I (Jonah Messinger) have several relevant comments. I would also like to be involved in both the selection of the consultant, campus groups making decisions on the anaerobic digestion facility, and what the ultimate application will be:

1) if CHP is pursued, biogas storage to produce electricity during peak demand times should be evaluated in this feasibility study, especially since this dispatchable renewable energy option would allow for more solar power deployment for the campus grid. Additionally, based off of a survey of empirical data from the USDA AgStar program.

2) in addition to those mentioned by the Energy SWAT team, a list of potential funding sources should include the Student Sustainability Committee, Illinois Clean Energy Community Foundation, and/or USDA grants.

3) UIUC should most certainty pursue a large scale anaerobic digester, but with an emphasis on ‘large.’ Based off of extensive review of the literature and empirical data from USDA’s AgStar program, anaerobic digestion projects exhibit strong economies of scale phenomena. Additionally, the scope of a digester should not be limited to just diary waste. Food scraps and fats, oils, & greases (FOGs) from dining halls need to be digested as well. Beyond the well-documented (California Air Resources Board) benefits of digestion for any and all organic waste, co-digestion of these high energy organics significantly boosts biogas production due to a lower lignin content and a high concentration of volatile solids (the solids that actual convert to the methane component of biogas). There is a tendency to do things small at first and then learn and iterate. However, THAT WILL NOT WORK HERE. This is not like, for example, solar power. With solar power smaller instillations can show the potential value of solar power and yield larger commitments in future projects. With anaerobic digestion scale, feedstock, and proper design and O&M is everything. On the subject of scale, if this digester is too small (on the order of hundreds of thousands of dollars) the true benefits of the economies of scale exhibited in anaerobic digestion will not be realized. It would still be feasible but not nearly as valuable from a climate or economic perspective. This project should be on the orders of millions or if enough feedstocks are secured, even 10-20 million dollars. These numbers may seem daunting at first but in actuality, if enough grants are secured to fund a truly aggressive project, much of these capital costs can be defrayed.

4) On the subjects of proper design and O&M, I think employing the expertise of faculty members is smart. However, in order to do this project, there can and should be no debate that a specialty EPC firm needs to be hired. As far as O&M is concerned, F&S should make approximately one to three additional new hires (depending on the size of the digester project) with specific backgrounds in effectively operating and maintaining an anaerobic digester. I have spoken with the Executive Director of the American Biogas Council on this subject and he without hesitation said that the two primary reasons for failed digester projects are a lack of proper engagement of an EPC in the design & build phase and a lack of experienced and properly trained digester projects operators/maintenance personnel.

5) building off the above point I think it is important for UIUC to pursue guidance and assistance from both the American Biogas Council and the Coalition for Renewable Natural Gas. These are the two leading associations for biogas and renewable natural gas in the country. Academic membership to both associations is pretty cheap, could likely be funded by the Student Sustainability Committee, and would have benefits to faculty and students beyond the immediate project. I have sent the relevant academic membership information to Morgan White and she is having an intern of hers look into both. It is important that UIUC support the biogas, renewable natural gas, and anaerobic digestion industries if UIUC seriously wants to implement these technologies.

6) on the subject of the climate benefits to be assessed in this feasibility study, a rigorous analysis should be done taking into account the type and approximate scale of the different feedstock scenarios. Additionally, it will be disappointing if an assessment is performed by a relatively inexperienced and non-expert consultant who draws conclusions that diverge from the literature and/or expert analysis performed by the California Air Resources Board (CARB). It is imperative that a thorough stakeholder engagement process is done when deciding who to hire for the feasibility study.

7) I do not know how far along ACES’s new dairy facility is but it goes without saying that the facility’s manure collection system should be a scrape system and not a flush system if there is an aspiration to build an anaerobic digester. I would guess that it is a scrape system but it is worth mentioning to be sure.

8) This is a preliminary opinion, but I know there are various stakeholders who have a desire to see this project be used for the campus transportation fleet via a CNG (compressed natural gas) fueling facility. I am, at least preliminarily, against this. The first reason is that this anaerobic digester project will only have a limited amount of feedstock and so we will only have a limited amount of biogas or converted renewable natural gas (RNG) to decarbonize (quite possibly make the carbon intensity (CI) go negative for the particular application as shown in CARB’s CI analysis of anaerobic digestion biogas use) operations on campus so the operation that is selected should be otherwise not practically decarbonized. In other words, the campus fleet can be electrified, which itself doesn’t decarbonize the transpiration fleet but it will allow for a pathway to a known area of decarbonization; the decarbonization of the power sector vie clean and/or renewable energy, which we know how to accomplish. However, campus heating and, Abbott Power Plant in particular, are not easily decarbonized. For that reason, I strongly urge the university to build a anaerobic digestion facility that conditions and upgrades the biogas to pipeline-quality RNG and either, connect to a nearby pipeline or build a new pipeline to Abbott Power Plant, to be used as a fuel source for the combined heat and power Abbott Power Plant. We quite frankly don’t have another pathway to decarbonizing Abbott Power Plant, which is by far the leading energy supplier and carbon emitter on the campus (and it isn’t remotely close).