

# WORK SO FAR...

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# PERMACULTURE



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- Lawn mowing
  - Produce Harvest:
    - Tomatoes
    - Chard
    - Ginger
    - Potatoes
    - Onions
  - Farmer's Market

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# RESEARCH WORK AT THE OFFICE

# COMMON ROOF MATERIALS

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- Asphalt
- EPDM
- Turbo seal
- Modified Bitumen
- PVC Membranes
- FTPO
- TPO
- GRP

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# SUMMARY - SUGGESTED ROOF MATERIALS

# TPO

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- As good as EPDM - UV rays & heat-resistance.
- Many benefits same as PVC - energy efficiency & low cost.
- Lower carbon footprint.
- 5 star by the Cool Roof Rating Council.
- **Advantages: Economical, Durable, UV-resistant, energy saver in summers, completely recyclable, chemically inert, unwanted fumes are not released to atmosphere over time.**

# FIBERGLASS FLAT ROOF (GRP ROOF)

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- Good environmental profile; much less energy is used to produce.
- Do not give off harmful substances.
- No toxic by-products.
- **Advantages: Light weight, Impact resistant, Chemical resistant, Fire resistant, Great insulator-thermal and electrical, nonconductive, maintenance free.**



# SOLAR FLAT ROOFS

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- Can generate electricity
- Harvest rain water.
- **Advantages: Cost saving on electricity, chemically inert, water can also be utilized for drinking purpose with less to almost no filtration and/or treatment, can be used with flat roofs as well, long life span.**

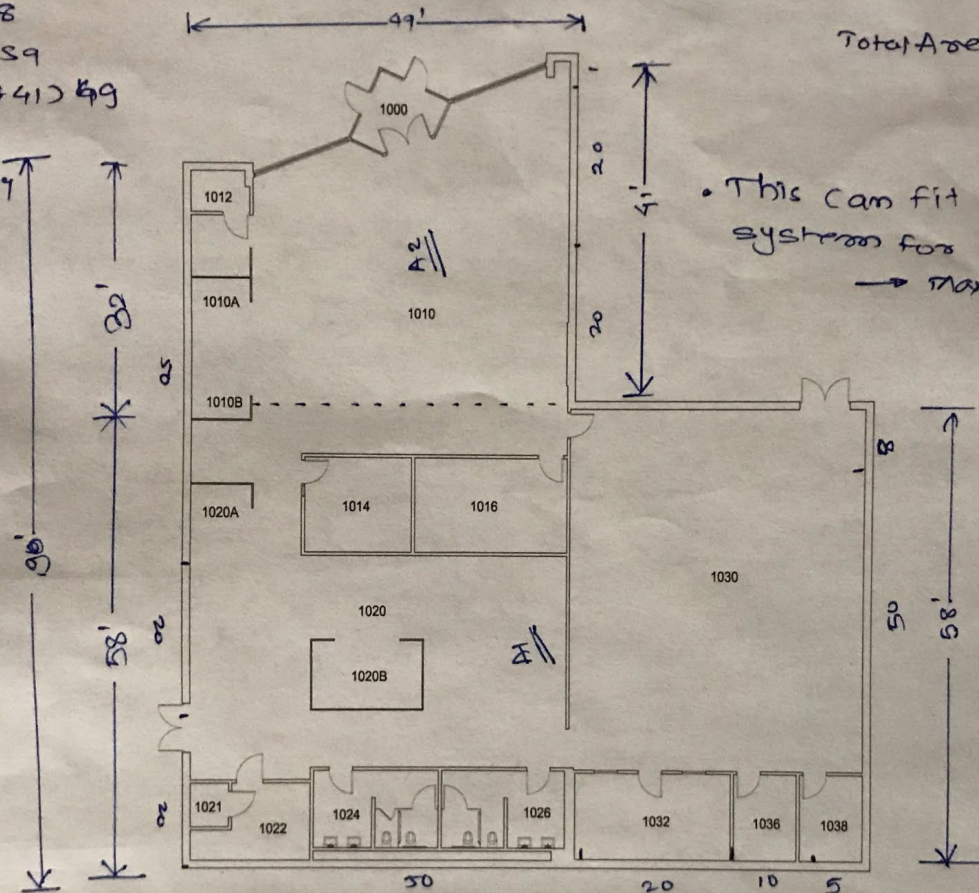
$$A_1 = 85' \times 58' = 4930' \text{ sq}$$

$$A_2 = \frac{1}{2}(32 + 41) \times 9 = 1788.5' \text{ sq}$$

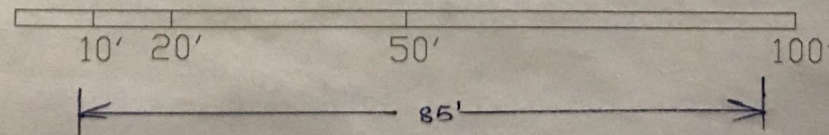
Total Area = 6700 sq. ft.  
(Approx).

$\approx 622 \text{ m}^2$

• This can fit ~~33~~ 100.5kw Solar system for 6700 sq. ft.  
→ max. capacity.



OFFICE FOR SUSTAINABILITY  
FIRST FLOOR PLAN



# INPUTS

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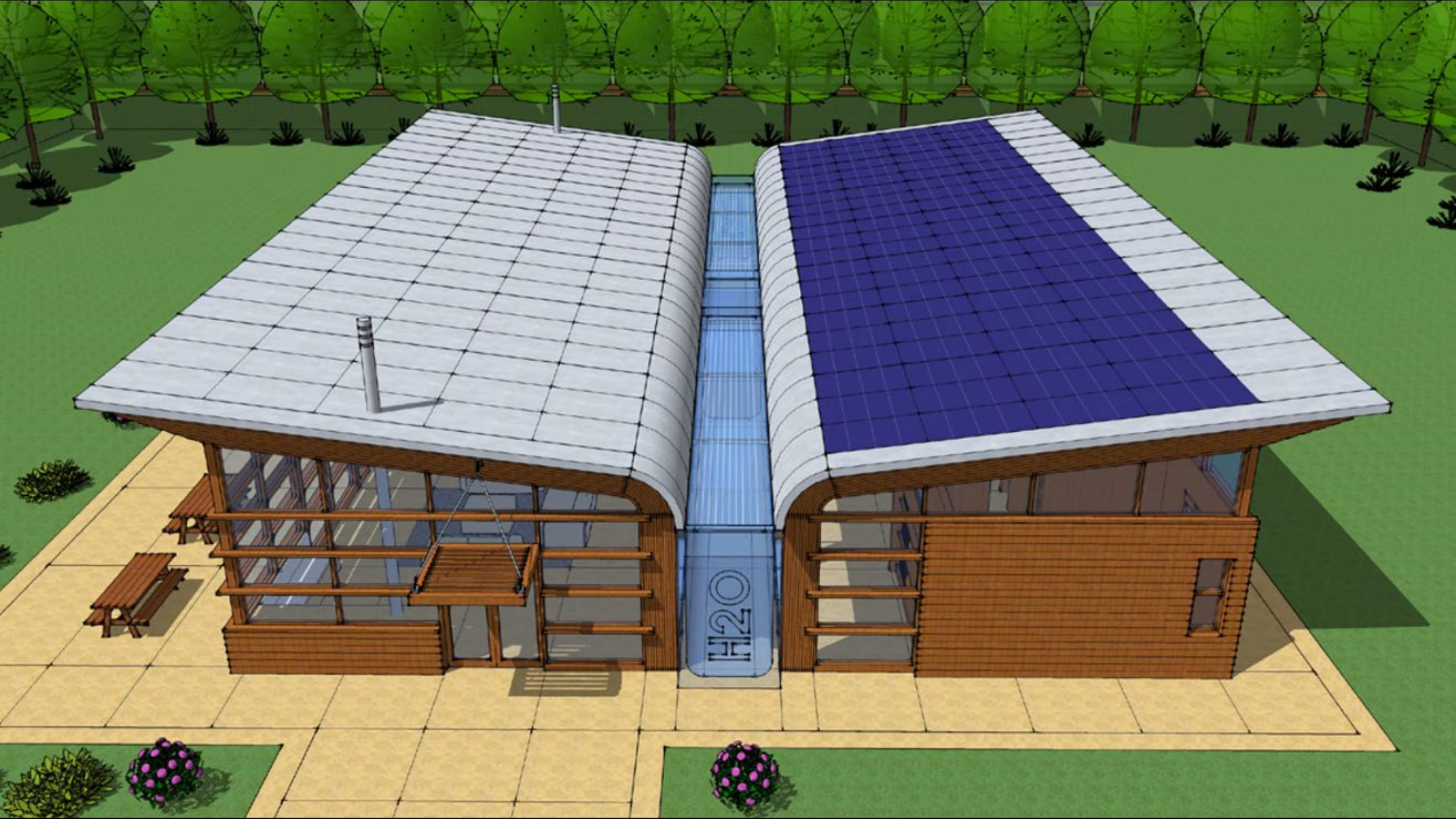
- Previous research
- Found important factors:
  - University wide solar potential
  - OFS solar potential.
  - Predicted annual kWh @ 10% fill

## Rooftop Solar Potential at OfS

Average Yearly kWh Usage:	21,048 kWh
Average Yearly CO <sub>2</sub> Production:	43,779.8 lbs
Average Monthly Electricity Bill:	256.44 \$
OfS Building Floor Print:	662.4 m <sup>2</sup>
kW per Meter Squared:	0.08 kW / m <sup>2</sup>
Rooftop Potential @ 50% Fill:	15.87 kW
Kilograms per Meter Squared:	5.86 kg / m <sup>2</sup>
Predicted Annual kWh:	20,273 kWh

## Rooftop Solar Potential University Wide

WMU Campus Floor Print:	324,847 m <sup>2</sup>
Rooftop Potential @ 10% Fill:	2,775.59 kW
Predicted Annual kWh:	3,544 MWh



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Thank you