SWATeam Recommendation

Name of SWATeam: Energy Generation, Purchasing, and Distribution

SWATeam Chair: Yu-Feng Lin   Date Submitted to iSEE: May 27, 2019

Specific Actions/Policy Recommended (a few sentences): Enter into a contract with an engineering firm to evaluate the feasibility of implementing geothermal energy technologies in future new construction and retrocomissioning of buildings on the UIUC campus.

Rationale for Recommendation (a few sentences): Because UIUC campus has achieved most goals for generating energy from solar and wind applications, future carbon offsets will be met by implementing other low-carbon renewable energy technologies. One such technology is geothermal energy. The development of geothermal systems on the UIUC campus is bolstered by several factors, including:

- Wide temperature range of the Midwest US climate (cold winter/hot summers)
- Favorable local geology and drilling conditions
- Potential feasibility of technologies for direct use heating and cooling and underground thermal storage
  Ambitious new building and retrocomissioning programs for next 10 years.
- Existing research capabilities to support advanced system designs and effective operation.

We recommend that a company specializing in implementing district-scale geothermal systems be hired to help evaluate the application of geothermal energy technologies on the UIUC campus.

Connection to iCAP Goals (a few sentences): The 1st objective in the Energy Generation, Purchasing, and Distribution chapter of the iCAP reads, "Explore Options for 100% Clean Campus Energy." This recommendation is in line with this objective.

Perceived Challenges (a few sentences): Since existing geothermal technologies in the Midwest US are not used to directly generate electricity, our SWATeam will therefore collaborate with the Energy Conservation and Building Standards SWATeam. This collaboration will require extensive teamwork and cooperation, but we do not perceive any substantial challenges because the adoption of geothermal energy will help both SWATeams to achieve their goals. Furthermore, the technology will increase the operational efficiency of buildings and in the process reduce the overall energy required (either self-generated or purchased) for heating and cooling on campus.

Suggested unit/department to address implementation: Facilities & Services (F&S) and other units that are overseeing the construction of new buildings or retrocomissioning of existing structures will work closely and with researchers at the University of Illinois at Urbana-Champaign to achieve optimized designs for the geothermal systems.

Anticipated level of budget and/or policy impact (low, medium, high): Medium. This effort will require the hiring of an engineering firm to perform the assessment of geothermal energy technologies on the UIUC campus. The assessment will require time and collaboration from the SWATeams and the F&S personnel, as they are all key players in the completion of this evaluation.

In the longer term, this effort will assist to reduce the future costs of implementing geothermal energy technologies and maximize the efficiencies of the campus' energy generation and distribution systems. The overall savings from the future implementation of geothermal energy are expected to be higher than the cost of completing this evaluation.

Individual comments are required from each SWATeam member (can be brief, if member fully agrees):

Team Member Name	Team Member's Comments
Yu-Feng Lin	As proposed above.
Andrew Stumpf	Fully agree. No other comments
Mike Larson	I agree with this recommendation. I would suggest that our recommendation be pursued before we consider policy changes regarding new and retro-commissioned buildings, which is our second recommendation.
Tim Mies	Fully support these recommendations without further comments.
Jonah Messinger	Agree. No other comments.
Gabriel Mishaan	Fully agree. No other comments

Comments from Consultation Group (if any; these can be anonymous): None

Explanation and Background (can be supplied in an attachment): None