

Western Carolina University

---

2011-2012  
Strategic Energy Plan

Submitted October 5, 2012  
Energy Management Office  
Facilities Management



# Western Carolina University

*Strategic Energy Plan  
2011-2012*

## **Mission Statement**

*To develop smart energy solutions in all aspects of our institution while creating a comprehensive approach for leading the Western Carolina University community towards a sustainable future.*

## **Executive Summary**

Western Carolina University (WCU) continues to expand its efforts in the areas of sustainability, waste reduction, energy management and reducing our “Carbon Paw Print”. The purpose of this program, which has remained constant from its beginning, is to take a holistic approach at educating faculty, staff and students about the importance of sustainability, waste reduction, energy consumption and how it affects the economy, environment and our overall footprint on the Earth. Our goals are: to raise awareness about the ecological and economic benefits of sustainability, teach methods on how to reduce energy consumption on campus, have a positive impact on long term energy consumption habits of our university community and lower overall campus energy usage.

Our comprehensive strategy for this program includes: overall management of our energy usage, assistance with energy related issues regarding our mechanical systems and capital projects, outreach to all divisions across campus, organizing sustainability related events, distributing informational materials, assisting with student research and projects, class lectures and instruction, service learning projects, and collaborating with all departments and increasing involvement with faculty, staff and student groups. Due to the current state of the economy and our recovery, we seem to have entered into a “new normal” regarding budget constraints while maintaining a high level of quality educational services for our students. Our efforts have required us to employ creative measures for conveying our message and educating the WCU campus community. To this end, we strive to operate in the most efficient and effective way possible while achieving our program goals. For more information regarding our efforts please visit <http://energy.wcu.edu/>.

One of our focuses for the past few years has been the development of pursuing an Energy Service Performance Contract (ESPC) for several buildings on our campus. This \$5.4M project included energy improvements to the following buildings: Liston B. Ramsey Activity Center, Hunter Library, Stilwell Science Building, Hoey Auditorium, McKee Building and Coulter Building. In the fall of 2011, it was determined to be in the best interested of WCU to cancel the entire ESPC project due to nonperformance by the ESCO. We were successful in terminating this contract without negative impact to the university. We will look at pursuing another ESPC in fall 2012.

Another energy project included the completion of an HVAC renovation and retro-commissioning for H.F. Robinson Administration Building. We received \$717K in funding from the American Recovery and Reinvestment Act through the North Carolina Energy Office. This 72,500 sq ft facility has several air quality concerns, comfort problems and energy issues that we were able to address.

In fall 2012 we will complete our first two LEED certified buildings projects. Health and Human Sciences is a \$46M project that will be Silver LEED. It includes natural day lighting, passive solar design, lighting controls, building and energy management controls, a living roof and a solar thermal hot water heater. Our other LEED project includes the renovation of a residence hall. Harrill Hall will be Gold LEED and incorporates a geothermal system for heating and cooling, lighting controls, building automation and energy management controls, and an energy dashboard kiosk called Eco Screen© from Automated Logic Controls (ALC). We are one of the first customers ALC in the country to feature this new product and we assisted in the design development of the dashboard to meet the needs of our occupants.

Western Carolina University

*Strategic Energy Plan  
2011-2012*

**Consumption Data**

Table 1 below summarizes our energy usage over the past 10 years. Overall, our energy performance has remained stable. Our total BTU per sq. ft. and % change of BTU per sq. ft. has decreased due to a mild winter. Since 2002-2003 our avoided energy costs have totaled \$15.8M from energy savings incurred.

**Table 1: WCU Energy Performance, 2002-to-2012**

FISCAL YEAR	TOTAL UTILITY COST	\$/MM BTU	\$/GS F	BTU/SQFT	% CHANGE, BTU/SQ FT (cumulative)
2002-2003	\$3,075,813	\$6.35	\$1.14	178,764	0
2003-2004	\$3,300,828	\$9.18	\$1.26	136,616	-24%
2004-2005	\$3,798,840	\$9.59	\$1.25	129,989	-27%
2005-2006	\$4,288,287	\$12.77	\$1.45	113,548	-36%
2006-2007	\$4,404,131	\$11.66	\$1.43	123,042	-31%
2007-2008	\$4,873,216	\$12.89	\$1.61	124,607	-29%
2008-2009	\$4,406,505	\$11.59	\$1.43	122,962	-31%
2009-2010	\$4,187,337	\$11.71	\$1.39	118,456	-34%
2010-2011	\$4,175,589	\$10.92	\$1.33	121,789	-32%
2011-2012	\$4,293,145	\$11.51	\$1.34	116,339	-35%

Our performance improvement is primarily a result of taking obsolete and heavily used facilities offline and replacing the buildings with high performance buildings. We also attribute energy reductions to retiring old equipment, installing new equipment with higher operating efficiencies, actively managing building occupancy schedules and successful educational programs for faculty, staff and students. Since the beginning of the Utility Savings Initiative in 2002-03, the combined benefits of these items reflect a reduction of energy consumption per gross sq. ft. of 35%. We have been concerned that our energy performance will decrease as we bring new buildings online and retrofit existing facilities with better mechanical systems. On the contrary, the data indicates that our overall energy performance improves in relation to our BTU/sq. ft. Our utility costs went up a little due to rate increases with the cost of electricity. It is expected to continue on this path over the next year as Duke files for another rate increase this coming winter.

**Detailed Consumption Data (See Table 2 – attached)**

Western Carolina University

Strategic Energy Plan  
2011-2012

**Energy Tactics Table**

**A. Energy Demand Management**

Past 12 Months Activities 2011-2012	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
Review of Energy Usage for all campus facilities	Monthly	Monthly			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>FM Staff</li> <li>Intern</li> </ul>	FM Operating Budget
Review opt-in for Duke Smart Saver Program. We opted-out January 2012 due to cost increase.	Monthly	Monthly	\$0	\$0	\$30K	<ul style="list-style-type: none"> <li>Energy Manager</li> </ul>	FM Operating Budget
Review natural gas rates for steam plant consumption. Incurred savings thru comparing natural gas vs. #6 fuel oil & hedging 50% of usage via a strip thru Oct. 2013.	Monthly	Monthly		\$3,009,486	1 hour/month	<ul style="list-style-type: none"> <li>Business Officer</li> <li>Energy Manager</li> </ul>	FM Operating Budget
All new buildings and renovations will be sub-metered and integrate into EMS. Includes: HF Robinson Administration Building, Balsam Residence Hall, Harrill Hall Renovation (LEED), Health & Human Science (LEED)	Monthly & Interval	Monthly & Interval				<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> <li>WCU Project Manager</li> <li>Harris Integrated Solutions, Inc.</li> </ul>	Privatized and Non-Appropriated
Retro-Commission HF Robinson Administration Building. Completed 12/31/12	Monthly	Monthly	119,765kwh \$6,887/year	TBD after one year of usage data 12/31/2012	\$717K	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>WCU HVAC</li> <li>WCU Project Manager</li> <li>Sud &amp; Associates</li> <li>Cooper Construction</li> </ul>	ARRA Stimulus Funds
New Construction: Health Sciences Building (Silver LEED Certified)	Monthly & Interval	Monthly & Interval	14% more efficient than baseline building	Completion date August 2012	\$46M	<ul style="list-style-type: none"> <li>WCU Project Manager</li> <li>Vannoy Construction</li> </ul>	Capital
Harrill Hall Renovation (Gold LEED Certified)	Monthly & Interval	Monthly & Interval	28% more efficient than baseline building	Completion date August 2012	\$15.5M	<ul style="list-style-type: none"> <li>WCU Project Manager</li> <li>New Atlantic Construction</li> </ul>	Non-Appropriated
Monitor campus heating and cooling temp set points, exceptions & building schedules based on state mandate requirements & University Policy #4	Weekly	Weekly		286 equipment runtime hours per week	10 hours/month	<ul style="list-style-type: none"> <li>HVAC Supervisor</li> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget
Replacing failed T-12 magnetic ballasts w/ T-8 electronic ballast	10 ballasts/month	10 ballasts/month		40% per fixture	\$16 per Fixture + Labor	<ul style="list-style-type: none"> <li>WCU Electric Shop</li> </ul>	FM Operating Budget

Western Carolina University

Strategic Energy Plan  
2011-2012

Next 12 Months Activities 2012-2013	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
Review of Energy Usage for all campus facilities	Monthly	Monthly			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>FM Staff</li> </ul>	FM Operating Budget
Review natural gas rates for steam plant consumption. Incurred savings thru comparing natural gas vs. #6 fuel oil & hedging 50% of usage via a strip thru Oct. 2013.	Monthly	Monthly			2 hours/month	<ul style="list-style-type: none"> <li>Business Officer</li> <li>Energy Manager</li> </ul>	FM Operating Budget
Energy Service Performance Contract	Monthly & Interval	Monthly & Interval			TBD	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>WCU Project Manager</li> <li>Celtic Energy, Inc</li> </ul>	Private Source
Retro-Commission HF Robinson Administration Building	Monthly	Monthly	119,765kwh \$6,887	Project still under construction	\$717K	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>WCU HVAC</li> <li>WCU Project Manager</li> <li>Sud &amp; Associates</li> <li>Cooper Construction</li> </ul>	ARRA Stimulus Funds
New Construction: Health Sciences Building (LEED Certified)	Monthly & Interval	Monthly & Interval	14% more efficient than baseline building	Project still under construction	\$46M	<ul style="list-style-type: none"> <li>WCU Project Manager</li> <li>Vannoy Construction</li> </ul>	Capital
Harrill Hall Renovation	Monthly & Interval	Monthly & Interval	28% more efficient than baseline building	Project still under construction	\$15.5M	<ul style="list-style-type: none"> <li>WCU Project Manager</li> <li>New Atlantic Construction</li> </ul>	Non-Appropriated
EcoScreen© Energy Dashboard Kiosk from Automated Logic Controls	Monthly & Interval	Monthly & Interval		Project still under construction	Included in Harrill Project	<ul style="list-style-type: none"> <li>WCU Project Manager</li> <li>New Atlantic</li> <li>Energy Manager</li> <li>Energy Management Specialist</li> <li>Harris Integrated Solutions</li> </ul>	Non-Appropriated
Replacing failed T-12 magnetic ballasts w/ T-8 electronic ballast	10 ballasts/month		40% per fixture		\$16/Fixture + Labor	<ul style="list-style-type: none"> <li>WCU Electric Shop</li> </ul>	FM Operating Budget
Continued to monitor campus heating & cooling temp set points, exceptions & building schedules based on state mandate requirements & University Policy #4	Weekly	Weekly	286 equipment runtime hours per week		10 hours/month	<ul style="list-style-type: none"> <li>WCU HVAC Shop</li> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget

Western Carolina University

Strategic Energy Plan  
2011-2012

**B. Energy Supply Management**

Past 12 Months Activities 2010-2011	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
Review of Energy Usage for all Auxiliary facilities	Monthly	Monthly			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>FM Office Staff</li> </ul>	FM Operating Budget
Perform steam trap survey and leak assessment. Repair system during steam shut-down in May	Annually	Annually			12 steam traps + labor	<ul style="list-style-type: none"> <li>WCU HVAC &amp; Plumbing Shop</li> </ul>	FM Operating Budget

Next 12 Months Activities 2011-2012	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
Review of Energy Usage for all Auxiliary facilities	Monthly	Monthly			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>FM Office Staff</li> </ul>	FM Operating Budget
Perform steam trap survey and leak assessment. Repair system during steam shut-down in May	Annually	Annually			Developing system to track cost and savings	<ul style="list-style-type: none"> <li>WCU HVAC &amp; Plumbing Shop</li> </ul>	FM Operating Budget

**C. Organizational Integration**

Past 12 Months Activities 2010-2011	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
WCU Sustainability Council	On-going	On-going			10-15 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> </ul>	FM Operating Budget
Continue sustainability awareness program - monthly energy tip, radio broadcast, presentations, audits, student projects, service learning, etc.	On-going	On-going			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget
Updated Strategic Energy Plan	Annually	Annually			30 hours/year	<ul style="list-style-type: none"> <li>Energy Manager</li> </ul>	FM Operating Budget
Presented display table at WCU Employee Appreciation Day & other campus events as needed	Annually	Annually			10 hours/year	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget
Organized events: Earth & Wellness Celebration, Recycle Mania, Battle of the Plug & Wild & Scenic Film Festival	Annually	Annually			25 hours/week	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> <li>Student Affairs</li> </ul>	FM Operating Budget
Collaborate programming with campus groups: Dining Services & Residential Living	Monthly	Monthly			5 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Student Affairs</li> </ul>	FM Operating Budget
Update websites: Facilities Management, Energy Management, Recycling & Sustainability Council	On-going	On-going			5 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget
WCU Energy Management Facebook Group	On-going	On-going			1 hour/month	<ul style="list-style-type: none"> <li>Energy Manager</li> <li>Energy Management Specialist</li> </ul>	FM Operating Budget
Advisor for Eco CATS Student Club	On-going	On-going			10 hours/month	<ul style="list-style-type: none"> <li>Energy Manager</li> </ul>	FM Operating Budget

Western Carolina University

Strategic Energy Plan  
2011-2012

Next 12 Months Activities 2010-2011	Measurement		Savings		Cost	Assigned to	Funding Source
	Expected	Actual	Expected	Actual			
Received funding for Graduate interns (2 students for 10 hours/week)	On-going	On-going			\$8,000/year	• Energy Manager	FM Operating Budget
Teach LEAD 152 Go Green, First Year Living Learning Community	On-going	On-going			5hours/week (fall)	• Energy Manager • Graduate Intern	FM Operating Budget Student Affairs
WCU Sustainability Council	On-going	On-going			10-15 hours/month	• Energy Manager • Graduate Intern	FM Operating Budget
Develop Campus Sustainability Plan	On-going	On-going				• Assoc. Vice Chancellor FM • Energy Manager • Designated Campus Leaders	FM Operating Budget
Continue sustainability program.-monthly energy tip, weekly radio broadcast, presentations, audits, student projects, service learning, etc.	On-going	On-going			10 hours/month	• Energy Manager • Energy Management Specialist • Graduate Intern	FM Operating Budget
Updated Strategic Energy Plan	Annually	Annually			30 hours/year	• Energy Manager • Graduate Intern	FM Operating Budget
Presented display table at WCU Employee Appreciation Day and other campus events as needed	Annually	Annually			10 hours/year	• Energy Manager • Energy Management Specialist • Graduate Intern	FM Operating Budget
Organized campus events: Sustainability Day, Earth & Wellness Celebration, Recycle Mania, Battle of the Plug & Wild & Scenic Film Festival	Annually	Annually			25hours/week	• Energy Manager • Energy Management Specialist • Student Affairs • Graduate Intern	FM Operating Budget
Collaborate programming across all divisions across campus	Monthly	Monthly			5hours/month	• Energy Manager • Graduate Intern • Student Affairs • Admin & Finance • Academic Affairs • External Affairs	FM Operating Budget
Update websites: Facilities Management, Energy Management, Recycling & Sustainability Council	On-going	On-going			5hours/month	• Energy Manager • Energy Management Specialist • Graduate Assistant	FM Operating Budget
WCU Energy Management Facebook Group	On-going	On-going			1 hour/month	• Energy Manager • Energy Management Specialist • Graduate Assistant	FM Operating Budget
Advisor for Eco CATS Student Club	On-going	On-going			10hours/month	• Energy Manager • Graduate Assistant	FM Operating Budget

Western Carolina University

---

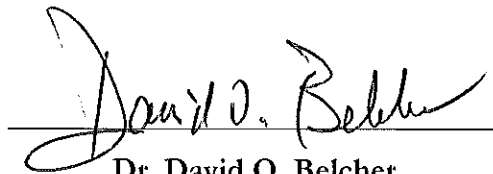
*Strategic Energy Plan*  
2011-2012

**Energy Declaration**

I have read the Strategic Energy and Water Plan for Western Carolina University.


The plan, as presented, supports the reduction required in Senate Bill 668.

Implemented this \_\_\_\_ day of \_\_\_\_\_, 2012.



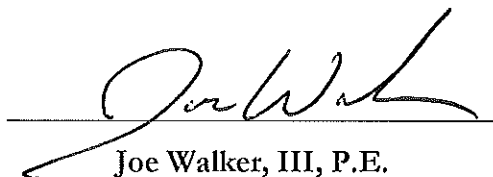
Dr. David O. Belcher

Chancellor



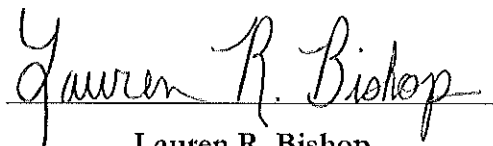
Mr. Robert Edwards

Chief Financial Officer



Joe Walker, III, P.E.

Associate Vice Chancellor for Facilities Management



Lauren R. Bishop

Energy Manager



