



# THE UNIVERSITY of TENNESSEE at CHATTANOOGA



## 2011 Climate Action Plan

August 22, 2011

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## Letter from the Chancellor

The Strategic Plan for The University of Tennessee at Chattanooga establishes an ambitious goal to ensure the campus becomes a leader in sustainability. Our commitment to this endeavor is grounded not only in our mission and strategic plan but also in our responsibility to the greater Chattanooga community with which we interact.

The University has taken significant steps toward environmental responsibility over many years with particular leadership from a number of campus units. The faculty designed the master's program in Environmental Science in 1997 to prepare students with a sound scientific and technical background based upon contemporary economic and political realities and a broad array of environmental research programs. The College of Engineering and Computer Science develops and deploys advanced technologies that utilize clean and secure sources of energy. Our Student Government Association demonstrated its commitment to environmental sustainability when, in 2007, they voted to implement a \$10 per student/per term green fee to support the campus recycling program, purchase green power, and assist other eco-friendly initiatives. Since FY 1997-1998, the Facilities and Management Department has achieved remarkable efficiencies in energy by modifying plants operations, thus reducing the natural gas and electricity usage 68 percent per E&G gross square footage and the water usage by 67 percent. The savings in net cost have exceeded \$28 million despite persistent fiscal challenges in a sour economy.

In 2009, on behalf of the University, I signed the American College and University Presidents' Climate Commitment (ACUPCC). In the same year, the University hired WAP Sustainability Consulting to complete an inventory of our greenhouse gas emissions. That study found over 90 percent of UTC's total greenhouse gas emissions is generated by natural gas and purchased electricity (61 percent) and by student and employee commuting, business travel and the university fleet (30 percent).

The Climate Action Plan presented on the following pages is the result of widespread campus participation, guided by WAP Sustainability Consulting. The final document was developed and written by the Steering Committee. The reductions in emissions that will enable the campus to reach neutrality in 2050 are conservative yet realistic goals that will be reviewed and updated bi-annually:

2012 – 2020	25 percent
2020 – 2030	25 percent
2030 – 2040	25 percent
2040 – 2050	25 percent Carbon Neutrality

We will reach these goals through four primary strategies and progressive actions: mitigation; education /curriculum; research; and service/engagement/partnerships. As our plan evolves, we intend that the University will mature in its leadership of sustainability initiatives and that we will make the necessary changes in our campus culture to effect the desired changes. Working with our partners, we shall achieve: it is the Chattanooga way.

Roger G. Brown, Ph.D.  
Chancellor, The University of Tennessee at Chattanooga  
July 27, 2011

## **Introduction**

This report represents the first Climate Action Plan for the University of Tennessee at Chattanooga (UTC). It was undertaken specifically to comply with the American College and University Presidents' Climate Commitment (ACUPCC), which was signed by Chancellor Roger Brown in 2009. It also supports the implementation of the Strategic Plan, which identifies an environmentally sustainable campus as one of its institutional goals.

The UTC Steering Committee, composed of Deborah Arfken, Sarah Boykin, Linda Collins, and Tom Ellis, provided leadership and direction in the development of the Climate Action Plan. WAP Sustainability Consulting organized meetings and contributed data and content. Brad McAllister was the principal in charge for the consulting firm.

## **Acknowledgments**

In completing this plan, the Steering Committee acknowledges the dedicated efforts of all participants. The Steering Committee also is grateful for the resources provided by Association for the Advancement of Sustainability in Higher Education (AASHE) and the American College and University Presidents' Climate Commitment (ACUPCC), which were invaluable in guiding us in this work.

## **Executive Summary**

The purpose of the Climate Action Plan is to define University goals and to describe institutional strategies and proposed actions for reducing greenhouse gas emissions and achieving carbon neutrality. It represents the University's commitment to address climate change and natural resources depletion; to promote healthy, sustainable communities; and to advance sustainability through education, research, service, and practice.

Consistent with its institutional mission, the University is committed to addressing the challenges of climate change and sustainability through curriculum development, sponsored research, strategic partnerships, campus planning, and facilities management. Currently, UTC faculty in departments and programs throughout the University are teaching courses, conducting research, and engaging in partnerships that address these challenges. For a number of years, the UTC Office of Facilities Planning and Management has provided leadership and expertise in the design of capital projects, building retrofits, and physical plant improvements designed to increase energy efficiency and reduce carbon emissions.

With this Climate Action Plan, the University is prepared to dedicate resources to expand faculty and student teaching, research, and service initiatives to fulfill its commitment to promoting sustainability and achieving carbon neutrality.

Reflecting UTC's institutional vision, the Climate Action Plan provides a general framework for addressing climate change with strategies and proposed actions that will support scholarly and academic achievements and "critical partnerships that...provide solutions to global concerns." It is a document that will be changed, revised, and updated to reflect institutional priorities, new knowledge, and best practices in creating healthy, prosperous, sustainable communities in a carbon constrained world.

## **Institutional Background**

For 125 years, The University of Tennessee at Chattanooga (UTC) has served the southeast region's educational, cultural, and economic needs as a four-year institution of higher education, a center for the arts, and a vibrant workplace in the heart of the city. Located a few blocks south of the Tennessee River and just east of the downtown area, UTC historically has been a strong presence and a positive influence in Chattanooga and the region.

Through multiple changes, affiliations, and consolidations with other institutions, UTC has become a metropolitan university in The University of Tennessee System with competitive undergraduate, master's and doctoral degree programs, recognized athletic teams, active alumni groups, and leading research that together have spurred innovation in all sectors.

Today that evolution includes a critical need to provide institutional leadership, support, and action in addressing climate change and advancing sustainability. This Climate Action Plan provides an important benchmark, outlining the opportunities and describing the challenges and goals that will inform the work ahead. It also suggests ways to strengthen UTC's mission, vision, and strategic plan through connections and partnerships with the City of Chattanooga and commitments that enhance UTC's distinctiveness as a leader in sustainability.

### Mission Statement

The University of Tennessee at Chattanooga is an engaged, metropolitan university committed to excellence in teaching, research, and service while focused and dedicated to meeting the diverse needs of the region through strategic partnerships and community involvement.

### Vision Statement

The University of Tennessee at Chattanooga will be recognized as a premiere metropolitan university, known for its outstanding undergraduate and graduate academic programs, scholarly and creative achievements, diversity and inclusiveness, and critical partnerships that take advantage of our setting to provide solutions to global concerns.

## **The Planning Process**

In 2010, a greenhouse gas inventory was conducted to document areas where UTC's climate and energy impact is the greatest. In January 2011, Chancellor Roger Brown appointed a steering committee and working committee to develop a Climate Action Plan. WAP Sustainability Consulting was engaged to assist with data collection, presentations, research, and meeting facilitation. Regular meetings were held throughout Spring 2011 with the steering committee, working committee, consultants, and community leaders, all of whom offered suggestions and recommendations for proposed actions. This document includes recommendations from these meetings, as well as other strategies and proposed actions that are appropriate for UTC, feasible for implementation, and best practices for achieving climate action and sustainability goals. Based on the greenhouse gas inventory data, target goals were proposed for reducing emissions and achieving carbon neutrality.

## **Summary of 2010 Greenhouse Gas Inventory**

(2008-2009 FY)

Scope 1.	On campus stationary fuel use (natural gas)	10%
	University fleet fuel use	8%
Scope 2.	Purchased electricity	51%
Scope 3.	Landfill waste	3%
	Scope 2 transmission and delivery losses	6%
	Business travel	4%
	Student commuting	14%
	Faculty and staff commuting	4%

Total gross emissions 56,315 Metric Tons CO<sub>2</sub>e

## **Timeline and Schedule: Reducing Emissions and Achieving Carbon Neutrality**

Proposed emissions reductions outlined below are understood to be conservative yet realistic goals (based on 2008-2009 emission levels) and will be updated bi-annually. The first phase of implementation will focus on increasing resource efficiencies, promoting conservation, implementing policies that address cultural/behavioral changes, greening the curriculum, and enhancing University-community partnerships. Additional feasibility studies will be undertaken and multi-disciplinary collaborations and partnerships created, which could advance sustainability beyond these target goals and expectations.

FY 2012-2020 – 25%

FY 2020-2030 – 25%

FY 2030-2040 – 25%

FY 2040-2050 – 25% (Carbon Neutral)

## **Climate Action Plan: Primary Components**

The UTC Climate Action Plan primary components in support of these target goals are:

- **Mitigation** – Reduction of greenhouse gas emissions, particularly carbon emissions from natural gas and purchased electricity for stationary energy use (facilities) and the university fleet, business travel, and commuter vehicles.
- **Education and Curriculum** – Expansion of teaching and learning opportunities related to climate change and sustainability, including revisions of existing courses, new courses, certificates, lifelong learning for faculty and staff, community education.
- **Research** – Expansion of current research and development of new initiatives.
- **Service/Engagement/Partnerships** – Identification and development of new opportunities to work collaboratively with diverse stakeholders, civic leaders, and community partners to address carbon emissions and to develop strategies for adapting to climate change.

Strategies have been identified within each component for addressing climate change and sustainability. In some cases, proposed actions to implement particular strategies are provided.

## **Mitigation**

Mitigation strategies and actions primarily address energy use, particularly facilities (61% of GHG emissions) and transportation (30% of GHG emissions), which together account for over 90% of carbon emissions. Water, food services, purchasing, waste management/recycling and space utilization are also included.

### 1. Energy – Facilities/Built Environment

Since 61% of UTC's total greenhouse gas emissions is generated by natural gas and purchased electricity for stationary energy use, most of the carbon footprint is attributed to Facilities/Built Environment (construction, operation, and use). To achieve this significant strategy, the following actions are recommended:

- Develop a comprehensive energy audit of all University owned facilities.
- Investigate feasibility of fundraising to retro-commission all University-owned campus buildings.
- Accelerate implementation of campus-wide building automation systems and use the collected data for further energy reduction.
- Continue to develop high performance building standards and use best practices in building renovations, retrofits, and new construction. When feasible, utilize LEED or a comparable performance rating system in capital projects.
- Retrofit facilities with energy efficient systems and fixtures.
- Develop a campus sustainability incentive program to reduce energy usage.
- Invest in alternative and renewable energy technologies.
- Acquire and implement a campus-wide Energy Dashboard to track and make public building-by-building energy consumption.
- Develop a Green Guide for campus and facilities planning and design projects.

### 2. Transportation – Commuting, University Fleet, Professional Travel

Transportation represents the second largest impact on the carbon footprint of UTC.

Transportation-related emissions include University fleet, student commuting, faculty/staff commuting and professional travel financed by the University. These actions are recommended:

- Increase the availability and feasibility of using alternative transportation options.
- Create incentives for using alternative transportation.
- Partner with the City of Chattanooga to expand use of buses into neighborhoods with University residents.
- Consider alternative vehicle/fuel infrastructure, such as EV charging stations, as a retrofit to current parking lots and a design requirement for future lots.
- Increase campus and neighborhood housing options to decrease commuting and transportation.

### 3. Water Consumption and Wastewater

Water consumption and storm water management on UTC's campus represents less than 1% of UTC's carbon footprint, according to the 2010 Greenhouse Gas Inventory. However, water conservation and stormwater management are recognized as critical components in the development of healthy, prosperous campuses, neighborhoods, and cities. Therefore, developing sustainable strategies for water conservation and management is a high priority in UTC's

commitment to utilizing resources efficiently and advancing sustainability on campus and throughout the city. Creating strategic partnerships in the city to manage water resources and to expand green infrastructure will be a part of UTC's water resource management plan to support a sustainable urban environment in the Chattanooga area. These actions are recommended:

- Establish minimum performance standards for all water fixtures and equipment.
- Develop rainwater collection systems, including cisterns, and condensate harvesting, to be used in grey water systems and landscape irrigation
- Retrofit and renovate existing buildings with high efficiency fixtures, including lavatories, urinals, toilets, showers, and laundries.
- Work with the City of Chattanooga and other stakeholders to develop a long range plan for managing storm water, conserving water resources, expanding green infrastructure, and developing sustainable neighborhoods in the University and downtown areas.
- Decrease impervious paving, particularly surface parking lots areas where practical to manage storm water and decrease heat island effect.

#### 4. Food Services

To reduce emissions associated with Food Services, the following actions are recommended:

- Continue to develop coordinated sustainability and energy efficiency goals between the University and food service vendors.
- Continue to develop off-campus composting partnerships.
- Support local food initiatives, including the support of community-based agriculture, local markets, organic growers in the Chattanooga area
- Encourage local food procurement for all University functions and activities.
- Identify sources for locally grown food and regionally available organic foods. Explore the possibility of partnerships and collaborations to promote healthy sustainable food choices for the university community.

#### 5. Purchasing

To meet its reduction targets, the following actions are recommended to promote low carbon purchasing:

- In partnership with vendors, develop and host sustainable purchasing seminars for the campus community.
- Adopt Energy Star and minimum energy and water efficiency standards when purchasing fixtures, furnishings, and equipment.
- Continue to expand the current system in which a department's surplus can be used by another department.

#### 6. Waste Management/Recycling

While solid waste contributes only 3% of the campus' GHG footprint, it is an important topic within the campus community. To reduce the emissions associated with UTC's solid waste, improved recycling efforts and waste management strategies are recommended:

- Expand current waste management and recycling operations.
- Provide recycling containers at convenient locations in all University buildings.
- Consider expanding single-stream recycling opportunities.

- Reduce the use of disposable plates, cups, and utensils at all University functions.
- Study the feasibility of developing a “pay as you throw” policy for all University departments.
- Maximize recycling of construction materials.

#### 7. Campus Space Utilization

Campus Space Utilization describes the use of University facilities that directly impact resource use. To achieve the strategy, the following actions are recommended:

- Use the campus master plan study to determine opportunities for creating greater efficiency in utilization of all campus buildings, which will reduce the need to add more buildings and parking spaces.
- Use performance metrics to track progress in space utilization.

### **Education and Curriculum**

The American College and University Presidents’ Climate Commitment’s educational requirement is to “make climate neutrality and sustainability a part of the curriculum and other educational experiences for all students.” Implicit in this requirement is another commitment: to teach those who teach, so that courses expand to include new bodies of knowledge that recognize the interdependence of culture, economy, and the natural environment. In order to include sustainability in courses throughout the curriculum, there will need to be faculty resources and opportunities for learning about climate change and the multiple dimensions of sustainability.

Education for sustainability suggests not just new format and content for courses, but also new contexts for learning. As existing courses are revised and new courses are developed to prepare students for the environmental, economic, and social challenges of our time, the framework for learning may also change. UTC will expand service learning opportunities in community settings to include sustainable development for healthy communities. Team teaching, university collaborations, and multi-disciplinary, practice-based courses are among the ways in which sustainability and climate change may be integrated into the curriculum.

In 2011, UTC made a commitment to increase the emphasis on sustainability in the curriculum by establishing a Faculty Senate ad hoc Sustainability Committee and by highlighting Sustainability in the Curriculum as the topic of the annual Instructional Excellence Retreat. The Senate committee plans to accomplish the following:

- Inventory sustainability-focused and themed courses that are currently being taught at UTC
- Continue to develop new courses in sustainability, including multi-disciplinary and General Education courses.
- Study the feasibility of a Certificate of Sustainability in multiple disciplines.
- Increase service learning projects and place-based educational opportunities on campus and in the Chattanooga area.
- Create incentives for development of new programs and courses.

## **Research**

As a metropolitan engaged University in a city known for its commitment to sustainability, UTC has many opportunities to address climate change and promote sustainability through education, community engagement, public service, and local partnerships. In addition, it has institutional resources and accomplished faculty and staff throughout the University, with knowledge and expertise in climate change research and sustainability projects.

The SimCenter for Computational Engineering at UTC is a national center that has been involved in researching alternate energy sources for a number of years. The Department of Environmental and Biological Sciences has faculty who are conducting research related to sustainable development, biodiversity, healthy ecosystems, and native species. In the College of Engineering and Computer Science's Center for Energy, faculty are engaged in research initiatives related to energy efficiency, transportation, and manufacturing. In other professional fields and across the curriculum, faculty and students are engaged in projects and research activities that promote healthy environments and sustainable communities.

In the context of sustainability, research is driven by vision and practicality, utilizing a systems approach to develop scope and to evaluate particular outcomes with environmental, economic, and social factors as inter-related and interdependent components. While this approach differs from the traditional discipline-specific, academic research, it offers unforeseen opportunities to expand University research initiatives by supporting multi-disciplinary work and applied research among students, faculty, and staff in centers, colleges, and departments throughout the University. In addition, applied research is enriched by collaboration among engaged partners that is critical in developing effective solutions that support a low carbon economy, protect biodiversity and create healthy, sustainable communities.

The proposed research strategies for addressing climate change and sustainability at UTC are ones that will continue to support existing work while creating new opportunities for multi-disciplinary, applied research. All strategies will build on the University's Core Values, particularly its commitment to "the development of ethical and socially responsible leaders, professionals, scholars, and citizens" and in "the creation of opportunities for those who seek truth, knowledge, and higher quality of life." The following recommended actions will support the research strategies:

- In partnerships with community stakeholders and civic partners, research the feasibility of revitalizing surrounding areas for mixed-use, mixed-income neighborhoods to accommodate faculty, staff and students.
- Support alternative/renewable energy research on campus and seek new funding sources to expand these initiatives.
- Identify research needed to support partnerships to address climate change and sustainability.
- Provide incentives and recognition, such as grants and awards, to faculty engaged in research related to sustainability.
- Identify ways to sponsor and promote community-engaged research and University initiatives that address sustainable development including transportation, housing/neighborhoods, water/storm water, public spaces/parks, and healthy environments.

- Identify funding sources to support research grants for collaborative, multi-disciplinary initiatives that utilize an integrated approach to addressing environmental, economic, and social issues.
- Prioritize funding for research initiatives that seek to provide practical, cost-effective solutions and have the best chance for implementation, enhancing the well-being of people, the economy, and the environment in specific contexts.
- Encourage applied research that supports the Climate Action Plan, particularly the University goals to reduce carbon emissions and provide new models for a sustainable institution.

### **Service/Engagement/Partnerships**

In aligning its mission, vision, and institutional goals “to meet the diverse needs of the region” and to provide “solutions to global concerns,” UTC has built a strong reputation in community service, civic engagement, and strategic partnerships throughout the state. In sustainability initiatives, UTC has been fortunate to have support and participation from organizations and government agencies throughout Chattanooga. The City of Chattanooga is an important ally and partner in the implementation of UTC’s Climate Action Plan. The University is not only committed to working with the city on climate action and sustainability initiatives but also to supporting the city in the implementation of its plan (completed in 2010). The University seeks to undertake the following:

- Create partnerships in sustainability with local utility boards, the City of Chattanooga, and surrounding regions.
- Support civic engagement and educational opportunities to advance healthy community initiatives including health care, biodiversity, and historic preservation.
- Develop teams of faculty, students, and staff as resources particularly in support of underserved needs in the community.

### **Challenges / Barriers / Implications**

The bi-annual Greenhouse Gas Emissions inventory will provide essential data to quantify reductions achieved to date. Data on energy consumption, water use, waste reduction, transportation options, and other strategies will be available periodically and could be collected annually, particularly to quantify savings realized by investments in retrofits, renovations, standards, policies, and practices. Performance metrics will need to be developed for each component to assist in tracking progress and monitoring results.

To implement the Climate Action Plan, dedicated resources and a professional staff will be needed to lead projects, develop partnerships, and manage new initiatives. With the Climate Action Plan as a reference and guide, UTC will need more detailed studies to support implementation of the plan.

In implementing this climate action plan, and particularly to achieve 25% reduction in the next eight years, the University must use a systems approach to address all areas, including creating a culture of change. Strategies and proposed actions of each component will need to be prioritized and sequenced, with some understanding of implications that include process, schedule, budget, and goals. A system for tracking progress, monitoring work, revising strategies, and addressing

conflicts and unforeseen issues will need to be identified, as well as a structure for reporting and accounting. How this work will be accomplished, who will be involved (so that a progress report can be issued in two years), and what resources are available will need to be addressed as soon as possible.

## **Next Steps**

The Climate Action Plan is intended to serve as a macro view of what is needed and what is appropriate for addressing climate change and achieving carbon neutrality at UTC. The Implementation Plan will provide more detailed analysis and study as well as describe how the proposed strategies and actions will be implemented at the University. A more detailed timeline will also be a part of the next steps in implementing the Climate Action Plan.

In a time when public universities are being asked to do more with less, it is particularly important that the University recognize there are escalating costs associated with delaying the essential tasks related to transitioning and responding to the critical social, economic, and environmental challenges of our time.

Addressing climate change and achieving carbon neutrality will require capital investments, institutional resources, and professional positions. More significantly, it will also mandate difficult changes in operational culture and expectations. However, significant cost savings and returns on investments will be realized through higher efficiencies in operations. A more engaged and informed academic community and a more prosperous, healthy, and fulfilling workplace and environment are among the substantial economic, social, and environmental benefits and measurable outcomes.

With the current projections to increase enrollment in the coming years, making a commitment to become a more sustainable university suggests that growth and change will be positive, providing new opportunities for UTC to enhance its reputation as a public university and to become a model for sustainability.

# UTC

## Climate Action Plan:

### Appendix

**Working Committee**

Dr.	Dee Dee	Anderson	Student Development
Dr.	Michael	Biderman	Fortwood Association
Ms.	Emily	Blackman	Athletics
Dr.	Lisa	Burke	College of Business
Mr.	Chuck	Cantrell	Marketing
Mr.	Andrew	Clark	SGA President
Ms.	Jean	Dake	Exempt Staff Council
Ms.	Kelly	Griffin	Employee Relations Committee
Dr.	Steven	Hood	Housing
Dr.	Frank	Jones	College of Engineering
Ms.	Callie	Klenner	City Sustainability Office
Mr.	Warren	Logan	Urban League of Greater Chattanooga
Mr.	Tom	Losh	Alumni Board
Mr.	Heath	Luallen	EDGE President
Mr.	Bob	Lyon	Advancement and Development
			College of Health, Education and
Ms.	Dana	Moody	Professional Studies
Ms.	Debbie	Parker	Budget/Business/Finance
Ms.	Cindee	Pulliam	Auxiliary Services
Dr.	Cynthia	Rice	Fortwood Association
Mr.	Charles	Scott	Procurement/Purchasing
Dr.	Vicki	Steinberg	Faculty Senate
Dr.	John	Tucker	Arts and Sciences
Mr.	Danny	West	Facilities/Waste Services

**Steering Committee**

Dr.	Deborah	Arfken	University Planning
Ms.	Sarah	Boykin	Interior Design
Ms.	Linda	Collins	Environmental Sciences
Mr.	Tom	Ellis	Facilities/Waste Services
Mr.	Brad	McAllister	WAP Sustainability Consulting



UTC  
 CLIMATE  
 ACTION  
 PLAN  
 COMMITTEE  
 MEMBERS