14_1 Geothermal - Aquifer Thermal Storage

Recap:

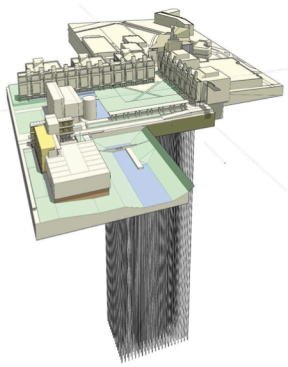
1. GSHPs:
   a. Utilize low quality heat without the penalty of conversion to electricity
   b. Distributed power opportunity for off-grid and remote use
   c. Broadly geographically available (in US) due to climatic zonations

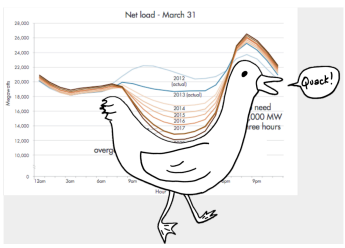
Movies: (Great Lakes SedHeat Network): https://igws.indiana.edu/glsn/speakers
(Mark): https://personal.ems.psu.edu/~fkd/courses/eme_497/videos/7_v_collmark_LATE.mp4
(Ryan): https://psu.zoom.us/rec/play/zA3PZ8P2YeJQJgVwg1bQWsnq2JwndddprhgG0smGb-WjvHyyauBeRyWwzK1lCkJyH9ZuRn1UNTyx2N8_.SXQtIdwyrRyQNzu9?startTime=1616982757000
(Brandon): https://personal.ems.psu.edu/~fkd/courses/eme_497/videos/15_v_lindgrenbrandon.mp4
(John): https://personal.ems.psu.edu/~fkd/courses/eme_497/videos/20_v_pavlakovicjohn.mp4

Resources: MR 4

Motivation:

1. Motivation [10%] Provide context for the topic. *Use of relevant public domain videos* are a useful method for this. Why is this particular topic or sub-topic important in the broad view of geothermal energy engineering?





Provide diurnal or inter-seasonal storage
Avoid issues of intermittency/dispatchability in renewables - load shifting
Address off-grid and local/distributed needs

Scientific Questions:

2. Scientific Questions to be Answered/Outline [10%] What questions arise from the motivation. What are the sub-topical areas that address these scientific questions.

Aquifer Thermal Storage

1. Modes and layouts - closed-versus-open systems
2. Mechanisms of storage
   A. Open
   B. Closed