8/30 Week 1

-Need thicker wire
    -Use 10/12 AWG
-Solar Panel wattage not sure what min spec we want? (2200 Watts)
-Solar charge controller (MPPT)
-Pure sine wave inverter
-Li-Ion batteries are more expensive but better and lighter
    -Battery capacity?
-Want a fuse
-Isolater
-Use flexible solar panel for compactness
    -Think about using a collapsible frame so that the main size constraint will be the battery
-Additionall battery for cold start circuit (to operate Arduinos if batteries are dead)
-Use multiple arduinos
    -May not be enough pins
    -Conserve power
    -Have master and slave Arduinos ie. one runs the motors, another the sensors, another the wifi and the last one manages all three, presumably using something like an Arduino Pro Mini as the main manager, Arduino Pro Mini quiescent current is 4.5 mA but if we really want we can remove its power LED and voltage regulator and get it in the 10's of uA range
    -We can also look at running the Arduino off of a battey that way we don't need to step down the voltage and don't need to deal with any complexity of using solar power. Ideally we could run a two AA battery system which would give us 6000mAh at 3.3V and would aim to have continous operation power of over 1 year
    -Main Arduino can use load switches to shut off different parts of the system when not needed to conserve power
    - Use Arduino built in dashboard for website, and pull data as needed
-Use my power USB stick to measure approximate power draw of management system, this can also be calculated off the quiescent currents from each parts respective datasheets
-Circuit breaker for the MPPT (50A maybe)

PV
-Flexible solar panels:
    -Cant afford nice flexible PV's if we want to get to 2000W can consider either cheaper alternatives or using a combo of rigid and flexible PV's
-Do we need 2000W?
-Since we have a weight constraint we should only use one battery and will be limited to a 12V system which is the more common version

-There are some specific adapters for PV's

Storage (Battery)
-To meet equivalent specs of the generator we would need 110V at 15 Amps for 3.2 hours
-Combining this data we get 5.28kWh
-Need to get around this capacity
-2000Wh
-Look for anything above 2kWh for battery Li-Ion

MCU
-Arduino based
-Arduino pro mini (master)
-Multiple arduinos for different functions to save power, by running the main off a low powered Arduino and the others control individual functions with load switches between to conserve power.
-Will need to compensate with a delay for turn on of these component especially if we are dropping voltage
-Potentially run IC to drop voltage off of a low powered timer that can be changed based off of resister values to save even more power, but it should not be too much of a drain.
-Can run master off of batteries and slaves off of dropped voltage from Solar/Batteries
-Arduino cloud for website
    -Use Arduino IOT dashboard
    -Simple to use and easy to edit with built in integration with the Arduino boards
-Lots of ESP Wifi boards (ESP8266) I have one to test with and an Arduino pro mini
-Arduino MKR Wifi 1010 and Arduino MKR ENV Shield (easy integration with IOT dashboard)
    -Could use wifi module instead

General Thoughts
-Cooling solutions if we are going to place product in an enclosure
-Enclosure should have required IP or NEMA ratings
-Consider multiple charging options later, for example being able to charge from EV charger or from outlet
-Implement wheels and a handle
-Use a touchscreen for on unit display
-Use load switches to reduce idle power draw
-Find low quiscent components

Questions
-Are we building the unit with the solar panels or are we plugging our battery system into an existing solar unit? If so what ranges do we want for that PV?

-Do we want 30A plug for RV/AC units
-Look into load requirements of Ninja BN701 Pro Series Blender and the Serene Life SLPAC10 10,000BTU portable air conditioning unit
    -Are they expected to run synchronously
-Is this unit going to be used outdoors?
    -If so we should use a standard -40 to 80 C range, don't have any way to test but can rely on datasheet

Parts
-Viktron Shunt has bluetooth to monitor battery
-https://www.youtube.com/watch?v=1VxP38XlVEQ
https://www.youtube.com/watch?v=H9iFewjO5Rc
^^

https://mitchross09.medium.com/solar-energy-monitoring-with-raspberry-pi-and-node-red-ed59e287cdd4

youtube.com/watch?v=qHxcnSVpVbM
^^^^^^^^^^^^^^^^^^^

https://www.youtube.com/watch?v=20R1JVOxnCw

Use Roovi sensors

https://www.youtube.com/watch?v=cn91Hplkl0w

Use raspberry PI instead
Power consumption will be worse but should be able to run 40hours of RPI

Appendix

https://www.youtube.com/watch?v=4SFZk_3FPCk
https://us.ecoflow.com/
https://www.youtube.com/watch?v=Fi6vhC5_YPA