



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

April 29, 2010

Chancellor Holden Thorp
UNC-Chapel Hill
103 South Building, CB 9100
Chapel Hill, NC 27599

Dear Chancellor Thorp:

On behalf of the UNC-Chapel Hill Energy Task Force, I respectfully submit an interim report of findings and recommendations for your consideration. We are at the midpoint of our deliberations and intend to submit a final report by September 30, 2010. The focus of our review to date has been energy generation and the opportunities that may exist to reduce greenhouse gas emissions, while meeting cost and technical parameters that are largely inflexible.

The energy landscape is changing rapidly, with new and improved technologies arising almost daily to meet the energy demands of a state that is adjusting to a carbon constrained future. For that reason, our interim recommendations are not intended to be prescriptive as to technologies or fuels that might meet those lower carbon targets. We do, however, provide timetables that we believe are reasonable to transition from carbon intensive fuels to a range of alternatives.

Despite the challenges and complexities inherent in the Task Force's charge, which pale in comparison to the task of energy managers who execute 24/7/365, we have identified a few key levers that offer potential for UNC-Chapel Hill to play an enhanced environmental leadership role in the state, region, and nation, while meeting campus energy needs with reliable low cost supply.

We wish to thank to the Campus Services Division, in particular Associate Vice Chancellor Carolyn Elfland and Energy Services Director Ray Dubose, for their presentations, responsiveness, and creativity as we looked to find real solutions to meet the needs of a changing community and state. We look forward to shifting our attention to energy efficiency and demand-side management in the months ahead.

The Task Force asked me to convey our gratitude for the opportunity to serve. It is noted that the attached interim report was endorsed by the full Task Force with one abstention but no opposition. Special thanks go to our student representatives, Elinor Benami and Mary Cooper, as well as to Ms. Tanya Moore for compiling comments and ideas from a very prolific membership.

Respectfully yours,

Tim Toben, Chair

UNC-Chapel Hill Energy Task Force: Interim Report
April 28, 2010

Background

In January 2010, Chancellor Holden Thorp appointed an Energy Task Force to study energy and carbon reduction plans at UNC-Chapel Hill. Though UNC-Chapel Hill has won numerous awards for being a national leader in campus sustainability, the Chancellor charged this body with assessing current and future energy plans to determine if more could yet be done and on a more ambitious schedule.

Energy Task Force Appointees

The task force includes faculty, students, a trustee, a member of the community-at-large, a former mayor and Secretary of the N.C. Department of Environment and Natural Resources, the State Director of N.C. Chapter of the Sierra Club, and the Chair of the N.C. Energy Policy Council.

- Tim Toben – Chair, N.C. Energy Policy Council and Chair, Board of Visitors, UNC-Chapel Hill Institute for the Environment
- Pete Andrews – Professor and Chair, Department of Public Policy
- Elinor Benami – 2009-2010 Senior advisor to the executive branch of student government
- Mary Cooper – 2009-2010 Co-chair of student government’s Environmental Affairs Committee
- Molly Diggins – State Director, N.C. Chapter of the Sierra Club
- Jonathan Howes -- Former Special Assistant to the Chancellor for Local Relations and former Secretary, N.C. Department of Environment and Natural Resources
- David McNelis -- Research Professor and Director, Center for Sustainable Energy, Environment and Economic Development, UNC-Chapel Hill Institute for the Environment
- Royce Murray – Kenan Professor of Chemistry, College of Arts and Sciences
- John Cooper – Board of Visitors, UNC-Chapel Hill Institute for the Environment and Program Director, MDC Inc., Expanding Opportunity, Advancing Equity.
- Alston Gardner – Member, UNC-Chapel Hill Board of Trustees and Managing Partner, Fulcrum Ventures

Purpose of the Task Force

The UNC-Chapel Hill Energy Task Force was asked to evaluate campus energy issues and plans to become climate neutral by 2050. The committee was also asked to make its recommendations within 6-9 months. UNC-Chapel Hill is a signatory to the American College and University’s Climate Commitment (ACUPCC), which pledges climate neutrality by mid-century.

Interim Report

The first three months of Task Force deliberations have focused on energy generation at UNC-Chapel Hill. The second three months will focus primarily on campus energy usage patterns and energy efficiency, while continuing to monitor issues related to energy generation. The interim report will summarize findings to date and make recommendations largely based on secondary

research and testimony from subject matter experts. These interim recommendations are consistent with the university's overall commitment to phase out fossil fuels.

Baseline Assessment

According to the 2009 Climate Action Plan, and based on results from the 2008 greenhouse gas inventory, UNC-Chapel Hill emitted approximately 570,000 metric tons of carbon dioxide equivalents (MTCDE) in 2008. Of those annual emissions, about 330,000 tons, or roughly 58% of total GHG's, came from a single source -- burning coal at the UNC-Chapel Hill Cogeneration Plant on Cameron Avenue.

The UNC-Chapel Hill Cogeneration Plant is one of the most efficient coal burning plants in the country, with almost 70% efficiency, as compared to electricity-only generating plants that operate at only 35-38% efficiency. This improvement is enabled by using the steam after it drives the turbines, which is typically wasted, for beneficial purposes, such as sterilization in UNC-Chapel Hill's medical facilities, operations in the food service venues, and heating buildings. Ultimately, the steam produces chilled water after condensing, which is then used to cool buildings and equipment. Cogeneration is also referred to as "combined heat and power," or CHP, and is recognized by the U.S. Environmental Protection Agency (EPA) and N.C. Department of Natural Resources (DENR) as one of the most efficient methods for reducing greenhouse gas emissions.

In addition to its highly efficient Cogeneration Facility, several other initiatives have earned UNC-Chapel Hill recognition as a campus sustainability leader. These include:

- Development of a district energy system;
- Ambitious composting, recycling, and waste diversion programs;
- Development of a reclaimed and non-potable water system;
- Innovative stormwater management practices to substantiate UNC-Chapel Hill's commitment to a no net increase in stormwater runoff on campus result despite major new building construction;
- Green building commitment: All non-healthcare buildings at Carolina North designed to meet or exceed LEED-Silver standards;
- Development of a campus/community mass transit system and a commuter alternatives program;
- The student-initiated and managed renewable energy fee, which amounts to approximately \$200,000 per year and has contributed to projects such as the solar array on Morrison Residence Hall, a geothermal heating and cooling system at the new N.C. Botanical Garden Education Center, biodiesel use in the university bus fleet, energy-efficient lighting renovations, and other projects;
- Development of campus-wide bike lanes, pedestrian paths and crosswalks;
- Development of building energy "dashboards" to report real time energy consumption with automated metering;
- A 174-panel solar thermal array on Morrison Residence Hall--one of the largest arrays in the Southeastern United States.

Interim Findings

Despite its extraordinary efficiency, the cogeneration plant still burns coal--the most carbon intensive of the fossil fuels and the target of increased state, national, and international regulation. Coal is the primary source of greenhouse gas emissions from the electric sector. New and proposed regulation will undoubtedly increase its cost. Previous regulation which increased the cost of coal use include Title IV of the 1990 Amended Clean Air Act, which established a cap and trade system to regulate sulfur dioxide and North Carolina's 2002 Clean Smokestacks Legislation, which required scrubbers on coal plants to reduce NO₂ and SO₂.

Southern Appalachian coal is reportedly nearly twice as expensive as western coal, because the cost to extract the smaller seams is higher (Appalachian Voices presentation 4/14/10). Also see April 16, 2010 Argus Coal Weekly (p. 10) Powder River Basin versus Central Appalachia coal prices. The effect of recent and likely US EPA rulings is that more and more of the cost of negative "externalities" associated with coal extraction, use, and waste disposal will be assigned to coal, which should make alternatives to coal more cost-competitive. These rulings include:

- December 2009: US Environmental Protection Agency Endangerment Finding for six key well-mixed green house gases. The finding could result in the regulation of CO₂ emissions from power plants.ⁱ
- January 2010: US Environmental Protection Agency proposed new ozone standards, which would reduce allowable ground level ozone from 75 ppm to between 60-70 ppm.ⁱⁱ Power plants produce nitrogen oxides, which are the major precursor of ground-level ozone.
- April 2010: US Environmental Protection Agency issues revised guidance on water quality standards that restricts the practice of "valley fills" associated with mountain top or surface mining of coal.ⁱⁱⁱ
- Likely 2010-11: US Environmental Protection Agency to increase regulation on mercury emissions and coal ash from power plants.^{iv}

The UNC-Chapel Hill 2009 Climate Action Plan identifies four long-term alternative energy plans (p.9), two of which enable cessation of coal use by 2020. It is in the strategic best interest of the university to pursue these or other lower carbon alternatives, in light of the preponderance of climate science and increased public demand and expectation to move away from carbon intensive fuels. Such a shift would be consistent with the University's history of leadership in sustainability.

Conclusions and Interim Recommendations

Based on secondary research and expert testimony, the Energy Task Force makes the following six near-term interim recommendations:

Interim Recommendation #1: End all use of coal on the UNC-Chapel Hill campus by May 1, 2020.

Once a firm date for conversion is established and an alternate fuel supplier is contracted, UNC-Chapel Hill may be able to convert from coal to its replacement fuel at a date earlier than May 1, 2020. An aspirational target of May 1, 2015 or before is recommended, pending successful test fires and scaling of the alternate fuel regime.

Interim Recommendation #2: UNC-Chapel Hill will seek to accelerate conversion from coal to a cleaner fuel or fuel mix.

Because the Circulated Fluidized Bed (CFB) boiler in the Cogeneration Plant requires 50% solids to operate as specified, it is possible that some form of biomass (wood pellets or torrefied wood) may be substituted for coal. Yet given the rapid pace of developments in renewable markets, the task force recognizes that UNC-Chapel Hill may move in a different direction in order to meet the primary goal of ending coal use by 2020. Since we wish to ensure that one problematic fuel is not substituted for another, the committee encourages life-cycle analyses to be conducted prior to the adoption of any new fuel source. The goal is to convert from coal to an alternate, cleaner fuel or fuel mix at an earlier date if financially feasible.

Interim Recommendation #3: If “biomass” is utilized as the alternate fuel, it will be sourced from certified “sustainably managed” forests, as determined by third party verification.

Woody biomass is a potentially large source of renewable energy for UNC-Chapel Hill and the state, but along with opportunity comes a new set of challenges. There are a lot of "undermanaged" forests in NC. Even as UNC-Chapel Hill is considering this source of lower-carbon fuel, moreover, all the state's major electric utilities will likely be considering it as well, in order to meet their legal mandate under the 2007 Renewable and Efficiency Portfolio Standard (REPS) target of 12.5% generation from renewable fuels by 2021. Currently, there is a debate emerging as to the appropriate level of controls on sourcing to ensure that burning wood for energy does not have the unintended consequence of adversely affecting the state's forest resources and wildlife habitat.

Ideally the production of woody biomass for renewable energy could produce a revitalized commercial forest industry in North Carolina, with certified sustainable management practices and attendant benefits in jobs and revenues replacing widespread forestland that is not well managed either for human use or for wildlife. Without appropriate policies to assure this result, however, this increased demand could instead simply create incentives for more rapid and careless deforestation with attendant ecological and aesthetic damage. UNC would need contractual assurances that it source wood only from forests which are certified as “sustainably managed.”

Should UNC-Chapel Hill pursue woody biomass in the form of torrefied wood or wood pellets as an alternative fuel, the University has an opportunity to play a leading role in how this energy source is utilized and managed in the future in our state.

Interim Recommendation #4: UNC-Chapel Hill will make best efforts to identify and secure coal that is certified by a third party and sourced from deep mines only. (i.e., not from surface or mountain top removal (MTR) mining).

There will be a significant period of time (perhaps several years) during this transition that UNC-Chapel Hill will continue to burn coal. In the summer of 2008, UNC-Chapel Hill's Energy Services made a commitment not to purchase coal supplied via Mountain Top Removal mining practices. Mountain Top Removal causes damage to surrounding human communities and entire ecosystems downstream from surface mines and is therefore not a practice UNC-Chapel Hill desires to support. To further clarify UNC-Chapel Hill's commitment that any purchased coal does not originate from practices that resemble Mountain Top Removal (valley fill, contour mining, etc.), UNC-Chapel Hill will make best efforts to purchase coal sourced from deep mines only.

There are still numerous open questions about MTR Coal, including (1) the sulfur content of deep mined coal vs. surface coal, (2) the cost to extract and transport deep mined vs. surface coal, and (3) the premium to the University for requiring deep mined coal. It was not clear that there was a supplier or certification authority who could/would verify "deep mined" coal, and typically coal is blended. The annual premium cost of \$1,000,000 for specifying deep-mined coal was suggested by Ray Dubose at the April 14 meeting, but our consultants suggested the cost might be even higher. All of these issues must be sorted out with the goal of eliminating the use of MTR mined coal.

To this effect, the task force further encourages 1) the use of "bonus points" or other contract incentives for non-MTR sourced coal and 2) a transparency/disclosure requirement that indicates where the coal is mined.

Interim Recommendation #5: Optimize use of natural gas as supplies and costs warrant

During the summer of 2009, coal consumption was cut dramatically and substituted with cleaner burning natural gas. Consistent with the CAP objectives, this model of optimizing gas is preferred, particularly when the coal/gas price is comparable.

Interim Recommendation #6: Periodic (once every two years) reviews of the potential for solar thermal and solar PV system installations will be undertaken.

The cost of solar thermal and solar photovoltaic systems is plummeting. Between 2007 and 2010, the cost of installed solar PV has dropped from approximately \$0.20/kWh to \$0.10/kWh, according to the North Carolina Sustainable Energy Association. Moreover, third party financing has made these systems profitable in public institutions. These systems can clearly play a central role on the Carolina North Campus, but they may also provide retrofit opportunities on the main campus.

Next Steps

The Task Force will submit its interim report to the Chancellor on April 29, 2010, and shift its primary focus to energy demand and energy efficiency for the second half of its deliberations. The focus will be on building efficiency and new construction, as buildings represent roughly 500,000 MTCDE, or almost 88%, of the 570,000 MTCDE emitted by UNC-Chapel Hill. A final report will be issued on September 30, 2010.

Endnotes

ⁱ USEPA (2009). "Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act." Retrieved April 2010 from: <http://www.epa.gov/climatechange/endangerment.html>.

ⁱⁱ USEPA (2010). "Fact Sheet Proposal To Revise The National Ambient Air Quality Standards For Ozone" Retrieved April 2010 from: <http://www.epa.gov/groundlevelozone/pdfs/fs20100106std.pdf>.

ⁱⁱⁱ USEPA (2010). "April 1, 2010 Memorandum: Improving EPA Review of Appalachian Surface Coal Mining Operations Under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order (Detailed Guidance)." Retrieved April 2010 from: http://www.epa.gov/wetlands/guidance/pdf/appalachian_mntop_mining_detailed.pdf

^{iv} Dewan , S. (2009). Administration Plans New Regulations on Coal-Ash Ponds. New York Times 9 March 2009. Retrieved April 2010 from: <http://www.nytimes.com/2009/03/08/us/politics/08ash.html>.

Addenda 1

Energy Task Force

2 p.m., February 10, 2010

3020 Steele Building

Minutes

Attendees

Committee members

- Tim Toben

Chair, N.C. Energy Policy Council and Chair, Board of Visitors for the UNC Institute for the Environment

- Elinor Benami

Senior adviser to the executive branch of student government

- Mary Cooper

Co-chair of student government's Environmental Affairs Committee and an environmental sciences major

- Molly Diggins

State Director, N.C. chapter of the Sierra Club

- Alston Gardner

Member, UNC Board of Trustees and Managing Partner, Fulcrum Ventures

- Jonathan Howes

Former Special Assistant to the Chancellor for Local Relations and former secretary, N.C. Department of Environment, Health and Natural Resources

- David McNelis

Director, Center for Sustainable Energy, Environment and Economic Development, UNC Institute for the Environment

- Royce Murray

Kenan Professor of Chemistry, College of Arts and Sciences

Presenters

- Carolyn Elfland, Associate Vice Chancellor for Campus Services
- Bruce Nilles, Director, National Sierra Club Coal Campaign (by phone)

Observers

There were about 10 observers, including representatives from the University, the Sierra Club, the Beyond Coal Campaign, The Daily Tar Heel and the Carolina Journal.

Agenda

2 p.m. **Opening remarks**, Holden Thorp, Chancellor

2:15 p.m. **Objectives and Process**, Tim Toben, Committee Chair

2:30 p.m. **UNC Cogeneration Plant**, Carolyn Elfland, Associate Vice Chancellor for Campus Services

3:15 p.m. **U.S. Campaign and Campus Initiatives**, Bruce Nilles, Director, National Sierra Club Coal Campaign

4 p.m. **Discussion & Adjourn**

Committee chair Tim Toben called the meeting to order and credited Chancellor Holden Thorp for forming the task force. He recognized the University for winning awards for the cogeneration plant's efficiency and in areas of sustainability but noted that the University's operations are still dependent on coal. He proposed that the committee meet over the next six to nine months and produce actionable results by the end of the year.

He thanked the Sierra Club and Laura Stevens for their environmental stewardship and Molly Diggins for her willingness to serve on the committee. He thanked the observers for coming and suggested that they submit their feedback through members of the committee. He asked that student questions be directed to student members, faculty questions through faculty members, questions from the community through Jonathan Howes and questions from the Board of Trustees through BOT member Alston Gardner. He said he would serve as the press liaison.

Toben explained the history of coal use at the University.

- He said that in the last half of the last century, the convention for choosing an energy source was described as lowest cost + most reliable = best choice. He said that during 1950-1990, coal fit that model.
- And in the 1980s and 1990s, the University made the decision to use coal and gas. The design allowed the University to produce both steam and electricity and capture nitrogen dioxide and sulfur dioxide. He noted that of the ways to burn coal, this method was the cleanest and recognized as such by the EPA. The cogeneration plant produces 28% of electricity for the campus and the steam needed for sterilization at UNC Hospitals and many research labs.
- He said in 2002, the General Assembly's Clean Smoke Stacks bill required emissions reductions from coal-fired power plants in North Carolina.
- And in 2007, the Renewable Energy Portfolio Standard was passed, recognizing environmental risks associated with carbon.
- This year, the Energy Policy Council is moving to an affordable low carbon paradigm, which moves away from the old model and takes into consideration things like cost, technical and policy implications.

Toben said that we've inherited an energy mix from an old paradigm, and we're trying to move into a new paradigm. In December, the EPA made its endangerment finding and will regulate carbon. Within the year, new EPA regulations on coal ash and mercury will drive up the cost of coal. The University's cogeneration plant will be subjected to these new regulations.

He said the impediments to moving away from coal are technical, policy, price and supply. He challenged the group to focus on the "big hitters" and to look at sources of steam, chilled water and electricity. He asked that they consider the University's base loads as well as peak and emergency demands. He also asked the committee to consider ways we may affect demand.

He said that each committee meeting will be structured with a presentation from an expert. Committee members will have an opportunity to ask questions of the presenter and have a week to submit follow-up questions to Tanya. All questions will be answered and posted on the task force Web site.

Chancellor Holden Thorp joined the meeting. Toben turned the meeting over to him.

Chancellor Thorp thanked the group. He said that he's spent a lot of time with Associate Vice Chancellor for Campus Services Carolyn Efland and her staff learning the ins and outs of energy policy. He noted that the issues are complex but some of the most important of our time. He said a lot of careful reasoning has gone into the University's Climate Action Plan, <http://www.climate.unc.edu/portfolio/cap2009>, and he credited Carolyn Efland and Ray DuBose for the quality of how we do things. He told the committee that the University is open to evaluation of the work we've done and open to the possibility that there are ideas we haven't considered and are worth discussing. He said he looked forward to their input.

Toben thanked Chancellor Thorp and introduced Carolyn Elfland.

Elfland gave an overview of the cogeneration operation. A copy of her presentation is available here:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/CogenPresentationforEnergyTaskForce.ppt

Elfland took questions from the committee.

Elfland and her staff agreed to provide answers to the following questions, which were raised by the Task Force:

1. How are indirect costs paid for?
2. Where is the ash disposed?
3. Who has responsibility of testing the ash?

Toben thanked Elfland and encouraged the committee to submit other questions.

Bruce Nilles joined the meeting by phone. Toben welcomed Nilles and turned the meeting over to him.

Nilles gave an overview of the Sierra Club's concern about coal. He said their involvement in the issue gained a new focus in 2007-08 because of Jim Hansen's research on global warming. Nilles encouraged the group to examine the real costs of energy. He said that according to research by the National Academy of Science, most environmental costs come from coal burning. [It was later suggested by the committee that it was more accurate to credit the NAS National Research Council for this study.] Nilles said that if hidden costs were calculated into the price of coal, it would be double. He cited the Province of Ontario as a model for response, since they control both the health care system and power generation sector. He said that they've already shut down one plant and taking the other four off line in the next four years because of health concerns.

He said the goal of the Beyond Coal Campaign is to eliminate coal plants in the next two decades and to turn people away from building new coal plants. He said the campaign is focused on universities for the following reasons:

- 60 campuses are still burning coal
- Universities are on the forefront of social movements
- Students will live with the consequences of burning coal
- Scientific discourse is in vogue on campuses

He cited three universities that have moved away from coal as progressive models:

- Cornell University
- University of Wisconsin-Madison

- Ball State University

Nilles challenged the group to examine the following:

- An assessment of the health costs of burning coal
- Replacing the existing boilers with ones that burn natural gas and don't have ash disposal
- Examining where the coal comes from and the cost of mining on a community.

The committee agreed to send Nilles some parameters for our cogeneration plant and the University's energy demand. Nilles will compare UNC with similar campuses that have moved away from coal for the committee to study further.

Toben thanked Nilles for his presentation and the conference call portion ended.

The committee discussed the pros and cons of switching to natural gas. They also talked about the lifespan of the boilers and other equipment at the cogeneration plant.

Toben asked for the committee to give input on this meeting format. They approved.

- Members submit questions to Tanya within one week of the meeting.
- Tanya and Tim read questions and send to the appropriate people for response.
- Questions and responses will be posted on the task force Web site.
- Tanya will work with the University's Web team to develop an online form for others to submit questions and ideas.

The committee discussed future meeting topics.

The meeting was adjourned.

Energy Task Force

2 p.m., March 17, 2010

3020 Steele Building

Minutes

Attendees

Committee members

- **Tim Toben**

Chair, N.C. Energy Policy Council and Chair, Board of Visitors for the UNC Institute for the Environment

- **Pete Andrews**

Professor and Chair, Department of Public Policy

- **Elinor Benami**

Senior adviser to the executive branch of student government

- **John Cooper**

Board of Visitors member, UNC Institute for the Environment, and Program Director, MDC Inc., Expanding Opportunity, Advancing Equity

- **Mary Cooper**

Co-chair of student government's Environmental Affairs Committee and an environmental sciences major

- **Molly Diggins**

State Director, N.C. chapter of the Sierra Club

- **Alston Gardner (by phone)**

Member, UNC Board of Trustees and Managing Partner, Fulcrum Ventures

- **Jonathan Howes**

Former Special Assistant to the Chancellor for Local Relations and former secretary, N.C. Department of Environment, Health and Natural Resources

- David McNelis

Director, Center for Sustainable Energy, Environment and Economic Development, UNC Institute for the Environment

- Royce Murray

Kenan Professor of Chemistry, College of Arts and Sciences

Presenters

- Ray DuBose, Director for Energy Services, UNC-Chapel Hill
- Jerry Schuett, P.E. Principal, Affiliated Engineers, Inc.
- Nick Travis, Principal, Energy Strategies
- Rob McKenna, Senior Consultant for Project Management of Energy, Energy Strategies
- Jeff Burks, Director of Sustainability and Climate Change, Energy Strategies
- Dennis Hazel, Associate Professor and Extension Specialist, Department of Forestry and Environmental Resources, College of Natural Resources, North Carolina State University

Observers

There were about 15 observers, including representatives from the University, the Beyond Coal Campaign and the media.

Agenda

Welcome

Tim Toben, chair

Climate Action Plan and Alternative Energy Overview

Ray DuBose, Director for Energy Services, UNC-Chapel Hill

Jerry Schuett, P.E. Principal, Affiliated Engineers, Inc.

Nick Travis, Principal, Energy Strategies

Rob McKenna, Senior Consultant for Project Management of Energy, Energy Strategies

Jeff Burks, Director of Sustainability and Climate Change, Energy Strategies

Woody Biomass as a Potential Energy Feedstock for UNC-Chapel Hill

Dennis Hazel, Associate Professor and Extension Specialist, Department of Forestry and Environmental Resources, College of Natural Resources, North Carolina State University

Committee chair Tim Toben called the meeting to order and reminded the task force of the Chancellor's charge to the committee. He said that their objectives are to:

1. Evaluate the sources of and uses for steam, chilled water and electricity—baseload and peakers, emerging power supplies and see where we're generating the most greenhouse gas.
2. Identify the new technologies or fuels that are scalable and cost effective. What are the financial, policy or supply barriers that stand in the way?
3. Examine ways (if any) to significantly affect demand.

He said that it was not in the committee's scope to debate climate change. He added that the following 10 statements are the North Carolina Department of Environment and Natural Resources' foundational premise for the work they are doing to mitigate the effects of climate change:

1. **Global warming is unequivocal and primarily human-induced.**
2. **Climate changes are underway in the United States and are projected to grow.**
3. **Widespread climate-related impacts are occurring now and are expected to increase.**
4. **Climate change will stress water resources.**
5. **Crop and livestock production will be increasingly challenged.**
6. **Coastal areas are at increasing risk from sea-level rise and storm surge.**
7. **Threats to human health will increase.**
8. **Climate change will interact with many social and environmental stresses.**
9. **Thresholds will be crossed, leading to large changes in climate and ecosystems.**
10. **Future climate change and its impacts depend on choices made today.**

Source: <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/key-findings>

He said that, rather, the committee is here to discuss current greenhouse emissions and to look at ways to reduce our carbon footprint.

Toben welcomed and introduced the speakers:

- Ray DuBose, Director for Energy Services, UNC-Chapel Hill
- Jerry Schuett, P.E. Principal, Affiliated Engineers, Inc.
- Nick Travis, Principal, Energy Strategies
- Rob McKenna, Senior Consultant for Project Management of Energy, Energy Strategies
- Jeff Burks, Director of Sustainability and Climate Change, Energy Strategies
- Dennis Hazel, Associate Professor and Extension Specialist, Department of Forestry and Environmental Resources, College of Natural Resources, North Carolina State University

He turned the meeting over to Ray DuBose. DuBose introduced Phil Barner, manager of the Cogeneration Facility. Then he turned the meeting over to Jerry Schuett.

Jerry Schuett, Nick Travis, Rob McKenna and Jeff Burks gave the following presentation:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/Task%20Force%20Presentation_Final_2010_03_18.pptx

They took questions from the committee.

Toben thanked the consultants for their time and introduced Dennis Hazel.

Dennis gave this presentation:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/biomass-presentation.ppt

He then took questions from the committee.

Toben reminded the task force that the next meeting will be from 2 p.m. to 4 p.m. on Wednesday, April 14. The location will be announced at a later date.

He also encouraged audience members to submit questions through committee members. The deadline for submission is March 24, one week following today's meeting. UNC staff will prepare responses and post them prior to the April 14 meeting.

The meeting was adjourned.

Energy Task Force

2 p.m., April 14, 2010

206 Peabody Hall

Minutes

Committee members

Present

- **Tim Toben**

Chair, N.C. Energy Policy Council and Chair, Board of Visitors for the UNC Institute for the Environment

- **Pete Andrews**

Professor and Chair, Department of Public Policy

- **Elinor Benami**

Senior adviser to the executive branch of student government

- **Mary Cooper**

Co-chair of student government's Environmental Affairs Committee and an environmental sciences major

- **Molly Diggins**

State Director, N.C. chapter of the Sierra Club

- **Jonathan Howes**

Former Special Assistant to the Chancellor for Local Relations and former secretary, N.C. Department of Environment, Health and Natural Resources

- **David McNelis**

Director, Center for Sustainable Energy, Environment and Economic Development, UNC Institute for the Environment

- Royce Murray

Kenan Professor of Chemistry, College of Arts and Sciences

Committee members not attending: **John Cooper**, Board of Visitors member, UNC Institute for the Environment, and Program Director, MDC Inc., Expanding Opportunity, Advancing Equity; and Alston Garner, Member, UNC Board of Trustees and Managing Partner, Fulcrum Ventures

Presenters

- Dr. Matthew Wasson, Ecologist and Program Director, Appalachian Voices
- Dr. Viney Aneja, Professor of Air Quality, Professor of Environmental Technology, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University
- Steven J. Mueller, President, International WoodFuels, LLC
- Mike Nicklas, FAIA, Innovative Design's Co-Founder and President

Observers

There were about 20 observers, including representatives from the University, the Beyond Coal Campaign and the media.

Agenda

- | | |
|-----------|---|
| 2 p.m. | Welcome
Tim Toben, Chair |
| 2:05 p.m. | The Human and Environmental Impacts of UNC's Energy Choices
Dr. Matthew Wasson, Ecologist and Program Director,
Appalachian Voices |
| 2:30 p.m. | Coal Dust Impact on Appalachian Communities
Dr. Viney Aneja, Professor of Air Quality, Professor of
Environmental Technology, Department of Marine, Earth, and
Atmospheric Sciences, North Carolina State University |
| 3 p.m. | Renewable Solid Fuel Options: A Commercial Update
Steven J. Mueller, President, International WoodFuels, LLC |
| 3:30 p.m. | Engaging Solar Developers in Financing, Installing and Maintaining Solar
Applications |

Mike Nicklas, FAIA, Innovative Design's Co-Founder and President

4:45 p.m.

Adjourn

Committee chair Tim Toben called the meeting to order and introduced the speakers.

Matt Wasson presented this PowerPoint:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/Wasson_UNC_Coal_Pres_Web.pptm

He then took questions from the committee.

Viney Aneja gave this presentation:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/Aneja%20UNC%20Energy%20Task%20Force.pdf

He took questions from the committee.

Steven Mueller presented this PowerPoint:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/UNC%20Presentation%200409.ppt

Mueller took questions from the committee.

Mike Nicklas presented this PowerPoint:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/10%20April%20short%20presentation.pdf

There were no questions for Nicklas.

Toben reminded the task force that they were appointed to look at ways of reducing the University's carbon footprint. He noted that the committee has focused on the Cogeneration plant, which to him made sense because contributes roughly 60% of the campus's greenhouse gas emissions. He challenged the task force to look at the uses of energy and not just the sources. He said the greatest uses of power included buildings and that the committee should focus its work there next.

Toben suggested that the group draft an interim assessment for the Chancellor in the next few weeks. He suggested that a subgroup of the committee assess where the task force stands before the next meeting. He said at the end of the academic year the committee will be past the halfway mark of their eight-month appointment, and he wants to see if members are ready to make some conclusions.

David McNelis, Mary Cooper, Jonathan Howes and Molly Diggins volunteered to help draft interim findings.

At the next meeting, Toben will present the subgroup's findings and talk about the next steps for the task force. He encouraged the task force to look at Figure 8 in the Climate Action Plan: <http://www.climate.unc.edu/portfolio/cap2009>.

Toben announced that the task force will reconvene at 2 p.m. on April 28 in 206 Peabody Hall. The meeting was adjourned.

Addenda 2

Energy Task Force presentation summary February 10, 2010 – April 14, 2010

February 10, 2010

Overview of Cogeneration Facility

Carolyn Elfland, Associate Vice Chancellor for Campus Services

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/CogenPresentationforEnergyTaskForce.ppt

March 17, 2010

Climate Action Plan and Alternative Energy Overview

Ray DuBose, Director for Energy Services, UNC-Chapel Hill

Jerry Schuett, P.E. Principal, Affiliated Engineers, Inc.

Nick Travis, Principal, Energy Strategies

Rob McKenna, Senior Consultant for Project Management of Energy, Energy Strategies

Jeff Burks, Director of Sustainability and Climate Change, Energy Strategies

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/Task%20Force%20Presentation_Final_2010_03_18.pptx

Woody Biomass as a Potential Energy Feedstock for UNC-Chapel Hill

Dennis Hazel, Associate Professor and Extension Specialist, Department of Forestry and Environmental Resources, College of Natural Resources, North Carolina State University

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/biomass-presentation.ppt

Speaker bios available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/Background%20for%203-17-10%20meeting.docx

April 14, 2010

The Human and Environmental Impacts of UNC's Energy Choices

Dr. Matthew Wasson, Ecologist and Program Director, Appalachian Voices

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/Wasson_UNC_Coal_Pres_Web.pptm

Coal Dust Impact on Appalachian Communities

Dr. Viney Aneja, Professor of Air Quality, Professor of Environmental Technology, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/Aneja%20UNC%20Energy%20Task%20Force.pdf

Renewable Solid Fuel Options: A Commercial Update

Steven J. Mueller, President, International WoodFuels, LLC

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/UNC%20Presentation%200409.ppt

Engaging Solar Developers in Financing, Installing and Maintaining Solar Applications

Mike Nicklas, FAIA, Innovative Design's Co-Founder and President

Presentation available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/2010-04-14/10%20April%20short%20presentation.pdf

Speaker bios available:

http://www.unc.edu/chan/chancellors/thorp_holden/files/energytaskforce/Energy%20Task%20Force%20meeting%20bios,%20April%202014.docx