Master Planning Council (MPC)

MEETING NOTES - November 18, 2009

Office of the Architect for the University

Summary: Environmental Footprint Reduction Plan

MPC Members
David J. Neuman, FAIA, LEED AP
Architect for the University

Arthur Garson, Jr (Dick Minturn attending)
Executive Vice President and Provost

Nancy Rivers
Chief Of Staff for The President, Associate Vice President for Admininistration

Ed Howell (Tom Harkins attending)
Vice President and CEO, UVa. Health System

Pat Lampkin
Vice President and Chief Student Affairs Officer

Craig K. Littlepage
Director of Athletic Programs

Yoke San L. Reynolds
Vice President and Chief Financial Officer

Colette Sheehy
Vice President for Management & Budget

Kim Tanzer
Dean of the School of Architecture

Ex-officio
Wayne Cilimberg (David Benish attending)
Director of Planning, Albemarle County

Bill Edgerton
Albemarle County Planning Commission

Genevieve Keller
Chair, Charlottesville Planning Commission

Judy Maretta
Director of Space and Real Estate Management

Julia Monteith, AICP, LEED AP
Sr. Land Use Planner, Office of the Architect

Donald E. Sundgren
Chief Facilities Officer

Jim Tolbert (Ebony Walden attending)
Director of NDS, City of Charlottesville

Rebecca White
Director of Parking & Transportation

Ida Lee Wootten
Director of Community Relations

Student Members
Zachary I. Manis
Graduate Representative

Brandi N. Cox
Undergraduate Representative

Meeting Agenda

- Introductions, by Julia Monteith, AICP, LEED AP, Senior Land Use Planner, Office of the Architect
- Overview of UVa's Environmental Footprint Reduction Plan by Andrew Greene, LEED AP, Sustainability Planner, Office of the Architect
- UVa Energy & Utilities by Cheryl Gomez, Director of Energy and Utilities

Presentation Summaries

Introductions by Julia Monteith, AICP, LEED AP

Ms. Monteith began the meeting with general introductions followed by a short overview and time line of sustainability initiatives at UVa since 2005. These include the 2006 Sustainability Assessment, the adoption by the BOV in 2007 of a commitment to Leadership in Energy and Environmental Design (LEED) Green Building Rating System certification for all new and renovation building projects, the creation of Sustainability Advisory Panel, the completion of a greenhouse gas emissions inventory at UVa, the creation of the Presidential Committee on Sustainability and the current development of the Environmental Footprint Reduction Plan. Catalysts for action toward sustainability goals has also come from outside the University through the American College and University Presidents' Climate Commitment and from the EPA.

Environmental Footprint Reduction Plan
Andrew Greene, LEED AP, Sustainability Planner, Office of the Architect

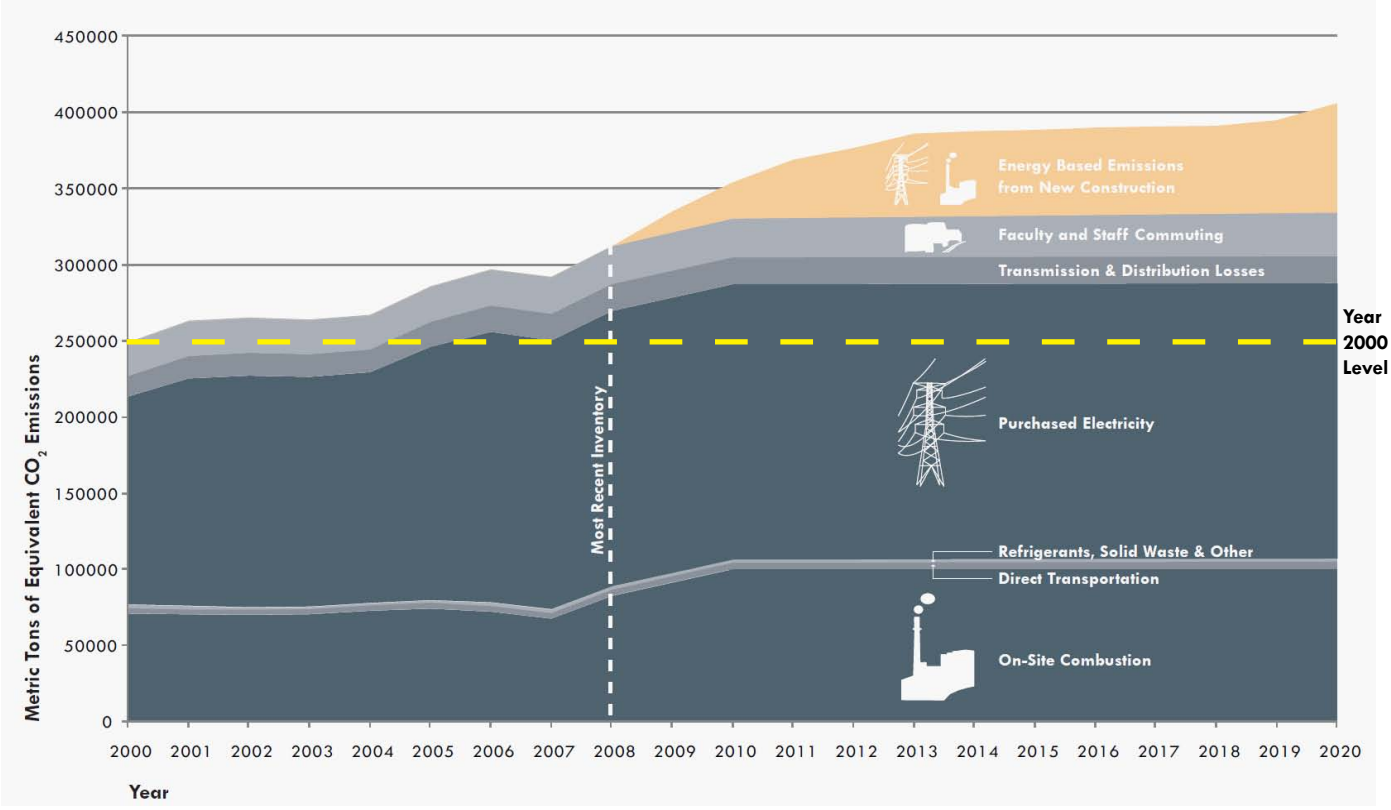
Andrew Greene presented the draft Environmental Footprint Reduction Plan (EFRP) under development by the President's Committee on Sustainability. This plan seeks to establish carbon, water, waste and nitrogen reduction goals for University and outline a path for achieving these goals. The draft EFRP has three main objectives: 1) to show UVa leadership in sustainability 2) to define realistic goals for the University and 3) Detail specific strategies for meeting the defined goals.

The plan is divided into four areas of resource use that require reduction. They are phase 1: greenhouse gas emissions (GHG), phase 2: water, phase 3: waste, and phase 4: nitrogen. Currently, the draft EFRP plan addresses phase 1, GHG emissions, though the final plan will contain goals and strategies for reducing phase 2, 3 and 4 emissions. GHG emissions are essentially CO_2 emissions created by the University. CO_2 emissions are measured in metric tons. For reference, one metric ton of CO_2 represents the energy required to a) power a compact fluorescent light bulb for 15.2 years, b) power an incandescent light bulb for 3.3 years, c) drive a sub-compact car across the United States or d) drive an SUV half way across the United States.

In developing the draft EFRP plan, CO_2 emissions from University operations have been categorized into one of three scopes. Scope 1 emissions include direct emissions generated by University-owned equipment and activities. Examples include the heating plant, fleet, University Transit Service, jet, fertilizer application and refrigerants. Scope 2 emissions are generated by the electricity purchased by the University and Scope 3 emissions are created by UVa sponsored activities such as commuting to and from work and as-yet unquantified activities like air travel, procured goods and services and construction activities.

The Office of Environmental Health and Safety, along with students, catalogued the University's CO_2 emissions for years 2000-2008. They found that scope 1 emissions account for 27% and scope 2 accounts for 56% of the University's carbon output. Not all of the scope 3 emissions are known, but they account for at least 17% of the total CO_2 emissions of the University. Understanding the source of emissions is important when devising strategies for reducing CO_2 output across Grounds. The draft EFRP proposes 3 strategies for reducing GHGs: 1) Minimize and mitigate emission's growth from new construction 2) Catalyze efficiency and conservation efforts and 3) Increase renewable energy generation and use.

Using a combination of these three strategies, the proposed University's goal will be to reduce carbon emissions to their year 2000 levels by the year 2020. This is 20% less than the 2008 level. This reduction target is more aggressive than the target espoused by Governor Kaine in Executive Order 59, which calls for a reduction in GHG output to 2000 levels by 2025. To put this target in perspective, the estimated year 2000 GHG emissions were about 250,000 metric tons of CO_2. If the University continued on its current trajectory, in 2020 it is estimated that 400,000 metric tons of CO_2 would be emitted. Thus, the draft EFRP calls for a 37.5% reduction in GHG emissions versus a business-as-usual approach. This is an ambitious goal, but it is less aggressive than many of its peer institutions. Cornell University has the most ambitious emissions reduction target of any major university in seeking to become carbon neutral by the year 2050. Their path to this goal would mean an approximately 40% reduction in carbon emissions by 2015. Virginia Tech, on the other hand, has a goal of reducing emissions to year 2000 levels by 2025 (as in Governor Kaine's Executive Order 59).



Several examples show how the strategies in the draft EFRP could be implemented. In the case of new construction, additional carbon emissions from a new dormitory will have to be mitigated through implementing energy efficiency technologies in existing buildings and/or using more renewable energy. For strategy 2, the Ivy-Emmet Street parking garage was highlighted. Recently, the lighting in this garage was retrofitted for more efficient

lighting. This one change resulted in a large reduction (336 metric tons annually) in carbon emissions and had a relatively short payback of two years. Strategy 3 involves both coordination with energy companies who supply UVa with electricity and installation of renewable energy generating capacity on Grounds. As energy companies continue to add renewable energy into their portfolio, UVa's emissions per kWh or purchased electricity will decrease. Complementing this strategy, UVa should also pursue the long-term goal of installing renewable energy generation on Grounds to further increase the amount of renewable energy in our energy portfolio.

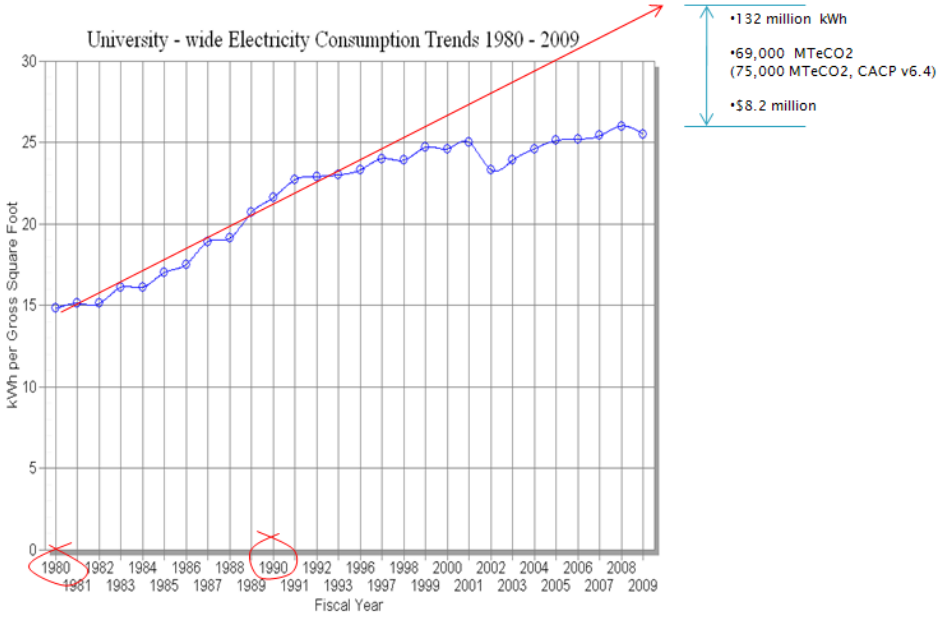
In the discussion following the presentation there were several important points made. The first was an acknowledgement that the goals of the draft EFRP are not always in line with the University's goals for future growth. To bring these two in line, there needs to be a serious discussion about how much we build in the years ahead. Space management of existing resources will play an increasingly important role in accommodating growth. Another important point made was that there has not been a definitive price tag put on the draft EFRP implementation strategy. It is always possible to buy Renewable Energy Certificates (RECs) to offset the University's carbon emissions, but this strategy would require an annual repeated expenditure of funds and have a less beneficial impact than the combination of strategies above. Before any implementation strategy is adopted, a series of cost/benefit analyses need to be completed. It was also noted that the University is already implementing many of the strategies for more energy efficient building design and efficiency improvements.

UVa Energy and Utilities

Cheryl Gomez, Director of Energy and Utilities

The 2008 Grounds Plan identified areas throughout Grounds for targeting infill and redevelopment. Though there are no plans to build-out each of these sites to their maximum potential, the future will undoubtedly see some level of new construction. Each new building leads to additional energy and utility use which makes achieving the goals of the draft EFRP harder. The current energy and utility usage of the University is immense: the University spends roughly $60 million/year on utilities. This figure includes commodity costs (gas, water, electricity, coal, etc.) and the day to day maintenance of the utility system. Additionally there is deferred maintenance of the utility infrastructure. Currently, there is between $84 to $93 million in deferred utility maintenance over the next two years, dependent on adequate funding.

Between 1980 and 2000, electricity consumption per square foot at the University was accelerating at a pace of 46% per decade. Since 2000 though, this metric has remained relatively stable. This was in large part due to efforts begun in the late 1990s. These efforts included an aggressive energy conservation program, a central approach to cooling and chilled water, and implementation of building guidelines for new construction. In effect, these efforts were akin to many of the strategies called for in LEED certification. Other utility usage rates have not increased quite as much as electricity since 1980. Heating has remained flat, on a per square foot basis. Water usage peaked in 1999, but has been declining since then and is now 142,800,000 gallons below the peak level. Trash generation has been increasing along with amount recycled, however total waste diverted from landfills is increasing.



UVa Energy and Utilities has undertaken a number of conservation efforts in order to improve energy efficiency. These efforts have included taking a centralized approach to heating, cooling and electrical demand; installing energy management systems and controls; upgrading lighting to more energy efficient types; and installing insulation, steam traps and weather stripping to existing buildings. In 2009, energy efficiency projects have realized cost avoidances of $1.1 million dollars and reduced emissions by 1500 metric tons of CO_2. One building, MR-4, was recently overhauled by the Energy and Utilities 'Delta Force'. Their efforts, which cost $434,000, resulted in $408,000 in annual cost avoidance and a reduction of 1,281 metric tons of CO_2. This project will pay for itself in a little over a year. There are many opportunities around Grounds for the 'Delta Force'. The next buildings they will evaluate and overhaul are the Jordan Hall addition, the Chemistry Building and the Multi-story building. In addition to 'Delta Force', Energy and Utilities is initiating other conservation projects, such as lighting retrofits, scheduling & setbacks, controls, insulation and leak identification and repair.

Energy and Utilities is also engaged in improving communication for efficiency initiatives. They have installed a sustainability kiosk 'dashboard' in Newcomb Hall and are planning a second one in Campbell Hall so occupants can monitor energy consumption. In the future, they would like to develop a program of building sustainability coordinators/leaders that can act as advocates for efficiency. The University applied for a Department of Energy Grant along with six other universities and three electric utilities in the Mid-Atlantic region for researching, measuring and demonstrating the capabilities of smart grid technology. We also submitted a grant to the Virginia Department of Mines, Minerals and Energy (DMME) that will allow the plant to burn up to 20% of wood pellets instead of coal. Virginia based suppliers of wood pellets made from residuals would earn extra points in the Request For Proposal project. We hope to learn of the outcome of this Biomass grant submittal in December, 2009.

The draft EFRP sets forth three strategies for reducing the environmental footprint of the University: 1) Minimize and mitigate emission's growth from new construction 2) Catalyze efficiency and conservation efforts and 3) Increase renewable energy generation and use. Right now, the University could choose to purchase RECs, carbon offsets and green power from Dominion, but this would cost upwards of $4.85 million annually. This money is better spent on conservation efforts. The theme of conservation being the smartest way to achieve emission reductions right now is reinforced by evaluating the cost/benefit of existing renewable energy technologies. Of the existing renewable technologies solar thermal and deep well geothermal appear to offer the best potential, but an analysis is yet to be completed. The payback on solar photovoltaics is lengthy (up to 75 years in terms of simple payback), but there are other reasons to install PV systems because they have an education, research and social benefit that is hard to price.

The University's carbon problem is essentially an energy problem – all buildings need energy to run. For now, conservation remains the best way to reduce the University's carbon footprint. To use other sources of energy would be expensive and problematic. Cheryl pointed out that it would cost the University $10.3 million to burn 100% natural gas over coal at its main heating plant and there would be substantial infrastructure costs to run new pipeline from the Interstate gas pipeline to enable the plant to run 100% on natural gas. In the case of electricity, we are dependent on our electric utility, and they continue to generate electricity with coal, despite its drawbacks.

Cheryl presented several options for the use of $1 million dollars to reduce or offset carbon emissions. Conservation and efficiency improvements win hands down due to the sustained carbon reduction and the payback potential. For success in reducing energy, it is strategically important to understand the University's carbon footprint and environmental impact, manage costs and risks involved in energy reduction and engage students, faculty and staff in order to change their perceptions about energy use.

In the discussion that followed the presentation, a number of important questions were asked and interesting points were made. First, it was noted that UVa retro-commissioning does not currently include building envelope analysis; meaning that energy reductions and cost savings could be even greater if this analysis was done. Building envelope analyses are currently done as part of facilities condition inspections and included in the deferred maintenance list of deficiencies that need funding. Next, there was interest in knowing what supply of projects exists for retro-commissioning. Cheryl stated that the University has almost 15 million GSF of opportunities. In addition, changes in technology will lead to the development of more energy efficient products which UVA will want to implement in the future. It was asked if the University needed to make any organizational changes to support initiatives. The organization seems to be in place. In addition, it was stated that the University appeared to be at an inflection point similar to that experienced by Recycling in the 1990's. With Recycling, people initially resisted recycling materials. Then, the culture changed and people wanted to do more to support recycling. Similarly, few used to be interested in energy conservation and its environmental benefits. Now, everyone wants to do more to reduce – a great place to be. Spe-

cifically, communication efforts have been successful and the culture has changed. The amount of engagement has increased immensely, but we need to keep asking questions and engaging the University community about these issues. On a final, related note, it was stated that sustainability should be a top priority of the new President of the University. The new President will need to increase visibility of sustainability and coordinate efforts across Grounds. Equally important is that the Provost and the Deans of the University need to take ownership and be involved in the evaluation and strategy development of this issue.