Natural Resource Conservation Plan UPDATE

Introduction

Remarkable improvements in utility operations and efficiency have allowed the University of Texas at Austin to double its size since 1977 with no increase in total energy consumption. Based on previous conservation efforts Campus Planning and Facilities Management (CPFM) has provided in excess of $20M in cost savings associated with reductions in resource demand. However, several factors are driving the need for a more integrated and strategic plan for the use of natural resources by the University:

1. Production side efficiency improvements have peaked
2. Continued campus growth threatens the ability to maintain current efficiency levels.
3. The need and opportunities to reduce demand side resources requirements
4. Exposure to changes in cost and availability of essential natural resources
5. Need for consistent funding sources to sustain on-going resource conservation efforts

The NRCP builds on the previous investments in the utility operation that have produced an extremely efficient production system and as well as the need to provide an uninterrupted supply of energy to meet the teaching and research requirements of the University.

The NRCP establishes, monitors, and updates resource use objectives, strategies for accomplishing these objectives and proposals for funding models that sustain existing conservation programs while providing the additional resources necessary to move forward with an aggressive demand side natural resource reduction program. Implementing innovative approaches to building operations and integrating these with utility operations will allow the University to enhance reliability at the individual building level, reduce water and energy use and their associated costs as well improving the return on investment in our campus operations. The intent of the plan is to make significant improvements in these areas by August 31, 2020.

As directed by President William Powers in July, 2011, the NRCP goals, objectives, strategies and funding proposals are being integrated into the Campus Master Plan Update process (http://www.utaustinmasterplan.com).

Resource Goals

The University can reduce the demand for water and energy, and minimize our financial exposure to changes in the cost of essential resources such as natural gas and water as well as the potential for future carbon costs by reducing demand side resource consumption and improving operational efficiencies and accomplish the following goals in an environmentally responsible manner.

Reliable and Efficient Energy System

CPFM will maintain utility system performance at, or above, its current level of reliability and annual average plant efficiency of about 88%, average electrical generation performance of about 8,500 BTU/kWh and chilling station performance at approximately 0.70 kW/Ton. In addition, CPFM will continue to anticipate changes in campus demand and plan to meet these new requirements utilizing existing equipment and systems, avoiding additional major capital investment, to the extent possible

Demand Side Energy Efficiency

By August 31, 2020, the University of Texas at Austin will reduce energy consumption at the building level by an average of 20% per square foot per degree-day, using 2009 as the base year. Accomplishing this goal will require an investment in energy management staffing, centralized building energy control systems, conservation and efficiency projects and a specific resource reduction goal for each building. Achieving this goal will produce three specific benefits; one is avoided energy costs (estimated at $4M annually), second will be a reduction in the campus carbon footprint (approximately 40,000 metric tons CO2e) and the third will be to allow the utility operation to maintain its current level of efficiency (a 1% loss of efficiency costs $300,000/year).

Alternative Generation

By August 31, 2020, 5% (just over 17M KWH) of all energy consumed by UT Austin facilities on the Main Campus, , will be generated from renewable sources. Renewable energy sources include solar, wind, waste management, biomass, wood burning, small hydro and other carbon neutral sources. Achieving this goal will reduce the UT Austin carbon footprint by an estimated 6,000 MTCO2e but may have a negative impact on overall cost reductions given the high cost and low efficiency of alternative generation compared to UT Austin's own current generation.

The university owns 546 KW of solar photovoltaic generation, estimated to be able to produce up to 1M kwh of electricity (actual generation data will be available over by fall, 2012). The university also owns 2M btu of solar thermal capacity (on the roof of the Norman Hackerman Building).

Water Conservation

By August 31, 2020, UT Austin will reduce domestic water use by 20% with at least 40% of total water use coming from reuse/reclaimed sources. Based on projected increases in water and wastewater costs, meeting this goal will produce annual avoided costs in excess of $2M annually. In addition achieving this goal will reduce the City of Austin's carbon footprint by at least 460 tons CO2 equivalent.

Waste Management

By August 31, 2020, UT Austin will divert 90% of the total waste stream from landfill using a variety of methods including reuse and recycling. This will reduce the UT Austin carbon footprint by 600 metric tons of CO2 equivalent and save at least $5,000 annually.

Campus Fleet and Mass Transit

By August 31, 2020, UT Austin will reduce overall gasoline and diesel fuel consumption for the campus vehicle fleet by 20%, while shifting 50% of the campus vehicle fleet to 50% E85 gasoline and other

alternative fuels. UT Austin will increase the number of car pool and mass transit users by 30% and utilize 100% natural gas fuel for the shuttle bus system. Achievement of these strategies will reduce the UT Austin carbon footprint and produce annual savings.

Purchasing

During the 2012-13 fiscal year, and in collaboration with the AVP of Purchasing, the PSSC will build on the green purchasing policy included in the Handbook of Business Procedures (section 7.12) to establish baselines of current green purchasing and to consider recommendation of green purchasing targets to be achieved by August 31, 2020.

Strategies For Reaching Resource Goals

In May 2007, President William Powers established the University Task Force on Sustainability and the University adopted a policy regarding sustainability in April 2008. In 2010, the President launched a Campus Master Plan Update that included tasks related to sustainability as well as to energy use and utility funding models. In July 2011, the President directed the NRCP objectives, strategies and funding proposals recommended by the PSSC in their 2010 Annual Report be integrated into the Campus Master Plan Update process (http://www.utaustinmasterplan.com).

CPFM has a history of successful implementation of resource conservation initiatives, saving the university $20M annually. In support of these recent directives to develop new conservation strategies to pursue additional resource and cost savings, CPFM is positioned to move the University forward in two areas; (a) how the utility enterprise provides energy to the Main Campus and (b) how to better manage the natural resources and facilities associated with supporting the teaching, research and public service functions of the University. Specific strategies in both areas will be refined within the Campus Master Plan Update.

Draft strategies for achieving the NRCP goals were presented in the original 2011 Natural Resources Management Plan, the draft strategies begin on page 3:
(http://www.utexas.edu/sustainability/documents/UTAustin_NaturalResourcePlan_021611.pdf).

Reinvestment and Funding Strategy

The rationale for investigating a new funding strategy remains as stated in the 2010 Annual Report:

> The current University practice of directing all avoided costs associated with conservation and efficiency efforts into the general University budget does not provide a sustainable funding model for resource conservation and efficiency efforts. The current approach does not provide a means to incentivize the campus community to support the cultural and organizational changes required to implement on-going resource conservation on a campus-wide basis.
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> In addition, strategic reinvestment in infrastructure and innovative technological solutions are required if the University is to reduce resource consumption and sustain on-going financial returns. As noted earlier, energy reductions associated with CPFM efficiency and conservation efforts from 1997 to 2009 have produced in excess of $20M in savings. All of the major efficiency and conservation projects implemented in the past several years are exceeding their estimated payback periods.

As part of the Campus Master Plan process, members of the university staff and faculty are reviewing the most appropriate and feasible means of pursuing a new funding strategy. Considerations include:

- Funding structure
- Size of corpus
- Source of capitalization
- Method of prioritizing investments
- Method of validating return on investments
- Personnel requirements

Summary

Implementing a clear resource management and conservation plan will have a significant impact on reducing campus energy consumption, meeting ongoing campus resource demands, lowering operational costs and expanding the energy portfolio by the end of fiscal year 2020. However, CPFM does not currently have sufficient organizational capacity to realize these goals nor are the funding mechanisms and policies currently in place to pursue the types of projects and implement the technologies necessary for success. The PSSC will continue to pursue the NRCP goals through the Campus Master Plan process in order to provide the positive outcomes desired by the University.