 8.6 | 0.3% | when not in use |
| Satellite receiver | 1 | 30 | 5 | 7 | 150.0 | 5.0% | |
| CombinationStereo/ CD | 1 | 10 | 5 | 7 | 50.0 | 1.7% | |
| Laptop Computer | 1 | 25 | 3 | 7 | 75.0 | 2.5% | |
| Computer Printer | 1 | 30 | 2 | 7 | 60.0 | 2.0% | |
| Small Power Tool | 1 | 750 | 0.25 | 2 | 53.6 | 1.8% | Circular Saw or Big Drill, etc. |
| Washing Machine | 1 | 200 | 1 | 4 | 114.3 | 3.8% | No electronics, 4 loads/ week |
| Sewing Machine | 1 | 80 | 0.25 | 1 | 2.9 | 0.1% | |
| Clothes Iron | 1 | 1000 | 0.5 | 1 | 71.4 | 2.4% | |
| Small Vacuum Cleaner | 1 | 650 | 0.5 | 1 | 46.4 | 1.5% | |
| Hair Dryer &curling iron | 1 | 1000 | 0.25 | 5 | 178.6 | 5.9% | |
| AC 1/2 HP Well Pump | 1 | 750 | 0.5 | 7 | 375.0 | 12.4% | 150Gal/ day from shallow well |
| | | Total Daily Average Watt-hrs | | | 3013.7 | | |

The "FRONTIER" System can run more normal household appliances for longer periods of time. The Coffee Maker, TV, Lights, and Computer are still all specially chosen high efficiency models. They are unplugged or turned off with a powerstrip when not in use to allow the inverter to be in sleep mode most of the time. A bigger Mod sine inverter can run larger appliances like a circular saw, washing machine (without electronics) , small refrigerator, shallow well pump, and hair dryer.

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|---|---|---|---|---|---|---|
| **PV System Worksheet** | | Customer: | Frontier Example | | | **Solar Ray** |
| © 1999 by Dankoff Solar Products | | Date: | Oct. 31, 2005 | | | **PO Box 2228** |
| **See Instruction File** | | Prepared by: | Ray | | | **Taos, NM 87571** |
| Version 2.0 8/99 adapted by SolarRay | | | | | | **(505) 737-9553** |
| | Yellow boxes are for your changes & input | | | | | |
| | | | TOTAL | | | |
| | | | **LOAD =** | **3014** | **Watt-Hours per Day** | |
| EFFICIENCY ESTIMATES | | | Battery Average Efficiency | **88%** | 3425 | |
| (See Instruction File) | | | Inverter Average Efficiency | **92%** | 3722 | |
| | | | Wiring & Distribution Efficiency | **98%** | 3798 | |
| | | | | **Energy to Be Generated** | **3798** | **Watt-Hours/Day** |
| DC System Voltage | **24** | | Season of max. energy use | | **Winter** | |
| Avg. Peak Sun Hrs/Day | **6** | | PV:Battery mismatch + loss factor | | **91%** | |
| Solar Tracker Gain ? | **0** | | **PV Array Required** | | **696** | **Watts (peak rating)** |
| **PV ARRAY - Select size & quantity of PV modules** | | | | | | |
| Full Array would be | **4** | **175** | **- Watt Modules =** | | **700** | Watts |
| Proposed Array of | **4** | **Modules = total rated - - -** | | | **700** | Watts |
| Array voltage | **12** | Module voltage | **12** | | | |
| **BATTERY BANK** | | | | | | |
| Days of Energy Storage | **5** | | At Maximum Depth of Discharge | | **100%** | |
| | | | Batt Capacity at Low-Temp | | **90%** | of 77°F standard rating |
| | | | **Requires Battery Bank of** | | **879** | **Amp-Hours** |
| **Battery amp-hr rating** | **250** | Required number of batteries = | | | **14.1** | |
| **Battery nom. Voltage** | **6** | Proposed number of batteries = | | | **16** | |
| | | for a Battery Bank of | | | **1000** | **Amp-Hours** |
| | | Proposed Days of Storage | | | **5.7** | |
| **BACKUP SYSTEM** | | | | | | |
| Battery Charger Amps (rated) | **35** | | Load Generator to | **90%** | **80%** | Power at Altitude (- 2 to 3% p |
| Trace DC Charging Effeciency | **50%** | | **Minimum Generator Rating =** | | **2,333** | **Watts** |
| **Generator Running Time per** | | | | | | |
| when peak sun per day is | **4.5** | Hours -- Generator Must Run | | | **9.3** | **Hours/Week** |
| when peak sun per day is | **1** | Hours -- Generator Must Run | | | **23.2** | **Hours/Week** |

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