UC Davis Health System
Energy Efficiency Work Group

August 21, 2012
FSSB, Room 3103
8:00 a.m. – 9:30 a.m.

Background / Meeting Notes

Attendees:
Mike Boyd                Patrick Putney
John Danby               Tom Rush
Dominick Giglini         Charles Witcher
Mike Mosca               David Zeiher
Alexandru (Alex) Musat

Background: The UC Regents and the leaders of UC Davis Health System place a high priority on sustainability and on energy efficiency. This priority is reflected in the University of California Sustainable Practices Policy and the UC Davis Smart Lighting Initiative and a broad range of other sustainability initiatives at UC Davis and the UC Davis Health System. This issue is also explicitly addressed in the 2011-16 UC Davis Health System Strategic Plan, which recommends the “use of evidence-based approaches to evaluate and reduce our impact on the environment and reduce our dependence on non-renewable energy.”

Work Group Charge: The focus of the UC Davis Health System Energy Efficiency Work Group is to identify and prioritize opportunities to foster energy efficiency on the UC Davis Sacramento Campus through new lighting technology, HVAC improvements, monitoring based commissioning (a.k.a., MBCx) and other initiatives that will improve system performance. Several factors will be considered by the Work Group as it prioritizes potential initiatives, including but not limited to: (1) potential energy savings; (2) projected payback period; (3) ease of implementation; (4) potential rebate opportunities available through SMUD, PG&E and others; (5) initial cost and funding availability; and (6) the potential impact of initiatives on the ability to deliver exceptional patient care. After potential initiatives have been fully vetted, the recommendations of this group will be presented to the Sustainability Sub-Committee. Ultimately, the recommendations will be presented to the Health System leadership for review and approval. The intent is to develop a portfolio of projects that can be implemented in phases depending on funding availability and logistical constraints. SEP loan funding is available from the Office of the President to fund UC Davis Health projects if the projected annual energy savings is at least 85% of projected debt service associated with the portfolio of projects. Ideally, priority projects of the Health System should have a payback period of less than 5-7 years.

UC Strategic Energy Plan (SEP): As part of this initiative, a document was prepared by Newcomb, Anderson and McCormick, Inc. (NAM) for the UC Davis Sacramento campus provides some information and data regarding potential energy savings opportunities, project costs, incentives and payback periods. While the SEP provides a useful frame of reference regarding the relative costs and benefits of various projects, additional due diligence is required to validate project specific costs, potential savings opportunities and payback periods. In addition to considering projects identified in the SEP, Work group members identified other initiatives that can provide substantial near-term energy savings (see below).
The group acknowledged the importance of many other initiatives that are being explored by the Health System to reduce energy demand. These involve changes in purchasing practices, IT equipment, operations and improvements at leased facilities. The primary focus of the first meeting of the Work Group was to identify “low hanging” fruit that can be aggressively pursued by the FD&C and PO&M to help the organization use energy more efficiently on the UC Davis Sacramento campus. The Work Group will reconvene no less than once a month to review progress, additional information prepared by team members, draft reports and submittals that will be provided to UCOP, PG&E SMUD and/or others.

Preliminary Recommendations / Next Steps: The following is a summary of preliminary recommendations based on a review of the projects included in the 2008 SEP and the collective knowledge and experience of Work Group members regarding current HVAC equipment, lighting systems and the Central Plant.

1. Near Term Recommendations: The group determined that there were some opportunities that should be explored immediately, such as: (1) the checking the calibration of the temperature sensors within air handling units serving portions of the hospital; (2) replacing control valves in the Davis Tower to optimize the use of hot and chilled water that is now pumped from the Central Plant to main hospital; (3) reducing the water pressure hot and chilled water pumped to and from the Central Plant; (4) reducing air changes in ORs that are not in use during off shift periods; (5) installing occupancy sensors in conference rooms that do not have automated controls; and, (6) continue to review utility incentive programs for applicability to energy efficiency projects.

Next Steps:

- PO&M will identify internal resources and/or consultants required to check the calibration of temperature sensors associated with air handlers serving the hospital *(Witcher/Putney)*
- Continue ongoing efforts to replace control valves in the Davis Tower to optimize hot/chilled water circulation; initiate a facilities request and PFR if necessary *(ongoing - Giglini, Mosca, Musat and Putney)*
- Evaluate appropriateness of settings regarding circulating pump pressure *(Giglini, Mosca, Musat, Putney and others)*
- Contact leadership of Perioperative Services to determine which ORs can have air changes reduced during off hours. *(Boyd)*
- Contact Johnson Controls to explore potential interface with OR Scheduling System to automate adjustments in air changes. *(Putney)*
- Confirm which conference rooms and classrooms do not have dual mode occupancy sensors installed and initiate Facilities Request and/or PO&M work orders after scope and cost has been determined *(Boyd/Witcher/Conference Services)*
- Maintain contact with SMUD and PG&E to identify and leverage incentive/rebate opportunities *(Danby/Boyd/Witcher)*
- Work with consultants to complete energy and water use audit of Food and Nutrition Services *(Danby/Yniguez)*
2. **Lighting Projects:** The 2008 SEP identified more than a dozen projects related to building lighting. The initial focus will be on validating the cost, potential savings, payback and feasibility of upgrading lighting in those buildings that appear to have the greatest potential for energy savings. This includes the Davis Tower, other portions of the Hospital, the Ambulatory Care Center and the Central Plant. Ongoing efforts led by key PO&M staff regarding exterior lighting serving streets and parking areas will continue to be pursued.

**Next Steps:**

- As necessary, submit one or more Facilities Request(s) for exterior lighting initiatives related to streets and selected parking areas *(Rush)*
- Determine how near term lighting improvement should be delivered (parking and street lighting) *(Rush/Witcher/Boyd)*
- Review preliminary vendor proposals regarding lighting options and if needed, consult with CLTC regarding changes in technology and other relevant information as necessary *(Putney, Witcher)*
- Review scope and cost information of those SEP lighting projects related to ACC, the Davis Tower and other portions of the main hospital; Determine what adjustments are necessary in scope, cost and lighting technology *(Witcher, Putney and Mosca)*
- PO&M to continue to search for existing Light fixtures with 40 watt T12 lamps with magnetic ballasts and replace them with new 32 watt T8 lamps with electric ballasts *(Witcher, Zieher and other PO&M staff)*
- Prepare funding request to replace the Central Plant metal halide light fixtures with new LED fixtures with occupancy sensors and wireless controls *(Rush/Witcher/Mosca)*
- Define process to evaluate alternatives used within the hospital (consult with Patient Care Services for recommendations on how to involve nursing and other members of the patient care team in the decision making process regarding potential lighting modifications). *(Boyd)*
- Explore potential use of parking funds to assist with lighting improvements in Parking Areas *(Boyd)*
- Establish standards (e.g., manufacturers, technologies) for lighting retrofit programs to assure uniformity in program application. *(Witcher, Zieher, Putney, Mosca)*

3. **Pavilion Heat Recovery System:** Plans indicate that key components of a heat recovery system were included in the Surgery and Emergency Services Pavilion. Piping connecting key elements of the system were not installed as a cost savings measure. Preliminary indications suggest that the activation of this system could result in a substantial reduction in heating hot water requirements. The cost and benefits of this potential initiative should be more fully explored.

**Next Steps:**

- FD&C engineers and key PO&M staff should verify field conditions and provide a preliminary assessment of scope and benefits. If there are substantial potential savings opportunities, a Facilities Request should be submitted and a more detailed study should be undertaken *(Giglini, Mosca, Musat and Putney)*
4. Commissioning: Monitoring Based Commissioning (MBCX) is a term used to describe a data driven approach to optimize the energy use of existing buildings by monitoring and adjusting critical systems to foster peak performance. This approach requires the installation of metering technology if it is not already in place. Efforts are in progress to install metering at older facilities on the UC Davis Sacramento Campus that are not equipped with metering equipment. As a first step, the Work Group members felt strongly that we need to optimize the performance of the Central Plant and we need to ensure the reliability and accuracy of existing metering equipment that is in place. This has the greatest potential to reduce near-term energy cost. This will be informed by Phase 2 of the Utility Master Plan now in progress (draft report due in November 2012). Additionally, a decision was made to put together a preliminary proposal to perform MBCx on the Research III Building. There appears to be significant energy savings potential by leveraging existing equipment and training of building occupants. Since there are many research buildings on the Sacramento campus, this may provide a test case for other research facilities on the UC Davis Sacramento campus.

Next Steps:

- Complete first draft of Phase 2 of the Utility Master Plan, including recommendations for improvements to Central Plant operations and automation. (Rush/Consultant team and others)
- Continue ongoing efforts to ensure that existing metering equipment is functioning properly (Giglini, Mosca, Musat and Putney)
- Continue efforts to install additional metering equipment in permanent buildings on the UC Davis Sacramento Campus (Giglini, Mosca, Musat and Putney)
- Initiate Facilities Request to develop a scope and cost proposal for MBCx of Research III (Rush)
- When appropriate, meet with SMUD to discuss potential incentives for MBCx of Research III (Rush and Danby)

5. Resetting of HVAC Controls: The SEP identified several projects that involve reprogramming HVAC equipment in existing buildings. Some of these projects potentially have very short payback periods and do not involve construction and one project (C 1519) estimated an energy savings of over 1,000,000 kW/year. The group felt that these opportunities should be investigated further to confirm scope and projected savings.

6. Other: The Health System should explore potential SMUD and PG&E incentives as it develops plans to develop the Translational Science Center (4875 Broadway Building).

Next Steps:

- Meet with SMUD after preliminary plans are completed regarding the Translation Science Center (Boyd, Danby and Rush)