NC State University – CEST Energy & Water Working Group

Energy and Water Tactic Development

MINUTES DATE: MARCH 21, 2011

MEETING DATE: MARCH 18, 2010

LOCATION: YARBROUGH TRAINING ROOM / COURT OF NORTH CAROLINA OUTDOOR CLASSROOM

TIME START: 1:39 PM **TIME END: 3:15PM** **CALL-IN NUMBER: N/A**

ATTENDANCE LOG		
PAUL MCCONOCHA	ELEN BUCKNER	LAURA BROWN
JACK COLBY	DARREN FALLIS	ROXANNE RYAN
TRACY DIXON	MAHOMET ACCILIAN	ERIN MOORE
JEFF HIGHTOWER	EDWARD SEKMISTRZ	PETER SQUIRE
GEORGE SMITH	LIZ BOWEN	JOHN MARRIOTT

	AGENDA	DESCRIPTION	*ACTION ITEMS*
1	**INTRODUCTION**	MEETING PURPOSE AND INTROS	NONE
2	**CEST UPDATE**		
2.1	**SUSTAINTBILITY STRATEGIC PLAN (SSP)**	• DRAFT RECEIVED WIDE EXPOSURE TO CAMPUS COMMUNITY • NO OPPOSITION • BOARD OF TRUSTEES (BOT) BULDINGS SUBCOMMITTEE ENDORESED • INTEGATION WITH UNIERSITY STRATEGIC PLAN SOUGHT	INFORMATION ONLY
2.2	**NEW MEMBERS/NEW WORKING GROUP**	• NEW COMMUNITY AND CULTURE WORKING GROUP HAS FORMED • LISA MAUNE NEW CHAIR OF BULDING WORKING WORKGROUP	INFORMATION ONLY
3	**SSP APPROVAL PROCESS**	• CEST UNANIMOUSLY APPROVED SSP ON 2/21/2001 • FINAL SSP WILL BE REVIEWED BY BOT FINANCE AND AUDIT COMMITTEE IN APRIL 2011 • CHANCELLOR APPROVAL WITH BOT SUPPORT SOUGHT IN APRIL 2011	INFORMATION ONLY
4	**TACTICS DEVLOPMENT**	• TACTICS WILL BE DEVELOPED TO ENABLE THE SSP TO BE IMPLEMENTED • TIPS FOR DEVELOPING TACTS WERE PRESENTED	WORKING GROUP MEMBERS ARE ASKED TO REVIEW PAST TACTIC RECOMMENDATIONS (SEE ATTACHED)

5	**OTHER UPDATES AND NEW BUSINESS**	• EARTHWISE AWARD NOMINATIONS WILL BE ACCEPTED THROUGH 3/28/2011 • SULLIVAN, CAROL AND TUCKER RESIDENTS HALLS HAVE RECEIVED ENERGY STAR CERTIFICATION FROM US EPA • THE CATES COGNERATION PLANT CAPITAL PROJECT LAUNCHED IN JANUARY 2011	INFORMATION ONLY
6	**NEXT MEETING**	REVIEW SPECIFIC ENERGY AND WATER TACTIC IDEAS, DEVELOP NEW LIST TO FIT SSP AND SUPPORTING DOCUMENTS	NEXT CEST ENERGY AND WATER WORKING GROUP MEETING WILL BE IN MID-APRIL.

PLEASE DIRECT ADDITIONS AND/OR CORRECTIONS TO PAUL MCCONOCHA. IF NO FEEDBACK IS RECEIVED BY 4/18, THE MEETING MINUTES WILL STAND AS SUBMITTED.

Draft Strategies & TACTICS	Theme	Impact on NCSU GHG Inventory?	Scope 1	Scope 2	Scope 3	Estimated Possible GHG Impact
5-year Strategies						
Achieve a 20% reduction in building energy consumption by 2015 (target reduction to 137,510 BTUs/GSF), with a stretch goal of achieving a 30% reduction (target reduction to 120,322 BTUs/GSF), compared to the 2002-2003 baseline (171,888 BTUs/GSF)						
Achieve a 45% reduction in building water consumption through 2015 (target reduction to 0.0363 CCF/GSF), with a stretch goal of achieving a 50% reduction (target reduction to 0.033 CCF/GSF), compared to the 2001-2002 baseline (0.066 CCF/GSF)						
Improve energy data management capability to make data-driven energy decisions						
Ensure a cost-effective and stable energy supply by developing business scenario hedge strategies						
Use return on investment calculations to help prioritize and guide energy conservation projects ("energy smart" repairs)						
Further develop Energy Performance Contracting as a means to achieve energy savings						
Adopt an aggressive energy and water conservation policy						
Enhance energy awareness program and align with other outreach programs						
Create buy in with Facilities staff and building end-users to properly operate building systems in an energy efficient manner						
Evaluate utility billing options that creative incentives for saving energy						
Green IT						
Set a goal of 90% virtualization for all servers and storage on campus, and 70% of personal computers. Virtualizing servers and storage can save up to 50% of energy costs on an annual basis		**Yes**	**NA**	**+**	**NA**	**Medium**

Virtualize servers	Data Centers	Yes	NA	+	NA	Low
Virtualize storage	Data Centers	Yes	NA	+	NA	Low
Virtualize personal computers	Data Centers	Yes	NA	+	NA	Medium
Energy Star certification for data centers	Data Centers	Yes	NA	+	NA	Low
Automatic computer/projector shutdown		Yes	NA	+	NA	Low
Implement an enterprise-wide client-based energy management strategy that dynamically powers computers up and down when not in use, and tracks overall energy savings across campus. This should be implemented for all campus-owned and student computers.		Yes	NA	+	NA	Low
Materials purchasing standards for IT products		Yes	NA	+	+	Low
Focus on leading edge design of new data centers to maximize efficiency	Data Centers	Yes	+	+	NA	
Upgrade rack infrastructure to closed-aisle systems such as those from APC, which can reduce energy consumption up to 30%	Data Centers	Yes	NA	+	NA	Medium
Consolidate smaller server rooms around campus into larger, more efficient data centers	Data Centers	Yes	+	+	+	Low
As an alternative to building large data centers, explore deploying "data center in a box" solutions like the Sun Modular Datacenter, which reduces cooling costs by 40% in 1/8 the space of traditional data centers and also allows high portability of server infrastructure and capacity, without the construction cost	Data Centers	Yes	+	+	+	Medium
Invest in moving compute power and storage off-site to zero carbon energy sources	IT Infrastructure	Yes	+	+	-	High
Join initiatives like the CANARIE Green-IT project and the Green Grid Consortium to invest in zero carbon infrastructure, grid computing, etc. This can potentially become a revenue source for the university by selling carbon credits to dirty industries through a future cap-and-trade system		Yes	NA	NA	+	Low
Implement aggressive recycling agreements with technology vendors and implement policy that all end-of-life technology should be put into recycling programs and not sent to state surplus	E-Waste	Yes	NA	NA	+	Nominal

End-user education/responsibility	End Users	Yes	NA	+	NA	Low
Use of IT to enable/enhance telecommuting, virtual meetings, distance learning		Yes	+	+	+	Low
Lab-specific ECMs						
Efficient (low flow) fume hoods		Yes	+	+	NA	High
Fume hood reduction (decommissioning)		Yes	+	+	NA	Medium
Assign students to keep VAV hoods closed		Yes	+	+	NA	Medium
Additional retro-commissioning		Yes	+	+	NA	Medium
Post-occupancy commissioning of new labs		Yes	+	+	NA	
Reduce minimum airflows during unoccupied hours (e.g., 2-4 ACH with occupancy override)		Yes	+	+	NA	Medium
Campus-wide ECMs						
Building-specific scheduling		Yes	+	+	NA	Medium
Additional retro-commissioning		Yes	+	+	NA	Medium
Heat capture/reuse (e.g., computing facilities)		Yes	+	NA	NA	Medium
Building occupancy sensors to control lights and HVAC		Yes	+	+	NA	Medium
Lighting retrofits (LED) indoor and outdoor		Yes	NA	+	NA	Low
Plug load management		Yes	NA	+	NA	Low
Building envelope upgrades (new buildings)		Yes	+	+	NA	Medium
Building envelope upgrades (existing buildings)		Yes	+	+		Low
Establish temperature policy/set points		Yes	+	+	NA	Low
Energy metering/sub-metering		No	NA	NA	NA	
Enhance/broaden digital building control; building specific programming		Yes	+	+	NA	Medium
Campus-wide energy audits & incentivize staff to support energy savings retrofits		Yes	+	+	NA	Medium
Low flow shower heads		Yes	+	NA	NA	Nominal
Building-level steam system modifications		Yes	+	NA	NA	Medium
HVAC Systems & Controls						
Repair/add outside air economizer controls	HVAC	Yes	NA	+	NA	Low
Convert pumps/fans to variable volume & reduce size to current load (where applicable)	HVAC	Yes	NA	+	NA	Medium
Add UV lights upstream of cooling coils (reduce static pressure)	HVAC	Yes	NA	+	NA	Nominal
Convert building chillers to central system	HVAC	Yes	NA	+	NA	Medium
Convert from steam to hot water heating	HVAC	Yes	+	NA	NA	Medium
Scheduling of unoccupied set points and airflows	HVAC	Yes	+	+	NA	Medium
3-way to 2-way valves (pressure independent control valves for chilled water)	HVAC	Yes	NA	+	NA	Medium
Renewable Energy						

Solar PV at Keystone & Flex Lab		**Yes**	**NA**	**+**	**NA**	**Low**
Solar Thermal at new landscape facility		**Yes**	**+**	**NA**	**NA**	**Low**
Solar Thermal at Centennial Student Housing		**Yes**	**+**	**NA**	**NA**	**Low**
Solar Thermal at Carmichael		**Yes**	**+**	**NA**	**NA**	**Low**
Campus Renewable Energy Ideals		**No**	**NA**	**NA**	**NA**	
Solar-ready future buildings, Hunt Library, etc.		**No**	**NA**	**NA**	**NA**	

	Outreach/ Engagement	Curriculum	Research	Buildings	Dining Services	Energy	Grounds	Purchas-ing	Transpor-tation	Waste	Sustainable Innovation
Overall	●	◔	◔	◑	○	◕	◔	◔	◔	◔	○
Energy Conservation	●	◔	◔	●	○	●	○	◑	○	◔	○
Campus-wide ECMs	●	◔	◔	●	○	●	○	◔	○	○	○
Conservation Outreach/ Behavior Change	●	○	○	●	○	●	○	○	○	○	○
Green Building Standards	●	○	○	●	○	●	○	●	○	●	○
Green IT	●	◔	◔	●	○	●	○	◑	○	◑	◔
Metering	●	○	○	●	○	●	○	○	○	○	○
Fuel Mix & Renewables	●	●	●	◑	○	●	◔	○	○	◔	○
Alternative Fuels	●	●	●	○	○	●	○	○	○	○	○
Biomass	●	◕	●	○	○	◕	◔	○	○	◑	○
Energy Efficiency	◑	◑	◑	◕	○	●	○	○	○	○	○
MSW	●	●	●	○	○	●	○	○	○	○	○
Nuclear	●	●	●	○	○	●	○	○	○	○	○
Solar	●	●	●	◕	○	●	○	○	○	○	○
Wind	●	●	●	○	○	●	○	○	○	○	○
Green Development	◕	◔	◑	●	◔	●	◔	◔	◔	◔	○
Building Renewables	●	●	●	●	○	●	○	◑	○	○	○
Green Building Standards	◕	◔	◔	◕	◔	◕	◑	◔	◔	◔	○
Space Planning & Management	●	○	◑	●	○	●	○	○	◔	○	○
Land Use	◑	◔	◔	○	◔	○	●	◑	◔	◔	○
Grounds Management	◑	◔	◔	○	◔	○	●	◑	◔	◔	○
Offsets	○	◑	◕	○	○	○	●	○	○	○	○
Sequestration	○	◑	◕	○	○	○	●	○	○	○	○
Transportation	●	◔	◔	◔	○	◔	◔	◔	●	○	○
Avoided Travel	◕	○	◑	◑	○	◑	○	○	●	○	○
Business Travel	●	◑	◔	○	○	○	○	◔	●	○	○
Fleet Vehicles	◕	○	○	○	○	◔	○	◑	●	○	○
Improved Commuting	◕	○	◔	◔	○	◔	◔	○	●	○	○
Inter-campus connectivity	●	◔	◔	○	○	◕	◑	○	●	○	○
Waste Management	●	◑	◔	◔	◔	◔	◔	◕	○	●	◔
Waste Management	●	◑	◔	◔	◔	◔	◔	◕	○	●	◔

	% of Items That Impact Each Factor
●	more than 80%
◕	between 60% and 80%
◑	between 40% and 60%
◔	between 20% and 40%
○	less than 20%