



November 18, 2005

Ms. J.B. Culpepper  
Planning Director  
Town of Chapel Hill  
405 Martin Luther King Jr. Blvd.  
Chapel Hill, NC 27514-05705

**Subject: Responses to Questions in the November 16, 2005 E-mail from NC WARN on the University of North Carolina at Chapel Hill's Special Use Permit Modification Request**

Dear Ms. Culpepper:

Following you will find our responses to questions submitted directly to the University by NC WARN on November 16, 2005.

1. Please send me copies of the electricity demand forecasting used to determine the need for the co-gen upgrade, as well as a summary of the findings.

Response: The electricity demand forecast was included in the University's Power Point Presentation of Additional Information to the Town Council on November 9, 2005. It can be found on the University's community website at <http://www.unc.edu/community>, Cogeneration Plant SUP, Main Presentation, slide 4.

2. The report mentions several projects and summarizes campus energy consumption and conservation measures, and notes that improving performance is a growing priority. Can you send detailed scheduling for pursuing efficiency upgrades in existing buildings? In other words, where are you on the continuum of maximizing energy efficiency for the entire campus, and at what pace is the Sustainability Office able to pursue that goal?

Response: The University is developing the capability to collect before-and-after data on energy efficiency projects. Automated steam, chilled water, and electric meters are being added to each building. Energy conservation projects are accomplished as part of larger building renovations, and as standalone energy conservation projects. The University has allocated over \$15 million for HVAC improvements in 10 buildings, \$2.4 million for window replacements in 6 buildings, and \$1.2 million for smaller energy upgrades such as replacing older fluorescent lights and installing variable speed motors. In addition, commissioning of new buildings and retro-commissioning of existing buildings is being carried out, with 10 buildings to be assessed for retro-commissioning in 2005-06. The University's design guidelines provide for maximizing energy efficiency.

- Has the university performed a cost-benefit analysis that compares increasing the efficiency programs mentioned above, versus the plan for expanding the power plant? If so, please provide a copy.

Response: Implementing energy conservation programs does not address the need to increase the capacity to serve critical facilities through self-generation. The University is in the midst of a \$1.5 billion capital program that will add 5.9 million square feet to the campus by 2008. Prior to the beginning of this program, the square footage of the campus was 13.9 million. Even with the University's aggressive sustainability and energy conservation efforts, implementing energy conservation programs alone does not save sufficient power to meet the magnitude of this additional demand.

- Have you prepared a cost-benefit analysis on whether demand could be met through renewable energy, in conjunction with efficiency noted above, instead of increasing power plant capacity? If so, please provide a copy.

Response: For institutional situations, the most efficient means of providing energy is through district systems utilizing cogeneration. These systems diversify peaks, provide redundancy with less total capacity, and significantly improve reliability and lower maintenance costs. The University has been a national leader in district energy for decades. The sunk costs in its existing systems are in the hundreds of millions of dollars. A cost-benefit analysis was prepared for the use of solar hot water in a residence hall building, and because of the efficiency of the University's energy systems the payback period was 28 years. The University does look for opportunities to use renewable energy sources in projects off the main campus, and is exploring alternative and renewable energy sources for its new Carolina North campus.

- Please send a detailed budget on the various aspects of the power plant upgrade, including a total cost estimate.

Response: The projects at the Cogeneration Facility are in various stages of design. The proposed budgets for the various projects are as follows:

Turbine generator upgrade and Phase 1 cooling tower replacement	\$13,350,559
New turbine generator	31,648,709
Phase 2 cooling tower replacement	3,965,363
Emergency generators (black start)	5,091,208
Substation improvements	12,306,888
Switchyard improvements	3,879,960
New storage facilities	<u>1,636,800</u>
Total	\$71,879,487

6. As I noted during the meeting, your statement that mercury emissions are being reduced by 90% represents an emission control factor unmatched anywhere in the industry. If my notes are correct on that figure, please explain what emissions control equipment and/or other methodologies are being used to achieve such destruction-and-removal capacity.

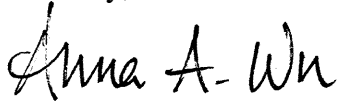
Response: The Cogeneration Facility uses circulating fluidized bed boilers where alkaline material is injected directly into the bed and later collected in a baghouse. Based on actual stack test measurements conducted in 2004, the Cogeneration Facility reduces mercury emissions by greater than 90% below the EPA's estimate for uncontrolled emissions and more than 50% below the mercury limit for new well-controlled boilers.

7. Finally, you noted during the meeting that Chancellor Moeser had recently instructed that the new north campus must exemplify sustainability. Can you provide more information about that commitment?

Response: The Carolina North project is in the very early stages, no policy documents have been issued yet. The University will be happy to share them once they exist. In the University's 2005 Campus Sustainability Report the Chancellor stated that, "Efficient use of energy, water, and materials, reduced life-cycle costs, and a comfortable and healthy environment are goals of every project." Further, he stated, "We are proud to be a leader in sustainability. Our teaching and research mission has long been coupled with public service. Now, at a time of unprecedented growth, we have the opportunity – and obligation – to introduce innovative best practices in our buildings and grounds." The University was recognized in 2005 with the State Government Sustainability Award, and is a recognized national leader in sustainability. We will continue this leadership at Carolina North.

With this submittal and the other information in the record, the University has submitted substantial, competent and material evidence to support the University's application for the Special Use Permit modification.

Sincerely,



Anna A. Wu, AIA  
Director of Facilities Planning

cc: Pat Crawford  
Carolyn Elfland  
Mary Jane Felgenhauer  
Bruce Runberg