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Thoughts on a power system for an observatory not on the power grid.

Major components include: charging system storage system load system

Charging System: solar, wind, gas generator

1) Solar panel

5w for trickle charge/maintenance charge (\$120 canadian tire) or
45-watt Cottage Solar Panel Kit Product# 11-1588-0 (\$500 canadian tire)

- * Ideal for charging deep-cycle batteries and running small appliances
- * ICP solar panels are completely weatherproof and can withstand ½-inch hailstones, up to 80°C (176°F) heat and can operate under 3 inches of snow (on sunny days)
- * Works under all light conditions
- * Kit includes three 15-watt solar panels
- * Can run both AC and DC appliances
- * Comes complete with 7-amp charge controller, ultra-bright fluorescent light and 140-watt DC to AC power inverter
- * Includes 12-volt socket with 10 feet (3 m) of wire, PVC frame, mounting hardware and battery clamps
- * Manufacturer's limited 5-year warranty on power output
- * Model No. 10058



2) Wind Generator:

unknown price, not as reliable as solar or generator

3) Generator:

The concept here would be to fire up the generator to charge up the batteries and then turn it back off. A low rated generator would work fine. Hmm should have DC outputs as well
Coleman MAXA 3000 Generator Product# 55-0313-6 (\$700 Canadian Tire)

- * Perfect generator for constructing small projects at home and cottage
- * 3,000 rated and 3,750 surge watts
- * Dependable 4-cycle, 5.5 hp Tecumseh overhead valve (OHV) engine
- * OHV engine provides improved fuel efficiency, longer life, easy maintenance and less noise
- * Up to 2 hours run time at 50% load with two 120V outlets
- * Weight: 92 lbs (41.8kg)
- * 3 quart Fuel tank capacity
- * Full perimeter 1" steel wrap-around carrier
- * Engine automatically shuts down when oil is low

All systems would require a charge controller so as to not overload the storage system. The 45 watt solar panel comes with a 7amp controller builtin

21-amp Charge Controller 00-0204-6 \$129.99

If generator has no DC outputs then we need a battery charger as well



Motomaster Automatic 10/2-Amp Battery Charger Product# 11-1567-0 \$70 (Canadian Tire)

Storage System: battery

No other real choices other than a deep cycle battery system design for deep discharge and recharge cycles. In addition we must consider extreme low temperatures and should place the battery within an insulated box with suitable vent holes for hydrogen (produced as a side effect of charging).

Other factors include a monitoring system (how much charge is still in the battery?)
And the expected load.

A Sealed lead acid UPS style battery rated at 35 amp-hours retails for \$85 (National Battery)
Motomaster Nautilus Deep Cycle Battery most powerful line of marine deep cycle batteries.
\$100 no rating
Building an insulated box with venting approx 2'x2'x2' may cost approx \$50
Monitoring of the battery using a voltmeter display \$10-20 (Canadian Tire)

Load System:

From the battery to a fused load centre.
From the load centre to 12vdc outlets
and from the load centre to a 12vdc to 110vac power inverter

Motomaster Eliminator 700 Watt Power Inverter
Price \$99.99

- * Converts 12-volt DC battery power to 120-volt AC household power
- * Solid state control circuits provide a maximum 700 W of power and 1000 W of surge capacity
- * Audible alarm warns of low battery voltage
- * Auto shutdown protects against overload, short-circuit, over temperature and low and high battery condition
- * Led indicators, green (power on), red (alerts user to fault condition)
- * Includes DC cable with clips



Miscellaneous: power cables, fuses, connectors, mounting equipment: \$100

Total estimated price tag for : 5w solar panel, 3kw generator, 21amp controller, battery charger, nautilus battery, box, meter, 700watt inverter: \$2000

This can be done in stages, use two batteries taking one home to charge and swapping, etc.
save \$700 on a generator, go to a 7amp charge controller