

Assessment #5

1) Solar Power!

- a) Explain how electricity is generated from the following 2 technologies. A diagram may be helpful:
- PV, or Photovoltaic *Electron Promotion, has nothing to do with heat. In fact, PV output decreases with increased temperature.*
 - Solar Thermal Electric (STE), also called CSP (Concentrated Solar Power).

Usually a Rankine Cycle.

b) In which of these two technologies could benefit from cogeneration? Please explain
Cogen is NOT combined cycle.

- c) Besides the above, please identify the relative advantages that each has over the other
- PV *Distributed generation? Simplicity of function and maintenance, coset.*
 - STE *Thermal storage is much cheaper than batteries. Cogen... CHP (combined heat and power).*

2. Climate ~~Change~~ Crisis

- What is the cause of our changing climate. In particular, what is the *mechanism* that causes the temperature to increase? Make a diagram if you like.

Sun's visible light? IR absorption and reemission on GHG – CO₂, methane, refrigerants, etc. industry?

- Besides a raising temperature, name another *physical* consequence of climate change. *Ice melting, Sea level rise, Ocean +acidification, Storms, desertification, Fires, Ocean currents.*

- Name/describe at least two *biological* consequences of climate change.

Increased growing seasons, lack of pest die off in winter, migration of species upward and toward poles, disease, extinction, coral bleach, human refugees Just to name a few.

- Identify and briefly explain at least 2 positive feedback mechanisms.

The two big ones: ice melt exposing darker areas to sun. Increased methane emissions from arctic melt and ocean bottom (methane clathrates).

- In your opinion, should this be considered a *crisis* or not? Please explain your reasoning.

One person said they were not sure. Everyone else said it is a crisis and gave several reasons.