2/25/22

**INTERVIEW WITH**: Energy iCAP Team Leaders, Energy SWATeam Chairs:

Bill Rose: Research Architect; heat, air, and moisture transport in buildings

Andrew Stumpf: Research Geologist; water supply, geologic hazards, climate change

**CONCISE SUMMARY:**

On 2/25/22, the team met with Bill Rose and Andrew Stumpf. As we are still in the stage of initial research and this was the first interview of this project, we were hoping to learn about their experience as Energy iCAP leaders as well as their recommendations. From this interview, we gained a lot of important information about their beliefs surrounding a clean energy transition as well as what they believe to be the biggest challenges. Overall, Bill Rose places a lot of emphasis on conservation and demand side improvements. Andrew also sees the importance of conservation but focuses on generation and supply side improvements. He places importance on a diverse portfolio of energy generation, including the use of geothermal for steam generation. They also provided us with peer institutions to investigate including Stanford and Ball State. Additionally, they provided us with potential people to interview including Meredith Moore, John Zhao (geothermal), a couple committees on campus and another senior design group that Andrew is working with. This was a very beneficial meeting to see the bigger picture and everything that must go into this plan. A recommendation from Bill was to potentially narrow the scope of our project as there are a lot of components that go into a clean energy transition plan. He is worried it may be difficult for us to cover everything.

**DETAILED INTERVIEW NOTES:**

**Questions:**

1. What do you feel is the biggest challenge for the clean energy transition on this campus?
   1. Bill’s biggest challenge is conservation of the energy, there is a large amount of waste across campus; conservation is often left out in comparison to generation
   2. Andrew’s biggest challenge (on generation side): Steam tunnel heat loss, reuse of waste heat. It is difficult to reduce thermal losses in a life cycle as energy converts to different applicable forms.
2. Do you think there are any weaknesses about previous plans that need to be specifically addressed and may need more attention in future?
   1. Greenhouse gas emission do not go down in master plan
3. Do you have a personal vision for clean energy transition on campus?
   1. Importance of conservation and reduction of waste
4. What do you believe will be the most important technology in energy transition?
   1. Potentially using a nuclear reactor to subsidize some energy
   2. Off campus solar farm potential
   3. Geothermal seems important, setbacks:
      1. Cost
      2. Difficulty in transitioning to new technology- financial vs technical??
   4. Backup sources are important
   5. Biofuels at abbot? In addition to coal and natural gas options as backup
   6. flexibility of energy sources, add more options to the portfolio
5. What is more important: Supply side or Demand side improvements?
   1. Conserve that energy needs are less
6. Following current plans for the transition, do you think you will meet goals?
   1. They don't know
   2. We won't meet it if there's no plan (or budget)
   3. Hard to predict
   4. Tries to use simple goals
7. Moving forward, would you recommend any people within your team that we could also contact/meet to gain more information?
   1. Andrew’s suggestions:
      1. Look into water usage and its relation to energy
      2. Student sustainability committee (they generally fund projects, but may have insights)
      3. Space committee
      4. PhD student John Zhao that works with geothermal
      5. Professor Wang is also an expert in geothermal
8. (Closing question) As this project develops, we may have more questions as the scope becomes more consolidated; is it okay if we can keep connected? What would be a preferred method of communication (email, zoom, teams, etc.)?
   1. Yes, email

**General Notes:**

* Plan did not really include energy conservation
  + “To what extent are we focusing on energy production/distribution vs conservation.
* Campus heating comes from high pressure steam tunnels. Steam is also used for electrical cogeneration.
  + Problem: does not function off renewable sources; would be very expensive to replace (200+ million)
  + Examples of places that replaced them: Ball St, Stanford (easier because of their climate)
    - Ball St. replacement was not entirely successful, as per Bill. Steam plants are generally replaced with hot *water* systems, which are more easily conductive to solar, geothermal etc. systems.
* Andy: Generation
* Bill: Conservation
* Look at Stanford’s plan it is the same firm U of I would use
* Look at Ball State’s and determine what they did wrong
  + Overheated the ground -> lowered system efficiency
* Stanford’s plan: May not be as useful because they benefit greatly from different weather (they have more access to solar / geothermal)
* Look at Epic healthcare and what they are doing for renewable energy; they have one of the best and largest geothermal systems
* Maybe to reduce scope; we can do a comparative study of different campus plans to understand the strengths and weaknesses of different conservation/generation plans. Or comparative of different energy systems (solar, wind, etc.) may be necessary.
* Suggestion from Bill: use AESB as a case study to make it energy efficient (has lots of glass staircases)
* Bill: iCAP is somewhat green washing- done to make the university look good
* 10 MW reactor vs 40-70 MW total University load. Bill is glad about this because we need to conserve and reduce total load
* Original plan called for no square foot expansion, but we've had ~16% expansion 2010-19. “Cheated” by using donations, then changed rules
* It's hard to plan because it's hard to know what future technologies will be available.
* Solar, Wind (there are some county restrictions on wind),
  + Geothermal: effective for heating and groundwater purposes
    - Can be put anywhere on campus (under athletic fields, parking lots, etc.)
* Champaign County has strict wind farm rules. Campus buys from a farm outside county
* Hydrogen projects being done
* Setbacks
  + Cost
  + Implementation takes years to transition so must be planned heavily in advance
  + Why does it take so long to transition (is it technological or economics)?
* Speak with Meredith Moore