4/8/22

**INTERVIEW WITH**:

Karl Helmink- Associate Director of Utilities and Services, Retrocommissing Manager

Paul Foote- Energy Efficiency and Conservation Specialist

**CONCISE SUMMARY:**

On 4/8/2022, the team met with Karl Helmink and Paul Foote. They both stressed an emphasis on energy conservation for the energy plan. They stated that a large problem stopping energy reduction is the “billions of dollars” worth of deferred maintenance that exist in campus buildings. This is in addition to the new buildings being constructed despite existing abandoned building space. They also informed us about the retro-commissioning team that they are both a part of. They reduce energy by an average of 25% for each building retro-commissioned and have saved the university over $100,000,000 in utilities since 2007. They do this by focusing on the “low hanging fruit,” this being scheduling, sensors and some maintenance. They roughly estimate that it will cost about 2 billion dollars to make the steam to hot water transition. This would take many years and about 10 boilers for redundancy. They recommend geothermal but warn that the university already has a lot of underground, so it would need to be placed carefully, possibly on the perimeter of campus. It would also still need a backup system (probably Abbott).

**DETAILED INTERVIEW NOTES:**

**Questions:**

1. What do you feel is the biggest challenge for the clean energy transition on this campus?
   1. Money
   2. Campus alignment of priorities
2. Do you think there are any weaknesses about the current utility master plan that need to be specifically addressed and may need more attention in future plans?
   1. Is just a 3-5 yr document, not long term
   2. Need to rely on innovative new tech. Important for effective plan
3. What sort of support/resources are needed for these changes?
   1. Money, support
   2. Can throw money if you’re throwing at people who know what they're doing
   3. Can hire architects and engineers
4. Is there typically more energy savings from improving building envelope efficiency, updating old HVAC equipment, or scheduling?
   1. Lowest hanging fruit is scheduling
   2. New control system, visit occupants, occupant sensors
   3. ABE 204 sensors also control HVAC
   4. At point where we need to do heavy, throughout updates
   5. This gives opportunity for envelope
   6. Hard to just improve just envelopes
   7. Windows expensive to replace
   8. RCX focuses more on door crack, insulation well maintained
5. Thoughts of steam use in buildings? In terms of mechanical renovations, what would it take to replace steam (possibly to hot water)?
   1. At least 2 billion $ and a lot of work
   2. University of British Columbia - Paul sent upgrade, took 10 years
   3. Steam is maintenance intensive
   4. Hot Water is better solution
   5. Probably need to be done probably in accordance with renovations
   6. Costs- construction,
   7. About 30 miles of steam piping on campus
   8. Probably need 10 boilers for redundancy

**General Notes:**

* Campus master plan- to reduce campus loads, but we are building/adding space
* “A billion dollars’ worth of deferred maintenance” davenport, turner, psych, library
* Example- UGL upcoming remodeling.
* Renovate old buildings faster
* Freer Hall north end renovated. South end vacated
* We’re not utilizing campus space
* Everitt renovation:
  + Previously 1 million $ utility bills
* Older science: Morrill and Burrill hall- Fume hood possible retirement
  + 1,700 fume hoods on campus. $5,000 per hood
* RCX History
  + Started 2007
  + Average 25% savings per building
  + $100 million total savings
* Currently working w housing
* Building disabling
  + We have existing unused space (that’s being heated/cooled)
  + ex: unused greenhouse still being heated
* Not best idea to clear up pipes/ mechanical systems
* Paul sent State of Facilities on Higher Education doc
* They mainly focus on low hanging fruit- updating
  + Easier and cheaper than new buildings
* 2 billion dollars is to convert from steam to hot water. Other universities have done this as well (check email for link)
  + Cost of change, construction is high
  + We would have to tear and replace miles of piping throughout campus. Would also need around 10 new boilers
* Already knocking off steam in some buildings as renovations are done
* Lab efficiency- share resources, improves efficiency, and causes higher quality research
* Geothermal-
  + CIF and a green house on S Fourth St.
  + CIF not running as efficiently as possible. $ per square foot
  + More efficient, but large upfront cost
  + Campus already has a lot of stuff underground
  + Probably best to put it on campus perimeter
  + You can put too much heat into the ground. All 300 campus bldgs. probably too big
  + Ball state & Indiana university
    - Water system probably becomes saturated at some point
  + Need a traditional back up system- probably Abbott
* Energy farm boiler