WDEP SHARED GOVERNANCE COMMITTEE ADDITIONAL QUESTIONS

The WDEP Shared Governance Committee explored several directions that may result in additional recommendations and alternatives or may be used in conjunction with A1 to make it even more desirable relative to Option 2E. For completeness, some outstanding questions are briefly stated below. It bears noting, however, that the Committee's preliminary recommendation against making the deposit is supported by the Committee's Preliminary Recommendation which is submitted separately and independent of the additional questions included below. Answers to these questions will be helpful to the Committee as it considers its final recommendations to the Chief Operating Officer by May 31, 2024. The questions listed are directed to Facilities staff.

The Committee was provided with steam data from the consultant's building energy model (Consultant Dashboard, slide 19). Actual data from plant generation has not been provided to the Committee to date. There is a large discrepancy between the 126 kpph peak from the building model and 200 kpph peak observed at the plant. This difference implies transmission losses of 37% of the heat from the energy plants.

- Can this number be verified with specific data?
- Can anything (within fiscal reason) be done to reduce these transmission losses?

The Climate Action Plan (Scenario 1) indicates that the University intends to reduce energy demand by 30% by 2030. Savings at this level should reduce demand for both steam heat and electricity. According to the consultant, these reductions have not been incorporated into the building energy model. Instead, a modeling assumption was made that the decreases will be fully offset by increases in energy consumption from new construction. [*Note: The Committee's current focus is on the implications of peak demand for resiliency purposes. However, if the offset assumed by the consultant is correct, the increases in energy use do not seem to be reflected in the CAP 2024 BAU and Scenario 1. This situation leads to a considerable underestimation of the University's emissions under the CAP*].

- What are the actual assumptions that went into 2024 CAP Scenario 1 regarding kWh and steam demand for the 2025-2030 period?
- What are the actual increases in demand expected from new construction?
- Can you provide specific information about how a 30% energy savings would translate into reduced demand for heat and electricity?
- Can you incorporate responses from the previous questions into the building energy model?

A related question concerns a possible change in the temperature set point for thermostats on campus. If buildings were set at 68 degrees Fahrenheit in the winter and 74 degrees Fahrenheit in summer, the campus could realize additional energy and emissions savings.

- Can you provide a spreadsheet with existing set-points? (as of Jan 1, 2024)
- Is it possible to model what thermostat temperature reductions in winter and thermostat temperature increases in the summer could achieve in terms of energy saving?

The Committee understands that Facilities staff are concerned about meeting maximum demand for steam heat.

- Can you provide a spreadsheet with data concerning plant-side production data on how many days in each of the last 5 years, campus demand for steam has exceeded – 150 kpph, 180 kpph, and 200 kpph?

It is possible that NOx controls could be added to the WDEP cogen facility thereby allowing it to operate more frequently than is currently allowed under the University's air permit. Facilities staff represented that the current rate of NOx emissions is about 65 ppm. If it were reduced to 42 ppm, then the existing cogen facility could presumably be operated at up to 100% capacity factor under Reg 7. Facilities staff has examined the issue of retrofitting the cogen facility with NOx reduction technologies, but the Committee found no analysis in the WDEP program plan.

- Can you share information on NOx control upgrades that were considered, with whom you consulted, and what an upgrade would cost?
- Specifically, did you consider: (1) induced flue gas recirculation; (2) water/steam injection into the boiler; and (3) low NOx burners. (See also, for example, https://www.wcrouse.com/blog/low-nox-without-flue-gas-recirculation/. The Committee notes that Mitsubishi's website suggests that upgrades to their boilers to address NOx emissions are available: https://power.mhi.com/service/boiler.)

As discussed above, Option 2E might trigger New Source Review (NSR). NSR would be triggered if the upgrade would increase actual NOx emissions by 25 tons per year (tpy). See https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-51/subpart-I/section-51.165#p-51.165(a)(1)(vi).

- To help assess the possibility of NSR, could you provide information about the rate of NOx emissions and total annual NOx emission from WDEP turbines and all WDEP and EDEP boilers?
- If NSR applies to the proposed upgrade of the cogen facility, how would you plan to comply with the relevant Clean Air Act requirements?

During the period between 2018 (when the cogeneration plant became fully operational) and Dec. 2020 (when Reg 7 entered into force) use of the cogeneration remained at near-zero levels.

- What were the considerations or constraints in not increasing cogeneration during that period when it would have reflected a GHG emissions reduction benefit?