**iCAP 2020**

**Energy Questions for iWG**

1. Do we want to eliminate the use of fossil fuel on campus? Should we decommission Abbott Power Plant and move away from steam heating via the steam tunnels? Is this related to the privatization conversation for energy?

	1. SWATeam notes, “Decommissioning of Abbott: Unlikely without significant deviation from the current Utilities Master Plan.”
	2. Morgan notes, “I believe using fossil fuels is acceptable, with offsets. Let’s investigate the impacts of offsets more thoroughly.”
	3. SWATeam suggests, “Study either abandonment of the Abbott Power Plant steam cogeneration system, or conversion of system to use non-fossil fuel sources, and have a decision by 2030.”
	4. If we do allow offsets there needs to be a maximum portion of emissions that can be reduced in this way to prevent leaning too heavily on

It is not practical nor is it necessary from a sustainability perspective to decommission Abbott Power Plant or move away from steam heating, both of which are extremely efficient. I also believe that offsets should be avoided as it does not address true decarbonization of the campus. In theory, we could just purchase carbon offsets for the whole campus and call it quits. I do not think anyone thinks that is an acceptable form of climate leadership and so likewise I do not think a minimal amount of carbon offsets suffices either. Instead I propose twofold; UIUC moves to decarbonize Abbott Power Plant by replacing fossil fuel (natural gas) with low-carbon hydrocarbons such as biogas and hydrogen methanation and in the meantime UIUC continues to promote geothermal heating to lower the utilization of Abbott Power Plant

There are two basic options for decarbonizing Abbott – 1) switch to hot water and geothermal, 2) use biogas and digesters, etc.

1. How do we address the divestment issue?

	1. Sarah noted, “This could also be added as another category, can begin with a Green Fund, school of engineering will argue it’s bad for their recent graduates and interns but students will take any internship the school directs them towards, why not green energy as opposed to companies like Chevron?”
		1. I second this comment. Divestment can (and possibly should) be addressed in its own category, and a Green Fund is a good step in the right direction. Also, divestment is unlikely to affect internship opportunities for students; even if it does, it will probably encourage the support of sustainable companies rather than fossil fuel companies!
	2. The SWATeam noted, “Carbon tax and campus divestment from fossil fuels: The SWATeam unanimously agrees that these issues should be addressed by the iWG and the administration. The Energy SWATeam is responsible for addressing issues concerning energy generation, conservation, and building standards. Topics involving policy and budgetary decisions are beyond this SWATeams’s purview.”

		1. I think the investments in fossil fuel companies are indirect contributions to the carbon footprint of the university. I don’t think it should be very hard to calculate the carbon emissions per dollar invested in these companies. That should give a rough idea of the indirect carbon emissions contributions through investments and if the university goal is to be carbon neutral, these emissions should be included. Hence, whichever SWATeam of working group has the responsibility of mapping the pathway to carbon neutrality (I believe this is iCAP as a whole, hence IWG) should take a look at this.
		2. To this question of “addressing the divestment issue,” I strongly urge the iWG (and all administrators, in fact) to consider the facts that our divestment movement (RSOs Beyond Coal, Fossil Free UIUC, and Students for Environmental Concerns) have, in some capacity, been continuously advocating for the divestment from coal (and now all fossil fuels) for over ten years. This makes our campus’s divestment campaign one of the oldest in the country. Additionally, this campaign has seen a great deal of support from the student body and UC Senate. The administration, however, has still failed to act.
		3. **I absolutely believe that a commitment to divestment needs to be included in the 2020 iCAP. Students from Fossil Free UIUC have already drafted an encompassing objective for the Climate Action Plan, which gives the administration until the end of 2020 to commit to divestment and another 24 months to fully divest the U of I system endowment from all companies involved in the extraction, manufacturing, production (and, ideally, transportation) of fossil fuels. This is more than enough time for the University to divest.**
		4. Divestment needs to be part of the iCAP regardless of where it lands within the document because it is essential to eventual carbon neutrality.
		5. I think divestment of investments in the endowment is of great importance. As a first move to that end, I think starting a green fund portion of the endowment is paramount. Furthermore, in addition to new budgetary reforms at UIUC, I believe a carbon tax should be installed. I think it should not be completely revenue neutral and instead a portion of the funds raised be given back to campus units with good carbon emissions performance and the rest of the funds be used to fund green projects on campus. I should add these carbon tax funds should be strictly spent on projects that lower carbon emissions, not general sustainability.
2. How do we address the need to be carbon-free while continuing to grow and expand our impact? How do we address the problem of measuring energy reduction/conservation with an expanding campus and enrollment?

	1. Sarah noted, “Possible accountability clause, ex. ‘if in the years of the target goals, the University is not expected to meet targets within a 1-year margin of error the university-wide administration must direct more funds into sustainability research, buy solar panels with overhead, implement sustainability gen-eds if initially resistant, etc. For every unit of carbon emitted over the limit university overhead must direct $X to sustainability on campus. Just some ideas but some sort of consequence is important.”
		1. I believe coming up with a plan for accountability is very important as well.
		2. I really like these ideas! Accountability and consequence are important to keeping the University on track to its goals.
	2. The SWATeam notes, “The SWATeam suggests F&S change the methodology for allocating energy to existing and new building space. For example, Campus should lower the baseline energy allocation to new buildings.” SWATeam also notes, “The greatest risk in setting targets is posed by the growing campus square footage.”
		1. Perhaps the targets can be set as normalized targets such as kWh/ft2 or per building etc.
	3. Morgan notes, “I don’t believe we have a method for allocating energy to existing buildings. Could we start doing this, with the adjustments to the space policy?”
	4. We should be careful about stunting campus growth but a comprehensive policy does need to be developed for determining by how much we expand and the consequences that expansion will have on the campus carbon footprint.
3. How do we set objective deadlines/dates so that they are both aggressive and achievable? How can we accelerate carbon reductions?

	1. Could we seek to be 50% carbon neutral by 2030?
	2. The deadlines in the draft objectives are not at all vetted for budget and schedules.
	3. Should iCAP objectives reflect existing efforts that are in progress? Morgan says, “I think the existing efforts need to be in the plan, to reflect the overall approach and the ongoing workload.”
		1. I think this is important that the current efforts are in the iCAP objectives, as it provides more visibility to efforts that will probably be ongoing in the first few years. It shouldn’t look like nothing is being worked towards.
		2. Yes but more aggressive and sweeping reforms/proposal should be the centerpeace of the 2020 iCAP

**Energy Objectives**

1. Develop a comprehensive planning document by FY24, with a detailed strategy for meeting the FY50 net-zero GHG goal.
2. Update the Space Policy in the CAM to reflect a realistic strategy for stewarding our campus resources and square footage, by FY23.
3. Use at least 140,000 MWh/year of clean power by FY25.
4. Support the transition to electric heating by converting campus buildings to use hot water low temp heating systems <add a specific metric, based on number of buildings to convert>
5. Continue to reduce Energy Use Intensity (EUI), to 40% by FY30, 45% by FY40, and 50% by FY50.
6. Implement the LED Campus Commitments, as defined in 2013.
7. Reduce total annual energy consumption from university-owned buildings in the University District of the original FY08 baseline total, as reported in the Energy Billing System, to 30% by FY30, 40% by FY40, and 50% by FY50.

**Energy Discussion/Explanation**

1. Develop a comprehensive planning document by FY24, with a detailed strategy for meeting the FY50 net-zero GHG goal.
	1. Include need for engineering firm and calculations in paragraphs.
	2. Describe that this is a feasibility study for capital – and that it is 25 years – including associated costs and benefits, and interim milestones.
	3. This would be feasibility study, done through a competitive process / RFP or QBS.
	4. Set specific and realistic goals for conservation, reduction of fossil fuels, and increased use of clean energy (renewables, waste to energy, and nuclear) through this process.
		1. Use the results for writing the iCAP 2025 energy objectives.
	5. *(SWATeam suggested, “By 2025, commission a comprehensive planning document for meeting the iCAP target of zero GHG emissions by 2050 or before.”)*
	6. This objective is good although I would avoid nuclear as it is not cost-competitive.
2. Update the Space Policy in the CAM to reflect a realistic strategy for stewarding our campus resources and square footage, by FY23.
	1. *(SWATeam suggested, “Maintain or reduce the campus gross square footage.”)*
	2. It would be good to know when the IVCB will actually be in effect. There are some sticking points for this, like deferred maintenance and conditions.
	3. It isn’t very realistic to say net zero space – we should minimize the total SF, and maintain the total space per person, net zero increase or even reduce it.
	4. Residents want more and more space
	5. Bathrooms need more space.
	6. Perhaps include a list of requirements for new spaces – like solar panels, etc. some sort of investment in existing buildings that ignore
	7. Some people want more space and some want a better environment…
	8. Pedagogy – active learning is going to more SF per student
	9. Equipment needs more space, eg. Loomis Lab.
	10. Requirements and expectations are changing with generational shifts.

This objective needs to be flushed out and more nuanced*.*

As we discussed, the SWATeam suggestion to maintain or reduce space from the previous baseline that was set would come at great sacrifice to many strategic initiatives and the overall academic mission of the University.  The objective to come up with an environmental sustainable space stewardship program that holds the University accountable for the highest standards of space efficiency and having a review and approval process to control growth in a responsible manner would be in better alignment with our mission (in my opinion).  The IVCB budget model will play a vital role in holding Units accountable for their space and will need to be monitored carefully to ensure it’s having the desired effect of promoting the efficient use of our resources.

1. Transition to carbon-neutral energy sources by FY35 – this should say FY50.

	1. Eliminate net-GHG emissions from Abbott Power Plant by FY35.
		1. I would even move this date closer to FY30. Please see separate document entitled “Private Energy Infrastructure Lease Proposal.”
	2. Complete a feasibility study for the implementation of micro-nuclear as a carbon-free source by FY24.
		1. Completely unrealistic and not a feasible option. Should not be mentioned in the 2020 iCAP unless in the context of supporting research for micro-nuclear.
	3. Use at least 140,000 MWH/year of clean power by FY25.
		1. Support the development of a new off-campus solar farm in Illinois through the so-called “Solar Farm 3.0” project. Keep the RECs associated with this new solar farm.
		2. By FY25, use at least 25% renewable electricity to power campus, with at least xx% of total energy produced from renewable sources on campus. Use 100% green power by FY35.
		3. This is not aggressive enough. I would suggest we set a goal of 35% renewable electricity by FY25. Renewable electricity is the easy part, decarbonizing Abbott Power Plant and hydrocarbons is the difficult task. I also think the percentage generated on campus is not crucial assuming the procured renewable electricity is local, in the state, or at a minimum in the same time zone and grid as UIUC. It is not clear what “green power” actually means. Does this mean clean power because if so, decarbonizing Abbott Power Plant needs to be addressed, since it generates a lot of campus electricity?
	4. By FY24, use at least 5% green energy for thermal energy, in addition to renewable power supply.
		1. By FY35 use at least 25% carbon-neutral energy for thermal energy, in addition to renewable power supply.
		2. Again, it is not clear what “green power” is, although I do like that thermal energy is specifically discussed. By FY 25 we should set a goal of ~5% green energy for thermal energy.
		3. Add more energy storage: geothermal, batteries, and chilled water
		4. All three make sense and should be deployed.
	5. Increase # of buildings using hot water low temp heating systems – need to know how many there are to convert…
		1. Transition to geothermal energy… *<<add specific metric>>*
		2. *SWATeam suggested, “Encourage implementation of other established and early deployment of renewable energy technologies (e.g., anaerobic digester, composting, thermal storage, fuel cells, batteries, heat pumps, reuse of waste heat, carbon capture, smart grids).”*
		3. *This is great but how UIUC would actually fund these projects is the key.* Please see separate document entitled “Private Energy Infrastructure Lease Proposal.”
	6. **Students suggested**, “introduce small scale electrical grids based on rooftop solar power generation (goal of 10 buildings powered this way by 2035) and fund a feasibility study to determine the best building candidates for this project by 2022.”
		1. potential buildings include the Campus Instructional Facility, Grainger Library, Everitt Lab, Gies BIF, ARC and CRCE (including solar thermal heaters for the pools)
		2. potential dorms for this include the newer 6 pack dorms, ISR, PAR, and FAR
	7. Students also emphasized the importance of transitioning to carbon-neutral energy sources **without increasing overall (gross) energy consumption**
2. Reduce total annual energy consumption from university-owned buildings in the University District of the original FY08 baseline total, as reported in the Energy Billing System, to 30% by FY30, 40% by FY40, and 50% by FY50.

	1. Ensure compliance with energy codes and standards *<<add specific metric>>*
	2. Complete building-level report cards and energy models for 100% of campus-owned buildings over 50,000 GSF in the University District by FY24.
		1. Very important
	3. Double energy conservation programming participation rates from FY21 to FY24.  *(SWATeam suggested, “Take measures to integrate iCAP goals into campus operations and lifestyle.”)* Track and report on participants in Ilini Lights Out, Certified Green Offices and Certified Green Labs, and any new conservation incentive programs.
		1. Great programs and Certified Green Labs should be scaled.
	4. Require all faculty, staff, students or employees leaving their offices for any length of time or facilitating the last class or meeting of the day, to ensure waste is removed from the room and energy conservation is in place, by turning off lights and other unneeded electronic equipment.
	5. Increase funding in the Revolving Loan Fund to $10M by FY24.
	6. **Students suggested**,
		1. “include University staff and faculty in Illini Lights Out programming, education, and generally turning lights off around campus.”
		2. “increase awareness of Eco-Olympics, Freezer Challenge, and other energy-saving competitions” (this also pertains to the Education/Outreach Team).
		3. “introduce motion sensor/detector lights (or timed lights if occupancy sensors are not feasible) in all buildings built before xxxx year by 2030”.
3. Continue to reduce Energy Use Intensity (EUI), to 40% by FY30, 45% by FY40, and 50% by FY50.
	1. Complete a large-scale energy conservation project (such as RCx or Energy Performance Contracting) in 50% of the university-owned buildings over 50,000 GSF by FY25 and 100% by FY40.
		1. Very important
	2. Replace all exterior lighting and Building Exit Signs with LEDs by FY24.
		1. Very Important
	3. By FY22, apply building envelope retrofit to at least 5 campus buildings.
		1. Add another goal for FY25 and make it more ambitious maybe and additional 10 building by FY25.
	4. Require Building Envelope Commissioning (BEC) and mechanical commissioning (and recommissioning if necessary) for all building projects. Empower the BEC agent to intervene at all stages of design and construction to ensure the measures taken for energy performance meet the modeled target performance.
		1. Very important
		2. Requiring BEC and RCx on all building projects may not be practical (at least for renovation projects).  F&S Planning should help determine which projects would benefit from these services based on the overall scope of work.
	5. By 2025, provide additional $10 million per year for ESCO and retrocommissioning.
		1. Should be more funding but this is why private financing is important.
	6. Reduce peak consumption by 20% by FY24.

