



Solar Thermal Power Production

The Little Turbine that could

Design Requirements

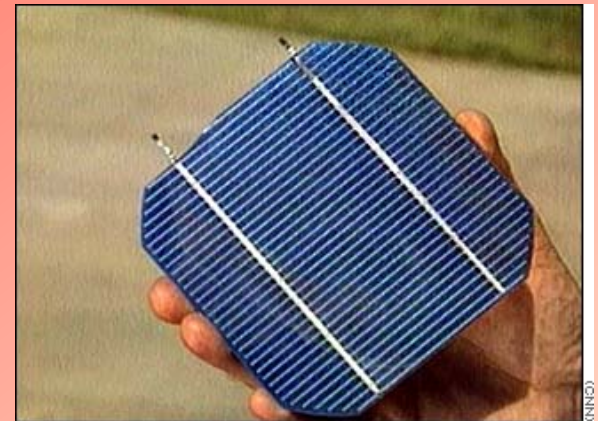
- Attach to existing mirror
- Cheap; under \$500
- 2-3 hp
- Dual-/Multi- purpose
- Assemble in country



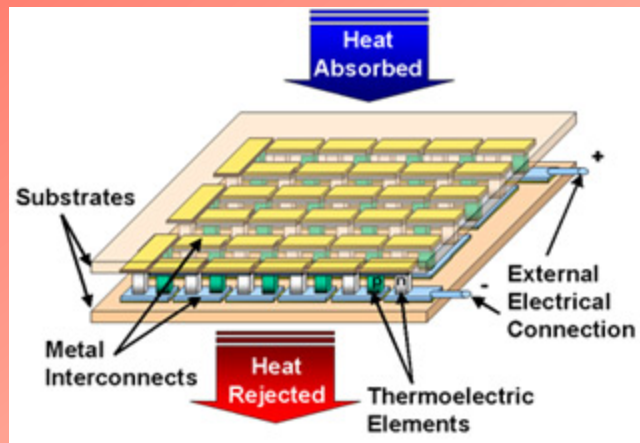
Alternatives



Steam Engine

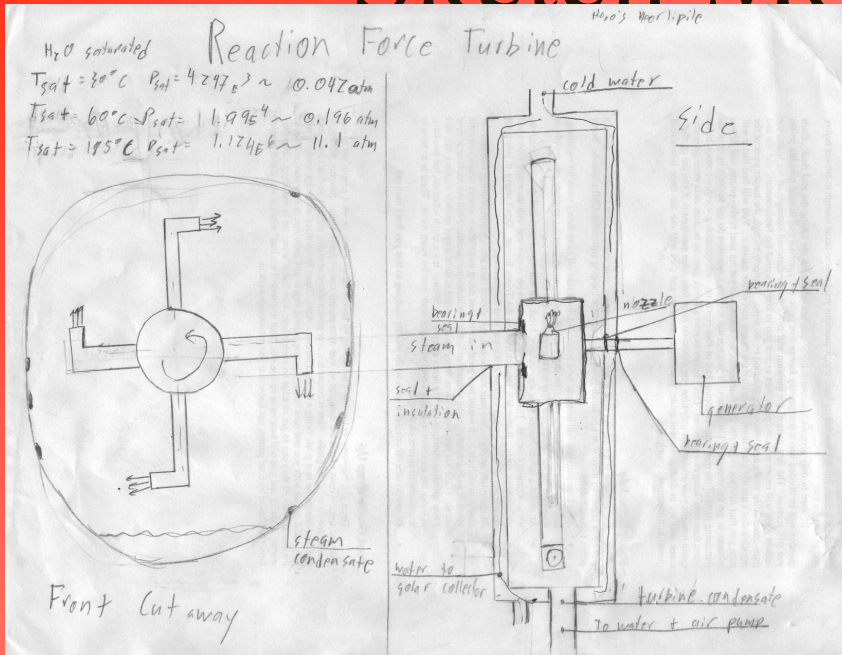


Photovoltaic



Thermoelectrics

Sketch Model & Design



Ideas Sketch

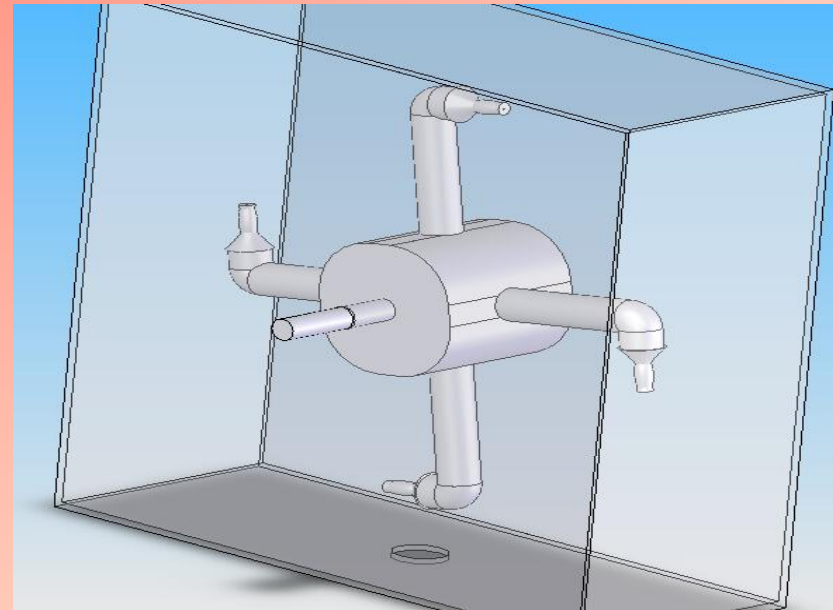
Challenges

- Shaft Bearings
- Pressure Lines
- Turbine Coolant

Pros

- One Moving Part
- Dual-Purpose
- Convenient
- High RPM
- Closed Loop

CAD SolidWorks Model



Technical Feasibility



Capture Area: 6.76m^2
Collected Heat: 6.76kW

15% Cycle Efficiency

Power output: 1014 W (1.3 hp)

Hot Water @ 60C: 46 g/s

5% Cycle Efficiency

Power output: 338 W (0.45 hp)

Hot Water @ 60C: 51 g/s

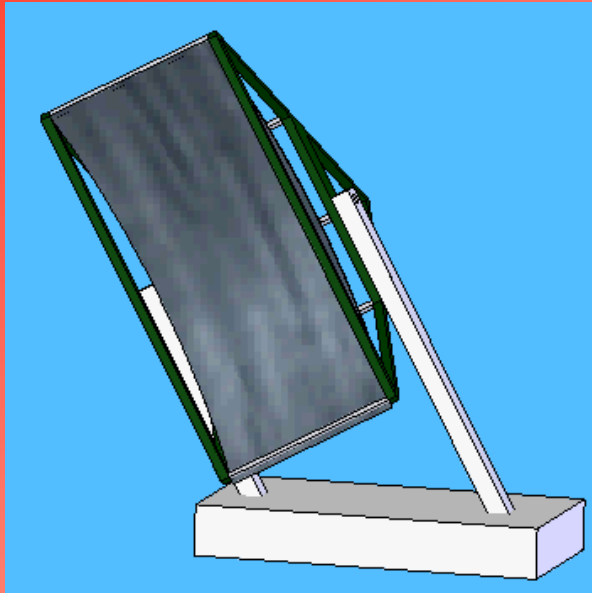
Water Pump

68 g/s

5 W

Conclusion

Solar Tracker



- Simple technology
- Cheap
- Accurate

Reaction Turbine

- ~15% total efficiency
- 1 hp
- Condenser
- Power and hot water
- One moving part
- Closed system

