



# **Virginia Tech Sustainability Plan: 2014 Update and Supplement to the 2009 VTCAC&SP**

**Energy & Sustainability Committee**

**September 2014**

## **History of Approvals for the Virginia Tech Climate Action Commitment and Sustainability Plan**

### **Original Virginia Tech Climate Action Commitment (VTCAC)**

- Approved by the Commission on University Support: March 19, 2009
  - Note: The Sustainability Plan was included as an attachment to the VT CAC at this level of approval, and was “endorsed,” but was not forwarded to University Council.
- Approved by University Council: April 22, 2009
- Approved by the President: April 22, 2009
- Approved by the Board of Visitors: June 1, 2009
- Effective Date: June 1, 2009
- Became Presidential Policy Memorandum No. 262

### **Update to the Virginia Tech Climate Action Commitment (VT CAC)**

- Approved by the Commission on University Support: April 18, 2013
- Approved by University Council: May 6, 2013
- Approved by the President: May 6, 2013
- Effective Date: Upon Approval by the President
- Revision 1 to Presidential Policy Memorandum No. 262

### **Update to the Sustainability Plan**

- Approved by the Energy & Sustainability Committee: October 27, 2014
- Approved by the Commission on University Support: January 15, 2015

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### Cover photos from left:

Presentation of 2011 Governor’s Gold Environmental Excellence Award to Virginia Tech for its Sustainability Plan, VMI, April 6, 2011

Student interns in the Office of Energy & Sustainability Internship Program, Fall 2013

Lavery Hall, LEED Silver, one of nine Virginia Tech LEED certified buildings

Earth Day 2011 Tree Campus USA Tree Planting with President Steger, Virginia Secretary of Natural Resources Douglas Domenech, VPAS and OES Staff, and students

**Acknowledgements:** This Update of the Virginia Tech Sustainability Plan was conducted under direction of Steve Mouras, Director of Transportation Planning and Sustainability, by the Committee on Energy & Sustainability’s Sustainability Plan Subcommittee, Denny Cochrane, John Randolph, and Rob Lowe, with participation of Kayla Smith, Rial Tombes, Eric Margiotta, Mark DiDilippo, Drew Gallagher, Richard Hirsch, Emily Schosid, Stephanie Smith, and Angie DeSoto.

## **I. THE VIRGINIA TECH CLIMATE ACTION COMMITMENT**

### **A. Historical Perspective**

Virginia Tech has long embraced recycling efforts, waste reduction, energy savings, and other sustainability measures, but a formal commitment or program was lacking until December 2007. That is when Virginia Tech students, led by their group The Environmental Coalition, met with Virginia Tech President Charles W. Steger to encourage him to sign the American College and University Presidents Climate Commitment (PCC). The PCC Mission Statement declares “colleges and universities must exercise leadership in their communities and throughout society by modeling ways to eliminate global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality.” President Steger told the students he would review the PCC before making a decision. In addition, he said he would only commit the university to do what is achievable given limited resources.

In April 2008, President Steger announced his decision to not sign the generic Presidents Climate Commitment, and provided his rationale for why the university would be better served by developing a commitment and sustainability plan that is specific to Virginia Tech and outlines clear, measurable, and realistic goals. He therefore charged the newly formed Energy and Sustainability Committee with the responsibility to develop a Virginia Tech climate commitment and a sustainability plan to achieve it. Furthermore, President Steger directed the commitment be placed in resolution format and forwarded through the university governance system.

During the 2009 Spring Semester the resolution was successfully advanced through the university governance process. On Earth Day April 22, 2009, the University Council approved the “Virginia Tech Climate Action Commitment” (VTCAC) and accepted the accompanying Sustainability Plan.

On June 1, 2009, the Virginia Tech Board of Visitors unanimously approved The Virginia Tech Climate Action Commitment. It subsequently became the President’s Policy Memorandum No. 262 The Virginia Tech Climate Action Commitment Resolution on July 31, 2009. The policy is shown in Appendix A.

### **B. The 2009 Virginia Tech Climate Action Commitment**

The 2009 Virginia Tech Climate Action Commitment contained 14 distinct points. Among the features it committed the university to do the following:

- Be a Leader in Campus Sustainability.
- Represent the Virginia Tech Climate Action Commitment and Sustainability Plan (VTCAC&SP) in the Virginia Tech Strategic Plan.
- Establish a target for the reduction of campus greenhouse gas (GHG) emissions to 80% below the 1990 emission level by 2050, with interim targets for 2012 and 2025.

- Improve energy efficiency and the reduction of energy waste.
- Engage students, faculty, and staff to reduce energy, water, and materials consumption through education and involvement.
- Pursue US Green Building Council Leadership in Energy and Environmental Design (LEED) Silver certification or better for all new buildings and major renovations.
- Establish an Office of Sustainability to oversee the implementation of the VTCAC, to monitor annual energy usage and GHG emissions, to coordinate campus sustainability efforts.
- Prepare an annual “report card” showing sustainability progress.

### **C. 2013 Update to the Virginia Tech Climate Action Commitment**

Point 13 in the VTCAC states that periodic reviews of the resolution would be conducted and adjustments made as appropriate. During the Academic Year 2012-2013, the Energy and Sustainability Committee conducted a detailed review of the language contained in each of the VTCAC fourteen points. In addition, the Committee reviewed the status of the implementation of the actions and measures in the Immediate Phase of the Sustainability Plan.

The Energy and Sustainability Committee prepared a detailed spreadsheet that contained the original language for the 14 points in the VTCAC, and provided recommended changes to that language along with the rationale for those recommended changes.

In April 2013 the Energy and Sustainability Committee forwarded the proposed revisions to the Commission on University Support. The Commission created the Resolution to Update the Virginia Tech Climate Action Commitment, which included the detailed spreadsheet, and forwarded it to the University Council for action. The Commission on University Support Resolution 2012-2013D is shown in Appendix B.

The University Council approved the proposed revisions to the VTCAC on May 6, 2013, and Virginia Tech President Steger subsequently signed Presidential Policy Memorandum No. 262 (Revision 1) on May 9, 2013. The Update to the Virginia Tech Climate Action Commitment is shown in Appendix C.

## **II. VIRGINIA TECH SUSTAINABILITY PLAN IMPLEMENTATION**

### **A. Overview**

The 2009 Virginia Tech Sustainability Plan that accompanied the VTCAC was developed as a working document to provide actions and measures that, when implemented, would position the university to achieve the goals in the VTCAC. The Sustainability Plan also contains the first greenhouse gas (GHG) emissions inventory for the university. The Plan is organized into six action categories and subcategories, which contain a number of proposed actions and measures for implementation. The six categories are as follows:

- Administrative Structure and Governance
- Facilities Infrastructure
- Facilities Operations
- Transportation
- Behavior and Campus Life
- Academic Programs

The Sustainability Plan is organized into three implementation phases. The Immediate Phase (2009-2012) identifies a number of no-cost and low-cost modifications to campus operations that can have an immediate impact and result in substantial savings. The Sustainability Plan looks beyond three years and identifies potential goals and strategies for the Mid-Term Phase (2013-2025), and the Long-Term Phase (2026-2050). The primary focus of implementation is with the Immediate Phase.

The Sustainability Plan contains 119 separate proposed actions and measures for implementation. There are 85 identified for the Immediate Phase, 27 for the Mid-Term Phase, and 7 for the Long-Term Phase. The full Plan is given at

<https://www.facilities.vt.edu/documents/sustainability/VTCACwithAppendices.pdf>.

### **B. Sustainability Plan Progress**

In accordance with VTCAC point 5, the Office of Energy and Sustainability was established on June 1, 2009 to oversee the implementation of the Sustainability Plan. In order to measure our sustainability progress, the VTCAC&SP Status Report was created to track the status of the 85 actions and measures identified in the Immediate Phase (2009-2012). The Status Report is a detailed spreadsheet, which is organized and aligned using the six action categories shown above. Actions and measures are listed in the same order as they appear in the Sustainability Plan. For each action and measure, the spreadsheet contains a brief description or rationale for that item, the status details, and the contact information of the person most responsible for oversight of the item. The overall status of each item is summarized using a color code as follows:

- Green indicates the action or measure has been completed or implemented.

- Yellow indicates the action or measure is in the process of being implemented.
- Red indicates the action or measure is either on hold or it has been cancelled.

The VTCAC&SP Status Report was updated on a quarterly basis and served as an effective management tool. The final Status Report was completed on July 17, 2012 and is shown in Appendix D. As shown in the upper right hand corner, 64% of the 85 actions and measures were coded green, indicating they were complete, 25% were coded yellow, indicating they were being implemented, and 11% were coded red, indicating they were on hold or canceled. The significant point is that three years after approval of the VTCAC, over 89% of the actions and measures identified for the Immediate Phase had been completed, or were in the process of being implemented.

### **C. Sustainability Annual Reports**

In accordance with VTCAC point 13, the Office of Energy and Sustainability has the responsibility for preparing annual sustainability reports for presentation to the Virginia Tech Board of Visitors. The 2010 *Annual Report on Campus Sustainability at Virginia Tech* was the first such publication and it may be viewed at Appendix E. The report includes an Executive Summary and progress to date for each of the VTCAC's 14 points.

The *Campus Sustainability at Virginia Tech 2011 Annual Report* is shown in Appendix F. The format for this report was changed to align with the six action categories in the VTCAC&SP.

The format for the 2012 annual report was significantly modified with measurements and metrics displayed using six bar charts with comments, and some narrative highlights as shown in Appendix G.

The *Virginia Tech Sustainability Annual Report 2012-2013* utilized the same six bar charts with comments, and expanded the highlights section to capture significant sustainability achievements and programs as shown in Appendix H.

### **D. Virginia Tech Sustainability Program Recognition**

The Virginia Tech Sustainability Program formally began during the Academic Year 2007-2008 and it quickly gained recognition at the local, state, and national levels. The university, the Town of Blacksburg, and the local citizens group, Sustainable Blacksburg formed a green partnership for sustainability collaboration and education. Consisting of over 30 separate events, Sustainability Week 2007 was launched the last week in October and included national, state, and local level guest speakers, educational activities, practical workshops, a Campus Sustainability Fair and a Town of Blacksburg Sustainability Fair. The Commonwealth of Virginia Secretary of Natural Resources proclaimed this event as a model program that should be adopted on a state-wide basis.

Item 1 in the VTCAC states: Virginia Tech will be a Leader in Campus Sustainability. Here is a representative listing of the notable achievements and accomplishments the university has received:

- Association for the Advancement of Sustainability in Higher Education’s “Sustainability Tracking, Assessment, and Rating System (STARS)” Silver Rating.
- Five “Governor’s Environmental Excellence Awards” (2 Gold and 3 Bronze) (2008, 2009, 2011, 2013 and 2014).
- Featured in the Princeton Review’s “*Guide to Green Colleges*” in 2011 (inaugural year) and for three consecutive years (2012-2014).
- Sixteen US Green Building Council Leadership in Energy and Environmental Design (LEED) registered new construction and major renovation projects representing nearly 1.3 million gross square feet (GSF). Specifically:
  - Nine projects LEED Certified (4 Gold, 4 Silver, 1 Certified)
  - Two projects awaiting LEED certification
  - Three projects under construction
  - Two projects in design
- “Best of Green Schools” in 2013 by the US Green Building Council for best collaboration (Celebrate Sustainability 2013 Program – formally Sustainability Week).
- “Tree Campus USA” Accreditation by the National Arbor Day Foundation in 2008 (inaugural year) with Reaccreditation each year for five consecutive years (2009-2013).
- “Bicycle Friendly University” designation from the League of American Bicyclists.
- Best Workplaces for Commuters designation by the US EPA for five consecutive years.
- “Campus Sustainability Report Card” B+ overall rating in 2011 from the Sustainable Endowments Institute (program began in 2008 and concluded in 2011).

### **III. Changes in Tracking Campus Sustainability**

Since the release of the Virginia Tech Sustainability Plan, the national movement for campus sustainability has evolved. The Association for the Advancement of Sustainability in Higher Education (AASHE) has become the leading organization for promoting campus sustainability, and its Sustainability Tracking, Assessment & Rating System (STARS) has become the accepted tool for evaluating and comparing campus progress towards sustainability. Virginia Tech was an early member of AASHE and participated in the STARS assessment in 2011 and 2013.

Because AASHE STARS has become the national standard for tracking and assessing university sustainability progress, the university chose to use STARS as its primary monitoring and management tool in lieu of using the campus Report Card.

#### **A. Overview of the Sustainability Tracking, Assessment, and Rating System (STARS)**

The Sustainability Tracking, Assessment & Rating System (STARS) is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. STARS was created by the higher education community for use by the same. STARS is a comprehensive management tool that encompasses the environmental, economic, and social dimensions of sustainability. STARS is designed to:

- Provide a framework of understanding sustainability in all sectors of higher education.
- Enable meaningful comparisons over time and across institutions using a common set of measurements developed with broad participation from the campus sustainable community.
- Create incentives for continual improvement toward sustainability.
- Facilitate information sharing about higher education sustainability practices and performance.
- Build a stronger, more diverse campus sustainability community.

STARS is a Rating System that uses a 100 point scale. The minimum score required for a specific STARS Rating is as follows: Bronze: 25; Silver: 45; Gold: 65; and Platinum: 85.

STARS contains 135 separate subject areas called “Credits.” There are two types of credits which are called “Tier 1 and Tier 2 Credits.”

- Tier 1 Credits focus on performance. Credits are based on measurements of sustainability performance and are typically quantitative. Tier 1 credits have point values from 1 to 14.
- Tier 2 Credits focus on strategies. Credits target approaches or processes that can be implemented to improve an institution’s performance. All Tier 2 credits have a point value of 0.25.
- STARS strives to prioritize performance over strategy.

The STARS Technical Manual provides a detailed description of the information and data requirements for each of the 135 STARS credits; the manual can be found at ([http://www.aashe.org/files/documents/STARS/stars\\_1.2\\_technical\\_manual.pdf](http://www.aashe.org/files/documents/STARS/stars_1.2_technical_manual.pdf)).

The Credits are placed in one of the following three broad categories:

- Education & Research (ER) Category (20% of the credits):
- Operations (OP) Category (53% of the credits):
- Planning, Administration & Engagement (PAE) Category (27% of the credits):

While the number of credits in each of the three categories is different, the total point value for each of the three categories is 100. The Operations Category has over half of the total credits.

STARS has a fourth category - the *Innovation Category*. An institution can receive one additional point towards its overall score for having implemented an innovation credit that is not covered by any of the STARS credits. An innovation credit requires a Letter of Affirmation from a subject matter expert at the institution confirming its uniqueness. The institution can earn up to four innovation credits, which are added to the average score of the points earned in the three primary categories.

The information and data submitted for a STARS rating must be accompanied by a letter from the institution's president that affirms the accuracy of all of the documentation. A STARS rating is good for 3 years. If, during the 3 year period following the STARS submission, an institution wishes to submit additional documentation and seek a new STARS rating, it must re-register with STARS. Changes to the submitted information can be made at any time by designated personnel. When appropriate, the institution can then re-submit their new documentation for a new STARS rating.

In conclusion, STARS provides the university with a reporting tool to manage 135 sustainability topics areas (credits). STARS is used by our peer institutions and is nationally recognized as the best sustainability product available to measure the university's sustainability performance.

## **B. Virginia Tech STARS Results**

Table III-1 gives Virginia Tech's summary results for submitted in August 2011. The university earned 75 percent of the total available points in the Education & Research Category, 73 percent of the total available points in the Planning, Administration, & Engagement Category, and 29 percent of the total available points in the Operations Category. The total of 61.91 points earned Virginia Tech a Silver rating.

**Table III-1 Virginia Tech STARS submission, August 2011**

Category	Points Earned	Category Score
Education & Research	75.01	75.01%
Operations	29.14	29.14%
Planning, Administration & Engagement	72.40	72.58%
Provisional Score		58.91
Innovation Credits (3)		3.00
<b>TOTAL SCORE for STARS</b>		<b>61.91</b>

Table III-2 gives a summary of the results for latest STARS rating submitted in 2013. Scores were similar to the initial submission.

**Table III-2 Virginia Tech STARS submission, March 2013**

Category	Points Earned	Category Score
Education & Research	75.01	75.01%
Operations	30.76	30.76%
Planning, Administration & Engagement	72.13	72.13%
Provisional Score		59.30
Innovation Credits (4)		4.00
<b>TOTAL SCORE for STARS</b>		<b>63.30</b>

Table III-3 gives more detailed results showing category and subcategory available points and points earned by Virginia Tech. A particular challenge in earning points under the Operations Category is STARS uses a base year of 2005 to determine progress in a particular item.

**Table III-3a STARS Education & Research and Virginia Tech Points Earned**

Sub-Category	Points Available	Points Earned
Co-Curricular Education	18.00	12.25
Curriculum	55.00	35.76
Research	27.00	27.00
Total Points	100.00	75.01
<b>Overall SCORE for ER</b>		<b>75.01%</b>

**Table III-3b STARS Operations and Virginia Tech Points Earned**

<b>Sub-Category</b>	<b>Points Available</b>	<b>Points Earned</b>
Buildings	13.00	1.89
Climate	16.50	2.25
Dining Services	8.50	2.82
Energy	16.50	1.58
Grounds	3.25	1.57
Purchasing	7.50	3.97
Transportation	12.00	5.15
Waste	12.50	8.28
Water	10.25	3.25
Total Points	100	30.76
<b>Overall SCORE for OP</b>		<b>30.76%</b>

**Table III-3c STARS Planning, Administration, Engagement and Virginia Tech Points Earned**

<b>Sub-Category</b>	<b>Points Available</b>	<b>Points Earned</b>
Coordination & Planning	18.00	18.00
Diversity & Affordability	13.75	13.75
Human Resources	19.75	16.30
Investment	16.75	0.43
Public Engagement	31.50	23.47
Total Points	99.75*	71.95
<b>Overall SCORE for PAE</b>		<b>72.13%</b>

## C. Process of Converting to STARS

As discussed in Section II, the Office of Energy & Sustainability has continually monitored progress in implementing the 2009 Plan in the Sustainability Plan Status Report that tracked 119 different items. The process of converting the Sustainability Plan to STARS involved cross-checking the 119 Sustainability Plan Status Report items to the 135 STARS credits. OES staff developed a spreadsheet for this cross-check. A portion of the spreadsheet is shown in Table III-4, which shows the Education & Research category. The process aligned the STARS credits with the Status Report items, and Status Report items that did not align were identified as VT-Unique items. The E&SC subcommittee working on the Plan update reviewed these VT-Unique items, decided which were still valid and of those which needed to be updated. The complete spreadsheet is shown in Appendix I.

**Table III-4 Aligning STARS Credits and VTCAC Education & Research**

EDUCATION AND RESEARCH (ER)						
Fall Semester 2013						
STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Co-Curricular Education</b>						
ER-1: Student Sustainability Educators Program	5	0	Not Pursuing	#45, 60		Could claim points if a "Sustainability Advisors/Eco Rep" peer-to-peer program is initiated
ER-2: Student Sustainability Outreach Campaign	5	5	Pursuing	#10, 72		
ER-3: Sustainability in New Student Orientation	2	2	Pursuing	#46		
ER-4: Sustainability Materials and Publications	4	4	Pursuing	#47, 50		May need to reinstate newsletter to claim full points in future
Tier2-1: Student Group	0.25	0.25	Pursuing			
Tier2-2: Organic Garden	0.25	0.25	Pursuing			
Tier2-3: Model Room in Residence Hall	0.25	0	Not Pursuing	#61		Could pursue in the future
Tier2-4: Themed Housing	0.25	0	Not Pursuing			Could pursue in the future
Tier2-5: Sustainable Enterprise	0.25	0	Not Pursuing			Could pursue in the future
Tier2-6: Sustainability Events	0.25	0.25	Pursuing	#33		
Tier2-7: Outdoors Program	0.25	0.25	Pursuing			
Tier2-8: Themed Semester or Year	0.25	0.25	Pursuing			Have claimed in past w/"Common Book Project" (09-10 and 10-11). Will need new program or common book that emphasizes sustainability to claim these points in the future
<b>Curriculum</b>						
ER-5: Sustainability Course Identification	3	3	Pursuing	#78		Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-6: Sustainability-Focused Courses	10	8.83	Pursuing	#78	12	Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-7: Sustainability-Related Courses	10	2.00	Pursuing	#78	12	Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-8: Sustainability Courses by Department	7	5.47	Pursuing	#78		Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-9: Sustainability Learning Outcomes	10	6.46	Pursuing	#78		Currently calculated from AY 09-10. Will need to be updated
ER-10: Undergraduate Program in Sustainability	4	4	Pursuing	#79		
ER-11: Graduate Program in Sustainability	4	4	Pursuing			
ER-12: Sustainability Immersive Experience	2	2	Pursuing	#77		
ER-13: Sustainability Literacy Assessment	2	0	Not Pursuing			Could pursue in the future
ER-14: Incentives for Developing Sustainability Courses	3	0	Not Pursuing			Could pursue in the future
<b>Research</b>						
ER-15: Sustainability Research Identification	3	3	Pursuing	#82		Research inventory will need to be updated
ER-16: Faculty Involved in Sustainability Research	10	10	Pursuing	#82		Research inventory will need to be updated
ER-17: Departments Involved in Sustainability Research	6	6	Pursuing	#82		Research inventory will need to be updated
ER-18: Sustainability Research Incentives	6	6	Pursuing	#82		
ER-19: Interdisciplinary Research in Tenure and Promotion	2	2	Pursuing	#82		
<b>Total</b>	<b>100</b>	<b>75.01</b>				
<b>VT Unique Items</b>						
			I	#81		Promote new research in energy efficiency and sustainability using undergraduate research and the university campus as a living laboratory.
			O	#85		Career Services provides information on Green Jobs to career counselors.

The subcommittee also identified additional goals, objectives, and strategies (GOS) that should be considered as VT-Unique GOS in the Sustainability Plan update. The results of this effort are presented in the next section.

## **D. 2014 Update of 2009 Virginia Tech Sustainability Plan**

This 2014 Update of the 2009 Virginia Tech Sustainability Plan integrates the goals, objectives and strategies of the 2013 Update to the Virginia Tech Climate Action Commitment (VT CAC) and adopts the AASHE STARS program as its primary monitoring and management tool. It also includes Plan goals, objectives and strategies (GOS) that go beyond the STARS protocol, what we call VT-Unique GOS.

This section presents the Plan, organized by the 2013 VT CAC. The section shows how STARS credits and VT-Unique GOS relate to the 14 points of the VT CAC. Relevant STARS credits are listed under each CAC point. More detailed STARS strategies and metrics are found in the Virginia Tech AASHE STARS documentation. VT-Unique GOS are given for each VT CAC point, including updated elements of the 2009 Plan (marked with \* below) as well as new elements (marked with \*\* below). Appendix J uses this format to give a summary of progress for each CAC point, based on the March 2013 STARS submission or current (April 2014) status of VT-Unique GOS.

### **The Virginia Tech Climate Action Commitment Update 2013 Presidential Policy Memorandum No. 262 (Revision 1)**

**1. Virginia Tech will be a Leader in Campus Sustainability. Sustainability is an integral part of the fabric of the university as it pursues enhanced economic stability and affordability, diversity and inclusion, environmental stewardship, expansion of knowledge, and education of future leaders.**

- STARS Credits
  - All Planning, Administration, Engagement (PAE) Sub-Categories:
  - Operations: Grounds
  - Operations: Water
  - Operations: Dining Services
- VT-Unique GOS:
  - 1.1. Achieve and maintain a STARS Gold Rating. \*\*
  - 1.2. Work towards continuing to be recognized in the Princeton Review's "Guide to Green Colleges." \*\*
  - 1.3. Work towards continuing to be recognized in Governor's Environmental Excellence Awards and other state and national programs. \*\*
  - 1.4. Provide environmental stewardship of campus, balancing physical development, recreational, and agricultural needs with protection of ecological, vegetative, air quality, water, and other natural resources. \*\*
  - 1.5. Be a Leader in Campus Dining Services Sustainability. \*\*

- 1.6. Continue to implement Policy 5505: Campus Energy, Water and Waste Reduction. \*
- 1.7. Continue to develop and implement innovative sustainability programs including those that result in quantifiable and measurable cost savings. \*\*

**2. Virginia Tech will represent the VTCAC&SP in the university Strategic Plan.**

- STARS Credits:
  - PAE-2 Strategic Plan
- VT-Unique GOS: None Applicable

**3. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level of 188,000 tons by 2050, and interim targets from 2006 emissions of 316,000 tons for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).**

- STARS Credits:
  - Operations (OP) OP-5 (GHG reductions)
- VT-Unique GOS:
  - 3.1. Continuing progress toward GHG target. \*

**4. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.**

- STARS Credits: Operations
  - OP-7 Building Energy
  - OP-8 Clean and Renewable Energy
  - Tier 2-13 to 2-18: Timers, sensors, metering, LED lighting, energy management
- VT-Unique GOS:
  - 4.1. Strive to reduce electricity and energy consumption per gross square foot and per enrolled student. \*
  - 4.2. Continue enhancements and upgrades to central chilled water system to improve efficiency. \*
  - 4.3. Explore the feasibility of additional Energy Service Company (ESCO) contracts, based on experience with current 5-building contract, to improve energy efficiency of campus buildings. \*\*
  - 4.4. Study the long-term feasibility of replacing high-carbon coal and fuel oil in the steam plant with lower-carbon natural gas and biomass fuels. \*\*
  - 4.5. Develop demand-side energy efficiency and load management programs on campus and in VTES municipal service area. \*

4.6. Develop plan for future VTES electricity that includes on-campus and VTES municipal service area demand-side management, smart grid infrastructure, and distributed sources. \*

4.7. Continue to implement Policy 5505: Campus Energy, Water and Waste Reduction. \*

**5. Virginia Tech will maintain a sustainability office to:**

- a. Coordinate programs for campus sustainability;**
- b. Oversee implementation of the VTCAC&SP;**
- c. Monitor annual electricity and other energy use and GHG emissions;**
- d. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory; and**
- e. Coordinate communication regarding campus sustainability initiatives and programs to the university community and external audiences.**

- STARS Credits: Planning, Administration, and Engagement (PAE)

- PAE-1 Sustainability Coordination
- PAE-3 Physical Campus Plan
- PAE-4 Sustainability Plan
- PAE-5 Climate Plan

- VT-Unique GOS:

- 5.1. Campus-wide student internship and undergraduate research program. \*
- 5.2. Maintain University Sustainability Website. \*

**6. Virginia Tech will improve the sustainability of its built environment by:**

- a. Achieving LEED Silver certification or better for all eligible and applicable new buildings and major renovations;**
- b. Evaluating the feasibility of LEED for Existing Buildings certification for its existing buildings.**

- STARS credits:

- OP-1 Building Operations and Maintenance:
- OP-2 Building Design and Construction:
- OP-3 Indoor Air Quality:

- VT-Unique GOS:

- 6.1. Implement LEED Silver or better certification for new buildings and major renovations. \*
- 6.2. Identify cost and potential funding strategies to pursue LEED certification for Existing Buildings to include cost savings. \*\*

**7. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations by:**

- a. Exceeding the most current version of ASHRAE 90.1 energy performance by 10% for all new buildings and major renovations. Capital budgets should account for future energy price, life cycle cost of building operation, and environmental benefits of achieving this level of performance;**
- b. Improving the heating and cooling infrastructure and operation, lighting efficiency, equipment efficiency, and metering and controls of its existing buildings.**

- STARS credits:
  - OP-1 Building Operations and Maintenance:
  - OP-2 Building Design and Construction:
  - OP-3 Indoor Air Quality:
  - OP-22 Water Consumption:
  - Tier 2-44 to 46 Waterless urinals, Water metering, Non-potable water use
- VT Unique GOS:
  - 7.1. Explore means to integrate life-cycle economic and environmental operating costs in capital budgets. \*
  - 7.2. In addition to LEED certification, evaluate energy performance of new buildings and major renovations to exceed ASHRAE 90.1 energy performance standard by 10% or more. \*
  - 7.3. Improve water-use efficiency of new and existing buildings. \*

**8. Virginia Tech will minimize waste and achieve a 50% recycle rate by 2020.**

- STARS Credits:
  - Dining Services Waste Tier 2-3,2-7 to 2-12: Trayless dining, Pre-consumer food waste compost, Post-consumer food waste compost, Food donation, Recycled content napkins, Reusable mug discounts, Reusable to-go containers
  - OP-17 Waste Reduction:
  - OP-18 Waste Diversion:
  - OP-19 Construction/Demo. Waste Diversion
  - OP-20 Electronic Waste Recycling
  - OP-21 Hazardous Waste Management
  - Waste Tier 2-38 to 2-43 Materials exchange, Limiting Printing, Materials on-line, Chemical reuse inventory, Move-in waste reduction, Move-out waste reduction
- VT-Unique GOS:
  - 8.1. Achieve 50% recycle rate by 2020. \*
  - 8.2. Participation and recognition in national Recycle-Mania competition. \*

8.3. Enhance quality and recognition of Dining Services Sustainability waste minimization.  
\*

8.4. Continue to implement Policy 5505: Campus Energy, Water and Waste Reduction. \*

8.5. Work with the YMCA at Virginia Tech and other groups to complement VT Recycling with move-in/move-out reuse programs like Y-Toss. \*

**9. Virginia Tech will:**

**a. Require purchase or lease of Energy Star rated equipment and maximum practicable recycled content paper, in accordance with University Policy 5505, with exceptions for special uses;**

**b. Consider a product's life cycle cost and impact when making purchasing decisions.**

• STARS Credits:

- OP-10 Computer Purchasing
- OP-11 Cleaning Products Purchasing
- OP-12 Office Paper Purchasing
- OP-13 Vendor Code of Conduct
- Tier 2-24,25 Historically Underutilized Businesses, Local Businesses

• VT-Unique GOS:

9.1. Continue to implement Policy 5505: Campus Energy, Water and Waste Reduction. \*

9.2. Continue to make sustainability a priority in the procurement department. \*

**10. Virginia Tech will engage students, faculty, and staff through education and involvement to develop and implement innovative strategies for efficient and sustainable use of energy, water, and materials in all university-owned facilities.**

• STARS Credits:

- Planning, Administration, Engagement (PAE)-1 Sustainability Coordination
- PAE-13 Staff Professional Development in Sustainability
- PAE-14 Sustainability in New Employee Orientation
- PAE-15 Employee Sustainability Educators Program
- PAE-20 Inter-Campus Coordination on Sustainability
- PAE-22 Community Service Participation
- PAE-23 Community Service Hours
- PAE-24 Sustainability Policy Advocacy
- Education and Research (ER)-2 Student Sustainability Outreach Campaign
- ER-3 Sustainability in Student Orientation

• VT-Unique GOS:

10.1. Develop and implement programs to engage students, faculty and staff in the implementation of the VTCAC and Sustainability Plan. \*

**11. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies and practices. The university will continue to implement programs that encourage the use of alternative transportation methods and will continue to implement programs and services that promote eco-responsible fleet management.**

- STARS Transportation Credits:
  - OP-14 Campus Fleet
  - OP-15: Student Commute Modal Shift
  - OP-16: Employee Commute Modal Shift
  - Tier 2-26 to 2-37 Bike sharing, Bicyclists facilities, Bicycle plan, Mass transit, Condensed work week, Telecommuting, Carpool/vanpool matching, Cash-out of parking, Carpool discount, Local housing, Prohibiting idling, Car sharing
- VT-Unique GOS:
  - 11.1. Continue to promote Alternative Transportation Program to reduce commuting vehicle miles traveled and related emissions. \*
  - 11.2. Develop multi-modal transit facility on campus. \*\*
  - 11.3. Blacksburg Transit should continue replacing old buses with more fuel-efficient buses to reduce their dependency on fossil fuels. \*

**12. Virginia Tech will continue to develop and implement innovative sustainability-related academic programs in instruction, research, and outreach, and will coordinate and communicate these programs to the university community and external audiences.**

- STARS Education, Research and Outreach Credits
  - ER-1 Student Sustainability Educators
  - ER-2 Student Sustainability Outreach
  - ER-3 Sustainability in New Student Orientation
  - ER-4 Sustainability Material & Publications
  - Tier 2-1 to 2-8 Student group, Organic garden, Model residence room, Themed housing, Sustainable enterprise, Sustainability events, Outdoors program, Themed semester or year
  - ER-5 Sustainability Course Identification
  - ER-6 Sustainability-Focused Courses
  - ER-7 Sustainability-Related Courses
  - ER-8 Sustainability Courses by Department
  - ER-9 Sustainability Learning Outcomes
  - ER-10 Undergraduate Program in Sustainability
  - ER-11 Graduate Program in Sustainability

- ER-12 Sustainability Immersive Experience
- ER-13 Sustainability Literacy Assessment
- ER-14 Incentives for Developing Sustainability Courses
- ER-15 Sustainability Research Identification
- ER-16 Faculty Involved in Sustainability Research
- ER-17 Departments Involved Sustainability Research
- ER-18 Sustainability Research Incentives
- PAE-19 Community Sustainability Partnership
- PAE-21 Sustainability in Continuing Education
- VT-Unique GOS:
  - 12.1. Promote new research in energy efficiency and sustainability. \*
  - 12.2. Use undergraduate research, the university campus and the surrounding community as a living laboratory. \*
  - 12.3. Continue to develop innovative sustainability related academic courses and programs. \*
  - 12.4. Career Services provides information on Green Jobs to career counselors. \*
  - 12.5. In community outreach and engagement, continue to work with, surrounding jurisdictions, especially the Town of Blacksburg, and community organizations to promote common interests in advancing sustainability. \*

**13. Virginia Tech will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.**

- STARS Credits: None Applicable
- VT-Unique GOS:
  - 13.1. Monitor progress in all 14 VTCAC elements and produce an annual report for presentation to the campus community and Board of Visitors. \*
  - 13.2. At approximately five year intervals, re-evaluate the VTCAC and Sustainability Plan and update as needed. \*\*
  - 13.3. Use AASHE STARS as a sustainability management tool to monitor progress. \*\*
  - 13.4. Accommodate STARS updated versions and submit new data as appropriate. \*\*

**14. Virginia Tech will work to provide funding to support sustainability programs. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds.**

- STARS Credits: None Applicable
- VT-unique GOS:
  - 14.1. Work to integrate life-cycle costs into both capital and operating budgets, especially for building efficiency and energy systems to better manage long-term costs. \*\*
  - 14.2. Continue annual Green RFP funding, or a similar funding mechanism, to support student-initiated proposals for sustainability-related projects consistent with this Sustainability Plan. \*\*

## **IV. Looking Ahead: Implementation of 2014 Virginia Tech Sustainability Plan**

### **A. Framework for Implementation: the VTCAC 14 Points**

The implementation of the 2014 Virginia Tech Sustainability Plan Update will focus on the VTCAC 14 points and improving progress toward the STARS credits and VT-Unique GOS given for each point. Progress should be reported in the Sustainability Annual Report to the Board of Visitors. Former submittal of STARS reported data should be done on about a three-year cycle and should consider evolving versions of the STARS protocol. The Virginia Tech Climate Action Commitment and Sustainability Plan should be updated on about a five-year cycle.

### **B. STARS as a Sustainability Management Tool**

AASHE STARS protocol has become the national standard for monitoring university progress toward sustainability. The data is used by other organizations rating university sustainability, such as the Princeton Review's "*Guide to Green Colleges.*" Using STARS as a management tool for Virginia Tech's sustainability planning and management provides efficiency in monitoring sustainability progress, comparison with other peer institutions, and a more systematic means of tracking compliance and progress toward VT's Climate Action Commitment.

## APPENDIX A: 2009 VT CLIMATE ACTION COMMITMENT

### The Virginia Tech Climate Action Commitment Resolution Commission on University Support Resolution 2008-2009C

First Reading by Commission on University Support	February 19, 2009
Approved by the Commission on University of Support:	March 19, 2009
First reading by University Council:	March 30, 2009
Approved by University Council:	April 22, 2009
Approved by the President:	April 22, 2009
Approved by the Board of Visitors:	June 1, 2009
Effective Date:	June 1, 2009

**Whereas**, in December 2007 President Steger met with students about the Presidents Climate Commitment, and in April 2008, President Steger charged the Energy & Sustainability Committee with drafting a Virginia Tech Climate Commitment and sustainability plan;

**Whereas**, Virginia Tech's electricity bill increased 54% from \$8.2 to \$12.6 million from 2004 to 2008 at a time of major state budget reductions, and electricity rates are expected to increase;

**Whereas**, efforts to reduce electricity and energy use and related greenhouse gas (GHG) emissions also reduce the rising costs of energy;

**Whereas**, the 2007 Virginia Energy Plan and 2008 report of the Governor's Commission on Climate Change call on the Commonwealth to reduce its GHG emissions to 2000 levels by 2025;

**Whereas**, the Governor's Commission, Governor Kaine, the Town of Blacksburg, the Obama administration, and countless states, cities, and campuses across the country, have endorsed a long term target for GHG emissions of 80% below 1990 levels by 2050;

**Whereas**, the Virginia Division of Engineering and Buildings issued new rules in December 2008 requiring all new state buildings and major renovations to achieve either LEED certification or a 30% improvement in energy performance over ASHRAE 90.1 2004 and other requirements;

**Whereas**, the Governor's Commission calls on the state agencies to lead the Commonwealth to lower emissions by example, and Virginia Energy Plan also calls on the state's universities to "lead by example by implementing energy-efficiency actions across their campuses. These actions will not only reduce energy use and lower energy bills but will also help educate our next generation of leaders on how to manage energy wisely in their lives;"

**Whereas**, many colleges and universities throughout the country have joined this “lead by example” challenge and joined a national movement to “green” university campuses; 606 have signed the American Colleges and Universities Presidents Climate Commitment, including 7 ACC schools, 15 Virginia colleges, 16 top 50 research universities, and 26 land grant institutions; and

**Whereas**, Virginia Tech is the premier technical and design university in the Commonwealth and should take on this leadership role, exceed minimum state standards, and demonstrate emerging technologies and management approaches to reduce energy consumption and costs and reduce GHG emissions; and

**Whereas**, Virginia Tech has adopted Campus Energy and Water Policy 5505 that establishes a foundation for this commitment regarding efficient use of energy on campus.

**Whereas**, 18 Virginia Tech student organizations are members of the Campus Coalition for Sustainability and student, staff, and faculty interest in sustainability issues is at an all-time high;

**Now, Therefore Be It Resolved:** that the university shall adopt the following Virginia Tech Climate Action Commitment:

1. Virginia Tech will be a Leader in Campus Sustainability.
2. The university will represent the VTCAC&SP in the Virginia Tech Strategic Plan.
3. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level by 2050, and interim targets from 2006 emissions of 316,000 tons consistent with the Virginia Energy Plan, the Governor’s Commission on Climate Change, the Town of Blacksburg, and the federal administration: for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).
4. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.
5. Virginia Tech will establish an Office of Sustainability to
  - a. Coordinate programs for campus sustainability,
  - b. Oversee implementation of the VTCAC&SP,
  - c. Monitor annual electricity and other energy use and GHG emissions, and

- d. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory
6. Virginia Tech will pursue LEED Silver certification or better and exceed ASHRAE 90.1 2004 energy performance by 35% (ASHRAE 90.1 2007 by 30%) for all new buildings and major renovations. Capital budgets should account for future energy price, cost of building operation, return on investment, and environmental benefits of achieving this level of performance.
7. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations, including the heating and cooling infrastructure and operation, lighting efficiency controls and operation, and equipment efficiency and controls.
8. The university will adopt at least 4 reduction measures in the Waste Minimization component of the national RecycleMania competition. Virginia Tech Recycling will adopt a goal of 35% recycle rate by 2012 and 50% by 2025.
9. Virginia Tech will require purchase of Energy Star rated equipment, maximum practicable recycled content paper, and other low life-cycle cost products, with exceptions for special uses.
10. Virginia Tech will engage students, faculty and staff through education and involvement to reduce consumption of energy, water, and materials in academic and research buildings, dining and residence halls, and other facilities.
11. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies. Alternative transportation use will increase from the current level of 45%, to a goal of 52% in 2015, and 60% in 2020.
12. The university will create and support a virtual Virginia Tech School of Sustainability or similar mechanism to coordinate, develop, and communicate related instructional, research, and outreach academic programs.
13. The university will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.
14. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a

joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds. Virginia Tech will provide funding to support sustainability programs through a variety of sources, which might include savings from reduced electricity and energy fuels, E&G funds, loans, a Green Development Fund from private sources, and a student Green Fee.

**APPENDIX B: COMMISSION ON UNIVERSITY SUPPORT RESOLUTION 1012-13D:  
2013 VTCAC**

**Resolution to Update the Virginia Tech Climate Action Commitment  
Commission on University Support  
Resolution 2012-13D**

First Reading by the Commission on University Support:	April 11, 2013
Approved by the Commission on University Support:	April 18, 2013
First Reading by the University Council:	April 29, 2013
Approved by the University Council:	May 6, 2013
Approved by the President:	<b>TBD</b>
Effective Date:	<b>Upon Approval by the President</b>

**WHEREAS**, the Virginia Tech Climate Action Commitment (VTCAC) was approved by the Board of Visitors on June 1, 2009; and

**WHEREAS**, the initial phase (2009-2012) of the VTCAC implementation plan has elapsed; and

**WHEREAS**, the Energy & Sustainability Committee (E&SC) established a subcommittee in the spring of 2012 to review the language of the VTCAC and recommend changes; and

**WHEREAS**, the E&SC subcommittee recommended several updates, as outlined in the attached; and

**WHEREAS**, the full E&SC has reviewed and recommended the proposed changes to the VTCAC for University Council approval;

**THEREFORE LET IT BE RESOLVED**, that the Virginia Tech Climate Action Commitment be amended as outlined in the attached;

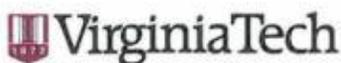
**AND BE IT FURTHER RESOLVED**, that the changes take effect in May 2013.

1. Virginia Tech will be a Leader in Campus Sustainability. Sustainability is an integral part of the fabric of the university as it pursues enhanced economic stability and affordability, diversity and inclusion, environmental stewardship, expansion of knowledge, and education of future leaders.
2. Virginia Tech will represent the VTCAC&SP in the university Strategic Plan.
3. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level of 188,000 tons by 2050, and interim targets from 2006 emissions of 316,000 tons for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).

4. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.
5. Virginia Tech will maintain a sustainability office to:
  - a. Coordinate programs for campus sustainability;
  - b. Oversee implementation of the VTCAC&SP;
  - c. Monitor annual electricity and other energy use and GHG emissions;
  - d. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory; and
  - e. Coordinate communication regarding campus sustainability initiatives and programs to the university community and external audiences.
6. Virginia Tech will improve the sustainability of its built environment by:
  - a. Achieving LEED Silver certification or better for all eligible and applicable new buildings and major renovations;
  - b. Evaluating the feasibility of LEED for Existing Buildings certification for its existing buildings.
7. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations by:
  - a. Exceeding the most current version of ASHRAE 90.1 energy performance by 10% for all new buildings and major renovations. Capital budgets should account for future energy price, life cycle cost of building operation, and environmental benefits of achieving this level of performance;
  - b. Improving the heating and cooling infrastructure and operation, lighting efficiency, equipment efficiency, and metering and controls of its existing buildings.
8. Virginia Tech will minimize waste and achieve a 50% recycle rate by 2020.
9. Virginia Tech will:
  - a. Require purchase or lease of Energy Star rated equipment and maximum practicable recycled content paper, in accordance with University Policy 5505, with exceptions for special uses;
  - b. Consider a product's life cycle cost and impact when making purchasing decisions.
10. Virginia Tech will engage students, faculty, and staff through education and involvement to develop and implement innovative strategies for efficient and sustainable use of energy, water, and materials in all university-owned facilities.
11. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies and practices. The university will continue to implement programs that encourage the use of alternative transportation methods and will continue to implement programs and services that promote eco-responsible fleet management.

12. Virginia Tech will continue to develop and implement innovative sustainability-related academic programs in instruction, research, and outreach, and will coordinate and communicate these programs to the university community and external audiences.
13. Virginia Tech will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.
14. Virginia Tech will work to provide funding to support sustainability programs. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds.

**APPENDIX C: 2013 VT CLIMATE ACTION COMMITMENT, PRESIDENTIAL POLICY MEMO 262**



Charles W. Steger, President

210 Burruss Hall (0131)  
Blacksburg, Virginia 24061  
540/231-6231 Fax: 540/231-4265  
[www.president.vt.edu](http://www.president.vt.edu) [president@vt.edu](mailto:president@vt.edu)

**Presidential Policy Memorandum No. 262**  
**Revision 1**

**TO:** All Virginia Tech Employees and Students  
**FROM:** Charles Steger *WS*  
**DATE:** May 9, 2013  
**SUBJECT:** Update to the Virginia Tech Climate Action Commitment

<b>Approved by the Commission on University Support:</b>	<b>April 18, 2013</b>
<b>Approved by the University Council:</b>	<b>May 6, 2013</b>
<b>Approved by the President:</b>	<b>May 6, 2013</b>
<b>Effective Date:</b>	<b>Upon Approval by the President</b>

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University Council approved a resolution regarding an update to the Virginia Tech Climate Action Commitment

Following is the text of the resolution.

- WHEREAS**, the Virginia Tech Climate Action Commitment (VTCAC) was approved by the Board of Visitors on June 1, 2009; and
- WHEREAS**, the initial phase (2009-2012) of the VTCAC implementation plan has elapsed; and
- WHEREAS**, the Energy & Sustainability Committee (E&SC) established a subcommittee in the spring of 2012 to review the language of the VTCAC and recommend changes; and
- WHEREAS**, the E&SC subcommittee recommended several updates, as outlined in the attached; and
- WHEREAS**, the full E&SC has reviewed and recommended the proposed changes to the VTCAC for University Council approval;

*Invent the Future*

**THEREFORE LET IT BE RESOLVED**, that the Virginia Tech Climate Action Commitment be amended as follows:

1. Virginia Tech will be a Leader in Campus Sustainability. Sustainability is an integral part of the fabric of the university as it pursues enhanced economic stability and affordability, diversity and inclusion, environmental stewardship, expansion of knowledge, and education of future leaders.
2. Virginia Tech will represent the VTCAC&SP in the university's Strategic Plan.
3. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level of 188,000 tons by 2050. Interim targets from 2006 emissions of 316,000 tons will be: for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).
4. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.
5. Virginia Tech will maintain a sustainability office to:
  - a. Coordinate programs for campus sustainability,
  - b. Oversee implementation of the VTCAC&SP,
  - c. Monitor annual electricity and other energy use and GHG emissions, and
  - d. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory, and
  - e. Coordinate communication regarding campus sustainability initiatives and programs to the university community and external audiences.
6. Virginia Tech will improve the sustainability of its built environment by:
  - a. Achieving LEED Silver certification or better for all eligible and applicable new buildings and major renovations.
  - b. Evaluating the feasibility of LEED for Existing Buildings certification for its existing buildings.
7. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations by:
  - a. Exceeding the most current version of ASHRAE 90.1 energy performance by 10% for all new buildings and major renovations. Capital budgets should account for future energy price, life cycle cost of building operation, and environmental benefits of achieving this level of performance.
  - b. Improving the heating and cooling infrastructure and operation, lighting efficiency, equipment efficiency, and metering and controls of its existing buildings.
8. Virginia Tech will minimize waste and achieve a 50% recycle rate by 2020.

9. Virginia Tech will:
  - a. Require purchase or lease of Energy Star rated equipment and maximum practicable recycled content paper, in accordance with University Policy 5505, with exceptions for special uses.
  - b. Consider a product's life cycle cost and impact when making purchasing decisions.
10. Virginia Tech will engage students, faculty, and staff through education and involvement to develop and implement innovative strategies for efficient and sustainable use of energy, water, and materials in all university-owned facilities.
11. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies and practices. The university will continue to implement programs that encourage the use of alternative transportation methods and will continue to implement programs and services that promote eco-responsible fleet management.
12. Virginia Tech will continue to develop and implement innovative sustainability-related academic programs in instruction, research, and outreach, and will coordinate and communicate these programs to the university community and external audiences.
13. Virginia Tech will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.
14. Virginia Tech will work to provide funding to support sustainability programs. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds.

Virginia Tech Sustainability Definition, Vision, & Mission:

Sustainability Definition:

Sustainability is the simultaneous pursuit of environmental quality, economic prosperity, and social justice and equity, through action, education, and engagement to address current needs without compromising the capacity and needs of future generations.

Sustainability Vision:

Virginia Tech serves as a model community for a sustainable society. Sustainability is an integral part of the fabric of the university as it pursues enhanced economic stability and affordability, diversity and inclusion, environmental stewardship, expansion of knowledge, and education of future leaders.

Policy Memorandum #262  
Revision 1  
Page 4  
May 9, 2013

**Sustainability Mission:**

The pursuit of sustainability is achieved through Virginia Tech's administration; physical environment and operations; student life and experience; campus culture and behavior; and academic learning, discovery, and engagement.

**Acronyms:**

ASHRAE – American Society of Heating, Refrigerating and Air Conditioning Engineers  
GHG – Greenhouse Gas  
LEED – Leadership in Energy and Environmental Design  
VTCAC&SP - Virginia Tech Climate Action Commitment & Sustainability Plan

**#####**

# APPENDIX D: VTCAC&SP STATUS REPORT, JULY 2012

## VIRGINIA TECH CLIMATE ACTION COMMITMENT AND SUSTAINABILITY PLAN - STATUS REPORT

Prospective Actions / Measures - Immediate Phase (2009 - 2012)

Prepared by the Office of Energy and Sustainability  
Revised as of July 17, 2012

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Administrative Structure and Governance	1
Facilities Infrastructure	4
Facilities Operations	9
Transportation	12
Behavior and Campus Life	14
Academic Programs	22

Reference: <http://www.facilities.vt.edu/sustainability/sustPlan.pdf>

INDEX	
Action/measures that have been completed	Completed
Action/measures that have been implemented and are continuously ongoing	Implemented / Ongoing
Action/measures that are in progress and in the process of being implemented	In Progress
Action/measures that are currently on hold	On Hold
Action/measures that are no longer being pursued	Cancelled
	64.2%
	24.7%
	11.1%

Administrative Structure and Governance (AS&G)					
Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
1	Establish a University Office of Energy and Sustainability	Responds to the need for continuous cross-university discussion and implementation of sustainability plan, especially behavioral elements	Established in June 2009 with location in the Facilities Services Department. Subsequently renamed the Office of Energy and Sustainability (OES). The office consists of the Energy and Sustainability Manager, the Sustainability Program Manager, the Campus Sustainability Planner, and a Graduate Assistant. Office reports to the Deputy Chief Facility Officer.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu	Completed
2	Establish a Sustainable Development Coordinator in Office of Outreach and International Affairs (OIA).	Demonstrates university commitment to VTCAC&SP and University Plan for International Program	A Sustainability Development Coordinator has not been identified, but John Randolph has assisted the provost with sustainability-related academic programs including outreach and engagement. See also the next item below. Despite lacking a Sustainability Development Coordinator in OIA, the university delivers a significant number of sustainability related projects and programs under outreach, extension, and continuing education. Measures of these programs are included in the AASHE STARS submittal.	Dr. John Randolph Professor, Urban Affairs & Planning, School of Public & International Affairs 231-7714 energy@vt.edu	On Hold
3	Establish a Senior Fellow or comparable position to coordinate and develop research, instruction, & outreach sustainability programs	Focused position to take advantage of funding opportunities in sustainability research, outreach, instruction	In May 2009, the Provost asked John Randolph to assist him in advancing the university's academic programs related to sustainability. The 2-year appointment ended in May 2011. Dr. Randolph established an ad hoc committee across the eight academic colleges and formed five working groups related to implementation. One initiative of the committee was the "College Survey of Academic Programs on Sustainability" to inventory all college's sustainability academic degrees and programs; to characterize their sustainability focus or brand; to capture ongoing collaboration, integration, and innovative teaching and learning; and to address college sustainability aspirations. The survey was distributed on December 15, 2009, and all of the colleges responded. The survey results were updated in summer 2011 for the education and research component of the AASHE STARS submittal. That submittal now serves as the best overview of VT's academic sustainability programs. There are currently no plans to establish a point person for academic programs related to sustainability. Program development and coordination depends on actions taken in the relevant departments and colleges.	Dr. John Randolph Professor, Urban Affairs & Planning, School of Public & International Affairs 231-7714 energy@vt.edu	On Hold

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
4	Establish sustainability internship program in Office of Energy and Sustainability	Engagement and training program for undergraduate students to develop young sustainability professionals through project and classroom based learning.	Facilities Services has established a student sustainability internship program. During the spring 2010 semester, 10 undergraduate students served as part time, unpaid interns, and worked on 4 different projects. There was one unpaid intern during the fall 2010 semester. The program was expanded for the spring 2011 semester with 4 project teams and 23 unpaid interns. A more detailed program structure was developed and professional development components were added to sharpen the soft skills of participants. The third cohort of interns began working on 3 different projects in June and the 23 students submitted final deliverables at the beginning of December 2011. The OES Internship Program will have its 4th cohort of interns starting in August 2012. This cohort has 30 undergraduate students working on six different campus sustainability projects for the entirety of the 2012-2013 academic year. The six projects include: Campus Sustainability Portal, Sustain Lane Initiative, Sustainability Advisers program, Procurement & Sustainable Materials Management Assessment, GIG Inventory Reassessment, and Sustainable Funding Mechanisms. In addition to these projects, interns will also have a weekly professional development workshop focused on developing a sustainability lens for decision making in the workplace and skill sets for young professionals.	Argie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing
5	Monitoring program to assess progress toward VTCAC goals	Monitoring energy & emissions to evaluate plan implementation	The Office of Energy and Sustainability has created this VTCAC&SP "Status Report" spreadsheet to monitor progress towards achieving VTCAC goals. This report will be updated semiannually and posted on the Office of Energy and Sustainability website: <a href="http://www.facilities.vt.edu/sustainability">www.facilities.vt.edu/sustainability</a>	Denny Cochrane Sustainability Program Manager 231-5184 demisic@vt.edu	Implemented / Ongoing
6	Virginia Tech becomes active in the Association for the Advancement of Sustainability in Higher Education (AASHE)	To become part of the sustainable university movement	AASHE is the nationally recognized professional sustainability organization for higher education. Virginia Tech established membership in June 2008 and renews its membership annually. Virginia Tech is a Charter Participant in the AASHE STARS (Sustainability Tracking, Assessment, and Rating System) Program and achieved a STARS Silver Rating on August 2, 2011. Virginia Tech's STARS Rating is shown at the following link: <a href="https://stars.aashe.org/institutions/virginia-tech-vat/report/2011-08-02/">https://stars.aashe.org/institutions/virginia-tech-vat/report/2011-08-02/</a> . OES Staff continues to participate in AASHE events and conferences at the state, regional, and national levels. Examples include the annual Virginia Sustainable Building Network Conference hosted at select colleges and universities in the Commonwealth of Virginia, the annual Stran and Sustainable Campuses Conferences hosted at the University of Maryland in April, and the annual AASHE National Conferences held at select locations throughout the United States in October.	Denny Cochrane Sustainability Program Manager 231-5184 demisic@vt.edu	Implemented / Ongoing
7	Improve Virginia Tech's overall rating on the Sustainable Endowments Institute's "Campus Sustainability Report Card" to an "A-" in 3 years	Provides realistic university-wide goal	The Sustainable Endowments Institute (SEI) awarded Virginia Tech an overall "B+" rating on their "College Sustainable Report Card 2011." This marked the third consecutive year that the university's overall rating increased (C- in 2008, B- in 2009, B in 2010). A total of 322 colleges and universities in the United States and Canada participated. SEI used four surveys to obtain data which included: a campus survey, a dining survey, an endowment survey, and a student survey. Responses to those surveys were used to determine ratings in nine separate categories. Virginia Tech received an "A" rating for six of the nine categories to include: Administration, Climate Change & Energy, Green Building, Student Involvement, Transportation, and Investment Priorities. The Food and Recycling category had significant gains this year and received a "B" rating. All six "campus operations" categories received an "A" or "B" rating which means Virginia Tech continues to be recognized as a "Campus Sustainability Leader." The Virginia Tech one-page profile is shown at the following link: <a href="http://www.greenreportcard.org/report-card-2011/schools/virginia-polytechnic-institute-and-state-univ">http://www.greenreportcard.org/report-card-2011/schools/virginia-polytechnic-institute-and-state-univ</a>  SEI elected to not have a "Campus Sustainability Report Card 2012," and has subsequently decided to suspend the report card for the foreseeable future. The AASHE STARS Program mentioned in item #6 has now become the standard for measuring sustainability progress in higher education.	Denny Cochrane Sustainability Program Manager 231-5184 demisic@vt.edu	Implemented / Ongoing (temporarily on hold)
8	Establish a student Green Fee	Student support is strong and revenue would offset budget reductions	As an alternative to a student green fee, the Office of Budget and Financial Planning has established a program to advance sustainability initiatives submitted by student sustainability organizations. The "Student Organization Sustainability Initiatives (Green RFP) Program" utilizes the university budget call format. Projects proposed must support the Virginia Tech Climate Action Commitment and Sustainability Plan. The specific process and timelines were developed in coordination with the Office of Energy and Sustainability and the Facilities Services Department. The pilot program was launched in August 2010 at the beginning of Academic Year 2010-2011. Student organizations submitted a total of eight RFPs. The Energy and Sustainability Committee reviewed and prioritized the projects, and the results were presented to the Office of Budget and Financial Planning for review and approval consideration at the end of October 2010. In March 2011, the university approved 5 proposals totaling \$28,763 and funding was provided for immediate implementation. Due to the success of the pilot program, the university implemented the program for Academic Year 2011-2012. A total of 19 proposals were submitted. Seven proposals were approved for a total of \$37,070. Results were announced in January 2012 and all proposals were completed or well underway prior to the completion on the 2012 spring semester.	Denny Cochrane Sustainability Program Manager 231-5184 demisic@vt.edu	Revised - Implemented / Ongoing

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
9	Establish a Green Development Fund for campus sustainability and other endowment funds for academic sustainability programs	Dedicated funds for donors to support sustainability programs and investment in campus efficiency	The Office of Energy and Sustainability will draft a proposal for presentation to the Office of University Development during Academic Year 2012-2013.	Denny Cochrane Sustainability Program Manager 231-5184 dennisco@vt.edu	In Progress
10	Host sustainability competitions between halls	Engages students in campus sustainability and promotes behavioral changes in energy and water consumption.	In the spring of 2010, the inaugural Eco-Olympics were launched by the Student Government Association (SGA). The Eco-Olympics are an annual inter-residence hall competition to see which hall can reduce their energy consumption the most. Eco-Olympics is sponsored by the SGA in coordination with the Office of Energy and Sustainability (OES), Housing & Residence Life, and Virginia Tech Electric Service.  In 2012, OES worked with the SGA Director of Sustainability to revamp Eco-Olympics. New to the 2012 Eco-Olympics, water usage was incorporated into the competition. Additionally, two new "winner categories" were added: Water Reduction and Electricity Reduction. OES will continue to support the SGA with planning and implementing the Eco-Olympics competition during Academic Year 2012-2013.	Alyssa Halle Graduate Assistant Office of Energy and Sustainability ahalles@vt.edu	Implemented / Ongoing

Facilities Infrastructure (FI)					
Item #	Action / Measure	Description / Rationale	Status	Contact Information	Status
11	Complete Upgrades to Power Plant.	1. Install new low NO(x) burners in Boilers 8, 9, 10. 2. Installation of condenser at turbine exhaust. 3. Installation of steam attenuators at Power Plant.	1. Completed and certified November 2008. 2. Completed and in service Spring 2008. 3. Completed and in service November 2009.	Byron Nichols Power Plant Supervisor 231-2073 bnichols@vt.edu	Completed
12	Complete Upgrades to Steam Distribution.	A \$28 million capital project to upgrade the university's aging heat production and distribution infrastructure.	Upgraded three boilers at the Power Plant with modern, energy efficient controls and burners. Existing steam and condensate return distribution lines upgraded with better insulation and operate more efficiently.	Byron Nichols Power Plant Supervisor 231-2073 bnichols@vt.edu	Completed
13	Increase steam plant electric generating capacity	Extend current projects to increase on-campus electricity generation	Project is currently on hold.	Byron Nichols Power Plant Supervisor 231-2073 bnichols@vt.edu	On Hold
14	Develop campus demand side and load management program.	Integrated plan for building and electricity efficiency based on results of ESCO program	<u>ESCO Program:</u> ESCO Technical Audit Phase is complete for six buildings (Central Steam Plant, Cassell Coliseum, Detrick Hall, Pritchard Hall, McBrayde Hall, and Hahn Hall). Contract was executed with Pepco on 12/20/12 to implement \$5.33 million worth of energy conservation measures in Central Power Plant, Cassell Coliseum, Detrick Hall, McBrayde Hall, and Hahn Hall. Construction is underway and overall project completion is scheduled for end of 2/13.  <u>Demand Management:</u> (1) VT successfully participated in the 2010 Pennsylvania/Jersey/Maryland (PJM electrical grid) Summer Capacity Demand Response Interruptible Load Reduction (ILR) Program with a 3MW load reduction commitment for a \$162k benefit in FY2011. For summer 2011, VT successfully met its increased participation target of 6 MW, resulting in a \$204,831 payout over FY2012. For summer, FY2012, VT has committed to an ILR campus demand reduction down to 20 MW, which will net VT \$136,121; a one-hour required demonstration test is scheduled for 6/13/12 from 3-4 pm.  (2) Development of a comprehensive plan to reduce AEP monthly summer demand through daily peak period HVAC curbacks continues with demand reductions centered on HVAC SD's of unoccupied areas.  (3) VT enrolled for participation in PJM Economic Demand Response program effective 7/1; new Siemens/Energy Connect interface currently capturing VTES baseline demand data COMPLETE; peak demand strategies involving HVAC and plug load reductions underway.	Fred Selby 231-6348 selby@vt.edu  Energy and Sustainability Manager	In Progress
15	Reduce purchased electricity by 10% from 2008 by 2012	By increasing efficiency, reducing waste, and increasing on-campus generation.	During summer, 2011, the campus LP steam was left in service which increased on-campus generation by 1,118 MWh and reduced purchased electricity by a corresponding amount. For summer 2012, purchased electricity will be higher than normal due to the unplanned shutdown of the Central Power Plant turbine-generator on 3/16/12 and subsequent outage that will have the TG out of service until fall, 2012.  In September, 2011 OES launched a new Monthly Electricity Report initiative to share specific building electricity consumption, cost, and electricity-related carbon footprint information with building users, raise awareness, and ultimately reduce energy consumption at Virginia Tech. Phase I began with posters being displayed on each floor in campus residence halls. Phase II expanded the reports to include Dining Services' facilities and the Student Centers. Reports are also available via the OES website <a href="http://www.facilities.vt.edu/sustainability/emissions.asp">http://www.facilities.vt.edu/sustainability/emissions.asp</a> . OES will expand the program further to include other campus buildings.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu	In Progress

Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
16	"Smart grid" plan and interconnection policies for on-site generators	Accommodate interconnection of on-site generators	New Parking Garage Solar Photovoltaics (PV) - Funding approval for ~124 kWdc (~148,000 kWh/year) Solar PV was announced on Earth Day (4/22/10). Ph. 1 system will cover ~12,440 square feet (~14% of the top deck). Current project status: Construction complete 4/12; commissioning and training underway.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu	In Progress
17	Complete upgrades to central chilled water system	Study of campus wide use of chilled water has been completed. This aims to maximize existing capacity and efficiency. This project will also assess potential for retrofitting existing R-11 chillers with more modern and environmentally friendly alternatives.	Chilled Water Infrastructure Master Plan Study completed July 2009. Facilities Services is evaluating implementation strategies and funding opportunities for system upgrades and improvements. Current focus priority is facilitating an extended central district chilled water loop in new Turner Place, Center for the Arts, and Signature Engineering buildings. Design of a new 2,300 ton chiller in the central chiller plant to increase capacity (for CFA demand) as well as replace the existing #1 R-11 chiller are underway; incorporated into the design is a conversion to a primary variable chilled water flow configuration.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu  Larry Smith Associate Director Mechanical/Electrical Systems 231-9921 launth@vt.edu	In Progress
18	Additional Chiller Plant and Distribution Upgrades	Campus chilled water study has identified configuration of future system. Study recommends several smaller plants located near peak demand centers.	Construction of the new Southwest Chiller Plant is underway with anticipated completion of June 2013. Two (2) chillers with 1,500 tons of cooling each will be installed, with room in Phase 1 for a third chiller when needed.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu  Larry Smith Associate Director Mechanical/Electrical Systems 231-9921 launth@vt.edu	In Progress
19	The Virginia Tech Climate Action Commitment Resolution item #6 states "Virginia Tech will pursue LEED Silver certification or better for all new buildings and major renovations	Governor's Executive Order 19 (2010) requires LEED Silver certification for all new state buildings. Virginia Tech can exceed minimum state energy standards.	The University has a total of 13 owned LEED registered projects with the US Green Building Council. Specific projects are listed below in gross square feet (GSF). <b>a. Recently completed &amp; LEED certified:</b> 1. Henderson Hall Renovation and Theatre 101 Addition: LEED Gold (38,750 GSF) 2. Addition to the Football Locker Room: LEED Silver (42,145 GSF) 3. Institute for Critical Technology & Applied Sciences II: LEED Gold (42,190 GSF) <b>b. Completed: Documentation submitted to USGBC - Pending LEED certification:</b> 1. Visitors and Undergraduate Admissions CTR (18,155 GSF) <b>c. Under construction:</b> 1. Renovate Ambler Johnston Residence Hall (272,000 GSF) 2. Academic & Student Affairs Bldg (91,200 GSF) 3. Center for the Arts (120,000 GSF) 4. Technology Research & Innovation Center (60,000 GSF) - NLA: in Hampton, VA 5. Vet Med Instruction Addition (22,000 GSF) 6. Signature Engineering Bldg (160,000 GSF) 7. Human & Ag Biosciences Bldg (92,000 GSF) 8. Renovate Davidson Hall Chemistry Bldg (50,000 GSF) 9. Chiller Plant 1 (18,650 GSF) <b>d. Under design:</b> None  The University owns seven new buildings totaling 769,454 GSF that were completed in the past four years that were designed and constructed in accordance with green building policies or guidelines that are not LEED certified. Specific projects are listed below in gross square feet (GSF). 1. Institute for Critical Technology & Applied Sciences-I (99,411 GSF) 2. Life Sciences I (71,799 GSF) 3. New Residence Hall West (92,800 GSF) 4. Basketball Practice Facility (52,944 GSF) 5. McComas Hall Addition (27,000 GSF) 6. Materials Management Facility (7,500 GSF) 7. Parking Structure (418,000 GSF) 8. West End Market Expansion and Renovation (7,432 GSF) 9. Infectious Disease Research Facility (15,700 GSF)	Leigh LaClair Deputy Chief Facility Officer 231-1149 llaclair@vt.edu	Implemented / Ongoing
20	Require 35% improvement of energy performance over ASHRAE 90.1-2004 standards.	This exceeds new state standard of 30%, provides 8 LEED-NC 2.2 or 10 LEED-NC 2009 points.	The VTCAC Resolution item #6 states VT will exceed ASHRAE 90.1 2004 energy performance standards by 35% (ASHRAE 90.1 2007 by 30%) for all new buildings and major renovations.	David Dent Associate Director University Planning, Design, & Construction 231-9326 ddent@vt.edu	On Hold

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status	
21	Continue the installation of Occupancy Sensors.	Installation of occupancy sensors completed in 152 general assignment classrooms.	Completed the installation in 146 classrooms in June 2008. Occupancy sensors are installed as areas are renovated.	Kim Bricle Associate Director of Engineering Operations Facilities Operations 231-8772 kbricle@vt.edu	Implemented / Ongoing	
22	Continue relamping of buildings.	Relamping completed in 36 buildings totaling 3 million ft <sup>2</sup> . Relamping projects scheduled in another four buildings.  Relamping another 21 bldgs totaling 1 mill. R2 requires replacement of fixtures.	Hancock Hall retrofit was completed in fall of 2008. The Sterrett Facilities Center conversions are completed as spaces are renovated.  Retrofit of lighting in these E&G facilities is addressed as spaces are renovated. Partial building retrofit projects in Burruss & Derrig were completed in FY12. Entire building retrofit/fixture replacement project were completed in the Food Science and Technology Building. Projects to retrofit/replace fixtures in Engel and Robeson Halls were completed in spring 2010.  Retrofit of lighting in Davidson Hall will be addressed with capital projects in FY13. Exit light retrofits for Burchard and Hancock Halls planned for FY13. As part of the ESCO Ph. 1 Project, extensive lighting upgrades will be completed in McBryde Hall, Hahn Hall-South, Dietrick Hall, Cassell Coliseum / Jamerson Center and the Central Power Plant.  Additional retrofit projects are planned for FY14, including Saunders Hall, Seitz Hall, Smyth Hall, Hutcheson Hall, Femoyer Hall, Holden Hall, and Franklin Life Science Institute.	Kim Bricle Associate Director of Engineering Operations Facilities Operations 231-8772 kbricle@vt.edu	Implemented / Ongoing	
23	Continue water conservation projects identified in campus-wide water audit	Implement cost-effective measures identified in audit	This project will be included in conjunction with the Energy Service Company (ESCO) initiative. As part of the ESCO Ph. 1 Project, 25 separate fixtures in Dietrick Hall will be upgraded.	Fred Selby 231-6348, selby@vt.edu	Energy and Sustainability Manager	In Progress
24	Incorporate mixed use, compact, infill principles into Campus Master Plan	Mixed use development lessens vehicle miles traveled (largely due to the location of key support services within walking distance to classrooms, labs and offices). Compact and infill development patterns maximize the efficient use of utility and transportation infrastructure and lessen impact on contiguous, undeveloped land.	The 2006 Master Plan includes the development of three walkable districts (Academic Core District, Life Sciences District, and a future land bank "Golf Course District"). In support of mixed use and infill development, a new dining and classroom facility (Academic and Student Affairs Bldg) will be completed in July 2012, located between ICTAS Land Randolph Hall. Implementation of efficient infrastructure and transportation planning includes the Perry St. Parking Garage (completed), distribution expansion of the existing North Campus District Chilled Water Plant, and the SW Campus Chilled Water Plant (in construction).	Hugh Latimer Campus Planning Architect 231-5343 latimerh@vt.edu	Office of University Planning	Implemented / Ongoing
25	Increase campus tree canopy by 100 trees per year	This action will add 100 2"+ caliper trees to the campus annually (net increase). This action will target adding trees to areas where multiple benefits can be achieved.	As of June 1, 2012, 129 trees have been planted since fall 2011 with 72 of the trees planted by students. 11 native trees were planted by students during the Fall 2011 Sustainability Week Planting, with 15 planted during the 2012 Earth Week/Arbor Day Planting, funded by the Office of Energy & Sustainability and a gift from a local nursery. The balance of the student trees were installed by classes. All trees are planted in conformance with the Campus Master Plan, largely to reforest areas of campus. The University again won the Arbor Day Foundation's "Root for the Home Team" contest by signing up more tree planters on the Arbor Day Website than any other U.S. university. We secured \$2,500 to purchase native trees for the Fall 2012 Sustainability Week planting, to be done by student volunteers. Currently, the tree planting goal is achieved through the use of Urban Hort Center research trees, funding by the Office of Energy and Sustainability, by landscape installations associated with capital projects, and special funding events. If these trees are not available, funding in the range of \$12,000 will be required to meet the goal and supply Sustainability and Earth Week volunteer plantings. The Arbor Day Foundation selected Virginia Tech for "Tree Campus USA" Status in 2008. This spring the university was informed by the Arbor Day Foundation that its yearly application for recertification was approved.	Matt Gart Landscape Architect 231-4186 gartm@vt.edu		Implemented / Ongoing
26	Complete Hydrologic Model to guide stormwater plans and practices	Comprehensive approach to stormwater management (SWM) requires a campus model and good analysis	Hydrologic and Hydraulic models were being developed for individual projects and are intended to be incorporated into a comprehensive model. Over 600 watersheds have been delineated and entered into the stormwater model. Project is currently on hold waiting funding.	Lauren Grimes Water Resources Specialist Site & Infrastructure Development 231-3716 lgrimes@vt.edu		On Hold
27	Incorporate Low Impact Development (LID) designs in all new building and parking projects to minimize impervious surface and maximize retention and infiltration of runoff on-site	On-site stormwater retention and infiltration is the most effective option to manage quantity and quality of storm runoff	New Construction projects continue to seek ways of managing stormwater on-site. The new Academic and Student Affairs building is using underground water quality and water quantity units on site to manage the stormwater. Past projects have utilized LID techniques to include the bioretention filters at New Residence Hall, Henderson Hall and Theater 101. Manufactured filters have been installed as part of the Football Locker Room Project and McCormac Hall Addition Project. West End project is using a manufactured BMP that utilizes plants/trees to assist with water quality along with a bio-retention filter. Visitors and Undergraduate Admissions Center is using four bio-retention filters and curb-cuts along with grass channels to manage the flow of stormwater instead of storm pipes.	Whitney Blankenship Water Resources Specialist Site & Infrastructure Development 231-2414 whitlyn@vt.edu		Implemented / Ongoing

Facilities Operations (FO)					
Item #	Action / Measure:	Description / Rationale:	Status:	Contact Information:	Status
28	Implement temperature settings outlined in University Policy 5505 "Campus Energy, Water, and Waste Reduction": 68°F heating season, 74°F cooling season.	Regulate set points of HVAC systems in buildings with automated control capability. Manually set thermostats not on the Building Automated System.	This has been implemented in accordance with University Policy 5505 "Campus Energy, Water, and Waste Reduction".	Larry Smith Associate Director Building Systems 231-9921 lsmith@vt.edu	Completed
29	Operation of Campus Air Handlers: shutdown 3 <sup>rd</sup> shift	The shutdown of air handlers during <b>unoccupied hours</b> over the third shift began during Spring, 2009. Shutdown schedules were developed to match unoccupied hours on weekdays and weekends. Extended shutdowns were implemented during holiday periods and breaks in the school calendar.	<p>During the spring of 2011, a Peak Electrical Load Reduction Strategy for the summer for the campus was developed. The Facilities Energy Manager and the Building Automation Supervisor worked with building contacts throughout campus to determine the best combination of HVAC equipment operational modifications and shutdowns to achieve targeted load reductions with minimal disruption to building activities and occupants' comfort.</p> <p>The strategies were proven to be effective on a pre-arranged one hour test on 6/23/11. On that day, the planned HVAC load reduction measures along with other energy saving activities throughout campus helped the University exceed a 6 megawatt reduction target reducing energy consumption by approximately 8.5 megawatts. This successful test allowed the University to participate in an Interruptible Load Reduction (ILR) program managed by Energy Connect that paid Virginia Tech more than \$206,000. For summer, FY2012, VT has committed to an ILR campus demand reduction down to 26 MW, which will net VT \$136,121; a one-hour required demonstration test is scheduled for 6/13/12 from 3-4 pm.</p> <p>The same HVAC load reduction strategies were also used on several days during the summer months of 2011 to keep energy consumption on campus below an established demand level thereby saving the University both energy and money.</p> <p>The program to save energy by shutting down air handling units during unoccupied periods was expanded further during the Thanksgiving and Winter Break periods of 2011-2012 and the summer of 2012. Efforts are continuing to look for opportunities to extend shut down hours and add equipment serving large assembly and recreational areas to the list when they are not being used during daytime hours. For a listing of the summer 2012 schedule for air handler units, please see: <a href="http://www.vtnews.vt.edu/notices/053112-vpo-summerair.html">http://www.vtnews.vt.edu/notices/053112-vpo-summerair.html</a></p>	Larry Smith Associate Director Building Systems 231-9921 lsmith@vt.edu	Implemented / Ongoing
30	Operation of Campus Chiller System: maximize free cooling opportunities	Maximize use of free cooling during favorable seasons in lieu of operating chilled water.	Free cooling opportunities for the campus chillers are being utilized annually during the winter months.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu	Implemented / Ongoing
31	Operation of Campus Chiller System: Raise chiller loop temperatures	Pilot program to raise chiller loop temperatures in existing chilled water system.	Current activities to identify central chilled water loop temperature constraints (server rooms, critical labs, etc.) and develop a plan to address constraints are underway.	Fred Selby Energy and Sustainability Manager 231-6348 selby@vt.edu	In Progress
32	Provide adequate and stable funding for Virginia Tech Recycling (VTR)	Continue campus-wide collection of mixed paper and cans/bottles from academic buildings, housing, and dining.	Virginia Tech is a jurisdictional member of the Montgomery Regional Solid Waste Authority (MRSWA). The Virginia Tech Climate Action Commitment states the university will adopt a goal of 35% recycling rate by 2012 and 50% by 2025. The Facilities Services Department has sufficient operating funds in Fiscal Year 2012-2013, and we expect will have appropriate funding in future years to support Virginia Tech Recycling.	Denny Cochrane Sustainability Program Manager 231-5184 denisccc@vt.edu	Implemented / Ongoing

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status	
33	Continue participation in the national RecycleMania competition including its Waste Reduction program	Compete in the national recycling competition for colleges and universities. Campuses compete in many different challenges, but most are on a per-capita basis.	For the seventh consecutive year, Virginia Tech participated in RecycleMania. The VTCCAC states "the university will adopt at least 4 reduction measures in the Waste Minimization component of the national RecycleMania competition." For RecycleMania 2012 we had 6 waste reduction measures including: active surplus property program, replacement of paper documents with online alternatives, implementing campus printing initiatives which prohibit or discourage unlimited printing, offering discounts or incentives on reusable mugs for dining operations, creating an active program to educate employees and students about waste minimization practices, and expanding our pre-consumer composting program. For RecycleMania 2012, we had a 32% increase in recycling rates of paper, cardboard, bottles & cans over the 2011 rates.	Denny Cochrane Sustainability Program Manager 231-5184 deniscc@vt.edu	Implemented / Ongoing	
34	Optimize the recycling program by gathering and analyzing data on recycle bin volume by location and modifying bin placement	This could be used to determine where the most effective indoor and outdoor locations for bins would be by looking at traffic patterns	A student intern team collected data on 51 E&G facilities using a detailed protocol and determined the best locations for "resource stations" in those buildings. In accordance with University Policy 5505 "Campus Energy, Water, and Waste Reduction" the Office of Energy and Sustainability successfully developed the "Comprehensive Waste Management Plan for Virginia Tech." The plan was completed on July 15, 2011 and included stakeholders from all major campus units. See: <a href="http://facilities.vt.edu/documents/sustainability/unlinked/Comprehensive_Waste_Management_Plan_Virginia_Tech_7_15_2011_Final.pdf">http://facilities.vt.edu/documents/sustainability/unlinked/Comprehensive_Waste_Management_Plan_Virginia_Tech_7_15_2011_Final.pdf</a> The plan includes short and long term recommendations, currently under way, to increase recycling activities on campus.	Denny Cochrane Sustainability Program Manager 231-5184 deniscc@vt.edu  Agnie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing	
35	Increase recycling rate to 35% by 2012	Expand and optimize program and increase participation	For the past three calendar years Virginia Tech's final recycling rate has exceeded this goal. Using the Commonwealth of Virginia's Department of Environmental Quality "Locality Recycling Rate" formula, the university achieved a 36.48%, 37.50% and 40.14% for calendar years 2009, 2010, and 2011 respectively. Dining Services' Composting Program continues to expand with over 406 tons for organic food waste being composted in calendar year 2010. With the introduction of a number of electronic reporting systems, the university has seen a remarkable reduction in municipal solid waste (trash) figures.	Denny Cochrane Sustainability Program Manager 231-5184 deniscc@vt.edu	Completed	
36	Require purchase of Energy Star rated equipment	Energy Star unless use requires otherwise	In accordance with University Policy 5505 "Campus Energy, Water, and Waste Reduction" page 7, paragraph 3.2 Building & Construction, item 3.2.4, and page 3, paragraph 3.3 Operation & Maintenance, item 3.3.5 the university shall "purchase or lease of Energy Star® rated appliances and equipment for all classification when designation is available and provided performance criteria are met."	Tom Kalospek Director of Materials Management Purchasing 231-6221 kals@vt.edu	Completed	
37	Require all purchases of copy paper to have at least 30% post consumer waste (PCW) content	30% PCW paper is readily available and not excessively more expensive than virgin paper. Units can order 50% or 100% if they chose.	Completed	Catherine Chambers Manager of Printing Services 231-3061 chamber1@vt.edu	Completed	
38	Establish sustainability guidelines for all product purchases	Furnishings: low impact carpet and other cleaning products	Sustainability guidelines are being developed.  Two departments share responsibility for housekeeping services and cleaning product purchasing at Virginia Tech. The Housekeeping Division of Facilities Services is responsible for the academic and administrative spaces on campus. The Housekeeping Department of Housing and Dining Services within Housing & Residence Life (HRL) is responsible for the residence halls and dining facilities. Both housekeeping departments implement green cleaning procedures and initiatives.  <b>Housekeeping Division of Facilities Services:</b> In January 2010, the Housekeeping Division of Facilities Services implemented a Green Cleaning Program. Their Standard Operating Procedures have been re-written to meet green cleaning procedures. All supervisors and managers have taken the Green Cleaning training provided by Betco, as well as refresher training on green cleaning. They have converted 100% of their buildings to chemical dispensing systems. The vast majority of the chemicals used are "green certified." They use micro fiber dust mops and cloths and no longer use cotton. All hand soap meets Green Seal GS-41 and as of July 2012, only foam soap will be used. They have tested several floor finishes and bowl cleaners to determine the best green product for our operation. The paper products used are certified "green" or meet the post consumer recycled content requirements. Their upright vacuums meet the Carpet and Rug Institute requirements to be labeled "green." They have purchased an autoscrubber that meets the green requirements and uses ionized water instead of chemicals and have purchased two additional units this year. Housekeeping LEED certified cleaning program was approved for the Henderson Hall Renovation and Theatre 101 Addition and the ICTAS II Project and will be our standard on future LEED projects.  <b>The Housekeeping Department of Housing and Dining Services:</b> In May 2010, the Housekeeping Department of Housing and Dining Services was awarded the Level III Clean Zone Certification for Green Cleaning initiatives from JanPak Janitorial Solutions. JanPak's Clean Zone program is a unique certification program designed to create a healthier environment through the implementation of sustainable products, systems and programs. The Level III designation is the highest level of the Clean Zone program and ensures that the Housekeeping Department is using sustainable products and services, has implemented sustainable systems and programs, and has a sustainable facility management program.	Tom Kalospek Director of Materials Management Purchasing 231-6221 kals@vt.edu  Wyatt Sasser Director of Custodial Services 231-7426 wsasser@vt.edu  Margie Lawrence Furnishings margie@vt.edu	Facilities Services   Assistant Director for Housekeeping and Housing & Residence Life 231-4984	In Progress

Transportation (T)					
Item #	Action / Measure:	Description / Rationale:	Status:	Contact Information:	Status:
39	Fleet Services – Switch from diesel to 10% biodiesel	FY 08/09 pumped 32,705 gallons of diesel. No mpg available for equipment using diesel fuel	10% biodiesel mix was used during spring and summer 2010. 5% biodiesel mix was used from October 2010 through March 2011. The use of biodiesel has been placed on hold due to mechanical problems associated with the use of biodiesel in campus vehicles.	Gene Reed, Manager Fleet Services 231-9927 wreered@vt.edu	On Hold
40	Fleet Services – Replace vehicles with more fuel efficient vehicles	Replace 11 Ford Crown Victoria rated at 25 mpg, 100,000 miles = 4,000 gal of gas producing 35.12 metric tons of CO <sub>2</sub> Options: a. Chevrolet HHR rated at 32 mpg on State contract cost \$15,421 each, 100,000 miles = 3,125 gal of gas producing 27.4 metric tons of CO <sub>2</sub> b. Hybrid Prius / Civic rated 45 mpg, estimated cost \$23,000 each, 100,000 miles = 2,222 gal of gas producing 19.5 metric tons of CO <sub>2</sub>	Facilities Services has replaced 9 of the 11 Ford Crown Victorias with the Chevrolet Cobalt (rated at 32 mpg). The remaining 2 Ford Crown Victorias were replaced with Chevrolet Impalas (estimated 30 mpg highway, 18 mpg city, 22 mpg combined). 5 Honda Insight vehicles have been added to the fleet. These vehicles have an estimated 40-43 MPG. 6 Chevrolet HHR vehicles have also been added to the fleet. These vehicles have an estimated 32 mpg. 1 Chevrolet Volt has been added to the fleet. The Volt is a full performance and full speed electric vehicle with extended range. The Volt operates two ways: in EV mode (battery powered) and extended-range (gasoline powered) mode.	Gene Reed, Manager Fleet Services 231-9927 wreered@vt.edu	In Progress
41	Parking Services - Moving parking trucks over to T-3 electric personal transport	Using T-3 in place of trucks for enforcement. The cost to operate one T-3 is between 4 and 5 cents per day.	Parking Services has replaced 4 pickup trucks with one T-3 electric personal transport and 3 Kubota diesel utility vehicles. Parking Services has reduced the number of pickup trucks in total by 4.	Richard McCoy Manager Parking Services 231-3949 rimccoy@vt.edu	In Progress
42	Blacksburg Transit – Encourage Blacksburg Transit to provide users with real-time transit information and trip-planning	To improve BT efficiency and creating a user-friendly interface by working on getting customer oriented real-time transit info available.	Blacksburg Transit (BT) has invested in Intelligent Transportation System (ITS) technologies, which allows collected information to be shared with customers to improve their overall experience riding BT. This process started with BT sharing this collected data to publish service information in the Google Transit Feed (GTF) so Google could include BT in the Google trip planning system. The GTF was developed using historical data from the last two years to give an anticipated departure time for every stop in the system. BT continues work on two projects to share data:  <b>BT4U</b> - This system provides real-time information to the ridership of Blacksburg Transit. The first version of this system, deployed in January 2011, allowed passengers to text bus stops numbers to the system and receive bus arrival times. This project serves to make the bus riding experience easier for both the new and experienced rider. During Spring 2011, the system expanded to include accessing the system through www.bt4u.org. In Fall 2011, we deployed an added module to access BT4U via a telephone with an Interactive Voice Response (IVR) system. A BT4U web portal and LED signage are currently in production.  <b>Application Developers Support</b> – BT is developing an Application Developer's webpage to provide the data necessary, such as Google Transit Feed (GTF), for independent application developers to build transit centered software/applications. The information will be available to anyone who wishes to build an application; however BT will not be responsible for maintaining the software/application developed.	Debby Freed Alternative Transportation Manager 231-0248 dfreed@vt.edu	Implemented / Ongoing
43	Blacksburg Transit – Blacksburg Transit should continue to be encouraged to work with the Virginia Department of Rail and Public Transportation to replace old buses (replacement buses) and expansion buses with hybrid electric buses, or other new technologies that become available, to help them move away from fossil fuel dependence.	Blacksburg Transit should be encouraged to work with the Department of Rail and Public Transportation to replace old buses (replacement buses) and expansion buses with hybrids, or other new technologies that become available, to help them move away from fossil fuel dependence.	Blacksburg Transit was not able to obtain funding for hybrids for the most recent bus purchase of four 2012 thirty-five foot New Flyers. However, these vehicles meet the EPA's latest strict environmental standards by using Diesel Exhaust Fluid (DEF) to destroy harmful emissions in the exhaust. DEF is non-hazardous and is used in combination with Selective Catalytic Reduction (SCR) technology. It is sprayed into the exhaust and combines with a catalyst to break down NOx, a harmful pollutant, into nitrogen and water. SCR technology offers many benefits, most importantly great fuel efficiency and reduced particulate matter emissions. Other benefits include greater reliability and a longer oil change interval, all of which adds up to impressive savings over the life of the vehicle. Between 2007 and 2009, a phase-in period allowed NOx emissions of 1.2 g/bhp-hr, but from 2010 all medium and heavy duty diesel vehicles must meet a 0.5 g/bhp-hr standard.	Debby Freed Alternative Transportation Manager 231-0248 dfreed@vt.edu	Implemented / Ongoing
44	Alternative Transportation – Assess participation in telecommuting /flex scheduling	Existing telecommute/flex schedule policy can have a big impact on commuting vehicle miles traveled (VMT) and emissions.	University Policy #4325, Alternative Worksite and Telework, was updated, March 2011. Policy 4300 (Hours of Work) was updated March 2011, Section 2.4, addressing alternative work schedules, was updated October 2009. Guidelines and agreement forms to accompany both policies were also developed. Completed agreements are maintained by VT Hokie Wellness. See Flexible Work Options – Apply online at: <a href="https://hrapps.hcvt.edu/forms/Lists.aspx">https://hrapps.hcvt.edu/forms/Lists.aspx</a> New online system facilitates employee completion, approval and submission of agreement forms for telework and alternate scheduling, implemented October 2010.	Cynthia Rutherford Director VT Employee Wellness 231-1205 cyr07@vt.edu	Implemented / Ongoing

Behavior and Campus Life (B&CL)					
Item #	Action / Measure	Description / Rationale	Status	Contact Information	Status
45	Continue Green Team funding	Ensure funding for student coordinators	The original intent of the Green Team was to provide peer to peer sustainability education on campus. An intern team in the spring 2011 cohort developed a program framework for a "Sustainability Advisors" program that would meet this mission in the residence halls. A second intern team will focus on implementing a pilot "Sustainability Advisors" program in 2-3 residence halls on campus during the 2012-2013 academic year. It is recommended that Green Team funding be shifted to support the OES internship program.	Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Revised - In Progress
46	Sustainability session at freshman and transfer student orientations	An introduction to the university's commitment to sustainability, and how they can get involved. Establishes a focus on sustainability for new students.	Beginning in 2009, sustainability has been featured in New Student Orientation. In 2009, OES participated in the New Student Orientation Hokie Resource Fair. In 2010, New Student Orientation was restructured to streamline the information provided to students. OES partnered with the Student Government Association (SGA) to train the 2010 New Student Orientation Leaders about the importance of sustainability at Virginia Tech, the ongoing sustainability initiatives, and ways that new students could get involved. Each Leader received a "Student Sustainability Guide for Orientation Leaders" reference handout. Additionally, the 2010 SGA president, Bo Hart, included remarks about sustainability in his speech during New Student Orientation. For 2011, OES again partnered with the SGA to train the New Student Orientation leaders about sustainability on campus and provided an updated Sustainability Guide to assist them in relaying sustainability-related information to incoming students. The 2011 SGA President, Corbin D'Arcangelo, also included remarks about sustainability in his orientation speech. In 2012, OES staff was able to again meet with all of the Transfer and New Student Orientation Leaders to give an overview of sustainability efforts across campus. Orientation Leaders were given an updated Sustainability Guide reference handout with all of the relevant information needed to share with incoming students. Copies of the past presentations and handouts are available on the OES website.	Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing
47	Sustainable Living Guide (SLG) development	Website addressing sustainability initiatives on campus and ways to live more sustainably that all new and current students have access to.	The SLG is now an interactive website that students can visit to learn all the basics that they need to live a more green lifestyle. It is located at <a href="http://www.facilities.vt.edu/sustainability/greenliving.asp">http://www.facilities.vt.edu/sustainability/greenliving.asp</a> . An update to the SLG will be completed during the Fall 2012 semester by a team of OES interns.	Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing
48	Student "Green Fee"	A small student fee to pay for sustainability initiatives on campus	As an alternative to a student green fee, the Office of Budget and Financial Planning has established a program to advance sustainability initiatives submitted by student sustainability organizations. The "Student Organization Sustainability Initiatives (Green RFP) Program" utilizes the university budget call format. Projects proposed must support the Virginia Tech Climate Action Commitment and Sustainability Plan. The specific process and timelines were developed in coordination with the Office of Energy and Sustainability and the Facilities Services Department. The pilot program was launched in August 2010 at the beginning of Academic Year 2010-2011. Student organizations submitted a total of eight RFPs. The Energy and Sustainability Committee reviewed and prioritized the projects, and the results were presented to the Office of Budget and Financial Planning for review and approval consideration at the end of October 2010. In March 2011, the university approved 5 proposals totaling \$26,763 and funding was provided for immediate implementation. Due to the success of the pilot program, the university implemented the program for Academic Year 2011-2012. A total of 19 proposals were submitted. Seven proposals were approved for a total of \$37,070. Results were announced in January 2012 and all proposals were completed or well underway prior to the completion of the 2012 spring semester.	Denny Cochran Sustainability Program Manager 231-5184 denmicc@vt.edu	Revised - Implemented / Ongoing

Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
49	Create a student sustainability internship program through the Office of Energy and Sustainability	Engagement and training program for undergraduate students to develop young sustainability professionals through project and classroom based learning.	Facilities Services has established a student sustainability internship program. During the spring 2010 semester, 10 undergraduate students served as part time, unpaid interns, and worked on 4 different projects. There was one unpaid intern during the fall 2010 semester. The program was expanded for the spring 2011 semester with 4 project teams and 23 unpaid interns. A more detailed program structure was developed and professional development components were added to sharpen the soft skills of participants. The third cohort of interns began working on 3 different projects in June and the 23 students submitted final deliverables at the beginning of December 2011. The OES Internship Program will have its 4th cohort of interns starting in August 2012. This cohort has 30 undergraduate students working on six different campus sustainability projects for the entirety of the 2012-2013 academic year. The six projects include: Campus Sustainability Portal, Sustain Lane Initiative, Sustainability Advisers program, Procurement & Sustainable Materials Management Assessment, GHG Inventory Reassessment, and Sustainable Funding Mechanisms. In addition to these projects, interns will also have a weekly professional development workshop focused on developing a sustainability lens for decision making in the workplace and skill sets for young professionals.	Angie Di Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing
50	Alumni sustainability update through magazine column or newsletter	Newsletter highlighting Office of Energy and Sustainability work to update and engage alumni	<p>The Office of Energy and Sustainability (OES) has developed a Virginia Tech Sustainability Newsletter. The first newsletter was published in July 2011. Subsequent newsletters were published in October 2011 and March 2012. The newsletter is intended to be a semiannual publication, which in future years will be published toward the beginning of each semester to highlight sustainability news and events that pertain to that semester. The newsletter is designed to highlight recent sustainability achievements, events, news, programs, sustainability tips, and contact information for sustainability-related personnel throughout campus. The Virginia Tech Sustainability Newsletter is published via the VT Daily News, VT News Student Edition and the OES website. The newsletter is available to all students, faculty, staff, and alumni.</p> <p>Virginia Tech President Charles W. Steger makes mention to half a dozen sustainability-related items in his "2011: A Year in Review Video." See: <a href="http://www.reports.president.vt.edu/2011-year-in-review/index.html">http://www.reports.president.vt.edu/2011-year-in-review/index.html</a> Additionally, President Steger featured sustainability in his 2011 Year-End comments and the "Virginia Tech in Review January 2010" highlight video.</p> <p>The Fall 2011 Edition of Virginia Tech Magazine highlighted the university's recent sustainability achievements of being named one of 16 colleges on The Princeton Review's 2012 Green Rating honor Roll and earning a Silver Rating from the Association of Sustainability in Higher Education (AASHE) for performance in the Sustainability Tracking, Assessment, and Rating System (STARS) program. The Virginia Tech Hybrid Electric Vehicle Team (HEVT) winning the EcoCAR Challenge was also featured in the Fall 2011 edition. In the Summer 2011 Edition, President Steger featured sustainability in his Message from the President entitled "Campus Makes Sustainability Gains." The Fall 2009 Edition of Virginia Tech Magazine featured sustainability and highlighted the BOV's approval of the VTCAC Resolution. The Virginia Tech Annual Report 2008-2009 contained an article titled "Green Gaining Ground at University."</p>	Derry Cochrane Sustainability Program Manager 231-5184 derrisc@vt.edu	Implemented / Ongoing

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
51	Incorporate environmental awareness into the common book selection	Having a sustainability oriented text as the common book	<p>The Division of Undergraduate Education has the overall responsibility for selection of the university common book which is required reading for all new students as part of their first year experience. The University Common Book Committee under the leadership of Dr. Mary Ann Lewis, Director, First Year Experiences, is directly responsible for handling the selection process (see: <a href="http://www.commonbook.vt.edu/">http://www.commonbook.vt.edu/</a>). The faculty is encouraged to incorporate the university common book into their course material. Sustainability is a very popular topic with students and faculty. As a result, the Committee selected books with a sustainability theme for AY 2009-2010 and AY 2010-2011.</p> <p>The University Common Book Committee selected "Animal, Vegetable, Miracle" for Academic Year 2010-2011. This marked the second consecutive year that the Common Book had a sustainability theme. Co-authors Barbara Kingsolver and Steven Hopp visited campus several days prior to Sustainability Week 2010 and participated in several activities including having discussions with select student groups, partaking in the Virginia Harvest Celebration Meal hosted by Dining Services, serving as special guests at a reception held at The Grove hosted by Mrs. Janet Steger, and giving a presentation to the campus and surrounding communities in Burruss Hall Auditorium. Daniel Goleman's <i>Ecological Intelligence</i> was the Common Book for Academic Year 2009-2010. Especially noteworthy, the Blacksburg Town Council selected Goleman's book as the first ever "Town Common Book." Dr. Goleman gave the keynote address for Sustainability Week 2009 on October 11, and had the opportunity to meet with students and participate in the Sustainability Week 2009 Kickoff Ceremony.</p>	Mary Ann Lewis Director of First Year Experiences 231-3341 malewis@vt.edu	Implemented / Ongoing
52	Education, assessment, and encouragement campaign, Sustainability Pledge (Students)	Education sessions, assessments of practices, and regular encouragement of sustainable practices in campus units. Understanding these issues is important for changing behavior.	A Sustainability Pledge was developed and was launched during the 2010 Eco-Olympics. The pledge can be seen here - <a href="http://www.facilities.vt.edu/sustainability/pledge.asp">http://www.facilities.vt.edu/sustainability/pledge.asp</a> . An update to the Sustainability Pledge will be completed during the Fall 2012 semester by a team of OES interns.	Argie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	Implemented / Ongoing
53	Education session for all new VT employees during orientation	Communicate campus sustainability policies and goals to all new employees	Sustainability has been incorporated into the materials provided to all new employees since Summer 2011. First, a slide highlighting sustainability efforts and resources on campus was included in the presentation that was given to all new employees. Second, all new employees are provided an orientation CD with information about Virginia Tech. A new Sustainability Brochure was created and included on each orientation CD. The Sustainability Brochure highlights the history of sustainability at Virginia Tech, provides information about the Office of Energy and Sustainability, Virginia Tech's achievements to date, sustainability tips for the workplace, and sustainability-related resources for employees throughout the Virginia Tech campus.	Gloria Smith Human Resources Service Center Supervisor 231-3441 ggsmith@vt.edu	Implemented / Ongoing
54	Introduce Sustainability Pledge	Emphasize campus sustainability policy through a pledge by faculty and staff	The Office of Energy and Sustainability will explore the feasibility of introducing a faculty/staff sustainability pledge as a part of larger campus-wide faculty/staff education campaign & training program. Intent is to target Sustainability Week 2012 (September 18-20) for introducing the pledge. Please see action item "Create a faculty and staff (F/S) group" below for details about the Green Campus Challenge and Green Campus Representatives.	Denny Cochran Sustainability Program Manager 231-5184 denisic@vt.edu	In Progress

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
55	IT collaboration and power strips distribution	Working with IT groups to promote turning computers off when not in use, and use of power strips to ease shut off	University Policy 5505 "Campus Energy, Water, and Waste Reduction" paragraph 3.3.2 Operations and Maintenance, requests computers set to default to the sleep mode after 15 minutes or less of disuse. Exploring other affordable power saving measures.	Job Stewart Chief of Staff and Deputy Chief Information Officer Office of the VP for Information Technology 231-2134 jst@vt.edu	Implemented / Ongoing
56	Create a faculty and staff (F/S) sustainability group.	This group would help address F&S behavior and develop innovative ideas to promote a F&S culture of sustainability	<p>The University Governance System's Energy and Sustainability Committee has faculty and staff member representation.</p> <p>The Energy and Sustainability Committee successfully conducted the first Virginia Tech Green Campus Challenge (GCC) during the 2010 Spring Semester. Blacksburg campus departments with 10 or more employees were eligible to complete the GCC survey. The survey encouraged our department leadership to establish sustainability procedures (similar to a pledge) with points awarded for implementation. Fifty departments participated representing over 4,700 employees, or two-thirds of the Blacksburg campus work force. Departments were asked to appoint a Green Communication Representative to serve on a campus-wide Green Communication Committee. The GCC was modeled after the "Green Commonwealth Challenge" that was issued to all Virginia state agencies and institutions in 2009. 80% of the departments identified a Green Campus Representative.</p> <p><b>Department Green Representative Training Program (under development):</b> During Academic Year 2010-11 the departmental Green Campus Representatives identified in the GCC participated in a sustainability listserv. In July 2011, the Office of Energy and Sustainability (OES) sent a "Green Representatives Survey" to the listserv offering a variety of sustainability training courses for Academic Year 2011-2012 and requesting feedback. In addition, the survey requested other topics of interest. During Sustainability Week 2012 (September 18-20), OES will conduct a meeting with Department Green Representatives to present sustainability training course options, solicit feedback, and formalize a training program.</p>	Denny Cochran Sustainability Program Manager 231-5184 dennicc@vt.edu	Implemented / Ongoing
57	Energy efficiency upgrades and infrastructure improvements in all residence halls.	Re-lamping buildings, low-flow water fixtures, motion sensors, etc. The installation of these items will considerably reduce energy and water consumption in the residence halls.	<p>During the summer 2011, the following upgrades and improvements were made to East and Main Campbell halls: installed 56 low flow toilets, 170 faucets with low flow aerators in student rooms (went from single handle to two handle faucets to efficiently adjust to variances in water pressure), 50 low flow shower heads, installed touch less faucets in all restrooms with on/off sensors in line of run time, and changed over 200 light fixtures to energy efficient T8 fixtures. No-VOC paints were used on the entire project. Carpets used in all common areas consisted of an ECO backing with 45% minimum recycled content and ECO fiber with 30% recycled content. All carpet has a 100% recyclable cradle-to-cradle warranty. Glass and porcelain tile used in all restrooms was specified to have a min of 30-40% recycled content. All appliances installed in kitchen renovations were energy star appliances. All construction debris was recycled.</p> <p>Water saving toilets, urinals, flush valves, faucets, and showerheads have been installed in Pinchard and Lee Halls. The renovation of Amber Johnston Hall will feature energy and water efficiency improvements.</p>	Tim Gift Associate Director for Facilities Management Student Programs 231-3180 tgift@vt.edu	Implemented / Ongoing

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
58	Increased recycling availability in and around residence halls	Making paper and commingled recycling more accessible in and around the residence halls by adding more bins and an efficient collection system	<p>The Green RFP Program (previously discussed in item #8 above) provided funds to purchase 10 outdoor mixed paper recycling containers in Academic Year 2010-11 and 5 more containers in Academic Year 2011-12. These containers have been strategically placed in our residence hall and special purpose housing areas and have played a significant role in our achieving a 40% final recycling rate for calendar year 2011.</p> <p>In the past, students in the residence halls have had an in-room hand-held container for commingled recycling material collection. Given the success of that program, the Green RFP Program in Academic Year 2011-12 provided funds to purchase 750 in-room hand-held mixed paper recycling containers. Students carry the two types of containers outside to the designated collection locations. Information is being distributed to new students beginning with the fall 2011 semester to encourage paper recycling by noting the location of the external mixed paper recycling containers. Based on the enthusiastic response from our students a request has been made to the Parent's Fund Academic Year 2012-13 to provide funds for additional in-room hand-held mixed paper recycling containers.</p>	<p>Kenneth Bekker Senior Associate Director for Housing Services Housing &amp; Residence Life 231-8058 kbekker@vt.edu</p> <p>Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu</p>	Implemented / Ongoing
59	Reusable Bag and Reusable Bottle initiatives	<p>Provide reusable bags for all on-campus students to use for to-go dining, bookstore purchases, and grocery shopping.</p> <p>Provide reusable bottles for primary use in dining halls.</p>	<p>Virginia Tech Services (VTS) Inc. introduced reusable bags for purchase at the University Main Bookstore, the off-campus Volume II Bookstore, and at their on-campus satellite locations. SGA, the EC, the Residence Hall Federation, and Housing &amp; Dining Services have decided not to pursue providing reusable bags for all on-campus students. Instead, signage will be placed in the dining halls encouraging patrons to bring their own reusable bag.</p> <p>Dining Services launched a reusable bottle program during Earth Week of 2010. During the first three days of the program, 200 bottles were sold. Since its launch, the program has sold almost 1,000 bottles. The unique bottles can now be seen everywhere in the hands of students. After fall of 2012, the bottles featured an updated design, updated logo, and a more effective opening without compromising safety. Students that show their old design or new design bottles to the cashier at a la carte dining centers receive free water or a discount on fountain beverages. The bottles are on sale at Owens Food Court at the cashiers' stations on an on-going basis.</p>	<p>Fred Kozl Operations Division Manager VTS 231-5991 fredk@bookstore.vt.edu</p> <p>Sustainability Coordinator Dining Services 231-1139 gscondining@vt.edu</p>	Revised - Implemented / Ongoing
60	Sustainability session/orientation for Residence Advisors	Have a session on the major environmental issues and causes, as well as an overview of what Virginia Tech is doing about these issues to be more sustainable.	<p>For AY12-13, Housing and Residence Life (HRL) will be having a one hour session with their sustainability personnel during supervisor training. HRL will be asking each of them to integrate these concepts into their Learning Plans for the communities. They will also have one dedicated space in every building for sustainability info, power and water usage postings, and related events. HRL is also editing the floor meeting agenda to include this as a topic to inform residents. During the RA portion of training, HRL will be offering an optional training where they hope to have about 20-30 people in attendance.</p>	<p>Kenneth Bekker Senior Associate Director for Housing Services Housing &amp; Residence Life 231-8058 kbekker@vt.edu</p> <p>Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu</p>	In Progress
61	Green the existing Model Room	Replace all of the items in the current model room with energy efficient and eco-friendly products	<p>Housing and Residence Life (HRL) is meeting with the vendor for room products soon to look at any products to be placed in the model room. HRL will be requesting a focus on green products when possible. HRL is creating a small committee to look at ways they can educate students about their rooms and consumption of resources from a residential space lens as the education and base expectation creation will have a greater impact than a physical product.</p>	<p>Kenneth Bekker Senior Associate Director for Housing Services Housing &amp; Residence Life 231-8058 kbekker@vt.edu</p>	In Progress

Item #	Action / Measure	Description / Rationale	Status Details	Contact Information	Status
62	Waste reduction through smaller-batch cooking and going tray less	See EPA Surplus Recovery Hierarchy	In order to reduce post-consumer waste, Dining Services removed trays in both "all you care to eat" facilities during the summer of 2008. In the fall of 2011, a follow-up study was conducted in order to quantify the real resource savings of this decision. In order to reduce pre-consumer waste, Dining Services implemented a food waste tracking system in spring 2011. This system was developed in partnership with the Human Nutrition, Foods, and Exercise Department in the College of Agriculture and Life Sciences. The system is currently in the working development phase.	Sustainability Coordinator Dining Services 231-1139 groedining@vt.edu	Implemented / Ongoing
63	Diverting edible un-eaten portions to Feeding America member organizations.	See EPA Surplus Recovery Hierarchy	Dining Services began to donate food in spring of 2009. All safe & edible grab-and-go items on campus that we may no longer sell due to internal policies are donated. D2 Dining facility piloted a hot food diversion program that same year, which has now been established into a permanent program. Hot food diversion has been expanded to Owens Food Court as of summer 2011, and is planned to expand further. In January 2012, West End Market began its hot food diversion program. Southgate Food Processing Center started its vegetable and fruit diversion program in fall of 2011, putting a diversion link in its waste plan to come before composting. The Dining Services Garden at Kentland Farm also began food diversion in the fall of 2011, allowing food banks to glean produce that is either not usable in dining centers or that Dining Services was unable to provide labor to pick before the produce was past maturity.	Sustainability Coordinator Dining Services 231-1139 groedining@vt.edu	Implemented / Ongoing
64	Composting in-edible organic wastes and utilizing compostable containers	See EPA Surplus Recovery Hierarchy	In late 2008 Poplar Manor Enterprises (PME) in Riner, Virginia, received a State Department of Environmental Quality permit to operate the first composting facility in the region. Dining Services began participating in the program with PME at their Southgate Food Processing Facility in January 2009 and then expanded composting to the Owens Hall Dining Facility (including Owens Food Court, Hokie Grill, and Personal Touch Catering) in October 2009. In 2011, all buildings that remained in Dining Services' plan were brought online: the remaining units within Dietrick (DXpress and Deer's Place), Squires (ABP, SBarro), the Graduate Life Center (ABP, Personal Touch Catering), and West End Market. In the fall semester of 2012, the new dining center Turner Place will be composting from its first day of operation.	Sustainability Coordinator Dining Services 231-1139 groedining@vt.edu	Implemented / Ongoing
65	Pledge to support local and sustainably produced food	Purchasing food products from local suppliers who use sustainable farming practices	The Farms & Fields Project in Owens Food Court is Dining Services' signature local, organic, and sustainable venue where these products are offered daily. In addition to Farms and Fields in the Owens Food Court, local products are being integrated into other Dining Centers as possible (e.g., VT meats, Kentland Farm Produce, and Homestead Creamery Ice Cream). The Dining Services Garden at Kentland Farm has expanded to over three acres of sustainable vegetable production for use in Farms and Fields and elsewhere. Additionally, Dining Services has hosted several meals that celebrate local and sustainable food. Three Earth Day meals have been held, and in 2010 its first all-local and sustainable meal, "The Virginia Harvest Celebration Meal," was held at D2 in honor of the 2010-2011 Common Book and the authors' campus visit. Over 2,300 customers attended. In the fall of 2011, the Tribute to Fall Harvest banquet meal was a six-course gourmet meal by reservation only, attended by about 100 students and special guests.	Sustainability Coordinator Dining Services 231-1139 groedining@vt.edu	Implemented / Ongoing
66	Incorporate sustainability into the student budget board process	Making student organization budget proposals electronic	The proposal process is now completely electronic with our Small Grant Funding requests as well as electronic sign-ups for all budget training workshops.	Monica Hunter Associate Director of Student Centers and Activities Centers and Activities 231-5431 monicah@vt.edu	Student Completed
67	Continue the development of a green facility improvement plan (Division of Student Affairs)	A currently being developed plan to incorporate more sustainability initiatives into practice	The Squires Student Center "Ten Point Green Facility Sustainability Plan, 2009-2015" is completed and annual implementation is underway. See: <a href="http://www.facilities.vt.edu/documents/sustainability/undrktok/Squires_Student_Center_10_Point_Sustainability_Plan_2009_2015.pdf">http://www.facilities.vt.edu/documents/sustainability/undrktok/Squires_Student_Center_10_Point_Sustainability_Plan_2009_2015.pdf</a> Johnston Student Center and the Graduate Life Center have also adapted the plan into sustainability practices.	Scott Reed Associate Director of Student Centers and Activities Centers and Activities 231-5431 sreed@vt.edu	Student Implemented / Ongoing
68	Add refilling stations for water bottles in student centers	Making stations available where students can refill their bottles with filtered water	Conversion of the existing water fountains to those with a bottle water refilling station feature is near completion. In Squires Student Center, six of the seven water fountains have been converted. In the Graduate Life Center, one of the two water fountains have been converted. All three water fountains in the Johnston Student Center have been converted. As funding is made available, the plan is convert all of the water fountains in those three facilities.	Scott Reed Associate Director of Student Centers and Activities Centers and Activities 231-5431 sreed@vt.edu	Student Implemented / Ongoing
69	Conduct an energy and waste audit and develop an efficiency and conservation plan for the Inn at Virginia Tech and Skelton Conference Center (IVT&SCC).	Assess the facility and operations to identify best ways to reduce costs, emissions, and energy consumption.	IVTSCC has developed key actions steps to conserve energy. Monitor all light settings in public areas meeting rooms and sleeping rooms. Replace incandescent lamps with compact fluorescent lamps. Monitor daily room temperatures in meeting rooms, sleeping rooms and public areas. Air handlers are being shut off or are operating at reduced fan motor speeds from midnight to 6am. Recycling program is in effect with the following items, cardboard, all paper products, cans, bottles (plastic and glass), as well as light bulbs. IVTSCC is now composting food waste and has established an herb garden.	Chris Compton Director of Property Operations IVT&SCC 231-0151 cocompton@vt.edu	Implemented / Ongoing

Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
70	More sustainable experience for guests at The Inn at Virginia Tech and Skelton Conference Center (IVT&SCC).	Having sustainability amenities and aspects of conferences let guests know that operations are sustainable.	The Inn at Virginia Tech is a Virginia Green Lodging Facility. The Skelton Conference Center is a Virginia Green Conference Center. Both have met all criteria for the Department of Environmental Quality's Virginia Green Program: <a href="http://www.deq.virginia.gov/virginiagreen">http://www.deq.virginia.gov/virginiagreen</a> The Virginia Green Lodging Profile is at: <a href="http://www.deq.virginia.gov/esport/sites/default/files/virginiagreenpdf/inn_at_VT.pdf">http://www.deq.virginia.gov/esport/sites/default/files/virginiagreenpdf/inn_at_VT.pdf</a>	Chris Compton Director of Property Operations IVT&SCC 231-0151 ccompton@vt.edu	Implemented / Ongoing
71	Waste Stream Assessment for major athletic venues.	Study to figure out how much of which materials are being generated at games. Helps in developing a waste reduction strategy.	A waste audit was conducted in the tailgating parking lots in 2009 and results determined approximately 50% of the items placed in trash containers were recyclable. This figure is consistent with similar audits conducted at peer institutions. The Sustain Lane Initiative interns team will be conducting a waste audit for Lane Stadium this fall to inform a zero waste stadium plan. Waste audits in other athletic venues have not yet been completed.	Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	In Progress
72	Game Day Recycling Program	Inside Lane Stadium and tailgating recycling program to collect recyclable material. Emphasizes and encourages sustainable behavior at athletic events.	The Sustain Lane Initiative, powered by OES interns, was launched during the summer of 2011. It focuses on reducing the environmental impacts of home football games and engaging fans through the Hokie Stone rally towel. Planning will begin during the fall 2012 semester to address game day material management and a zero waste stadium plan will be developed in partnership with the Athletics Department and Grounds Department. A toolkit on best practices for game day materials management was produced by a separate intern team in collaboration with the US EPA, AASHE, CURC, and a panel of technical experts. The toolkit was developed to benefit the entire higher education community and can be downloaded here - <a href="http://curc.vt.edu/images/pdf/collegiate_football_srmn_guide_final.pdf">http://curc.vt.edu/images/pdf/collegiate_football_srmn_guide_final.pdf</a> .	Angie De Soto Campus Sustainability Planner 231-7358 adesoto@vt.edu	In Progress
73	Operations assessment and development of an efficiency and sustainability plan for the Athletic Department	Assess facilities and operations to determine where waste can be cut and more efficient practices can be incorporated.	Energy Service Company Technical Audit Phase for Cassell Coliseum is complete and specific recommendations are being evaluated for the adoption of energy conservation measures. The New Basketball Practice Facility and Football Locker Room have motion lighting in every room. The Athletic Department is maximizing the use of recycling containers and recycled paper. New Locker renovations over the next 18 months will include replacing toilets and showers with more efficient controls to reduce water use.	James Torgerson Facilities Manager Department of Athletics 231-7584 jtorc08@vt.edu	Implemented / Ongoing

Academic Programs (AP)					
Item #	Action / Measure:	Description / Rationale:	Status:	Contact Information:	Status
74	Establish a Senior Fellow or comparable position to coordinate and develop research, instruction, & outreach sustainability programs	Focused position to take advantage of funding opportunities in sustainability research, outreach, instruction	In May 2009, the Provost asked John Randolph to assist him in advancing the university's academic programs related to sustainability. The 2-year appointment ended in May 2011. Dr. Randolph established an ad hoc committee across the eight academic colleges and formed five working groups related to implementation. One initiative of the committee was the "College Survey of Academic Programs on Sustainability" to inventory all college's sustainability academic degrees and programs, to characterize their sustainability focus or brand, to capture ongoing collaborations, integration, and innovative teaching and learning; and to address college sustainability aspirations. The survey was distributed on December 15, 2009, and all of the colleges responded. The survey results were updated in summer 2011 for the education and research component of the AASHE STARS submittal. That submittal now serves as the best overview of VT's academic sustainability programs. There are currently no plans to establish a point person for academic programs related to sustainability. Program development and coordination depends on actions taken in the relevant departments and colleges.	Dr. John Randolph Professor, Urban Affairs & Planning, School of Public & International Affairs 231-7714 jerry@vt.edu	On Hold

Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
75	Establish a Virtual School of Sustainability to coordinate sustainability-related instruction and learning programs	A web-based clearing-house of all sustainability-related instruction and learning programs.	Our work group of the ad hoc committee addressed the nature and web-presence of such Virtual School, but did not develop a specific proposal. Student sustainability interns have been working on a web portal to university programs that may provide many of the functions of the Virtual School. A number of academic program initiatives have been developed and proposed. CNRE's executive Masters in Natural Resources in Leadership for Sustainability is being offered in the National Capital Region and is now in its second cohort. Another program being developed is a cross-university undergraduate degree in Water Resources Policy and Management that will be administered in the Department of Forest Resources and Environmental Conservation within the College of Natural Resources and Environment. The framework and curriculum of the interdisciplinary degree are being developed by a faculty committee representing five colleges. The proposal is likely to commence through the governance process in 2012-13.	Dr. John Randolph 231-7714 energy@vt.edu	In Progress
76	Establish a Green Curriculum Coordinator to develop the Virtual School of Sustainability	GCC coordinates programs and develops VSVT	Dr. John Randolph's assignment to the Provost was equivalent to a Green Curriculum Coordinator. That appointment ended in May 2011.	Dr. John Randolph 231-7714 energy@vt.edu	On Hold
77	Provide stable funding of marquee VT sustainability instructional programs: Earth Sustainability (ES) and Green Engineering (GE)	Base funding for ES and GE which serve as primary vehicles to integrate sustainability into curriculum	The Earth Sustainability program was awarded the University's prestigious Exemplary Department Award in February 2010. Both the ES and GE programs underwent a planning process for the programs' future. Due to faculty retirements, the Earth Sustainability program is no longer being offered. The GE minor continues to be very successful in attracting students, but it still requires a stable funding stream. Another cross-college sustainability program is the Catochu Sustainability Center, a 177 acre site in Rensselaer County now administered by the Office of Outreach and International Affairs. A number of faculty and students have used the Center for class and research projects. The Center has been funded by external grants and discussions continue how to best integrate this resource into instructional, research, and outreach programs and how to establish a sustainable funding stream.	Dr. John Randolph 231-7714 energy@vt.edu	Implemented / Ongoing
78	Benchmark peer institutions and inventory VT undergrad and grad degree, minor, and certificate programs to identify gaps and opportunities to enhance offerings available to students	University needs a full inventory of programs and good ideas borrowed from peer institutions	Except for some benchmarking by sustainability student interns, this plan for benchmarking has not been formally done. The AASHE STARS program provides consistent data that can be used for benchmarking.	Dr. John Randolph 231-7714 energy@vt.edu	On Hold
79	Implement campus-wide sustainability minor, graduate certificate; consider literacy requirement	Multi-path approach to assure all VT students understand the challenges & solutions of their planet	Sustainability academic program initiatives have developed within colleges. The College of Natural Resources and Environment (CNRE) has been the most prominent, establishing sustainability as a theme that defines that college. CNRE has created a number of sustainability courses at both undergraduate and graduate levels, established an Executive Masters in Natural Resources that focuses on sustainability, and renamed some departments to reflect their focus on sustainability. The CNRE Dean has initiated a process to develop a new cross-university, interdisciplinary undergraduate degree in Water Resources Policy and Management.	Dr. John Randolph 231-7714 energy@vt.edu	In Progress

Item #	Action / Measure:	Description / Rationale:	Status Details	Contact Information:	Status
80	Retain the Special Assistant for Energy Initiatives position in Office of the Vice President for Research	Point person for energy and sustainability research initiatives	In accordance with the recommendation in the "Selective Mid-Term Review of the 2006 Strategic Plan" and the Provost's "Response and Action Plan," the Office of the Vice President for Research has created the new position "Director of Energy Initiatives." In March 2011, Dr. Satish Kulkarni was appointed to this position. Most recently at Georgetown University, Dr. Kulkarni has three decades of experience in energy and environment research.	Dr. John Randolph 231-7714 energy@vt.edu	Implemented / Ongoing
81	Promote new research in energy efficiency and sustainability using the university campus as a laboratory and using undergraduate research		Facilities Services has established a student sustainability internship program. During the spring 2010 semester, 10 undergraduate students served as part time, unpaid interns, and worked on 4 different projects. There was one unpaid intern during the fall 2010 semester. The program was expanded for the spring 2011 semester with 4 project teams and 23 unpaid interns. A more detailed program structure was developed and professional development components were added to sharpen the soft skills of participants. The third "cohort" of interns began working on 3 different projects in June and the 23 students will submit final deliverables at the beginning of December 2011. Intensive planning and program development will take place during the spring 2012 semester to transition the program into a studio based class to provide more classroom based learning opportunities to supplement the existing project based learning arrangement.  Office of the Vice President for Research has funded the Community Action Grants for Energy Research Program for Academic Year 2009-2010. Two grants selected are the "Y-Wind" YMCA Program and "Advancing the Blacksburg Energy and Climate Action Program." The "Y-Wind and Solar Demonstration Project" Dedication Ceremony was held at the YMCA on North Main Street in Blacksburg on September 18, 2010 during Sustainability Week 2010.	Dr. John Randolph 231-7714 energy@vt.edu	In Progress
82	Benchmark peer institutions and inventory VT sustainability-related research expertise, centers, and institutes to identify gaps and opportunities to enhance sustainability research funding	University needs a full inventory of programs and good ideas borrowed from peer institutions	Except for some benchmarking by sustainability student interns, this plan for benchmarking has not been formally done. The AASHE STARS program provides consistent data that can be used for benchmarking.	Dr. John Randolph 231-7714 energy@vt.edu	On Hold
83	Establish a Sustainable Development Coordinator in Office of Outreach and International Affairs (OIA).	SDC coordinates/develops sustainability outreach & green training professional education programs	A Sustainability Development Coordinator has not been identified, but John Randolph has assisted the provost with sustainability-related academic programs including outreach and engagement. See also the next item below. Despite lacking a Sustainability Development Coordinator in OIA, the university delivers a significant number of sustainability related projects and programs under outreach, extension, and continuing education. Measures of these programs are included in the AASHE STARS submittal.	Dr. John Randolph 231-7714 energy@vt.edu	On Hold
84	Develop a Green Jobs Training Program in Continuing and Professional Education	Significant funding should be available for Green Job development	In January 2010 a \$3.8 million project for Green Jobs training was funded by the Department of Labor as part of the American Recovery and Reinvestment Act (ARRA). Virginia Tech, is one out of 7 regional partners pioneering this effort to revive Virginia's economy and train and employ citizens throughout the Commonwealth in green jobs. Partner's include the Virginia Tech's Office of Economic Development in OIA, VT faculty in the College of Architecture and Urban Studies and the College of Engineering, faculty from three Southwest Virginia Community Colleges (Virginia Western, New River, and Wytheville), and the Community Housing Partners (a Christiansburg nonprofit organization). The CREATES (Construction, Retrofitting, and Energy-Efficiency Assessment, Training and Employment Systems) Program provides free training "Energy Training Partnership" grant, in green construction, retrofit and energy efficiency industries to unemployed, dislocated and incumbent workers.	Dr. John Randolph 231-7714 energy@vt.edu	Implemented / Ongoing
85	Identify a Green Jobs Coordinator in Career Services	Assist VT students in seeking growing market for green jobs	Staff development sessions have included sustainability-oriented academic majors at VT and green career options and paths. The initiative has been taken to get to know the faculty in these areas, the coursework that students are required to take and hands-on work experience required or offered. We also continue to purchase resources for the Career Resource Center and have added links for our students on this topic.	Donna Ratcliffe Director of Career Services 231-8077 cassell@vt.edu	Revised -- Implemented / Ongoing

*2010 Annual Report on  
Campus Sustainability at  
Virginia Tech*



Presented by the Virginia Tech  
*Office of Sustainability*

## 2010 Annual Report on Campus Sustainability at Virginia Tech

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Angie De Soto, Campus Sustainability Planner, Facilities Services

Fred Selby, Energy Manager, Facilities Services

## Executive Summary

The Virginia Tech Office of Sustainability is pleased to present the *2010 Annual Report on Campus Sustainability at Virginia Tech*. The purpose of this report is to provide a comprehensive status of implementation of the Virginia Tech Climate Action Commitment and Sustainability Plan (VTCAC&SP) and to highlight the accomplishments and breadth of sustainability programs at Virginia Tech. The creation of this report also meets the requirement of the Virginia Tech Climate Action Commitment Resolution, Point 13: "The university will monitor energy use and GHG emissions as well as changing internal and external conditions, *prepare an annual 'report card'* showing progress towards targets, and periodically reevaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies."

The numerous highlights from fiscal year 2010 (FY2010) are summarized below in order of their appearance in the report:

- † President Steger highlighting Sustainability achievements in both his Virginia Tech Annual Report 2008-2009 Message from the President and the "Virginia Tech Year in Review, January 2010" video
- † Creation of the of Director of Energy Initiatives position to lead the university's overall large-scale energy research initiatives
- † 6.0% decrease from calendar year 2006 GHG emissions, normalized for both campus GSF and FTSE population
- † 9.7% decrease from FY2007 annual energy use, normalized for both campus gross square footage (GSF) and climate conditions
- † 10.0% decrease from FY2008 purchased electricity use
- † February free cooling results at Central Chilled Water Plant and satellite chiller plants of 2,502,402 tons, or 91% of total demand
- † Scheduled shutdown of approximately 172 Air Handler Units (AHU's) in 40 buildings and space temperature setback programs netting an estimated \$1.0 million in annual energy savings
- † Virginia Tech's successful enrollment in PJM's Summer Capacity Demand Response Interruptible Load Reduction (ILR) program to receive \$162,000 for a 3 MW load reduction commitment
- † Approved grant for a new solar photovoltaic (PV) installation on the new Perry Street parking garage
- † Henderson Hall Renovation and Theatre 101 project being awarded US Green Building Council (USGBC) LEED Gold certification, achieving the goal of LEED Silver or better, and the first buildings to receive LEED certification on campus and in Blacksburg
- † 36.5% recycling rate in calendar year 2009, already exceeding a recycle milestone rate of 35% by 2012
- † Successful recycling events RecycleMania, Ytoss?, and Green Effect Game
- † Successful introduction of composting to the Owens Hall and Dietrick Dining Facilities
- † Facilities Services Department Custodial Services implementing a LEED-certified Green Cleaning Program and Housing and Dining Services Housekeeping Department being awarded JanPak Level III Clean Zone Certification
- † First Eco-Olympics successfully being held on campus
- † University Common Book Committee successfully incorporating environmental awareness into the common book process for the first time
- † Fifty departments, representing 4,747 employees or two-thirds of the Blacksburg campus work force, participating in the Virginia Tech Green Campus Challenge survey
- † More than 350,000 hours again being pledged and served by students, faculty and staff members, and alumni participating in VT-ENGAGE
- † Virginia Tech again being designated one of the Best Workplaces for Commuters Race for Excellence and receiving a gold award for its Alternative Transportation programs in the Best Workplaces for Commuters Race to Excellence
- † 48% campus alternative transportation use relative to 2009 baseline level of 45%
- † Lumenhaus, Virginia Tech's entry into the 2009 Solar Decathlon and 2010 Solar Decathlon Europe competitions, placing first in the June, 2010 European Solar Decathlon in Madrid, Spain
- † Virginia Tech receiving a Campus Sustainability Report Card 2010 overall grade of "B" from the Sustainable Endowments Institute (SEI), the second consecutive year the university's overall grade has improved
- † SEI recognizing Virginia Tech as a "Campus Sustainability Leader"
- † Virginia Tech placing third among top-scoring state agencies in this year's "Green Commonwealth Challenge"
- † Virginia Tech being recognized by AASHE for their sustainability leadership

# Virginia Tech's Climate Action Commitment & Sustainability Plan Implementation Progress

## Point 1 – Leadership: “Virginia Tech will be a Leader in Campus Sustainability.”

### Background

On April 25, 2008 Virginia Tech President Charles W. Steger charged the newly established Energy and Sustainability Committee with the important responsibility of “developing a Virginia Tech Climate Commitment and Sustainability Plan that is specific to Virginia Tech.” In addition, he directed the Committee to have the draft documents reviewed through the University Governance System, and to have the “Virginia Tech Climate Commitment” placed in resolution format presented to the University Council for action by the end of the 2009 Spring Semester.

The Energy and Sustainability Committee immediately created a Subcommittee consisting of 20 individuals from all facets of the university to conduct appropriate research and to prepare the drafts. The Commission on University Support reviewed and recommended the approval of all draft documentation in March 2009. On Earth Day, April 22, (less than one year from President Steger’s charge) the University Council recommended approval of “The Virginia Tech Climate Action Commitment Resolution” and accepted the accompanying Sustainability Plan. On June 1, 2009, at their regularly scheduled meeting, the Virginia Tech Board of Visitors unanimously approved the 14-point “**The Virginia Tech Climate Action Commitment Resolution**”<sup>1</sup> and accepted the accompanying “**Sustainability Plan**”<sup>2</sup> (VTCAC&SP). The Sustainability Plan is a living document and provides a way for the university to achieve the points in the VTCAC Resolution. The foundation of the policy is that **Virginia Tech is to become a leader in campus sustainability.**

### Ongoing Leadership Support

President Steger continued to show university leadership’s ongoing support in FY2010 by highlighting sustainability achievements in both his Virginia Tech Annual Report **2008-2009 Message from the President**<sup>3</sup> and the “Virginia Tech Year in Review, January 2010” video.<sup>4</sup>



“The university made huge strides in its effort to become “greener.” The Board of Visitors and the University Council approved the Virginia Tech Climate Action Commitment Resolution and accepting the accompanying Sustainability Plan. The plan calls for, among other things, pursuing LEED Silver certification or better for all new buildings and renovations, a 35 percent recycling rate by 2012, specific targets for reductions in greenhouse gas emissions, reductions in electric usage, and improvements in transportation efficiency.”

Dr. Charles W. Steger  
President’s Message

### 2010 - A Campus Sustainability Leader

Virginia Tech is committed to becoming a national and international leader in campus sustainability. During Academic Year 2009-2010 the university received special sustainability leadership recognition.

First, the Sustainable Endowments Institute’s College Sustainability Report Card 2010 recognized Virginia Tech as a “**Campus Sustainability Leader**” for receiving an average rating of “A-” or better for the six campus operations categories. The Administration, Student Involvement, and Transportation categories received an “A” rating, and the Climate Change & Energy, Green Building, and Food & Recycling received a “B” rating. Only 80 of the 332 colleges and universities surveyed earned this distinction.<sup>5</sup>

<sup>1</sup> <http://www.facilities.vt.edu/sustainability/climateAction.pdf>

<sup>2</sup> <http://www.facilities.vt.edu/sustainability/sustPlan.pdf>

<sup>3</sup> [http://www.president.vt.edu/annual-reports/09-10\\_annual\\_report.pdf](http://www.president.vt.edu/annual-reports/09-10_annual_report.pdf)

<sup>4</sup> [http://www.reports.president.vt.edu/2009\\_year\\_in\\_review/](http://www.reports.president.vt.edu/2009_year_in_review/)

<sup>5</sup> <http://www.greenreportcard.org/report-card-2010/awards/campus-sustainability-leaders>

Second, Virginia Tech was included in the 2010-2011 edition of Princeton Review's exclusive *"Guide to 286 Green Colleges."*<sup>6</sup> The guide to 286 U.S. colleges and universities highlights schools that have demonstrated an "exemplary commitment to sustainability." Other Virginia institutions listed in this guide include the College of William and Mary, George Mason University, James Madison University, Radford University, University of Richmond, and the University of Virginia.

Third, Virginia Tech placed third in Virginia's "Green Commonwealth Challenge" and was the only higher education institution to finish in the top five.

### **Energy and Sustainability Committee**

The Energy and Sustainability Committee (E&SC), established in 2007, is the University Governance System Committee charged "to review and provide advice to the University Administration on broad policy issues relating to the university's energy supply and use, and resource conservation." It consists of 19 members (6 administrators, 5 faculty, 4 staff, and 4 students)<sup>7</sup>. The E&SC met seven times during the Academic Year 2009-2010.<sup>8</sup>

The three E&SC primary goals for academic year 2009-2010 were:

1. **Revise University Policy 5505 "Campus Energy and Water" to incorporate requirements contained in former Governor Timothy Kaine's Executive Order 82 (2009), "Greening of State Government," effective June 10, 2009.** Status: The policy name was revised to read Policy 5505 "Campus Energy, Water, and Waste Reduction." Revision 2 to Policy 5505 was in the process of being finalized for submission to the approving authority (Vice President for Administrative Services) when current Governor Robert McDonnell issued Executive Order 19 (2010) effective July 1, 2010.<sup>9</sup> While E.O 19 (2010) contains many of the requirements in E.O. 82 (2009), the Committee anticipates having to modify Revision 2 to Policy 5505 this fall.
2. **Participate in the Governor's "Green Commonwealth Challenge" which was contained in E.O. 82 (2009).** Status: Complete. See "Point 13 – Annual Report Card", Section "Green Commonwealth Challenge (p. 26).
3. **Develop and implement the "Virginia Tech Green Campus Challenge" Survey.** Status: Complete. See "Point 8 – Engagement", Section, "Green Campus Challenge" (p. 18).

**Point 2 - Strategic Plan:** *"The university will represent the VTCAC&SP in the Virginia Tech Strategic Plan."*

### **Virginia Tech Strategic Plan Mid-Term Review**

The Virginia Tech University Strategic Plan is updated every six years to reaffirm the university's commitment to achieving excellence as a comprehensive, land-grant university that makes innovative contributions in learning, discovery, and engagement to the Commonwealth of Virginia, the nation, and the world. While the current 2006-2012 University Strategic Plan update did not specifically address sustainability issues per se, a 2009 mid-term review recommended the creation of a high-level position to strategically and pro-actively lead the university's overall large-scale energy initiatives effort as a top priority.<sup>10</sup> As a result, a new position, **Director of Energy Initiatives** was created.

**Point 3 - GHG Emissions Inventory:** *"Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level by 2050, and interim targets from 2006 emissions of 316,000 tons consistent with the Virginia Energy Plan, the Governor's Commission on Climate Change, the Town of Blacksburg, and the federal administration: for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level)."*

### **2006 Inventory**

In 2007, students in Urban Affairs & Planning at Virginia Tech conducted a comprehensive energy and GHG inventory for the Town of Blacksburg and Virginia Tech<sup>11</sup> and determined total GHG emissions for calendar year 2006 to be **316,000 tons** of CO<sub>2</sub> equivalent. Although coal, natural gas and purchased electricity each represented approximately one-third of campus energy sources consumed in 2006, purchased electricity contributed the majority of emissions at 60%, with campus coal at 21%, natural gas at 8%, and commuting at 8%. The remaining emissions resulted from solid waste at 1%, water/wastewater at 0.9%, VT fleet at 0.6%, and VT aviation at 0.3%.

<sup>6</sup> <http://www.princetonreview.com/green-guide.aspx>

<sup>7</sup> [http://www.facilities.vt.edu/sustainability/e\\_s\\_roster\\_10.pdf](http://www.facilities.vt.edu/sustainability/e_s_roster_10.pdf)

<sup>8</sup> [http://www.facilities.vt.edu/sustainability/meeting\\_minutes\\_09-10.pdf](http://www.facilities.vt.edu/sustainability/meeting_minutes_09-10.pdf)

<sup>9</sup> [http://www.governor.virginia.gov/Issues/ExecutiveOrders/pdf/EO\\_19.pdf](http://www.governor.virginia.gov/Issues/ExecutiveOrders/pdf/EO_19.pdf)

<sup>10</sup> [http://www.provost.vt.edu/documents/provost\\_response\\_1\\_08\\_10.pdf](http://www.provost.vt.edu/documents/provost_response_1_08_10.pdf)

<sup>11</sup> [http://www.facilities.vt.edu/sustainability/GHG\\_Emissions\\_Inventory.pdf](http://www.facilities.vt.edu/sustainability/GHG_Emissions_Inventory.pdf)

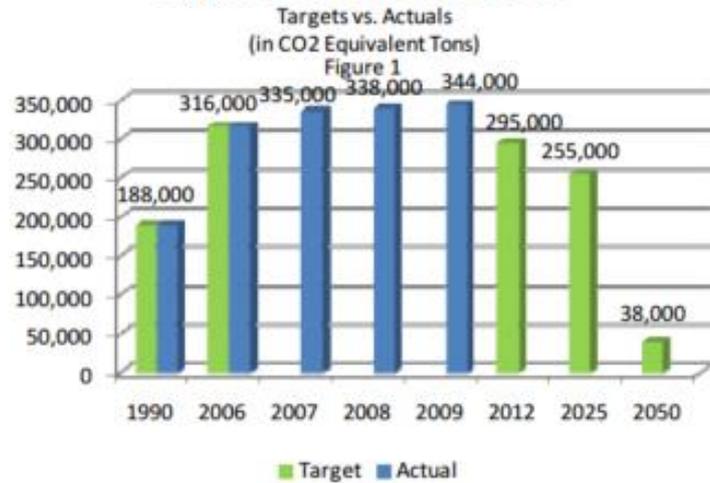
### GHG Emissions Trend

Figure 1 shows an increasing, but leveling, GHG emissions trend to date, including a slight increase of emissions in the 2009 calendar year over recent years to **344,000 tons**, an 83% increase from the original 1990 baseline and a 1.8% increase over 2008.

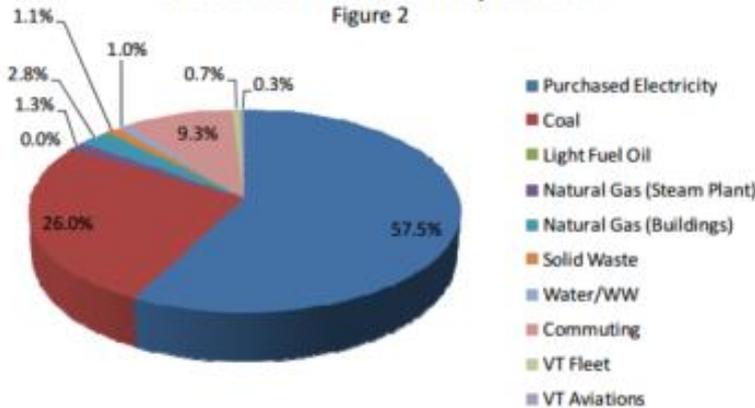
### 2009 Inventory and Analysis

The calendar year 2009 inventory result of 344,000 tons represents an increase of 28,000 tons, or 8.9% in total GHG emissions over the 316,000 tons from the 2006 inventory. One significant driver for the increase was the intentional maximizing of the campus Central Power Plant's coal-burning capability to meet budget commitments; however, this was for the most part offset by emissions reductions resulting from achieved reductions in 2009 campus energy usage. In 2006, coal accounted for 75.0% of total boiler fuel input on a per-Btu basis, while lower GHG-emitting natural gas accounted for 24.6% and fuel oil the remaining 0.4%. In 2009 however, coal Btu percentage of total boiler fuel input increased to **92.8%**, while natural gas decreased to only 6.2%, and fuel oil at the remaining 1.0%. For comparison purposes, on a per-Btu basis, coal-related GHG emissions are 85.4% greater than that of natural gas and 31.6% greater than that of fuel oil. Figure 2 shows that in 2009, purchased electricity continued to be by far the predominant GHG emissions category.

### Virginia Tech GHG Emissions



### 2009 GHG Emissions % By Source



input increased to **92.8%**, while natural gas decreased to only 6.2%, and fuel oil at the remaining 1.0%. For comparison purposes, on a per-Btu basis, coal-related GHG emissions are 85.4% greater than that of natural gas and 31.6% greater than that of fuel oil. Figure 2 shows that in 2009, purchased electricity continued to be by far the predominant GHG emissions category.

Two additional factors contributed to the overall GHG emissions increase for 2009 over 2006 - campus gross square footage (GSF) and student population (FTSE); per Table 1 below, 2009 GHG emissions, when normalized for both campus GSF and FTSE population actually have been **reduced by 6.0%** since 2006. Regardless, the VTCAC&SP commits the university to **absolute GHG reductions**, which must be the continuing focus.

Table 1: 2009 vs. 2006 Emissions Normalized for GSF and FTSE

	2006	2009	% Change + or ( )
Total Emissions (tons CO <sub>2</sub> e)	316,000	344,000	+8.9%
Full-Time Student Equivalents (FTSE)	28,622	30,181	+5.4%
Emissions / FTSE	11.04	11.40	+3.2%
Campus GSF (M-GSF)	7,650,213	8,403,343	+9.8%
Emissions / 1,000 GSF	41.31	40.94	(0.9%)
Emissions / FTSE / 1,000,000 GSF	1.44	1.36	(6.0%)

**Point 4 - GHG Emissions Reduction:** "Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP."

## Energy Usage

### Overall Usage Trends

Virginia Tech is a comprehensive, innovative research university with the largest full-time student population in Virginia. Its Blacksburg campus includes more than 138 buildings occupying more than 8.4 million gross square feet (GSF). During FY2010, the Virginia Tech campus consumed over **1.893 trillion Btu's** of coal, natural gas (Central Power Plant only), fuel oil and purchased electricity, representing a 1.23% increase over FY2009 and a 13.69% increase over FY2006. Figure 4 shows this steadily increasing overall consumption over the most recent five-year period. However, similar to the GHG emissions analysis, other factors must be considered.

Since FY2006, the Virginia Tech campus footprint has grown from 7,503,425 gross square feet (GSF) to 8,403,343 in FY2010, a 12% increase. Recent E&G building additions such as the **Institute For Critical Technologies & Applied Sciences (ICTAS) I** (99,411 GSF), **Life Sciences I** (71,799 GSF) and **Bishop-Favrao Hall** (31,651 GSF) are state-of-the-art research facilities and therefore inherently energy-intensive. New fully-air conditioned auxiliaries additions including **New Hall West** residence (92,800 GSF) **Hahn-Hurst Basketball Practice Facility** (52,944 GSF) and **Football Locker Room** (42,145 GSF) have also added significant electrical load to the campus. **ICTAS II** (42,190 GSF) is currently under construction with project completion scheduled for December 2010.

The winter of 2009-2010 was one of the coldest and most severe in recent Blacksburg history. The eastern United States encountered winter storms almost weekly during the months of December, January and February. Through FY2010, Blacksburg experienced **5,260 Heating Degree Days (HDD's)**, a quantitative index used to reflect climate severity, calculated by subtracting mean daily temperature from a 65°F balance temperature and summing only positive values over an entire year), a 3.16% increase over FY2009 and a 11.99% increase over FY2006.

Normalizing campus energy use for both building GSF and annual HDD's, figure 5 instead shows a steadily decreasing energy consumption trend over the previous three years since energy conservation efforts began in earnest and a **9.67% reduction** in FY2010 over FY2007.

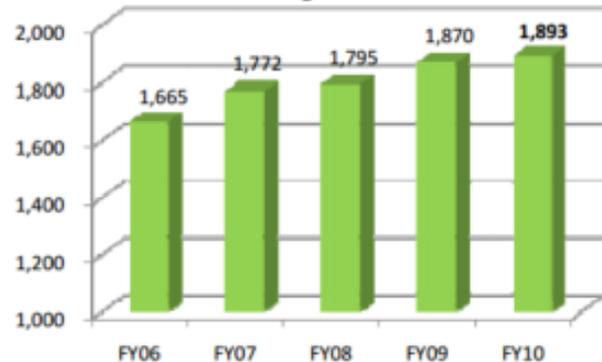
### Energy Fuel Source Trends

Virginia is a net exporter of coal, and coal mining continues to be a significant economic driver of the Southwest Virginia economy. Virginia Tech's Central Power Plant, which provides district steam for heating and process needs to the majority of campus buildings, reflects that fact with its 200,000 pounds per hour of coal-fired steam generating capacity.

For FY2010, natural gas and fuel oil continued to cost significantly more on a per-Btu basis than coal. With the university facing multi-million dollar reductions in its FY2010 operating budget, Facilities Services opted beginning in FY2009 to maximize coal-firing steam generation for the immediate future, coupled with continued energy conservation and efficiency improvement efforts. Figure 6 shows the resultant increase in per-Btu coal consumption over the most recent three year period relative to natural gas and fuel oil. Figure 7 provides a detailed energy fuel source percentage per-Btu breakdown for FY2010. While the campus currently relies heavily on coal as a cost-effective fuel source, it does so in an environmentally-responsible manner and in full compliance with all existing state and federal regulations.

### Campus Energy Use\*

Coal, Oil, Natural Gas, Purchased Electricity  
(In Billions Btu's)  
Figure 3



### Campus Energy Use\* - Normalized

Normalized to Building GSF and Heating Degree Days  
(In Btu's per GSF per HDD)  
Figure 4



\* Numbers do not include unmetered natural gas to individual building package boilers; FY2010 coal, oil, and natural gas numbers based on projected 12-month usage

By comparison, American Electric Power's (AEP) electrical generation capacity by fuel source in 2009 was coal at 66%, natural gas/oil at 22%, nuclear at 6%, and hydro/pumped storage/renewable at 6%.<sup>12</sup>

### Purchased Electricity Reduction

Figures 6 and 8 also show a continuing decrease in annual purchased electricity use resulting from conservation efforts combined with a slight increase in self-generation at the Central Power Plant. Both results support VTCAC&SP goals to "Reduce purchased electricity by 10% from 2008 by 2012" and "Increase steam plant electric generating capacity." FY2010's purchased electricity use of 169,110 MWh's represents a **10.0% decrease** over FY08's 187,807 MWh's.

### Virginia Tech Policy 5505

Virginia Tech Policy 5505, *Campus Energy and Water*, continues to provide the foundation for the university's goal to "achieve the highest standards in energy/water usage with consideration of the impact on environmental quality and economic performance."<sup>13</sup> Policy 5505 contains procedures for Efficiency and Conservation, Facility Design, Building Operation and Maintenance, Transportation, Billing, Point of Contact, Energy and Sustainability Committee, University Departments and Regulatory Agency Contracts, and Implementation and Compliance.

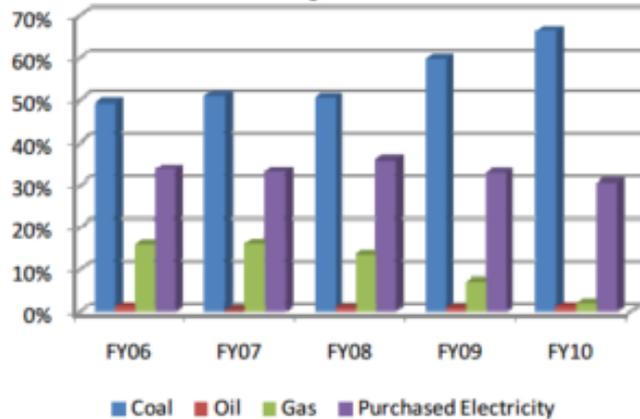
### Chilled Water Supply Optimization

In July 2009 the **Chilled Water Infrastructure Master Plan Study** was completed. The study recommended consolidation of Virginia Tech's existing combination of district and decentralized/stand-alone chilled water networks into a total of five regional center chilled water production plants, joined to an interconnected distribution network. The five regional plants would consist of: (1) the existing Central Chilled Water Plant, renamed the North Chiller Plant (NCP); (2) an expanded Dietrick Chilled Water Plant (DCP); (3) a new Perry Street Chilled Water Plant servicing the Northwest (NWCP); (4) a new Northeast Academic Core Chilled Water Plant (NECP); and (5) a new Southwest / Life Sciences District Chilled Water Plant (SWCP). The project proposed \$46 million in present value savings 30-year life cycle over the current stand-alone chiller expansion approach. Currently, design of new Southwest Chiller Plant is underway, with a Construction Manager at-Risk having been selected and a request for construction funding having been submitted to the state; construction is anticipated to begin once construction funding is appropriated by the state. In addition, chilled water sourcing for planned new construction projects such as the Academic & Student Affairs Building and Performing Arts Center will be considered in view of this master plan.

### Campus Energy Use\*

By Percent Energy Source

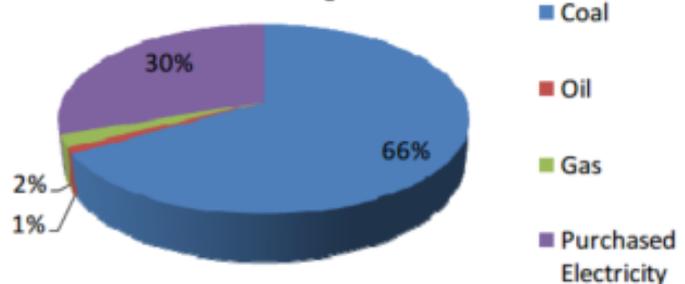
Figure 5



### Campus Energy Use\*

By Percent Energy Source - FY2010

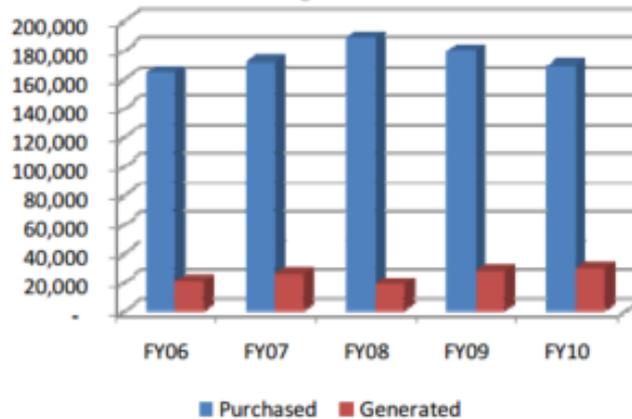
Figure 6



### Campus Electricity Use

Purchased vs. Self-Generation (in MWh's)

Figure 7



\* Numbers do not include unmetered natural gas to individual building package boilers; FY2010 coal, oil, and natural gas numbers based on projected 12-month usage

<sup>12</sup> <http://www.nxtbook.com/nxtbooks/aep/accountability2010/#/34>

<sup>13</sup> <http://www.policies.vt.edu/5505.pdf>

During the 2009-2010 winter, Virginia Tech utilities personnel took advantage of the cold temperatures to maximize **free cooling** opportunities at the Central Chilled Water Plant and satellite chiller plants. Free cooling uses the colder cooling tower condensing water to create the refrigeration cycle with no energy having to be expended in the chiller's compressor. Free cooling-related record keeping began on January 15, 2010. Results for the 2nd half of January were 543,067 tons from free cooling, or 54% of total chilled water tonnage demand. Results for February were **2,502,402 tons** of free cooling, or **91%** of total demand. Free cooling season ended in early March and will resume this winter.

### **Air Handler Unit Shutdowns**

Beginning in May 2009 procedures were implemented to shut down campus air handling units (AHU's) during unoccupied periods, primarily third shift on weekdays and extended hours on weekends. Since the program's inception in May, 2009, AHUs have been gradually added to the shutdown list. Approximately 172 AHU's in 40 buildings have been included. Preliminary calculations show an estimated savings of **\$181,500** for the 2009 cooling season due to reductions in electricity and chilled water usage.

For the first time, beginning in the fall of 2009, the University aggressively pursued AHU shutdowns during holiday and break periods. Preliminary calculations show an estimated combined electrical and steam savings for Thanksgiving Break and Winter Break periods as **\$372,470**.

In addition to resuming cooling season scheduled HVAC shutdowns in May, the number of summer scheduled buildings was increased from 25 in 2009 to approximately 50 in 2010; also, the number of scheduled-off hours was increased from 72 hours per week to approximately 80 hours per week. Most recently, building owners from 11 buildings identified areas mostly unoccupied during the summer in their buildings, allowing 38 AHU's to be shut down during peak demand periods and reducing summer billed demand by an average of 766 kW. Total AHU-related estimated annual savings are **\$700,000**.

### **Space Temperature Setbacks**

Space temperature setpoints adjustments back to 68 degrees for the heating season and 74 degrees for the cooling season implemented campus-wide in December, 2008 continued throughout FY2010, for an estimated **\$300,000** annual savings.

### **Electrical Demand Response**

Electric demand response refers to large energy users reducing or shifting their electric demand during periods of unusually high aggregate electric demand and/or wholesale electricity prices. The U.S EPA recognizes electrical demand response as one of several "cost-effective strategies for reducing peak electric demand, achieving air quality benefits, and contributing to electric supply reliability."<sup>14</sup> PJM Interconnection (PJM), the regional transmission organization (RTO) that manages the high-voltage electric grid and wholesale electricity market serving Virginia, 12 other states and the District of Columbia, currently offers two types of demand response programs to Virginia customers.

Virginia Department of Mines, Minerals and Energy (DMME) has selected EnergyConnect, Inc., a third-party Curtailment Service Provider to administer PJM's demand response programs in the Commonwealth. During FY2010 EnergyConnect enrolled Virginia Tech in both PJM's **Summer Capacity Demand Response Interruptible Load Reduction (ILR)** and **Economic Demand Response** programs. For the ILR program, Virginia Tech committed to a 3MW demand reduction in the event of a significant grid event in exchange for a **\$162,000 benefit** to be paid during FY2011. As a requirement for the enrollment process, Virginia Tech successfully demonstrated a one hour-long 3MW load reduction test on June 24. EnergyConnect also enrolled Virginia Tech in PJM's Economic Demand Response program effective July 1, 2010, which will compensate the university when it electively reduces energy consumption during select hours when wholesale electricity rates are high. To facilitate Virginia Tech's participation, Siemens and EnergyConnect have partnered to develop a web-based interface utilizing the existing Siemens Building Automation System (BAS) that will provide EnergyConnect with real-time demand data originating from Virginia Tech Electrical Services (VTES). Although a detailed demand reduction plan has yet to developed, July's wholesale electricity rates exceeding \$0.20/kWh on several occasions demonstrate the financial potential that exists with this program.

### **Alternative and Renewable Energy Sources**

While renewable energy sources are not currently used, approval for the funding of a new solar **photovoltaic (PV) installation** on the new parking garage was announced on Earth Day, April 22. The PV system will tentatively generate approximately **148,000 kWh/year**, cost an estimated \$1.3 million, and will provide approximately 14.1% of the total energy needs of the structure. The system will physically cover approximately 12,440 ft<sup>2</sup> or 14% of the top deck.

Preliminary discussions have taken place this year between the Virginia Tech Office of Sustainability, utilities staff, and faculty from the College of Engineering's Department of Mining & Minerals Engineering to explore the application potential of dewatered coal fines from abandoned waste coal slurry ponds as a fuel source for Virginia Tech coal boilers, either alone, or in combination with biomass (switchgrass).

<sup>14</sup> [http://www.epa.gov/statelocalclimate/documents/pdf/hedd\\_clean\\_energy\\_options.pdf](http://www.epa.gov/statelocalclimate/documents/pdf/hedd_clean_energy_options.pdf)

**Point 5 - Office of Sustainability:** "Virginia Tech will establish an Office of Sustainability to: a.) Coordinate programs for campus sustainability; b.) Oversee implementation of the VTCAC&SP; c.) Monitor annual electricity and other energy use and GHG emissions, and d.) Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory."

### Office of Sustainability

The Office of Sustainability was established in 2009 under the Facilities Services Department and serves as an information clearing-house, coordinating continuous discussion between the various administrative units, administrators, facility infrastructure and operational groups, and students. Currently, the Office of Sustainability currently consists of six full-time employees: Sustainability Program Manager; Energy Manager; Campus Sustainability Planner; Graduate Assistant; and two Green Team Coordinators. In addition, numerous staff and faculty employees and both paid and unpaid student interns campus-wide support sustainability initiatives as liaisons, coordinators of specific sustainability programs, or leaders of departmental curriculum efforts.

The Office of Sustainability established a student sustainability internship program in 2009 and the program continues to grow each semester. During FY10 interns focused on implementation of the VTCAC&SP and coordination of student sustainability education and worked on projects involving Comprehensive Waste Management, Annual Report Data Collection and Graphic Design, Attitudes and Awareness Assessment, and Electronic Media Strategies.

### Office of Sustainability Website

The Office of Sustainability website<sup>15</sup> was created to be the central clearinghouse for Virginia Tech sustainability-related news and information. It is updated regularly and provides current status on ongoing sustainability initiatives, activities and events. The website provides a venue for viewers to communicate with Office of Sustainability staff on initiatives, ask questions about programs, and submit new project ideas. Interns spent time this spring identifying Office of Sustainability website best practices and made recommendations for improvements that will be incorporated into a major website update planned for the following academic year.



**Point 6 – LEED Certification:** "Virginia Tech will pursue LEED Silver certification or better and exceed ASHRAE 90.1 2004 energy performance by 35% (ASHRAE 90.1 2007 by 30%) for all new buildings and major renovations. Capital budgets should account for future energy price, cost of building operation, return on investment, and environmental benefits of achieving this level of performance."

### Henderson Hall Renovation and Theatre 101 Addition Project

The Henderson Hall Renovation and Theatre 101 Addition projects were awarded the US Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) **Gold certification** on February 5, 2010 for their sustainable energy use, lighting, water and material use as well as incorporating a variety of other sustainable strategies.



LEED Gold-Certified Henderson Hall Renovation



President Steger Delivering an Earth Day 2010 Message in Front of the New LEED Gold-Certified Theater 101 Addition

<sup>15</sup> <http://www.facilities.vt.edu/sustainability/>

The buildings are the first to receive LEED certification on campus and in Blacksburg. President Steger unveiled a US Green Building Council LEED Gold Rating Plaque for each building during an Earth Day 2010 Celebration Ceremony on April 22.

### Virginia Green Program

The "Virginia Green" program<sup>16</sup> works to reduce the environmental impacts of Virginia's Tourism Industry. It is run as a partnership between the Virginia Department of Environmental Quality, the Virginia Tourism Corporation and the Virginia Hospitality and Tourism Association. The Inn at Virginia Tech is certified as "Virginia Green Lodging" facility and the Skelton Conference Center is certified as a "Virginia Green Conference Center."

### Future LEED Projects

The university currently has 11 additional projects totaling over 1 million GSF currently registered with the USGBC, with six currently under construction and five in the design phase:

#### Buildings Under Construction (581,855 GSF):

ICTAS II (42,000 GSF)  
 Ambler Johnston Residence Hall Renovation (272,000 GSF)  
 Academic and Student Affairs Building (91,200 GSF)<sup>17</sup>  
 Visitors and Undergraduate Admissions Center (18,155 GSF)  
 Football Locker Room Addition (38,500 GSF)  
 Center for the Arts (120,000 GSF)<sup>18</sup>

#### Buildings In Design Phase (422,000 GSF):

Signature Engineering Building (160,000 GSF)  
 Virginia Bioinformatics Institute Addition (50,000 GSF)  
 Human and Agricultural Biosciences Building (92,000 GSF)  
 Davidson Hall Chemistry Renovation (50,000 GSF)  
 Myers Lawson School of Construction Phases II and III (70,000 GSF)

**Point 7 - Energy Efficiency:** *"Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations, including the heating and cooling infrastructure and operation, lighting efficiency, controls and operation, and equipment efficiency and controls."*

### Lighting Retrofits and Occupancy Sensors

Further large-scale progress on lighting upgrades was minimal during FY2010 due to budgetary constraints and was limited primarily to new construction and building renovation projects. Projects to retrofit or replace fixtures in Engel and Roberson Halls were completed in spring 2010, while other projects remain on hold due to unavailability of funds. The Sterrett Facilities Center lighting conversions are being completed as spaces are renovated. Similarly new installations of occupancy sensors are on hold pending funding availability.

### ESCO Performance Contracting

In January, Pepco Energy Services (Pepco), selected to be the Phase 1 Energy Services Company (ESCO) for Virginia Tech submitted their Technical Audit to the university. The Technical Audit verified and expanded upon the savings of the "Back of the Envelope Proposal" submitted in March, 2009 for six initial campus buildings (Central Power Plant, Cassell Coliseum, Dietrick Hall, Pritchard Hall, McBryde Hall, and Hahn Hall-South). The Technical Audit also provides a basis for an energy performance contract with a detailed and specific scope of work with measurable and verifiable energy and water savings.

Pepco proposed \$11.7 million of Energy Conservation Measures (ECM), with \$0.88 million in annual energy savings totaling over \$19 million over the 15-year contract term, a 21.1% guaranteed reduction in energy and a 8.3% reduction in water consumption. Environmentally, the proposed ECM's in total would reduce annual GHG emissions by approximately 4,514 tons. Facilities staff has reviewed the list and will recommend eliminating some of the lowest-return ECM's for a revised \$8.7 million Phase 1 ESCO project with projected annual savings of \$0.83 million for a 10.5-year simple payback; a presentation for final review is currently under development.



McBryde Hall



Pritchard Hall



Cassell  
Coliseum



Dietrick Hall



Hahn (South)  
Hall



Central  
Power Plant

<sup>16</sup> <http://www.deq.state.va.us/p2/viriniagreen/>

<sup>17</sup> [http://www.pdc.facilities.vt.edu/mediawiki/index.php/File:Acad\\_Stu\\_Afrs\\_Aug\\_09\\_Page\\_1.jpg](http://www.pdc.facilities.vt.edu/mediawiki/index.php/File:Acad_Stu_Afrs_Aug_09_Page_1.jpg)

<sup>18</sup> <http://www.vtnews.vt.edu/articles/2010/06/2010-477.html>

**Point 8 - Waste Minimization:** "The university will adopt at least 4 reduction measures in the Waste Minimization component of the national RecycleMania competition. Virginia Tech Recycling will adopt a goal of 35% recycle rate by 2012 and 50% by 2025.

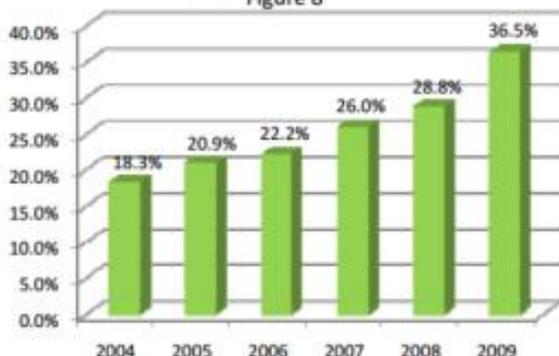
## Recycling

### Waste and Recycling Trends

Having achieved a 2009 recycling rate of **36.5%**, Virginia Tech has already exceeded its recycle milestone rate of 35% by 2012 and is on pace to meet or exceed its 50% recycle rate goal by 2025. Figures 8 and 9 show continuing favorable rate trends in overall recycling increase, municipal solid waste (MSW) reduction, and printable recyclable materials (PRM) increase.

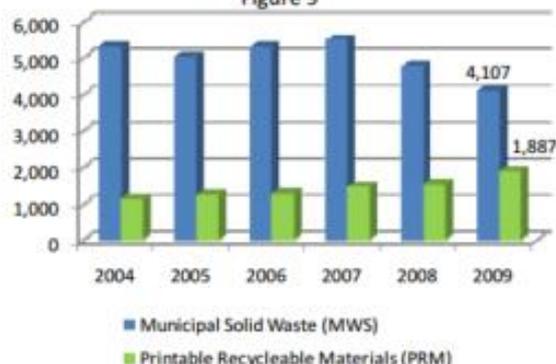
**Final Recycling Rates**

Calendar Years 2004-2009  
Figure 8



**MSW and PRM Rates**

Calendar Years 2004-2009 (in Annual Tons)  
Figure 9



In addition, more than 10,300 tons of new construction and demolition waste for capital and renovation projects was diverted at a rate of **75.8%**.

### RecycleMania Competition

For the fourth consecutive year, Virginia Tech successfully participated alongside of more than 600 colleges and universities nationwide in the 2010 RecycleMania tournament. University highlights included a **6.6% increase** in cumulative recycling rate, a **7.3% increase** in pounds of recycled material, and a **4.7% decrease** in pounds of trash generated. Additionally, Food Service composting pounds tripled and waste generation significantly lowered as the result of Dining Services' recycling efforts. In general the university ranked in the middle of the pack when compared to institutions within the ACC and the Commonwealth of Virginia in all categories. Results are available on the RecycleMania website.<sup>19</sup>

### Ytoss?

The YMCA at Virginia Tech, Virginia Tech's Office of Sustainability, the Department of Residence Life, the Town of Blacksburg and other campus and community-based organizations again partnered for this year's Ytoss? event<sup>20</sup>. The program is a recycling event that collects gently-used items students often "toss" during move-out, including TVs, electronics, microwaves, refrigerators, furniture, rugs, clothing, hutches, and fans. Non-refrigerated foods, paper products, and laundry detergent are collected and donated to a local food bank. This year, **9.86 tons** of materials were diverted from the landfill and the program received the University Student Leadership Award for "**Outstanding Achievement by an Organization**" in April 2010. Ytoss? not only reduces move-out related dumping fees it provides a substantial fundraising opportunity for the YMCA at Virginia Tech's leadership development programs.

### Waste Management Planning

Virginia Tech is one of the five jurisdictional members of the Montgomery Regional Solid Waste Authority (MRSWA). During Academic Year 2009-2010 the university participated in the comprehensive process of updating the "MRSWA Solid Waste Management Plan."<sup>21</sup> The plan was approved by the Board of Directors on March 18, 2010.

<sup>19</sup> <http://www.recyclemaniacs.org/Index.htm>

<sup>20</sup> [http://www.facilities.vt.edu/sustainability/ytoss\\_2010\\_summary.pdf](http://www.facilities.vt.edu/sustainability/ytoss_2010_summary.pdf)

<sup>21</sup> [http://www.mrswa.com/assets/MRSWA\\_SWMP.pdf](http://www.mrswa.com/assets/MRSWA_SWMP.pdf)

In the past, Virginia Tech trash and recycling were managed by several independent departments. In January, a Waste Management Taskforce was formed to begin development of a **Comprehensive Waste Management Plan**. The plan will document current waste management practices and consolidate currently decentralized policies for managing trash, recyclables, and special materials such as construction debris, compostable material, and special events waste. The plan will outline short-term, medium-term and long-term university waste reduction goals and will be updated on an annual basis or as needed.

This past year, a diverse, undergraduate student intern team collected waste and recycling data in 50 buildings across campus. Following the team's analysis of current bin locations, location efficiency, signage needs, and overall contamination issues, recommended best approaches to managing waste and recycling for each building were submitted in a detailed report (copies of this report are available through the Office of Sustainability.) The intern team's recommendations will be incorporated in the Comprehensive Waste Management Plan.

### **Recycling at Hokie Home Football Games**

At Virginia Tech's 2009 football season home opener with Marshall, the SGA Sustainability Committee and the Environmental Coalition partnered to conduct a **waste audit** in the tailgating parking lots and determined that approximately 50% of the items placed in trash containers during the game were recyclable. Tailgaters cited reasons for lack of recycling such as (1) not enough recycling receptacles available, (2) receptacles not in central enough locations, and (3) not knowing recycling was available. Student leaders are spearheading an effort to develop an in-stadium and tailgating recycling and fan engagement program for 2010 home football games.

The SGA and Athletic Department designated the Virginia Tech-Nebraska game on September 19, 2009, as the first **Green Effect Game**. The SGA, along with nearly 150 student volunteers visited all designated parking lots encouraging tailgaters and fans to recycle and to distribute recycling bags. As the result, there was an estimated **70% increase** in recycled material collected at the Green Effect Game over the 1.05 tons of recycled material collected during the previous Saturday's Virginia Tech-Marshall game. The 2010 Green Effect Game will be the Virginia Tech – East Carolina game on September 18 and will be the kickoff event for Sustainability Week 2010.

## **Food and Dining**

### **The Farms and Fields Project and Local Foods**

The Farms and Fields Project first opened in Owens Food Court in January of 2008 to provide sustainable, organic and local options. In addition, local products are being integrated into other Dining Centers. A Dining Services-run garden has been expanded to one acre of vegetable production and produce generated will be used in Farms and Fields and other dining facilities on campus. To further integrate local foods into the offerings in dining facilities, Homestead Creamery, a family-owned business in southwest Virginia, meats and ice creams are available in multiple locations.

Dining Services incorporated its own sustainability campaign into New Student Orientation meals. A display was placed in D2 for orientation breakfast and dinner, reaching all incoming students and their families during their first meal. The display highlighted composting efforts at the dining facility, the Dining Services Garden harvest present at the meal (local and sustainably managed produce), and the ability to reserve a reusable bottle for use in the fall through the "Plant the Seed for Sustainability Campaign." Additional signage and tablecards were posted throughout the facility.



A life-sized water bottle display greets visitors from the Pritchard-side entrance, letting them know that "every drop counts" to Virginia Tech Dining.

### **Composting**

Dining Services completed a highly successful composting pilot program at their Southgate Food Processing Facility and expanded composting to the Owens Hall Dining Facility at the beginning of the 2009 Fall Semester. Composting was introduced to the Dietrick Dining Hall this summer with the goal of having composting at all on-campus dining facilities in the near future. Poplar Manor Enterprises (PME) in Riner, Virginia, the first composting facility in the region, composted **131 tons** of Virginia Tech's dining hall waste in calendar year 2009. Pre-consumer food scraps for 100% of meals prepared on campus are now composted.

### **Waste Recycling, Reduction, Diversion and Donation**

Dining Services has initiated a variety of initiatives in dining halls to reduce food waste, including encouraging the use of reusable dishware and conducting a food waste audit. Dining Services initiated tray-less dining in "all you care to eat" facilities - Shultz and D2 - in 2008 following a successful test week in April during which trays were removed from the D2 dining center. The pilot study resulted in approximately a **30% reduction in food waste**, or the equivalent of **1,546 pounds of food**.<sup>22</sup> Additionally, Dining Services is developing a comprehensive waste tracking system for employees to assess and adjust overproduction, prep, and other waste to more effectively reduce, donate, and divert food waste. This program will be piloted in summer and fall 2010. Dining Services is working on providing recycling for mixed paper and commingled containers to customers in all dining centers and equipping kitchens with recycling receptacles for staff use. Dining Services has selected a specific reusable bottle design that meets all food service standards for use in a la carte dining facilities for free water and discounted fountain drinks. The bottle was piloted during Earth Week 2010 and was made available for reservation during New Student Orientation.

A food donation initiative began during the 2009 spring semester and was expanded during the 2009 fall semester. Edible un-eaten food is currently being diverted from trashcans in the dining halls to the local non-profit organization Feeding America. All grab-n-go and individually packaged items not sold within the time period for quality standards yet still safe for consumption are donated daily. Dining Services additionally piloted "hot food diversion" this year in the D2 facility. Plans are to expand this type of diversion throughout dining centers on campus.

## **Campus Landscape and Grounds**

### **Tree Canopy**

The Arbor Day Foundation selected Virginia Tech for "Tree Campus USA" Status in 2008 and subsequently approved its yearly application for recertification. As of April 22, 2010, 252 trees had been planted this fiscal year (153 of them planted by students) with a goal to increase the canopy by at least 100 trees per year. The Department of Horticulture's Urban Horticulture Center provided 74 native trees that were planted by student volunteers during the Earth Week 2010 tree planting event and 54 trees planted by students during the 2009 Sustainability Week Planting. Individual classes planted the remainder of the student trees.

### **Stormwater Management**

Low impact development (LID) design is being incorporated into all new building and parking projects. Past projects utilizing LID techniques include the bioretention filters at New Residence Hall, Henderson Hall and Theater 101. Future projects incorporating LID into stormwater management (SWM), include West End, Visitors and Undergraduate Admissions Center, and Academic & Student Affairs Building. A team of interns is helping to develop individual project Hydrologic and Hydraulic models, which will then be incorporated into a comprehensive model. A goal of 60% of the campus modeled by October 2010 has been set.



Students show that teamwork is key when planting trees to increase the campus carbon sink.

**Point 9 – Procurement:** *“Virginia Tech will require purchase of Energy Star rated equipment, maximum practicable recycled-content paper, and other low life-cycle cost products, with exceptions for special uses.”*

### **Purchasing Policies and Practices**

Sustainability product purchase guidelines to support Environmentally Preferable Purchasing (EPP) are currently under development. Upon the approval of the latest revisions of Policy 5505, Virginia Tech will require that all purchases of equipment for which Energy Star ratings are established must meet Energy Star ratings unless specific use of the product requires otherwise. This policy will also require that all purchases of copy paper contain a minimum of 30% post consumer waste (PCW) content.

### **Green Cleaning**

In January 2010, Custodial Services, within the Facilities Services Department, implemented a **Green Cleaning Program**. The LEED-certified cleaning program was approved for the Henderson project and will be standard for future projects. Chemical dispensing systems have been installed in close to 50% of the E&G buildings on campus with Custodial Services planning to install more each quarter. Equipment now being used and purchased is more sustainable. Three Nobles floor scrubbers that do not use cleaning

<sup>22</sup> <http://www.vtnews.vt.edu/articles/2008/06/2008-421.html>

chemicals but instead convert ordinary tap water into a powerful cleaning agent instead of have been purchased. In addition, floor cleaning practices now use micro fiber mops and cloths to increase efficiency and reduce waste and upright vacuums are highly energy efficient.

In May 2010, for their Green Cleaning initiatives, the Housing and Dining Services Housekeeping Department was awarded the **JanPak Level III Clean Zone Certification**, the first such certification awarded in a university setting<sup>23</sup>. This program is made available through JanPak Janitorial Solutions and is a unique certification program designed to create a healthier environment through the implementation of sustainable cleaning products, systems and programs.

**Point 10 – Campus Engagement:** *“Virginia Tech will engage students, faculty and staff through education and involvement to reduce consumption of energy, water, and materials in academic and research buildings, dining and residence halls, and other facilities.”*

## Engaging Students

### Student Involvement and Organizations

Numerous student organizations currently either focus on campus sustainability or have a working group within their organization that works on sustainability issues. Examples include Beyond Coal at Virginia Tech, Soil and Water Conservation Society, Environmental Coalition, Student Government Association, Mountain Justice Blacksburg, SUSTAIN (themed housing), Office of Sustainability Green Team, Virginia Tech Sustainable Food Corps, Poverty Awareness Coalition for Equality, YMCA Student Programs / YToss?, Residential Hall Federation, and Young Democrats.

### New and Transfer Student Orientation

The Office of Sustainability participated in 2009 orientation events for both new and transfer students. The office manned a booth at the orientation’s Hokie Resource Fair, prepared and distributed four separate handouts about various sustainability topics, and led an information session for all orientation leaders.

The Office of Sustainability also participated with a booth at **Gobblerfest 2009**, the annual welcome festival for students, staff, faculty and community members. The Office of Sustainability was one of over 370 student organizations, businesses, non-profits, and Virginia Tech departments to participate and the event was attended by more than 18,000 students and community members.

### Eco-Olympics

The first **Eco-Olympics** was held this spring from March 29 through April 30. Eco-Olympics focuses on reducing energy consumption and engaging students to develop sustainable behaviors. Residence Halls receive points by having the lowest per-capita energy consumption and by participating in various events throughout the month-long competition. On-campus housing buildings are separated into five categories to help normalize the data: large, medium, small, air-conditioned, and Oak Lane. The Eco-Olympics website<sup>24</sup> is updated every week during the competition to show point totals, kWh consumed, and GHG emission reductions for students to track their hall’s weekly progress. A winner is declared in each of the five categories and a Grand Champion is selected based on overall effort at the end of the month. The event kicked off with Earth Hour 2010, where Virginia Tech joined communities across the world to turn off all non-essential lighting for one hour as a show of support for climate change action.

### Congratulations to the 2010 Eco-Olympics Winners:

- 🏆 Grand Champion: West Ambler Johnson (Large category)
- 🏆 Medium: O’Shaughnessy
- 🏆 Small: Hillcrest
- 🏆 AC: New Hall West
- 🏆 Oak Lane: Tri Delta

Dr. Leon McClinton, Director of Residence Life, (second from left) with the award winners and event organizers. Congratulations to West Ambler Johnston Residence Hall for being our “Grand Champion.”



<sup>23</sup> <http://www.janpak.com/story.aspx?sid=27&pid=1&id=9>

<sup>24</sup> <http://www.housing.vt.edu/saveenergy/>

## Earth Week 2010

The Environmental Coalition student organization organized *Earth Week 2010* this spring with workshops, live music, guest speakers, displays and roundtable discussions.

## The Common Book Project

The University Common Book Committee<sup>25</sup> successfully incorporated environmental awareness into the common book process for the first time by selecting Daniel Goleman's *Ecological Intelligence* for academic year 2009-2010. In conjunction with the university selection, the Blacksburg Town Council also selected Goleman's book as the first ever "Town Common Book." Dr. Goleman gave the keynote address for Sustainability Week 2009, and had the opportunity to meet with students and participate in the Sustainability Week 2009 Kickoff Ceremony. Dr. Mary Ann Lewis, Director, First Year Experience, recently announced that Barbara Kingsolver's *Animal, Vegetable, Miracle* has been selected as the University Common Book for academic year 2010-2011<sup>26</sup> and that Kingsolver is scheduled to speak on campus this fall.

## Engaging Faculty and Staff

### Green Campus Challenge

The Virginia Tech Green Campus Challenge<sup>27</sup> (GCC) was an online survey launched in March 2010 by the Energy and Sustainability Committee as an education, assessment, and encouragement campaign to campus departments with ten employees or more. The survey was modeled after the Green Commonwealth Challenge issued to all Virginia state agencies and institutions in 2009. **Fifty departments participated in the challenge representing 4,747 employees, or two-thirds of the Blacksburg campus work force.** Special congratulations go to Facilities Services, Materials Science and Engineering, Military Affairs/Corps of Cadets, and University Scholarships and Financial Aid for being the four departments achieving the highest point totals. As a show of his support for the GCC, President Steger will be inviting a representative from each of those departments to join him in the President's Suite for a home football game this fall. Full survey results can be viewed online.<sup>28</sup> As a result of the Green Campus Challenge, most departments now have green policies:

- **74%** to shut down computers at night, **88%** to turn off lights at COB; **94%** to encourage recycling
- **86%** to print/copy on both sides of 30% recycled paper; **90%** to use electronic media rather than print
- **76%** encourage carpooling to meetings, all use teleconferencing (saving 21,000 VMT/mo), **34%** have flex-work policy, **60%** have telecommuting policy (saving combined 2,050 commuter days/mo)
- **80%** identified a Green Campus Representative to keep the green campus dialogue alive

### Green Jobs Training Programs

In January 2010 a **\$3.8 million** project for Green Jobs training was funded by the Department of Labor as part of the American Recovery and Reinvestment Act (ARRA). Virginia Tech is one of 7 regional partners pioneering this effort to revive Virginia's economy and train and employ citizens throughout the Commonwealth in green jobs. The **CREATES** (Construction, Retrofitting, and Energy-Efficiency Assessment, Training and Employment Systems) Program provides free training through an "Energy Training Partnership" grant, in green construction, retrofit and energy efficiency industries to unemployed, dislocated and incumbent workers.

## Engaging Community

### Community Service

"Ut Prosim, *That I May Serve*" has been the university's motto and mission of service since 1896, and community service continues to be vitally important to the Virginia Tech community. The mission of VT-ENGAGE,<sup>29</sup> the central community service entity for the university, is to "encourage everyone everywhere to do volunteer work as a way to give back to the community." Virginia Tech students, faculty, and staff are encouraged to perform as much community service per year as possible, both on campus and their respective communities. Additionally, VT-ENGAGE and Virginia Tech have proudly partnered with the Montgomery, Radford, and Floyd United Way to serve the volunteer needs of local communities. **In the 2009-2010 academic year, 350,000 hours of community service were pledged<sup>30</sup>.**

<sup>25</sup> <http://www.commonbook.vt.edu/>

<sup>26</sup> <http://www.vtnews.vt.edu/articles/2010/06/2010-535.html>

<sup>27</sup> <http://www.vtnews.vt.edu/articles/2010/06/2010-470.html>

<sup>28</sup> [http://www.facilities.vt.edu/sustainability/vt\\_green\\_campus.pdf](http://www.facilities.vt.edu/sustainability/vt_green_campus.pdf), [http://www.facilities.vt.edu/sustainability/gcc\\_results.pdf](http://www.facilities.vt.edu/sustainability/gcc_results.pdf)

<sup>29</sup> <http://www.engage.vt.edu/>

<sup>30</sup> <http://www.vtmagazine.vt.edu/spring09/feature1.html>

### One Big Day. One Big Thanks

Every spring thousands of students, faculty and staff come together on a Saturday to complete hundreds of community service projects throughout Blacksburg, Christiansburg and the New River Valley. With 5,700 participants in 2009 and more than 7,000 participants and over 900 jobs in 2010, the **Big Event**<sup>31</sup> is Virginia Tech's largest service event. Started in 2002, it is a student-run community service effort through the Student Government Association that has grown into one of the largest events of its kind in the nation.

### Sustainability Week

Virginia Tech and the Town of Blacksburg continue to work together on many sustainability endeavors. A "green partnership" was formed between these two parties and a local citizens group, Sustainable Blacksburg,<sup>32</sup> to begin sponsoring a week of events focused on sustainability. **Sustainability Week**<sup>33</sup> began in October 2007 and has become a highly successful, annual event. Throughout the week, Virginia Tech is able to work with local community groups such as the Blacksburg Farmers Market and local schools through events that entertain, educate, and highlight sustainability programs and practices. Sustainability Week ends with the annual Community Sustainability Fair featuring local vendors, children's activities, demonstrations, and much more.



Virginia Tech President Dr. Charles Steger delivering a message at the Sustainability Week 2009 Kickoff Ceremony held at The Inn at Virginia Tech and Skelton Conference Center's

### Catawba Sustainability Center

The Catawba Sustainability Center continues to be a community partnership initiative of the Office of Outreach and International Affairs at Virginia Tech Roanoke. The center, a 377-acre farm in Roanoke County and former dairy for the adjacent Catawba Hospital is a living classroom and facility to support development of more sustainable rural communities and "green" job opportunities and provides education and outreach opportunities, a landcare enterprise incubator that includes training, and community engagement activities.<sup>34</sup> Virginia Tech faculty and students, representatives of the Virginia Department of Conservation & Recreation, and community members are working together to develop a 50-year conceptual plan for the site<sup>35</sup>. Initial activities included an informal dinner in April, and a follow-up stakeholder planning workshop for the site held in May.

## Engaging Peers

### The Association for the Advancement of Sustainability in Higher Education (AASHE)

In 2008, Virginia Tech became a member of AASHE<sup>36</sup> and has renewed its membership every year since. AASHE's mission is to empower higher education to lead in sustainability transformation by providing resources, professional development, and a network of support to enable institutions of higher education to model and advance sustainability in everything they do, from governance and operations to education and research. AASHE is a member-driven, independent 501(c)(3). As part of its active engagement in AASHE, Virginia Tech became a Charter Participant in the AASHE STARS (Sustainability Tracking, Assessment, and Rating System) Program and has sent a representative to its conferences each year. AASHE membership benefits are listed under the Office of Sustainability website.<sup>37</sup>

### Inter-Campus Collaboration on Sustainability

The Office of Sustainability partners with other campuses on sustainability issues in several ways. *First*, office members participate in the "Green schools listserv"<sup>38</sup>, a discussion list focused on sustainable campus operations and devoted to the exchange of ideas, support, and technical information. *Second*, Virginia Tech is a part of the **Virginia Sustainability in Higher Education Consortium**<sup>39</sup> where office members can interact with, and learn from other sustainability offices across the Commonwealth. By creating a network of Virginia-specific higher education sustainability professionals, colleges and universities in Virginia can leverage the experiences of others, share resources, build networks of subject matter experts from both within and outside their respective institutions, and form partnerships in research and education. Other Consortium members include George Mason University, James Madison University, Radford University, Virginia Commonwealth University, and the University of Virginia. *Third*, webinars and conference calls are scheduled regularly to discuss different challenges of sustainability in higher education.

<sup>31</sup> <http://www.vtbigevent.org/index.php>

<sup>32</sup> <http://www.sustainableblacksburg.org/>

<sup>33</sup> <http://www.recycle.vt.edu/sustain/>

<sup>34</sup> <http://www.landcarecentral.org/References/EngagementMatters-CSC-LandcareIncubator.pdf>

<sup>35</sup> [http://www.vtrc.vt.edu/May2010Newslette\(Rev\).pdf](http://www.vtrc.vt.edu/May2010Newslette(Rev).pdf)

<sup>36</sup> <http://www.aashe.org/about>

<sup>37</sup> <http://www.facilities.vt.edu/sustainability/aashe.asp>

<sup>38</sup> <http://www.aashe.org/lists/lists.php>

<sup>39</sup> [http://groups.google.com/group/VASHE\\_Consortium?hl=en](http://groups.google.com/group/VASHE_Consortium?hl=en)

## Engagement Communication

### Media-Based Communication

In addition to the Office of Sustainability website, sustainability-related news and information is communicated to student, staff and faculty, and the community through numerous electronic and printed venues. Both the **Collegiate Times**, the officially-recognized, student-run newspaper serving Virginia Tech since 1903 and **The Roanoke Times** with its local *New River Valley Current* section have featured sustainability-related articles in both their printed newspaper and online editions. Recent articles highlighted Virginia Tech's improving its Sustainability Endowments Institute 2010 report card grade from a "B-" to a "B",<sup>40</sup> Virginia Tech's vanpool and Alternative Transportation programs<sup>41</sup> and Virginia Tech finishing third in former Governor Tim Kaine's "Green Commonwealth Challenge."<sup>42</sup>

A section of the **Virginia Tech Magazine Fall 2009 Edition** was dedicated to highlighting the Hokies's efforts to green campus<sup>43</sup> and highlighted the Board of Visitor's approval of the VTCAC Resolution. Additionally, one page of the home football game program was dedicated to letting Hokie football fans know that recycling at games is important and alerted them to the "Green Effect" football game.



Cover photo of Main Horticulture Garden by Eric Peterson



2009 Home Football Program Ad

Virginia Tech sustainability activities and accomplishments were also featured in the following:

- ✦ Virginia Tech Annual Report 2008-2009 containing the article "Green Gaining Ground at University"
- ✦ President Steger featured sustainability in his "Virginia Tech in Review January 2010" highlight video.
- ✦ Sustainability-related articles in Virginia Tech News Daily E-mail sent to faculty and staff employees daily
- ✦ *Metro Magazine* featured Virginia Tech's Alternative Transportation program<sup>44</sup>
- ✦ A recent Arbor Day Foundation article recognized Virginia Tech as one of twenty-nine colleges and universities to receive re-accreditation in 2009 for "Tree Campus USA" status<sup>45</sup>

**Point 11 – Transportation:** "Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies. Alternative transportation use will increase from the current level of 45%, to a goal of 52% in 2015, and 60% in 2020."

### Nationally-Recognized Leader

Virginia Tech has again been designated one of the **Best Workplaces for Commuters**<sup>46</sup> and continues to be nationally recognized for its outstanding Alternative Transportation Programs. Virginia Tech was one of three higher education institutions in the nation to receive a gold award for its Alternative Transportation programs in the **Best Workplaces for Commuters Race to Excellence** in December 2009.<sup>47</sup> For the **Green Commonwealth Challenge**, Virginia Tech was recognized for its many employees using alternative commuting to get to campus. It is estimated that the University's **Carpool and Bike, Bus, and Walk (BB&W)** programs are reducing GHG emissions by approximately 2,531



<sup>40</sup> <http://www.collegiatetimes.com/stories/14702/university-improves-sustainability-grade>

<sup>41</sup> <http://www.roanoke.com/news/nrv/wb/254007>

<sup>42</sup> <http://www.roanoke.com/news/nrv/wb/231401>

<sup>43</sup> <http://www.vtmagazine.vt.edu/fall09/index.html>

<sup>44</sup> <http://www.metro-magazine.com/News/Story/2009/11/Virginia-Tech-honored-for-sustainability-practices.aspx>

<sup>45</sup> <http://www.arborday.org/media/pressreleases/pressrelease.cfm?id=205>

<sup>46</sup> <http://www.bestworkplaces.org/>

<sup>47</sup> <http://www.vtnews.vt.edu/articles/2010/01/2010-18.html>

metric tons per year and saving its employees approximately \$839,777 per year in gasoline costs.

### **Virginia Tech Parking and Fleet Services**

In response to the VTCAC&SP, Virginia Tech Parking Services has reduced their fleet of fossil fuel-powered pickup trucks by four. They currently have one T-3 electric personal transport which costs between 4 and 5 cents per day to operate and plan to purchase 2 Kubota utility vehicles this summer.

Fleet Services, as the result of their "Green Fleet" initiative,<sup>48</sup> has replaced 9 of its 11 Ford Crown Victorias with 32 MPG-rated Chevrolet Cobalts, with the goal to eventually replace all eleven. Additionally, five Honda Insights, hybrid vehicles with an estimated 40-43 MPG, have been added to the fleet. Beginning this year, a 10% biodiesel mix will be used from April through September and a 5% biodiesel mix will be used from October through March. To date, over 15,655 gallons of biodiesel have been used in campus fleet vehicles.

## **Alternative Transportation Program**

At the end of FY2010, campus alternative transportation use was at **48%**, relative to the 2009 baseline level of 45% and 2015 goal of 52% and 2020 goal of 60%. Virginia Tech gauges the level of participation as a ratio of number of permits sold to number of resident students, commuter/graduate students, and employees. Breaking down the total by category, resident students were at a 63% usage rate, commuter/graduate students at a 48% usage rate, and employees at a 30% usage rate.

### **Local and Regional Public Transit**

Locally, the Virginia Tech community utilizes the **Blacksburg Transit (BT)** bus system, which averages 2.95 million passengers per year. Blacksburg Transit received federal and state funding in fiscal year 2010 to purchase seven 40-foot and two 60-foot hybrid diesel-electric buses which will be in operation starting fall 2010.<sup>49</sup> BT has also invested in Intelligent Transportation System technologies, which allow collected information to be shared with customers to improve their overall experience while riding BT.

To commute to and from Roanoke, community members have access to the **Smart Way bus**<sup>50</sup>, which offers free Wi-Fi to enable passengers to work while commuting in a more sustainable manner. Smart Way buses transport more than 64,000 passengers each year. Virginia Tech faculty, staff, and students also have access to discounted monthly passes.<sup>51</sup> During academic year 2009-2010, Smart Way Bus introduced a larger, 57-seat motor coach manufactured by Motor Coach Industries (MCI) to replace their current fleet of 32-seat buses.<sup>52</sup>

### **Commuter Alternatives Program (CAP)**

The Commuter Alternatives Program (CAP)<sup>53</sup> oversees university permit-based Carpool Programs and the Bike, Bus & Walk (BB&W) program. Carpool programs exist for both students and Faculty/Staff.<sup>54</sup> Virginia Tech is a Workplace member of RIDE Solutions<sup>55</sup>, a regional ridesharing program, which makes these programs possible. Beginning in the fall 2010 session, a new \$15 registration fee will help offset rising administrative and maintenance costs and will also be used to improve campus infrastructure such as bike racks and crosswalk enhancements.

### **Vanpool Program**

A vanpool program<sup>56</sup> is also available for full-time, permanent employees for commuting purposes. There are three operational vanpools commuting from Pulaski County, Roanoke, and West Virginia. In addition, a VT Rideboard will be available this fall to help Virginia Tech students find rides for trips, breaks, and anywhere else. The Home Ride<sup>57</sup> of Virginia program is still available.

<sup>48</sup> <http://www.facilities.vt.edu/tcs/fleet/greenfleet.asp>

<sup>49</sup> <http://www.collegiatetimes.com/stories/15611/hybrid-buses-look-to-save-bt-money>

<sup>50</sup> <http://www.smartwaybus.com/>

<sup>51</sup> <http://www.facilities.vt.edu/tcs/passes.asp>

<sup>52</sup> <http://www.vtnews.vt.edu/articles/2009/12/2009-946.html>

<sup>53</sup> <http://www.facilities.vt.edu/tcs/alternative/cap.asp>

<sup>54</sup> <http://www.facilities.vt.edu/tcs/alternative/cap.asp#carpool>

<sup>55</sup> <http://www.ridesolutions.org/index.asp>

<sup>56</sup> <http://www.facilities.vt.edu/tcs/alternative/van.asp>

<sup>57</sup> <http://www.homeride.com/>

### **U Car Share**

U Car Share<sup>58</sup>, a subsidiary of the U-Haul company program on campus provides a sustainable alternative to car ownership. U Car Share provides 24 hours a day, 7 days a week availability of a car to students, staff and faculty. Members pay only for what they use in one low hourly rate with U Car Share covering all fuel, insurance, and maintenance costs. Virginia Tech's Transportation and Campus Services and U Car Share recently announced a new departmental billing option that will allow university departmental employees to rent vehicles for official university business and have the cost billed back to their departments via Hokie Mart.<sup>59</sup> U Car Share has provided six EPA SmartWay certified vehicles including two hybrids.

### **Bicycles**

Virginia Tech Policy 5005 "Bicycle and Personal Transportation Devices"<sup>60</sup> was passed in June 2009 and establishes responsibilities and procedures to ensure pedestrian safety, proper vehicular operation, and enforcement of bicycles, skateboards, in-line skates, roller skates, mopeds, motor scooters and electronic personal assistance mobility devices on campus, as well as parking regulations.

Transportation and Campus Services at Virginia Tech has been awarded funding through TEA-21 Enhancement grants for a bicycle pathways project called the "Hokie Bikeways."<sup>61</sup>

### **Telecommuting and Flexible Work Options**

Flexible Work Options (FWO)<sup>62</sup> provide alternatives to the traditional "8-to-5" workday, the standard workweek, or the traditional workplace. FWO can help employees balance work and personal responsibilities, while meeting business needs and objectives. Since telecommuting or flexing one day per week can decrease emissions by up to 20% per employee participating in the program, this can have a substantial positive impact on commuting emissions as well. Applicable University policies are Policy 4325, Alternate Worksite and Telework, updated December 2008 and Policy 4300, Hours of Work, Section 2.4, updated October 2008. Accompanying guidelines and agreement forms have been developed and are now available on the Work Resources website<sup>63</sup> for more convenient online submission.

Currently, there are 26 teleworkers and 21 employees working alternative schedules, with nine utilizing both options at the same time. Participation is expected to increase as publicity and outreach to employees increase.

**Point 12 - Academic Programs:** *"The university will create and support a virtual Virginia Tech School of Sustainability or similar mechanism to coordinate, develop, and communicate related instructional, research, and outreach academic programs."*

## **Curriculum**

### **Special Advisor on Academic Sustainability Programs**

In May 2009, in response to the VTCAC&SP plan recommendation to establish a Senior Fellow for Sustainability Programs or comparable position to develop and coordinate academic instruction, research, and outreach sustainability programs, Provost Mark McNamee appointed Professor John Randolph (Urban Affairs and Planning, School of Public and International Affairs, College of Architecture and Urban Studies) as his **Special Advisor on Academic Sustainability Programs**. Dr. Randolph has since established an ad hoc committee from across the eight academic colleges to develop sustainability-focused curricula, and has formed five work groups related to VTCAC&SP plan implementation: (1) New sustainability-related degree in CNR; (2) College survey of sustainability-related academic programs; (3) Cross-college and interdisciplinary sustainability programs; (4) sustainability literacy; and (5) Website for the Virtual School of Sustainability.

### **College of Natural Resources and Environment**

Virginia Tech's Board of Visitors approved at its June 2010 meeting re-naming the College of Natural Resources as the College of Natural Resources **and Environment** to more accurately reflect Virginia Tech's broad-based programs and increasing emphasis on sustainability initiatives<sup>64</sup>. The College's programs are ranked among the top three in North America by its peer institutions. The

<sup>58</sup> <https://www.ucarshare.com/secure/Home.aspx>

<sup>59</sup> [http://www.vtnews.vt.edu/campus\\_notices/campusnotice.php?item=3052](http://www.vtnews.vt.edu/campus_notices/campusnotice.php?item=3052)

<sup>60</sup> <http://www.policies.vt.edu/5005.pdf>

<sup>61</sup> <http://www.facilities.vt.edu/tcs/alternative/>

<sup>62</sup> [http://www.worklife.vt.edu/alt\\_work\\_opt/index.html](http://www.worklife.vt.edu/alt_work_opt/index.html)

<sup>63</sup> [http://www.worklife.vt.edu/alt\\_work\\_opt/index.html](http://www.worklife.vt.edu/alt_work_opt/index.html)

<sup>64</sup> <http://www.vtnews.vt.edu/articles/2010/06/2010-489.html>

College also recently announced an expansion of its graduate-level programs in the National Capital Region to focus on leadership for sustainability, including a new first of its kind **Executive Master of Natural Resources degree**<sup>65</sup>.

### **Earth Sustainability Program**

Virginia Tech's Earth Sustainability (ES) course series was recently named as one of two 2009 University Exemplary Department Award winners.<sup>66</sup> Presented annually since 1994, the University Exemplary Department Award recognizes the work of departments or programs that enhance the teaching and learning environment for students and faculty. This year, the awards were presented to departments and programs that effectively linked research and scholarship with teaching, with particular emphasis on innovative undergraduate programs. The series is part of the newly emerging "Living in the 21st Century" program, designed to integrate the goals of the university's Curriculum for Liberal Education in an interdisciplinary theme-based learning experience. Students work together as a group and in learning communities of 25-30 students, each facilitated by a faculty member.

### **Green Engineering Minor**

Green Engineering, first offered in Spring 2009, focuses on design of materials, processes, systems, and devices while minimizing overall environmental impact, including energy utilization and waste production, throughout the entire life cycle of a product or process, from initial extraction of raw materials used in manufacture to ultimate disposal of materials that cannot be reused or recycled at the end of the useful life of a product. Approximately 200 students are pursuing the minor currently, and an estimated 50 students received the minor in Spring 2010.

## **Research**

### **Director of Energy Initiatives**

Following a 2009 mid-term review of the current 2006-2012 University Strategic Plan, the Provost's Response and Action Plan<sup>67</sup> recognized an area of special need involving the overall energy agenda for the university; "the increased emphasis by federal, state and special agencies (such as the Tobacco Commission) on large-scale energy initiatives requires us to be as strategic and pro-active as possible in promoting a clear, effective energy research strategy. The creation of a high-level position to lead the overall effort, in partnership with the institutes and the colleges, is a top priority."

As a result, the position of **Director of Energy Initiatives** was created with specific job responsibilities to serve as a central resource for energy-related initiatives within the university, promote areas of energy-related research expertise to outside constituencies, be aware of research opportunities focusing on energy and related fields and develop mechanisms to bring these opportunities to the Virginia Tech research faculty, and work with ICTAS and other stakeholders and researchers in the university to promote and coordinate multidisciplinary and interdisciplinary energy-related research efforts and policy initiatives. While this position will report directly to the Director of the Institute for Critical Technology and Applied Science, the incumbent will assume a strong liaison role with the Vice President for Research.

### **Virginia Tech Wins 2010 European Solar Decathlon Competition**

In June, 2010 Lumenhaus, Virginia Tech's entry into the 2009 Solar Decathlon and 2010 Solar Decathlon Europe competitions, **placed first in the European Solar Decathlon** in Madrid, Spain.<sup>68</sup> Lumenhaus bested entries from 16 university teams from seven countries on three continents. A team of faculty, undergraduate, and graduate students from four Virginia Tech colleges — the College of Architecture and Urban Studies, the College of Engineering, the Pamplin College of Business, and the College of Liberal Arts and Human Sciences, designed and built the 100% solar house. The zero-energy home, inspired by architect Mies Van Der Rohe's Farnsworth House, has north and south walls that are all glass to maximize exposure to natural daylight and incorporates movable screens, recyclable materials and extremely efficient lighting.



The Virginia Tech Lumenhaus at the 2010 Solar Decathlon Europe

<sup>65</sup> <http://www.vtnews.vt.edu/articles/2010/06/2010-457.html>

<sup>66</sup> <http://www.vtnews.vt.edu/articles/2009/12/2009-910.html>

<sup>67</sup> [http://www.provost.vt.edu/documents/provost\\_response\\_1\\_08\\_10.pdf](http://www.provost.vt.edu/documents/provost_response_1_08_10.pdf)

<sup>68</sup> <http://www.vtnews.vt.edu/articles/2010/06/062910-caus-lumenhauswins.html>

Prior to the European competition, Lumenhaus was exhibited in Times Square in New York City in January and was featured on ABC's Good Morning America.

### Green500 Supercomputer List

Since its 2007 debut, the Green500 Supercomputer List, founded by Virginia Tech's Associate Professor Wu Feng of the Departments of Computer Science and Electrical & Computer Engineering, College of Engineering<sup>69</sup> has ranked the energy efficiency of the world's 500 fastest performing supercomputers. The most recent sixth edition of the Green500 List shows continuing improvement in energy efficiency among the world's fastest supercomputers.

### EcoCAR Challenge

The Hybrid Electric Vehicle Team of Virginia Tech<sup>70</sup> (HEVT) continues to provide students with the opportunity to research, develop, and build usable hybrid, plug-in hybrid, full-electric and alternative fuel vehicles. HEVT is currently participating in the 2008 – 2011 international "EcoCAR: The NeXt Challenge Advanced Vehicle Technology Competition Series" sponsored by General Motors and the U.S. Department of Energy, to redesign the power train of a stock, conventional vehicle in order to reduce petroleum energy use and greenhouse gas emissions, while still maintaining safety and consumer acceptability. HEVT recently took second place in the international EcoCAR Challenge, a three-year design competition that seeks to inspire science and engineering students to build more energy-efficient "green" automobiles. HEVT's EcoCar can be seen in action on a youtube.com MotorWeek video.<sup>71</sup>

### Smart Grid Information Clearinghouse

In 2009, Virginia Tech was awarded a \$1.25 million five-year contract by the U.S. Department of Energy (DOE) to develop, manage, and maintain a public Smart Grid Information Clearinghouse (SGIC) Web portal that encourages use of electricity in an environmentally responsible way.<sup>72</sup> The SGIC portal will be designed to serve as a repository for public smart grid information and to direct its users to other pertinent sources or databases for additional data, case studies, etc. It will facilitate direct sharing and dissemination of smart grid information among various stakeholders on knowledge gained, lessons learned, and best practices.

Virginia Tech announced recently it has posted a beta version of the Smart Grid Information Clearinghouse (SGIC) Web portal to invite comments and suggestions on usability from both consumers and the smart grid community<sup>73</sup>, with the full version of the site expected to be released this fall.



### Blacksburg Wind and Solar Project



Blacksburg Wind & Solar Power<sup>74</sup> received a \$15,000 Community Action Grant from Virginia Tech's Office of the Vice President for Research on April 1, 2009 and installed a 640 watt residential/small-business scale wind turbine and 1,050 watt solar array at the YMCA Center at 1000 North Main Street, less than 0.5 miles from the Virginia Tech campus, to investigate the feasibility of wind energy in an urban environment and to serve as an educational tool about alternative energy sources.<sup>75</sup>



<sup>69</sup> <http://www.vtnews.vt.edu/articles/2009/11/2009-797.html>

<sup>70</sup> <http://www.me.vt.edu/hevt/>

<sup>71</sup> <http://www.youtube.com/user/Motorweek#p/search/0/9Pa6ckOw4fc>

<sup>72</sup> <http://www.vtnews.vt.edu/articles/2009/10/2009-801.html>

<sup>73</sup> <http://www.vtnews.vt.edu/articles/2010/07/070710-ncr-smartgrid.html>

<sup>74</sup> <http://www.blacksburgwindpower.com/index.php>

<sup>75</sup> <http://www.roanoke.com/news/nrv/wb/243943>

### Student Research Projects

Many student research projects address sustainability directly. Some examples of these are described below.

Graduate students in Economic Development helped green businesses emerge in nearby Floyd County. The class of eight students conducted a market analysis of Floyd County's assets and then worked to determine what business opportunities might be the best fit. Considering startup costs, needed labor skills, employment possibilities, and community input, the class recommended the following four green businesses: (1) a wood pellet manufacturing facility; (2) a micro dairy; (3) a flooring and countertops manufacturing facility; and (4) a "sustainable living" training-and-education center.

To renew interest in the possibilities of passenger rail travel, four senior industrial design lab teams developed high-speed train concepts. The designs were required to comply with the Americans with Disabilities Act, use a locomotive design based on an operational engine, accommodate 250 to 350 passengers, and be used as a signature vehicle for the proposed Southeast High Speed Rail Corridor from Richmond, Virginia to Charlotte, North Carolina, and Atlanta, Georgia. The students were invited to present their high-speed passenger train designs to the American Public Transportation Association's annual meeting in Chicago in June 2009.



One of the passenger rail concept designs developed by students

A team of undergraduate students from Virginia Tech's Department of Biological Systems Engineering in the College of Agriculture and Life Sciences and the College of Engineering was one of 14 teams to win an Environmental Protection Agency (EPA) P3 Award at the 6th Annual National Sustainable Design Expo<sup>76</sup>. Virginia Tech's award-winning design developed a combined riparian zone with a stream denitrifying biofilm, for nitrate reduction in aquatic ecosystems. The team was awarded \$75,000, which will be used to further refine the design and to implement a pilot-scale model at Stroubles Creek in Blacksburg.

**Point 13 – Annual Report Card:** *"The university will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies."*

### Internal Assessment and Accountability

This report, "2010 Annual Report on Campus Sustainability at Virginia Tech", authored by the Office of Sustainability is the first of future reports to provide a comprehensive status of implementation of the VTCAC&SP and to highlight the accomplishments and breadth of sustainability programs at Virginia Tech. The creation of this report also is intended to meet the requirement of an "annual 'report card'" in Point 13 above.

In addition, the Office of Sustainability has created a spreadsheet report to track the implementation of the proposed actions and measures listed in the VTCAC&SP for the Immediate Phase (2009-2012).<sup>77</sup> The spreadsheet is organized into the following six categories in order: Administrative Structure and Governance, Facilities Infrastructure, Facilities Operations, Transportation, Behavior and Campus Life, and Academic Programs. Following each action/measure is a brief description, the current status and contact information. The report will be updated on a quarterly basis and will be utilized in the VTCAC Annual Report.

### College Sustainability Report Card

The Sustainable Endowments Institute (SEI) released its Campus Sustainability Report Card 2010 on October 7, 2009, and Virginia Tech received an overall grade of "B",<sup>78</sup> the second consecutive year the university's overall grade has improved. The university received an "A" in the Administration, Student Involvement, Transportation, and Investment Priorities categories, and received a "B" in the Climate Change & Energy Category, Food and Recycling, and Green Building categories. Furthermore, SEI recognized Virginia Tech as a "Campus Sustainability Leader" for receiving an average grade of "A-" or better in the six campus operations categories (Administration, Climate Change & Energy, Food & Recycling, Green Building, Student Involvement, and Transportation). Only eighty of the 332 surveyed institutions earned this distinction.<sup>79</sup> Virginia Tech's one-page summary report card may be viewed online.<sup>80</sup>

<sup>76</sup> [http://www.epa.gov/p3/project\\_websites/2010/2010awardwinners.html](http://www.epa.gov/p3/project_websites/2010/2010awardwinners.html)

<sup>77</sup> <http://www.facilities.vt.edu/sustainability/vtcac.pdf>

<sup>78</sup> <http://www.facilities.vt.edu/sustainability/>

<sup>79</sup> <http://www.greenreportcard.org/report-card-2010/awards/campus-sustainability-leaders>

<sup>80</sup> <http://www.greenreportcard.org/report-card-2010/schools/virginia-polytechnic-institute-and-state-univ>

### **Green Commonwealth Challenge**

Virginia Tech placed **third** among top-scoring state agencies in former Gov. Tim Kaine's "Green Commonwealth Challenge" and was the only college and university represented in the top five.<sup>81</sup> The challenge was part of Kaine's "Renew Virginia" energy conservation and sustainability initiative stemming from Executive Order 82 and called on state agencies to increase recycling and energy conservation and decrease carbon emissions from driving. Employees from the top three agencies were awarded a day off.

### **Shooting for the STARS.**

The AASHE Sustainability Tracking Assessment and Rating System (STARS) is a transparent, self-reporting framework for colleges and universities to gauge relative progress toward sustainability.<sup>82</sup> Institutions earn points in three main categories: Education & Research; Operations; and Planning, Administration & Engagement. Each of these categories includes subcategories such as Purchasing, Curriculum, Energy, and Human Resources. Virginia Tech earned recognition from AASHE for their leadership in sustainability by registering as a STARS charter participant this spring and will be submitting for a rating this winter.



**Point 14 – Funding:** *“With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds. Virginia Tech will provide funding to support sustainability programs through a variety of sources, which might include savings from reduced electricity and energy fuels, E&G funds, loans, a Green Development Fund from private sources, and a student Green Fee.”*

### **Green Development Fund**

The VTCAC&SP recommended the establishment of a Green Development Fund for campus sustainability and other endowment funds for academic sustainability programs. The idea is to provide donors with an opportunity to support sustainability programs and investment in campus sustainability. The Office of Sustainability has had preliminary discussions with University Development representatives and the initiative appears promising. The Office of Sustainability will prepare and advance a draft proposal to be forwarded through the Associate Vice President for Facilities Services and the Vice President for Administrative Services for consideration.

### **Pilot Program for the Green RFP**

The Office of Budget and Financial Planning, in partnership with the Office of Sustainability, has created a pilot program to solicit and respond to proposals from recognized student organizations that will help to advance the VTCAC&SP. The purpose of this pilot program is to determine if this can be an effective strategy to understand and respond to student priorities in the area of sustainability. The intent of this process is to direct a variety of existing university financial resources to sustainability initiatives each year in order to accomplish the intended impact of a so called "Student Green Fee" but without requiring an additional increase in the fees charged to students. This approach acknowledges the complexity of the institutions regulated funding structure, the cross-cutting nature of sustainability, and the institutional wide interest in sustainability.

<sup>81</sup> <http://www.vtnews.vt.edu/articles/2010/01/2010-14.html>

<sup>82</sup> <http://stars.aashe.org/>

## Conclusion and Future Steps

In conclusion, the Office of Sustainability would like to acknowledge the time and efforts expended by many over the past year. Implementation of the VTCAC&SP is a team effort, and the Office wishes to thank those individuals who contributed to initial implementation steps as well as the preparation of this document. The past year indeed has seen much accomplished in all facets of initial sustainability implementation at Virginia Tech. However, much work lies ahead.

Specific focus areas of implementation of the VTCAC&SP for the coming year and listed by Virginia Tech Climate Action Commitment Resolution key point:

### Point 1 – Leadership

- † Strive to improve Virginia Tech's overall rating on the Sustainable Endowments Institute's College Sustainability Report Card 2011. The Campus Survey, the Dining Survey, the Endowment Survey, and eight Student Surveys were completed and submitted to SEI by July 21, 2010. Results are expected to be released in September 2010.
- † The Energy and Sustainability Committee will seek to obtain approval of Revision 2 to University Policy 5505 "Campus Energy, Water, and Waste Reduction" that incorporates the requirements contained in Virginia Governor Robert McDonnell's Executive Order 19 (2010).
- † The Office of Sustainability, in coordination with appropriate university activities, will coordinate the preparation and submission of our AASHE "STARS" program documentation.
- † Continue to promote Virginia Tech's sustainability achievements in local, state, and national publications.

### Point 2 - Strategic Plan

- † The Office of the Vice President for Research will select the new Director of Energy Initiatives.

### Point 3 - GHG Emissions Inventory

- † Conduct a comprehensive GHG emissions inventory at the conclusion of calendar year 2010.

### Point 4 - GHG Emissions Reduction

- † While maximization of coal-fired steam capability will continue to be required in the interim for budgetary reasons, continue to offset and reduce overall GHG emissions through increased coal-boiler efficiency and steam demand reductions.
- † Continue reducing purchased electricity (the highest per-Btu GHG-emitting energy source) through aggressive space temperature setbacks, continued expansion of AHU shutdown program, and maximization of onsite electrical self-generation.
- † Continue implementation of the 2009 Chilled Water Master Plan Study and associated action items by providing district chilled water to the new Academic and Student Affairs and Performing Arts Center buildings if feasible and by completing the design of new Southwest Chiller Plant.
- † Continue to develop a working partnership with Virginia Tech College of Engineering's Department of Mining & Minerals Engineering faculty to explore environmentally-friendlier fuel alternatives for Virginia Tech boilers such as dewatered coal fines from abandoned waste coal slurry ponds and biomass, as well as more sustainable solutions for boiler ash disposal.
- † Actively participate in PJM's Economic Demand Response programs; develop demand response strategies involving occupancy-based HVAC equipment shutdowns, chilled water temperature reset, and lighting and plug load reductions.

### Point 5 - Office of Sustainability

- † Continue to implement all tasks in Point #5 of the VTCAC Resolution.
- † Expand the VTCAC&SP "Status Report" spreadsheet to include actions and measures listed for the "midterm phase (2013-2025)."
- † Enhance the Office of Sustainability Website.
- † Coordinate and submit the AASHE "STARS" program documentation.
- † Coordinate the implementation of the "Student Organization Sustainability Initiative (Green Request for Proposal) Pilot Program with the Office of Budget and Financial Planning.
- † Complete the Virginia Tech Comprehensive Waste Management Plan.
- † Expand Student Intern sustainability opportunities.

### **Point 6 - LEED Certification**

- † The university has 11 capital projects registered with the U.S Green Building Council (USGBC) with six under construction and five in the design phase. The Football Locker Room Addition and ICTAS-II are scheduled for completion this fall and provide excellent opportunities for ceremonies and celebration.

### **Point 7 - Energy Efficiency**

- † Continue to implement energy-efficient lighting fixture, lamp, and control technologies in buildings as funds become available.
- † Continue to pursue advancement of the ESCO Project process; seek to obtain funding for Phase I Project ECM's and begin scope development for a Phase II project.

### **Point 8 - Waste Minimization**

- † Complete the Comprehensive Waste Management Plan.
- † Increase our overall Recycling Rate for Calendar Year 2010.
- † Expand our overall composting program and introduce composting at additional on-campus dining facilities.
- † Continue participation in Recyclemania 2011 with the goal to increase traditional recycling materials and composting figures, while simultaneously decreasing municipal solid waste.
- † Adopt additional reduction measures in the Waste Management component of the nation Recyclemania nation competition.
- † Continue to improve our Y-Toss? Program and increase volunteer participation.

### **Point 9 – Procurement**

- † Seek approval of Revision 2 to University Policy 5505 "Campus Energy, Water, and Waste Reduction" which includes provisions for purchasing Energy Star rated equipment, the use of recycled paper content, and other efficiency and conservation requirements.

### **Point 10 - Campus Engagement**

- † The Office of Sustainability will continue to support university student programs to include New Student Orientation, Gobblerfest 2010, student sustainability organizations and events, Sustainability Week 2010, Eco-Olympics, Recyclemania 2011, and Earth Week 2011.
- † Seek to expand implementation of sustainability initiatives within the Virginia Tech Department of Athletics.
- † Continue to promote and participate in sustainability communications using internal and external sources.

### **Point 11 – Transportation**

- † Virginia Tech's Fleet Services and Parking Services will continue to implement improvements with its vehicle fleet and personal transport.
- † The University's award winning Alternative Transportation Program is nationally recognized and consistently strives to improve its excellence. The program will continue to increase the current alternative transportation usage toward the goal of 52% by 2015.

### **Point 12 - Academic Programs**

- † Continue to support the Special Advisor to the Provost on Academic Sustainability Programs in a variety of sustainability initiatives.
- † Promote the use of university facilities as a learning laboratory for teaching and research.
- † Explore collaborative sustainability opportunities with university teaching, research, and administrative faculty & staff, and students.
- † Establish a Virtual School of Sustainability website as a portal to Virginia Tech academic programs related to sustainability, with links to college and department programs and content related to and profiles of campus sustainability programs.

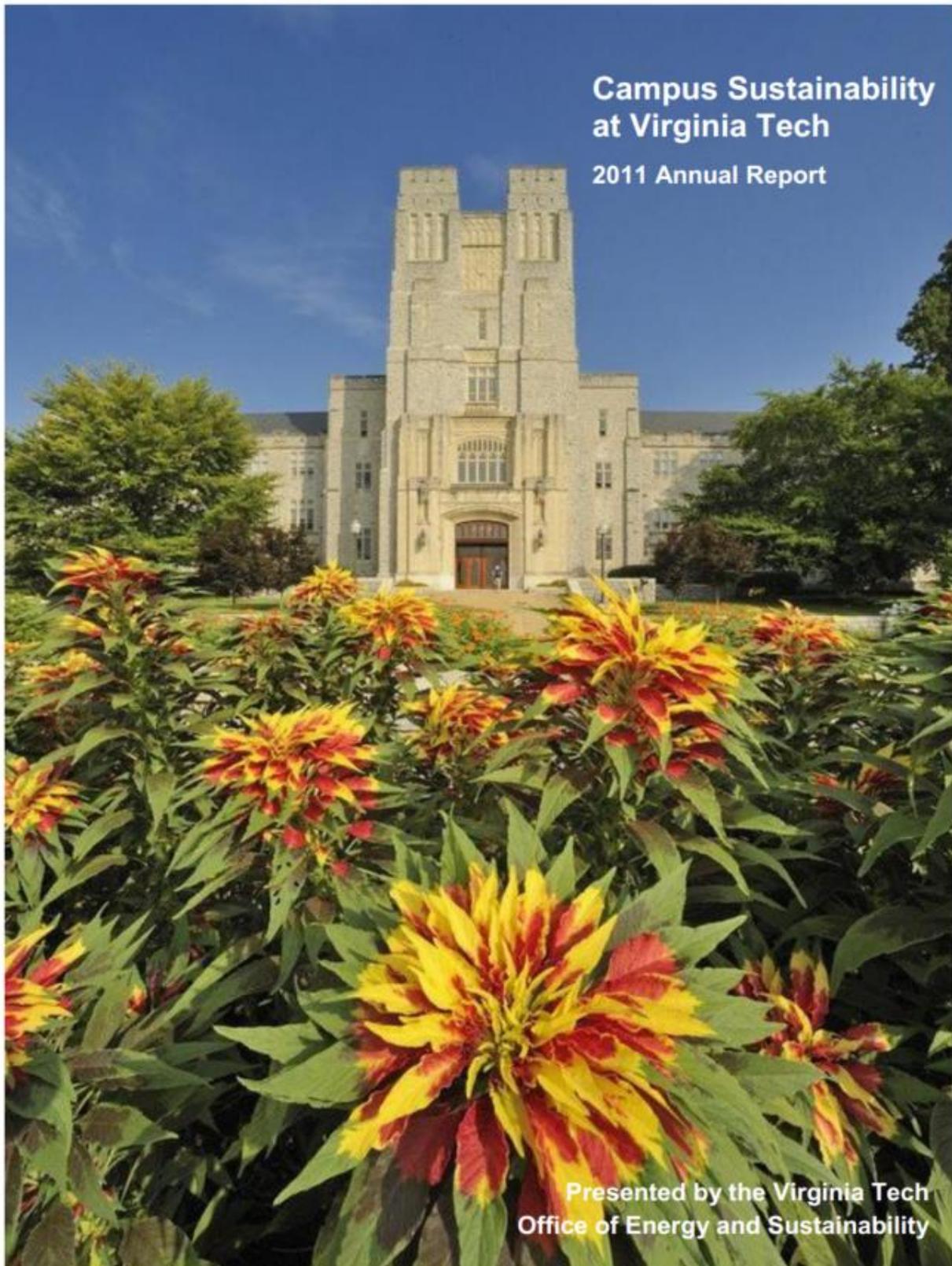
### **Point 13 - Annual Report Card**

- † Enhance and expand the Annual Report Card format and content.
- † Develop a single-page comprehensive scorecard containing metrics for key sustainability initiatives, threshold/target/stretch goals for each metric, and current progress against goals for each metric; update on a quarterly basis at minimum.

### **Point 14 – Funding**

- † Advance discussion on the establishment of a Green Development Fund.
- † Implement the Student Organization Sustainability Initiatives (Green RFP) Pilot Program.

**APPENDIX F: 2011 SUSTAINABILITY ANNUAL REPORT**



**Campus Sustainability  
at Virginia Tech**  
2011 Annual Report

Presented by the Virginia Tech  
Office of Energy and Sustainability

## 2011 Annual Report on Campus Sustainability at Virginia Tech

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## Acknowledgement

The Office of Energy and Sustainability would like to sincerely thank the multitude of faculty, staff, students and administrators that have contributed in many and diverse ways to Virginia Tech's continued sustainability progress over this past reporting year. We are confident that the upcoming 2011-2012 fiscal year will result in even greater accomplishments and we will look forward to your continued support as we work together to ensure a more sustainable future for us all.

Sincerely,  
Fred Selby, Energy and Sustainability Manager, Facilities Services  
Denny Cochrane, Sustainability Programs Manager, Facilities Services  
Angie De Soto, Campus Sustainability Planner, Facilities Services

## Executive Summary

The Virginia Tech Office of Energy and Sustainability (OES) is pleased to present the *2011 Annual Report on Campus Sustainability at Virginia Tech*. The purpose of this report is to provide a comprehensive status of implementation of the Virginia Tech Climate Action Commitment and Sustainability Plan (VTCAC&SP) and to highlight the accomplishments and breadth of sustainability programs at Virginia Tech. The creation of this report also meets the requirement of the Virginia Tech Climate Action Commitment Resolution, Point 13: "The university will monitor energy use and Green House Gas (GHG) emissions as well as changing internal and external conditions, *prepare an annual 'report card'* showing progress towards targets, and periodically reevaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies."

The significant highlights from the 2010-2011 fiscal year (FY 2011) are summarized below in order of their appearance in the report:

- ✦ Virginia Tech received a Sustainable Endowments Institute Report Card "B+" grade, a "Silver" rating in the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment and Rating System (STARS), and a 2011 Governor's Environmental Excellence Award.
- ✦ The Office of Energy and Sustainability expanded the Student Internship Program by forming four interdisciplinary teams, comprised of 28 students. These teams utilized the creativity of our students to reach across the boundaries of departments, colleges, administrative units, and auxiliary units to develop key pilot projects that can improve our campus - ranging from a collaboration with the EPA on football game-day best practices to a "sustainability advisors" program in the residence halls.
- ✦ A total of 15 Blacksburg campus Leadership in Energy and Environmental Design (LEED) registered projects with the US Green Building Council, including completion of and certification submittals for the Football Locker Room Addition, Institute for Critical Technology and Applied Science (ICTAS) II, and Visitors and Undergraduate Admissions Center, and an additional 908,982 gross square feet of new and renovation building projects currently either under construction or in design.
- ✦ A 4.0% reduction in Energy Use Intensity (thousand btu's per campus gross square footage) over FY 2009-10 and a slight decrease in annual greenhouse gas emissions, despite a 1.6% increase in campus footprint size and a continuing budgetary emphasis on maximizing coal-based steam production.
- ✦ An overall recycling rate of 37.5% for calendar year 2010, the second straight year of exceeding the VT Climate Action Commitment's 2012 goal of 35%.
- ✦ An alternative transportation use rate of 54%, significantly higher than the FY 2009-10 rate of 48% and FY 2008-09 rate of 45% and already exceeding the year FY 2014-15 VTCAC&SP goal of 52% four years ahead of schedule.
- ✦ Virginia Tech was awarded a gold award for the second year in a row for their alternative transportation programs in the Best Workplaces for Commuters (BWC) Race to Excellence.

## Background

On April 30, 2007, University Council approved the establishment of the Energy and Sustainability Committee and charged it with the responsibility to review, develop, and oversee the implementation of an energy and sustainability policy. The committee consisted of 19 members and included administrators, an academic dean, four faculty, four staff, and four students (two graduate students and two undergraduate students).

On April 25, 2008 Virginia Tech President Charles W. Steger charged the Energy and Sustainability Committee with the important responsibility of “developing a Virginia Tech Climate Commitment and Sustainability Plan that is specific to Virginia Tech.” In addition, he directed the Committee to have the draft documents reviewed through the University Governance System, and to have the “Virginia Tech Climate Commitment” placed in resolution format presented to the University Council for action by the end of the 2009 Spring Semester. The Energy and Sustainability Committee immediately created a subcommittee consisting of 20 individuals from all facets of the university to conduct appropriate research and to prepare the drafts. The Commission on University Support reviewed and recommended the approval of all draft documentation in March 2009.

On Earth Day, April 22, (less than one year from President Steger’s charge) the University Council recommended approval of “The Virginia Tech Climate Action Commitment Resolution” and accepted the accompanying Sustainability Plan.

On June 1, 2009, at their regularly scheduled meeting, the Virginia Tech Board of Visitors unanimously approved the 14-point “The Virginia Tech Climate Action Commitment Resolution” and accepted the accompanying “Sustainability Plan” (VTCAC&SP). The Sustainability Plan is a living document and provides a way for the university to achieve the points in the VTCAC Resolution. The foundation of the policy is that Virginia Tech is to become a leader in campus sustainability.

### Virginia Tech Climate Action Commitment Resolution

Per the Virginia Tech Climate Action Commitment Resolution (VTCAC), the university has adopted the following sustainability commitments:

1. Virginia Tech will be a Leader in Campus Sustainability.
2. The university will represent the VTCAC&SP in the Virginia Tech Strategic Plan.
3. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level by 2050, and interim targets from 2006 emissions of 316,000 tons consistent with the Virginia Energy Plan, the Governor’s Commission on Climate Change, the Town of Blacksburg, and the federal administration: for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).
4. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.
5. Virginia Tech will establish an Office of Sustainability to
  - a. Coordinate programs for campus sustainability,
  - b. Oversee implementation of the VTCAC&SP,
  - c. Monitor annual electricity and other energy use and GHG emissions, and
  - d. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory
6. Virginia Tech will pursue LEED Silver certification or better and exceed ASHRAE 90.1 2004 energy performance by 35% (ASHRAE 90.1 2007 by 30%) for all new buildings and major renovations. Capital budgets should account for future energy price, cost of building operation, return on investment, and environmental benefits of achieving this level of performance.
7. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations, including the heating and cooling infrastructure and operation, lighting efficiency, controls and operation, and equipment efficiency and controls.
8. The university will adopt at least 4 reduction measures in the Waste Minimization component of the national RecycleMania competition. Virginia Tech Recycling will adopt a goal of 35% recycle rate by 2012 and 50% by 2025.
9. Virginia Tech will require purchase of Energy Star rated equipment, maximum practicable recycled-content paper, and other low life-cycle cost products, with exceptions for special uses.

10. Virginia Tech will engage students, faculty and staff through education and involvement to reduce consumption of energy, water, and materials in academic and research buildings, dining and residence halls, and other facilities.
11. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies. Alternative transportation use will increase from the current level of 45%, to a goal of 52% in 2015, and 60% in 2020.
12. The university will create and support a virtual Virginia Tech School of Sustainability or similar mechanism to coordinate, develop, and communicate related instructional, research, and outreach academic programs.
13. The university will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.
14. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds. Virginia Tech will provide funding to support sustainability programs through a variety of sources, which might include savings from reduced electricity and energy fuels, E&G funds, loans, a Green Development Fund from private sources, and a student Green Fee.

### Virginia Tech Sustainability Plan

The Virginia Tech Sustainability Plan<sup>1</sup>, completed in April, 2009 and approved by the Virginia Tech Board of Visitors on June 1, 2009 plan incorporates three objectives:

1. A statement of Virginia Tech's Climate Action Commitment more specific to the university than the American Colleges and Universities Presidents Climate Commitment (PCC).
2. An action plan to achieve the goals of that commitment.
3. A plan to enhance Virginia Tech's sustainability programs and culture.

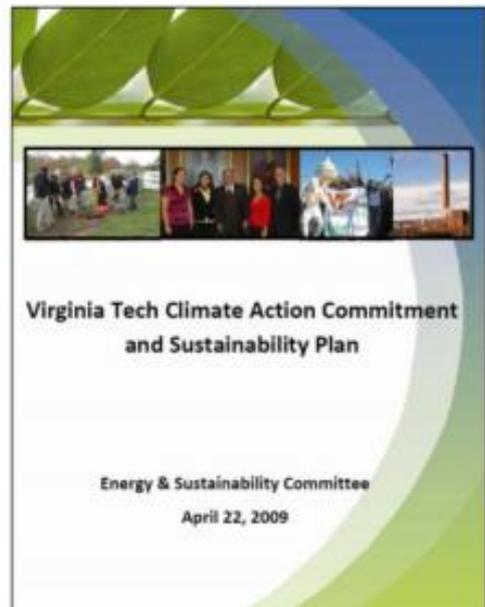
By its nature, the plan has a long time horizon since climate action and sustainability are long term issues that will not be addressed overnight. The plan recommends 118 specific actions over three time periods:

1. Immediate: 0-3 years (2009-2012) – 87 action items
2. Midterm: 4-16 years (2013-2025) – 24 action items
3. Long term: 17-41 years (2026-2050) – 7 action items

To date, approximately 67% of the immediate period action items have been completed.

The plan focuses on six action categories which will be used to provide the framework for the *2011 Annual Report on Campus Sustainability at Virginia Tech* as follows:

1. Administrative Structure and Governance
2. Facilities Infrastructure
3. Facilities Operations
4. Transportation
5. Behavior and Campus Life
6. Academic Programs



<sup>1</sup> <http://www.facilities.vt.edu/documents/sustainability/sustPlan.pdf>

# Virginia Tech's Climate Action Commitment & Sustainability Plan Implementation Progress

## 1. Administrative Structure and Governance

*"During the past two decades, the university has made attempts to better coordinate its environmental programs. Most of these efforts have focused on instructional and research programs, and few resulted in any substantive centralized direction of sustainability-related university activities until very recently." (Virginia Tech Climate Action Commitment and Sustainability Plan)*

### Leadership

Since charging the newly established Energy and Sustainability Committee on April 8, 2008 with the important responsibility of developing a Virginia Tech Climate Commitment and Sustainability Plan specific to Virginia Tech, Virginia Tech President Charles W. Steger continues to be one of its biggest proponents.

On March 17, 2011, Dr. Steger charged Paul Knox to chair a Presidential Task Force to develop a "Plan for a New Horizon" for Virginia Tech for 2012-2018<sup>2</sup>. In his year-end comments to the university community on May 12, 2011 President Steger wrote "having a collective vision of the future institutional profile well understood and accepted by the community is essential in our fast changing world. It enables us to focus on what matters, particularly as current events might impinge on our actions and ideas."<sup>3</sup> Including sustainability as one of several "key structuring questions" that must be addressed in the university's Long Range Plan initiative, he continued: "Sustainability must become part of our culture. How do we inculcate a mindset that lightens our footprint on the community and, by extension, on our planet? But few actions are no-cost. Indeed, many require large investments. Where should we invest? What evaluative mechanisms will we use to achieve useful cost/benefit analysis?"<sup>4</sup>



**"Sustainability  
must become part  
of our culture."**

Charles W. Steger  
Virginia Tech President  
Year-end Comments  
May 12, 2011

### Recognition

During the recent academic year, Virginia Tech's campus sustainability leadership again was demonstrated through a number of state and national sustainability-related awards and recognitions.

Virginia Tech received an overall rating of B+ from the **Sustainable Endowments Institute's College Sustainability Report Card 2011** which profiled 322 college and universities across the nation on sustainability performance. The university's overall grade has improved each year since it first participated in the survey in 2008. Virginia Tech received overall grades of C- in 2008, B- in 2009, and B in 2010. Virginia Tech received an A rating in six of nine categories (administration, climate change and energy, green building, student involvement, transportation, and investment priorities) used in the survey. In addition, three categories (climate change and energy, green building, and endowment transparency) improved one full letter grade from the 2010 report. Six categories (administration, food and recycling, student involvement, transportation, investment priorities, and shareholder engagement) received the same grade found in last year's survey. Virginia Tech has received an A rating in the transportation

<sup>2</sup> <http://www.longrangeplan.vt.edu/>

<sup>3</sup> <http://www.vtnews.vt.edu/articles/2011/05/051211-president-yearendcomments.html>

<sup>4</sup> <http://www.vtnews.vt.edu/articles/2011/05/051211-president-yearendcomments.html>

category for all four years it has participated in the survey, and student involvement received an A rating for all three years since this category was introduced in 2009.



In 2009, Virginia Tech registered as a charter institution in a new program to encourage sustainability in all aspects of higher education. The program, called the **Sustainability, Tracking, Assessment and Rating System (STARS)**, is administered by the Association for the Advancement of Sustainability in Higher Education (AASHE), which Virginia Tech became a member of in 2008. STARS is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. Currently 230 colleges and universities are participating in the program. Participants report achievements in three overall areas: education and research; campus operations; and planning, administration, and engagement, and receive rating levels similar to that of LEED certification: Bronze, Silver, Gold, and Platinum. Based on its recently submitted response, Virginia Tech received a **"Silver" rating** with a sustainability performance score of 61.94. For a comparison with its peer group, eight of the twelve Atlantic Coast Conference schools have registered for STARS and five have completed their submission. Duke University received a "Gold" rating with a score of 65.74, University of North Carolina received a "Silver" rating with a score of 53.11, Wake forest University received a "Silver" rating with a score of 53.05, and Florida State University received a "Silver" rating with a score of 50.21. Georgia Tech, University of Virginia and North Carolina State University are all scheduled to complete their STARS submissions within the coming year.

On April 6 at the Environment Virginia 2011 Symposium in Lexington, Va., Virginia Tech was among the 20 winners to receive a **2011 Governor's Environmental Excellence Award**, receiving a gold award for its Sustainability Plan Implementation and specifically its 2010 Green Campus Challenge. The Green Campus Challenge, modeled after the state-wide 2009 Green Commonwealth Challenge, challenged the campus administrative units to adopt policies and behaviors to conserve and reduce energy, water, materials, and transportation. A total of 50 departments participated and produced positive results that improved administrative practices and behavior regarding sustainability. Pictured left to right receiving the award are: Doug Domenech (Virginia Secretary of Natural Resources), Rob Lowe (Virginia Tech), Angie De Soto (Virginia Tech), John Randolph (Virginia Tech), Fred Selby (Virginia Tech),



Denny Cochrane (Virginia Tech), Mike Coleman (Virginia Tech), David Paylor (Director, Virginia Department of Environmental Quality), and David Johnson (Director, Virginia Department of Conservation and Recreation).

Also receiving a 2011 Governor's Environmental Excellence Award as a Gold Medal winner was the **Virginia Master Naturalist Program**, a multi-agency initiative based in Virginia Tech's College of Natural Resources and Environment. The mission of the Virginia Master Naturalist Program is to train a statewide corps of volunteers to provide education, outreach, and services to benefit Virginia's natural resources. With 30 program chapters across the state and more than 1,000 active volunteers, the program is a rapidly growing force through which volunteers broaden their own knowledge about Virginia's natural resources while benefitting their communities and the environment. Volunteers have reached more than 130,000 people through educational programs for parks, community groups, festivals, and schools.<sup>5</sup>

Virginia Tech was again listed among the most environmentally responsible colleges in the United States and Canada, according to "The Princeton Review."<sup>6</sup> The well-known education services company selected Virginia Tech for the second year in a row for inclusion in its second annual edition of its online book, **"The Princeton Review's Guide to 311 Green Colleges: 2011 Edition."** Created by "The Princeton Review" in partnership with the U.S. Green Building Council, "The Princeton Review's Guide to 311 Green Colleges" is the only free, comprehensive guidebook profiling institutions of higher education that demonstrate a notable commitment to sustainability in their academic offerings, campus infrastructure, activities and career preparation. "The Princeton

<sup>5</sup> <http://www.vtnews.vt.edu/articles/2011/05/050911-cnre-masternaturalistaward.html>

<sup>6</sup> <http://www.vtnews.vt.edu/articles/2011/05/051911-facilities-vtprincetongreenguide.html>

Review" selects schools for this guide based on a survey the company polled in 2010 on sustainability initiatives. The key for Virginia Tech's qualification includes the Climate Action Commitment and Sustainability Plan which set goals for reducing greenhouse gas emissions, energy efficiency, and the commitment to pursue LEED Silver certification standards or better for new campus buildings. The integration of sustainable programs into the academic curriculum and research also was a significant consideration. Programs focused on careers in sustainability offered by Virginia Tech's Career Services. The numerous opportunities for student involvement on campus combined with the participation levels in alternative transportation, recycling, composting, and more boosted Virginia Tech as a leader in sustainability.

### Governance

The Energy and Sustainability Committee continued to meet on a monthly basis during the 2010-2011 academic year to discuss numerous ongoing campus sustainability initiatives. The Committee revisited the current draft revision 2 to University Policy 5505 "Campus Energy, Water, and Waste Reduction" in light of Commonwealth of Virginia Governor Robert F. McDonnell's issuance of Executive Order 19 (2010) "Conservation and Efficiency in the Operation of State Government". Following the committee's approval of several minor changes to the policy, Vice President for Administrative Services, Dr. Sherwood G. Wilson approved Revision 2 on February 28, 2011.

### Student Internship Program

The Office of Energy and Sustainability continues to develop its innovative student sustainability internship program. Begun in the spring semester, 2010, its mission is to provide an academic, project, and people-based learning experience to turn campus into a living laboratory and invent the future of sustainability at Virginia Tech. The program has evolved to where it now provides students the opportunity not only to develop creative solutions to ongoing campus sustainability challenges in a structured setting, but also provides leadership training and skills-based workshops for personal and professional development. The program's strength and uniqueness lies in its emphasis on interdisciplinary collaboration between all layers of the university and its focus on synergy between project-based and classroom-based learning outcomes.

Following a fall semester 2010 program hiatus, four project teams comprising 28 unpaid student interns were created for spring semester 2011 to begin development work on the following four projects:

- **Virginia Tech Sustainability Web Portal** - a comprehensive and dynamic information portal ([www.sustainability.vt.edu](http://www.sustainability.vt.edu)) for the Virginia Tech community to streamline, connect, and organize all sustainability-related activities
- **Football Game Day Recycling Best Practices Toolkit & US EPA Partnership** - a list of best practices in the ten specified areas of game day operations, a "10 Quick Fixes" guide on getting a game day program started, and case studies on the nation's top programs; this team has and will continue to work in collaboration with the US EPA and a panel of technical experts from universities across the nation to compile data on how to best handle material management processes for large and small scale football games
- **Greening of Virginia Tech Athletics: Near Zero Waste Games and "Sustain Lane" Partnership with Athletics Department** - a full assessment of Virginia Tech game day operations, applying the best practice toolkit to game day programs and developing a logistical framework and implementation plan for a near-zero waste (90% diversion rate) football season; a "Green Effect" type program similar to the successful Student Government Association's (SGA) orange and maroon effect campaigns, built around a sustainably-produced "rally towel" to be developed, promoted and sold throughout the season in conjunction with the near zero waste game day efforts and to generate funds for sustainability initiatives on campus
- **Framework for a "Sustainability Advisors" (Eco-Reps) Program** - a peer-to-peer education and engagement program to promote sustainable living in Residence Halls

At present, a group of 23 returning and new students are working on the Virginia Tech Sustainability Web Portal, Football Game Day Recycling Best Practices Toolkit & US EPA Partnership, and Greening of Virginia Tech Athletics: Near Zero Waste Games and Rally Towel Fan Engagement teams throughout the summer and will continue through the fall semester, building on the results from the previous semester's teams. A five-year strategic plan entitled "Tomorrow's Sustainability Professionals" has been developed for the student internship program that implements a studio class structure for the 2012-2013 academic year and grows to a total of 12 teams, with two teams each working on specific projects within the following six comprehensive campus sustainability program strategic pathways:

1. Academic Programs and Research
2. Campus Culture and Social Sustainability
3. Sustainable Materials Management
4. Current Built Infrastructure & Campus Expansion
5. Sustaining Sustainability on Campus
6. Outreach and Community Partnerships



The Football Game Day Recycling Best Practices Toolkit & US EPA Partnership team was invited to present their semester work on Wednesday, April 27th in Washington, DC to representatives from the EPA as well as members of the Technical Experts Panel. Pictured from left to right are: Front Row: Katie Cooke (VT Intern), Erica Putman (VT Intern), Noor Khalidi (VT Intern, Ash Venkat (VT Intern), Angie De Soto (VT Sustainability Planner); Back Row: Jennifer Thangavelu (VT Project Manager), Thomas Younce (VT Intern), Josh Dickson (VT Intern), Katie Ridgeway (VT Project Manager), and Ron Vance (US EPA)

## Funding

As an alternative to a student green fee initiative suggested in VTCAC point #14, representatives from the Office of Budget and Financial Planning and the Office of Energy and Sustainability established the “**Green RFP (Request for Proposal) Program**”, a successful pilot program to solicit and respond to proposals from recognized student organizations to help advance campus sustainability. Student organizations submitted their Green RFPs to the Office of Energy and Sustainability during October 2010, which included additional bicycle racks, mixed paper recycling containers at residence hall collection locations, hosting the Fall 2011 Virginia Power Shift Conference on the Virginia Tech campus, a drip irrigation system and water line connection for the Sustainable Garden Demonstration project located near the Smithfield Plantation, a portable solar power generator, outdoor individual recycling containers for aluminum cans and bottles, Terracycle Recycling Receptacles for Residence Halls, and a Green Wall/Modular Trellis system on an existing building.

The individual proposals were reviewed and prioritized by the Energy and Sustainability Committee with four proposals recommended for university funding:

1. 15 Bike Racks
2. 10 Mixed Paper Recycling Containers for External placement near Residence Halls
3. Partial funding for Virginia Tech Students to host the “2011 Virginia Power Shift Conference”
4. Irrigation System and Water Connecting Line for the Sustainable Garden Demonstration

In his March 15 Memorandum, Vice President for Finance and Chief Financial Officer, Mr. M. Dwight Shelton, Jr. approved all four proposals and provided funding in the amount of \$26,763. Priority projects 1, 2 and 4 began during the 2011 Spring Semester, while coordination is underway to develop a strategy for students to raise their half of the funding required for project 3. The program is expected to be continued during the coming academic year.

## 2. Facilities Infrastructure

*“Any effort to reduce greenhouse gas emissions on campus must begin with its physical infrastructure.”* (Virginia Tech Climate Action Commitment and Sustainability Plan)

### Campus Growth

FY2011 saw continued growth to Virginia Tech’s ever-changing Blacksburg campus landscape. The completion of both the Institute for Critical Technology & Applied Sciences (ICTAS) – II and Visitors and Undergraduate Admissions Center buildings, combined with the new Football Locker Room Facility completion increased the number of major buildings from 139 to 141 and increased total campus major building gross square footage (GSF) from 8,539,232 GSF to 8,641,722 GSF. In addition, new buildings currently under construction include the Veterinary Medicine Infectious Disease Facility (October, 2011 scheduled completion), West End Market Expansion and Renovation (December, 2011 scheduled completion), Academic & Student Affairs Building (May, 2012 scheduled completion), Veterinary Medicine Instruction Addition (summer 2012 scheduled completion), and Center for the Arts (September, 2013 scheduled completion.)<sup>7</sup> Completion of these new construction projects will add an additional 256,332 GSF to the Blacksburg campus and increase its total to 8,898,054 GSF.

<sup>7</sup> <http://www.facilities.vt.edu/documents/udc/proposals/status/narrative.pdf>

### LEED Certification

The university now has a total of 15 owned LEED-registered projects with the US Green Building Council (USGBC) located on the Blacksburg campus. The Henderson Hall Renovation and Theatre 101 Addition project was completed in fall 2009 and received LEED "Gold" certification on February 5, 2010. During FY2011, three LEED-registered projects were completed and documentation for each sent to USGBC for certification determination. These projects include the addition to the Football Locker Room, the Institute for Critical Technology & Applied Sciences (ICTAS) II, and the Visitors and Undergraduate Admissions Center. Seven LEED registered projects are under construction and four are in the design phase. Specific projects are listed below:

#### Recently Completed & Documentation Submitted to USGBC – Pending LEED Certification (102,490 GSF)

- Addition to the Football Locker Room (42,145 GSF)
- Institute for Critical Technology & Applied Sciences (ICTAS) - II (42,190 GSF)
- Visitors and Undergraduate Admissions Center (18,155 GSF)

#### Under Construction (588,332 GSF)

- Renovate Ambler Johnston Residence Hall (272,000 GSF)
- Academic & Student Affairs Building (91,200 GSF)
- Center for the Arts (120,000 GSF)
- Infectious Disease Research Facility (15,700 GSF)
- Technology Research & Innovation Center- Hampton Campus (60,000 GSF)
- West End Market Expansion and Renovation (7,432 GSF)
- Vet Med Instruction Addition (22,000 GSF)

#### Under Design (320,650 GSF)

- Signature Engineering Building (160,000 GSF)
- Human & Ag Biosciences Building (92,000 GSF)
- Renovate Davidson Hall Chemistry Building (50,000 GSF)
- Chiller Plant I (18,650 GSF)



Inside the Hokie's New Prestigious and LEED-Registered Football Locker Room Facility



ICTAS II



Visitors and Undergraduate Admissions Center

## Tree Campus USA Recognition

Virginia Tech earned national **Tree Campus USA** recognition for the third consecutive year from the Arbor Day Foundation for its continued dedication to campus forestry management and environmental stewardship, the only institution of higher education in Virginia so recognized.<sup>8</sup>

During the fall semester, more than 900 Virginia Tech students, alumni, donors, and supporters signed up to become tree planters on the Arbor Day Foundation website, more than any other Tree Campus USA college or university. By finishing with the most tree planters, Virginia Tech won the Tree Campus USA "Root for Your Home Team" contest and received \$2,500 in free trees to plant on campus.<sup>9</sup> As a result, Virginia Tech students, employees, and members of the community were invited to take part in the planting of 25 new native hardwood (Pin Oak, Tulip Poplar, Black Gum, Red Oak, and Sweet Gum) trees near Slusher Wing (north of Dietrick Dining Hall) as a part of Earth Week 2011 on April 21. President Steger and Virginia Secretary of Natural Resources Doug Domenech participated in the event by presenting speeches and planting a ceremonial first tree.



Janaki Alavalapati, Professor and Forest Resources Department Head, President Steger and Doug Domenech, Va. Sec. of Natural Resources, Plant Ceremonial Tree During Earth Week Ceremony



Tree-Planting Ceremony Participants

## 3. Facilities Operations

*"The physical infrastructure determines to a large extent campus energy use and related carbon emissions, but so does its operation."* (Virginia Tech Climate Action Commitment and Sustainability Plan)

### Greenhouse Gas (GHG) Inventory and Analysis

For FY2011, total campus GHG emissions of 330,372 tons of CO<sub>2e</sub> represented a slight reduction from FY2010's 332,155 tons, and a 4.1% reduction from 2009's reported inventory maximum of 344,477 tons. Conservation efforts and efficiency improvements however, have helped to offset the growth in campus buildings over the last several years; on a per-GSF basis, GHG emissions have been reduced from FY2008's high of 0.0424 tons CO<sub>2e</sub> / GSF to 0.0387 tons CO<sub>2e</sub> / GSF in FY2011, an 8.7% reduction.

Although the university's coal-fired power plant continues to be the focal point for GHG emissions, in reality GHG's resulting from purchased electricity contribute most significantly to the university's carbon footprint. Electricity purchased from Appalachian Power Company is sourced predominately from coal-based, traditional Rankine-cycle power plants operating with overall efficiencies in the 30 to 40 percent range. Conversely, Virginia Tech's combined heat and power (CHP) facility operates in the 70 to 80 percent range. As a result, on a per-btu basis, GHG emissions from purchased electricity are 2.7 times greater than that of coal.

EPA categorizes GHG emissions as Scope 1 (direct GHG emissions from sources that are owned or controlled by the entity), Scope 2 (indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated off site but purchased by the entity, and the transmission and transmission/distribution losses associated with some purchased utilities such as chilled water, steam, and high temperature hot water) or Scope 3 (indirect GHG emissions from sources not owned or directly controlled by the entity but related to the entity's activities).<sup>10</sup>

<sup>8</sup> <http://www.vtnews.vt.edu/articles/2011/03/031011-vpas-treecampus.html>

<sup>9</sup> <http://www.vtnews.vt.edu/articles/2011/04/041411-cpsre-treeplanting.html>

<sup>10</sup> <http://www.epa.gov/oaintrnt/ghg/index.htm>

Per the VTCAC, the university is committed to reducing its carbon footprint by 2050 to 38,000 tons CO<sub>2e</sub> annual (80% below 1990 emission level), with intermediate milestones of 295,000 tons CO<sub>2e</sub> annual by 2012 and 255,000 tons CO<sub>2e</sub> annual by 2025.) Figure 1 shows emissions by EPA scope category and campus GSF trends along with VTCAC&SP emissions milestone targets.

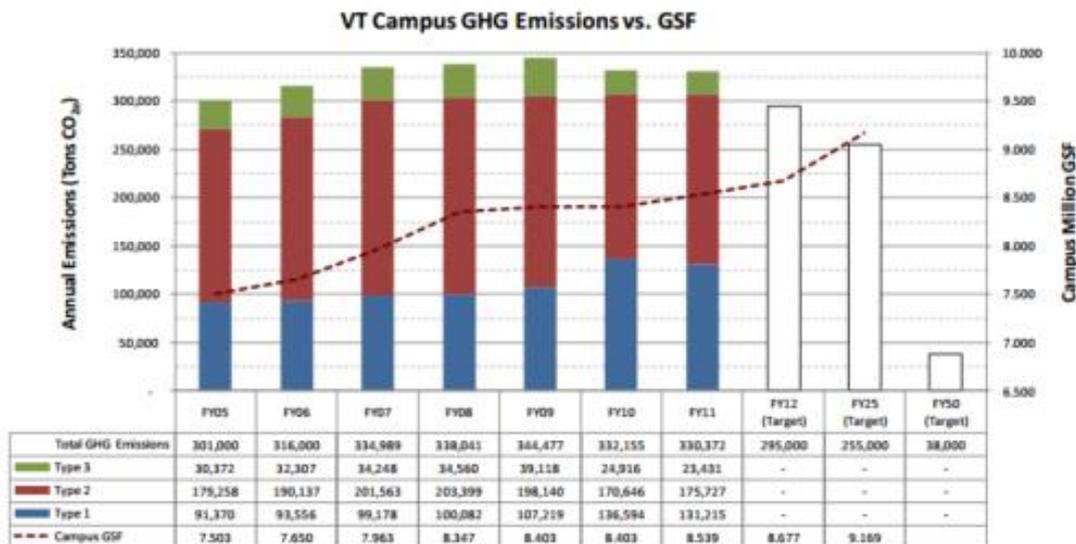


Figure 1

### Renewable Energy Opportunities

Over the last several years, the university has invested significantly in its highly efficient, environmentally compliant, and relatively low operating cost coal-based combined heat and power (CHP) facility and will continue to maximize the central powerplant's operation in the near term. However, in addition to continued efforts in energy reduction and efficiency improvements, a third short term solution to reducing the university's footprint is co-combusting of **solid biomass fuel** in the central powerplant. During FY2011, Virginia Tech Facilities personnel investigated the feasibility of co-firing several types of biomass fuels, namely native warm season grasses, wood pellets, and wood refuse. The campus central powerplant's chain grate stoker boilers naturally lend themselves to a co-firing of biomass with coal. Virginia Department of Environmental Quality (DEQ) approval for test burns to determine operating and emissions characteristics was requested and granted. A co-firing test burn of native warm season grasses is scheduled for late summer / early fall of 2011. Test burns of other biomass sources will be scheduled as both fuel and boiler availability exists.

At their March 28 quarterly meeting, the Virginia Tech Board of Visitors approved plans for the new **Perry Street Parking Garage solar photovoltaic (PV) array** to be installed on the parking garage roof. The nominal 100 kW<sub>peak</sub> dc, utility grid connected solar photovoltaic power system will consist of a total of 480 solar panels and cover approximately 16,000 square feet of area. The system is expected to produce 136,415 kWh or 13 percent of the estimated annual energy use of the facility. Once approved, construction on the \$1.3 million project could begin this fall. The project is being funded from federal stimulus money coming from the state of Virginia.

### Energy Consumption and Analysis

Energy consumption on campus was reduced from 1.954 trillion Btu's in FY2010 to 1.906 trillion Btu's in FY2011, or 2.48%. Volume data for natural gas to campus buildings, unavailable in time for the 2010 Annual Report, was included in FY2011 results and added to FY2010 results retroactively, in order to provide a complete energy consumption picture. Energy Use Intensity (EUI), a measure that represents energy consumed on a per-GSF basis improved by 4.0%, from 232.6 kBtu's per GSF in FY2010 to 223.2 kBtu's/GSF in FY2011. For comparison, the USA Energy Information Administration's (EIA) "Commercial Building Energy Consumption Survey" information aggregated data showed an average source EUI for higher education of around 280 kBtu's per GSF per year.<sup>11</sup> Figure 2 and 3 below show campus absolute and per-unit energy consumption trends and FY2011's purchased energy source percentage breakdown on a per btu basis:

<sup>11</sup> <http://www.aashe.org/forums/energy-usage-intensity-eui-benchmarks>

## VT Total Energy Use

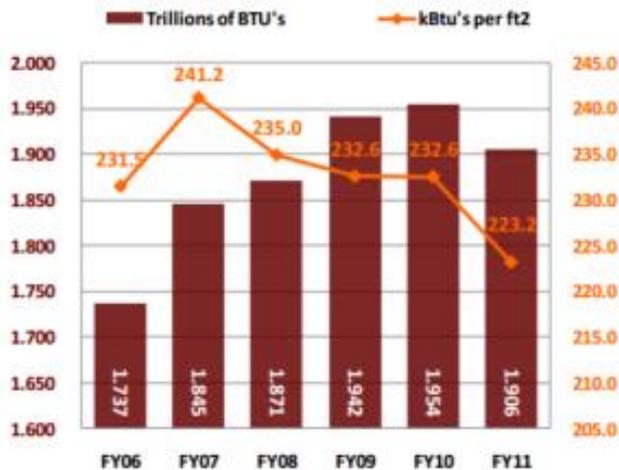


Figure 2

## FY11 Campus Energy Use By Source

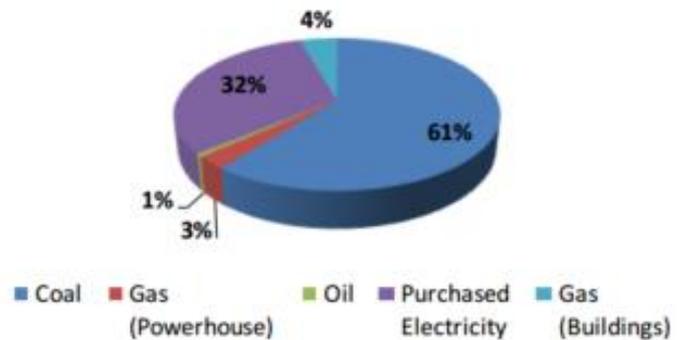


Figure 3

During the summer of 2010, Virginia Tech enrolled in “**Interruptible Load Reliability**” (ILR), an electrical demand response program that pays customers in exchange for a commitment to reduce electrical load in the event of an electrical grid emergency condition that could result in outages. ILR is sponsored by regional electric grid operator PJM Interconnection, overseen in Virginia by the Virginia Department of Mining, Minerals, and Energy and administered by EnergyConnect Inc. For 2010, Virginia Tech participated in the program with a 3,000 kilowatt reduction commitment and received a \$162,210 phased-in payment for its participation. For 2011, the university doubled its commitment to 6,000 kilowatts, and will receive payments totaling \$204,831 once it successfully completes its participation for the remainder of the summer. To help facilitate the program requirement for participants to successfully demonstrate for one hour their ability to meet their load reduction commitment, Facilities Services sponsored a “Lights Out! / Power Down!” event on June 23, where campus community members were asked to turn off and unplug, if appropriate, all non-critical lighting and electrical loads during the 3:00 pm to 4:00 pm hour. Although the university still awaits the official results from EnergyConnect, on-campus metering revealed that the university exceeded its 6,000 kilowatt goal by approximately 2,500 kilowatts.

**Maximizing electrical self-generation** in the central powerplant continues to be a short-term focus to reduce energy costs and resultant GHG emissions. Historically the campus has idled its low pressure steam distribution system during the summer and provided only medium pressure steam to users. Due to changing summertime steam load profiles over recent years, the low pressure system was able to remain in service for the summer of 2011, increasing output of the turbine generator and minimizing steam flow to the summer condenser unit.

Providing chilled water for campus cooling continues to represent a significant energy demand for the university and is also its most pressing future energy need. In July 2009 the **Chilled Water Infrastructure Master Plan Study** was completed and recommended consolidation of Virginia Tech’s existing combination of district and decentralized/stand-alone chilled water networks into a total of five regional chilled water production plants, joined to an interconnected distribution network. During FY2011, the Master Plan Study was revisited in light of current cooling energy loads and the need to soon provide district chilled water cooling to the new Academic & Student Affairs and Center for the Arts buildings, both currently under construction, as well as the new 154,935 GSF Signature Engineering Building, with its groundbreaking scheduled within the next several months. The Master Plan Study revisit revealed that all three buildings could now be accommodated by increasing chilled water capacity in the existing central chiller plant, negating at present the Master Plan Study recommendation to construct a new Northwest Chiller Plant (NWCP) to supply chilled water to the Signature Engineering Building.

### Water Consumption

Campus water consumption continued to increase, with FY2011’s total of 492,088,171 gallons representing a 21.3% increase over FY2010’s total of 405,635,683 gallons. Despite the increase, sustainable water use practices are prevalent across campus: a comprehensive domestic water metering and billing system to users, using non-potable water from the Duck Pond to irrigate the Virginia Tech Golf Course, using plants requiring a lot of water only in areas that have access to naturally occurring water, and specifying native drought-resistant trees and shrubbery as preferred in its Campus Design Principles document.<sup>12</sup>

<sup>12</sup> [http://facilities.vt.edu/documents/sustainability/unlinked/Virginia\\_Tech\\_design\\_principles.pdf](http://facilities.vt.edu/documents/sustainability/unlinked/Virginia_Tech_design_principles.pdf)

### Waste Minimization

For the second consecutive year, Virginia Tech exceeded its 2012 goal of achieving an **overall 35% recycling rate** with a FY2011 result of 37.5% and improving over FY2010's 36.5%. Although the quantity of Principle Recyclable Materials (paper, cardboard, yard waste, tires, e-waste, oil, etc.) declined slightly from 2010 to 2011, a 10.8% reduction in Municipal Solid Waste generated drove the overall improvement in rate.

Virginia Tech was among the 550 colleges and universities in the United States and Canada participating in **RecycleMania 2011**, a friendly 8-week competition among college and university recycling programs in North America and Canada designed to promote waste reduction activities in their respective campus communities. This is the sixth consecutive year that Virginia Tech has participated. Among its peer colleges and universities within the Atlantic Coast Conference, Virginia Tech typically placed in the bottom third for recycling categories, but achieved 2nd place in the Waste Minimization category at 38.32 cumulative waste pounds / person, improving over its 2010 performance of 42.41.

The Office of Energy and Sustainability teamed up again with the YMCA at Virginia Tech, the Department of Residence Life and the Town of Blacksburg to host **Ytoss 2011**. Ytoss encourages students to donate leftover goods they no longer want, such as clothing, food, furniture, rugs and any kind of electronics. The slogan for Ytoss 2011 was "we want what you've got" and more than ten tons of goods were collected. These items have been cleaned, tested and stored for the summer and will be resold back to the community during the first two days of move-in the fall. All proceeds go to YMCA community student-led programs, such as after-school tutoring, senior connections, buddy playgroup and alternative service break trips. Eight collection points across campus were set up for students to donate their items, with each located next to a dumpster for trained volunteers to encourage students throwing goods away to donate them instead.

Virginia Tech Dining Services' successful and growing **composting program** also continues to help drive the improving recycling rates. In 2008 Dining Services established a partnership with Poplar Manor Enterprises (PME), LLC and began to compost its pre-consumer food waste in January of 2009 at its Southgate Food Processing Center. Composting was next introduced at the Owens Hall Dining Facility and these two facilities composted 131 tons of food waste. During calendar year 2010 the university introduced composting at the Dietrick Dining Hall (the largest dining facility on campus), several other small dining venues, and at the Inn at Virginia Tech and Skelton Conference Center and diverted over 325 tons of food waste from the landfill which was instead collected and processed into rich soil by PME.<sup>13</sup> Some of this soil was also used at the Dining Services Garden at Kentland Farm, which is run in collaboration with the College of Agriculture and Life Sciences. In early 2011, the program was expanded further, with the new inclusion of Sbarro and all Au Bon Pain locations. Within a year, West End Market is expected to be participating in the program and the newest dining center currently under construction, Turner Place, is expected to be composting beginning with its first day in operation.<sup>14</sup> Dining Services has as its goal to expand its composting program to include all 12 dining facilities in the future.

In June, the Office of Energy and Sustainability's Waste Management Taskforce completed its **Comprehensive Waste Management Plan for Virginia Tech (CWMP-VT)**. The CWMP-VT describes current waste management operations on campus and recommended improvements for the management of campus waste. The plan's stated "long term goal is the development of a comprehensive strategy to reduce all waste streams in all campus units." Several specific recommendations to enable the university to reach the Virginia Tech Climate Action Commitment's next state, designated benchmark of a 50% waste reduction by 2025 were made in the following areas:

- Municipal Solid Waste and Recycling Collection
- Compostable Material Collection
- Reusable Material
- Waste Minimization

### VT Waste Generation and Recycling

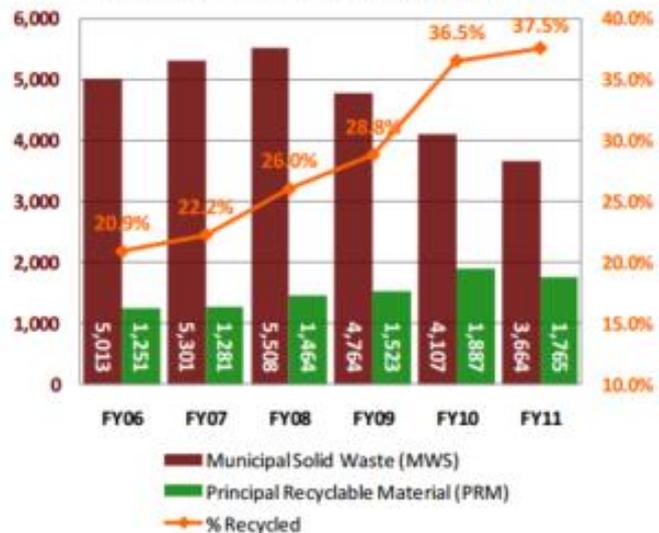


Figure 4

<sup>13</sup> <http://www.vtnews.vt.edu/articles/2011/04/041211-dsa-composting.html>

<sup>14</sup> <http://www.dining.vt.edu/sustainability/composting.php>

## 4. Transportation

*“Transportation is a critical element of campus sustainability. According to the GHG inventory, commuting and on-campus transportation contributes about 8-10% of campus GHG emissions. In addition, fuel used by Fleet Services amounts to another 0.6% and aviation services another 0.3% of total Virginia Tech emissions.”* (Virginia Tech Climate Action Commitment and Sustainability Plan)

### Alternative Transportation



Students Commuting by Bicycle on Campus

Virginia Tech continued to make great strides in the area of alternative transportation, with overall campus alternative transportation use increasing for the third consecutive fiscal year. FY2011's **alternative transportation use rate of 54%** was significantly higher than both 2010's rate of 48% and 2009's rate of 45%. By achieving this, the university has already exceeded the VTCAC&SP goal of 52% by 2015 (four years ahead of schedule) and now has the 2020 goal of 60% in its short-term sights.

Virginia Tech was awarded a gold award for the second year in a row for their Alternative Transportation programs, in the 2010 **Best Workplaces for Commuters (BWC) Race to Excellence**. A total of 23 companies, institutions, and individuals nationwide were recognized in the 2010 Race to Excellence which is designed to encourage sustainable transportation innovation and recognize organizations that have taken exemplary steps to offer transportation alternatives for their employees, thereby reducing air pollution, traffic congestion, and fuel consumption. Virginia Tech's gold award for 2010 is attributed to new and/or enhanced programs such as the new

departmental billing option from U Car Share, Virginia Tech's support to the new Smart Way buses, the hybrid and articulated Blacksburg Transit buses, a significant increase to carpool participation, the launch of the first Freshman Summer Bike Sale during orientation, and the official online Virginia Tech Ride Board.<sup>15</sup>

Virginia Tech Transportation and Campus Services and Blacksburg Transit teamed up in the **2011 Commuter Challenge** to track commute times and methods from April 11 to April 15 in an effort to raise awareness of alternative transportation methods and efficiencies.<sup>16</sup> Results from 141 logged commutes that included car, bus, bike, and walking as primary modes of travel, or some combination thereof, were released during Earth Week.<sup>17</sup> Fifty percent of the commutes that were logged were multi-modal commutes where people put their bikes on buses, or walked a fair distance to catch the bus. One surprising result was that even though cars traveled at a faster speed, cyclists had the quickest commute from Terrace View Apartments to Burruss Hall, taking only 9 minutes, versus 15 minutes by car and 17 minutes by transit.<sup>18</sup> Participants were able to log their commuting information online daily at the Commuter Challenge website and each time a participant logged their information, they were automatically entered into a daily prize drawing.

Through Virginia Tech's contract with **U Car Share** which originally brought six vehicles to campus in August 2009, a new departmental billing option was made available for Virginia Tech departments. By registering a departmental account with U Car Share, employees within that department are now able to reserve and use the U Car Share vehicles for official university business and have the charges billed back to their departmental fund instead of paying out of their pocket and dealing with complicated processes and forms involved in reimbursements when employees use their own personal vehicles for such purposes.<sup>19</sup> Virginia Tech's U Car Share program also implemented its new NOVA car sharing technology that eliminates the need for the members' card to gain entry into the vehicle. In addition to faster access, it requires less energy, and captures more information about each reservation.<sup>20</sup>

<sup>15</sup> <http://www.vtnews.vt.edu/articles/2011/02/021811-tcs-bwgold.html>

<sup>16</sup> <http://www.vtnews.vt.edu/articles/2011/04/040611-tcs-commutechallenge.html>

<sup>17</sup> <http://www.vtnews.vt.edu/articles/2011/06/060311-tcs-commutechallengeresults.html>

<sup>18</sup> [http://www.facilities.vt.edu/documents/tcs/alternative/commuterchallenge\\_highlights.pdf](http://www.facilities.vt.edu/documents/tcs/alternative/commuterchallenge_highlights.pdf)

<sup>19</sup> <http://vtnews.vt.edu/articles/2010/09/090810-tcs-ucarshare.html>

<sup>20</sup> <http://www.vtnews.vt.edu/articles/2011/01/011411-tcs-ucarsharetech.html>

Virginia Tech's Alternative Transportation division launched an **online ride board** that will become a central location for easy carpooling among students.<sup>21</sup> The ride board aims to encourage on-campus students to leave their car at home. With a fully functional, official ride board in place, carpoolers can now also easily link up and find rides to and from locations that do not have easy access to other public transportation options.<sup>22</sup>

On March 28, the Virginia Tech Board of Visitors approved the conceptual plan and design preview of a new **multi-modal transit facility** tentatively sited in what is now the Derring parking lot. The proposed 12,000-gross-square-foot facility, an initiative of the university and the Town of Blacksburg, would include a conditioned rider waiting area with information services, a bike share/bike co-op, multi-use meeting space, public restrooms, and administrative space for transit operations. In addition, the current plan calls for 14 canopied bus loading/unloading bays grouped around a central green space. No date has been set for construction to begin.<sup>23</sup> A request of \$1.6 million was made to the federal government in early spring for designing the building, and projected construction costs are estimated to be between \$15 million and \$20 million.<sup>24</sup>



### Parking and Fleet Services



During the past year Virginia Tech Parking Services invested in three new **biodiesel-powered Kubota RTV1100 utility vehicles**, replacing three full-sized pickup trucks. The Kubotas will allow parking enforcement officers to travel easily and efficiently around campus while significantly reducing fuel consumption. Following the purchase of the Kubota vehicles, Parking Services saw a 50 percent decrease in the amount of fuel needed for their daily operations. These vehicles also help contribute to the university's effort to minimize damage to the campus landscape and the small size of the vehicle also enables Parking Services employees to maneuver more easily than a car or truck through parking lots and sidewalks. In addition to the general campus enforcement operations, it was necessary that the vehicle selected would be able to perform jump-starts and carry the equipment necessary for football and special event parking, maintenance, and for helping those who are locked out of their cars.<sup>25</sup>

<sup>21</sup> <http://www.ridesolutions.org/workplace/vt/index.shtml>

<sup>22</sup> <http://vtnews.vt.edu/articles/2010/09/091510-tcs-rideboard.html>

<sup>23</sup> [http://www.bov.vt.edu/documents/Buildings\\_and\\_Grounds\\_open\\_03-28-11.pdf](http://www.bov.vt.edu/documents/Buildings_and_Grounds_open_03-28-11.pdf)

<sup>24</sup> <http://www.collegiatetimes.com/stories/17325/tech-bt-to-construct-bus-hub-in-parking-lot/p2>

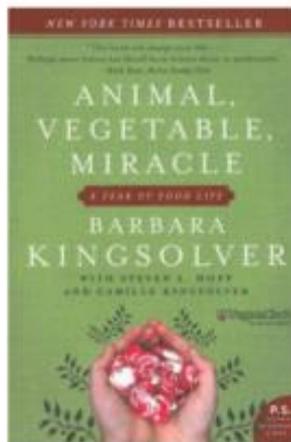
<sup>25</sup> <http://www.vtnews.vt.edu/articles/2010/10/102010-tcs-kubota.html>

## 5. Behavior and Campus Life

*"...the behavior of students, faculty, and staff directly impacts the effectiveness of all of the VTCAC's proposed actions in terms of participation, engagement, and overall campus culture. Reducing campus-wide emissions requires conscious and educated efforts to mitigate personal and institutional impacts on the natural environment, as well as the reexamination of consumer habits."* (Virginia Tech Climate Action Commitment and Sustainability Plan)

### Sustainability Events

The **2010 New Student Orientation** was restructured to streamline the information provided to incoming students. Campus organizations and departments were invited to participate in **Gobblerfest 2010**, which occurs the Friday of the first week of the fall semester, instead of the Hokie Resource Fair. To ensure that sustainability was still prominently featured in the 2010 New Student Orientation events, the Office of Energy and Sustainability partnered with the Student Government Association (SGA) to train the 2010 New Student Orientation Leaders about the importance of sustainability at Virginia Tech, the ongoing sustainability initiatives, and ways that new students could get involved. Additionally, the 2010 SGA president, Bo Hart, included remarks about sustainability in his speech during New Student Orientation. Gobblerfest, the outdoor welcome festival for students, staff, faculty, and community members to learn more about Virginia Tech and the Town of Blacksburg community, supports ways to get involved with student organizations, volunteer opportunities, campus events, and learn what local businesses have to offer. It has become a highlight of the start of the academic year. Gobblerfest 2010 attracted an estimated 19,000 people for the street fair and 3,000 students for the late-night activities held in Squires Student Center. The Office of Energy and Sustainability had a booth at Gobblerfest 2010 to promote Virginia Tech's ongoing sustainability initiatives and sustainability-related student organizations on campus.



On September 14, Barbara Kingsolver and her husband Stephen Hopp, co-authors of *Animal, Vegetable, Miracle: A Year of Food Life*, the **University Common Book** for Academic Year 2010-2011, visited the Virginia Tech campus. Kingsolver and her husband gave a presentation in Burruss Hall Auditorium and signed copies of their book afterward. This visit included the "Virginia Harvest Celebration" dinner which showcased the late-summer harvest in Southwest Virginia, with fresh seasonal vegetables and locally raised beef, pork, and lamb sourced from the Dining Services Garden at Kentland Farm, other Virginia farms, or sustainable food operations. The meal gave students the opportunity to experience a night of local dining inspired by Kingsolver's book. The meal was held at the D2 Dining Facility, was a huge success, and fed over 2,300 including 175 from outside the university community.

For the fourth consecutive year Virginia Tech, the Town of Blacksburg, and the local citizens group Sustainable Blacksburg green partnership hosted **Sustainability Week** the week of September 18-25, with Sustainability Week 2010's theme being "Celebrate, Educate, Motivate." First launched in 2007, Sustainability Week has been recognized with the Governor's Environmental Excellence Award for the efforts and abilities to promote sustainability awareness and education, and to support positive actions with practical results. Highlights of the week included:

- Saturday: Game Day Tailgate Recycling at the Virginia Tech – East Carolina University football game, where the recycling rate improved to 10.49% compared with 2009's game day recycling event rate of only 1.56%
- Monday: Ribbon-cutting and dedication ceremony for the YMCA on North Main Street's "Y Wind and Solar" project, a 640 watt wind turbine and 1,050 watt solar array initiated by a \$15,000 Community Action Grant from Virginia Tech's Office of the vice President for Research
- Tuesday: Planting of approximately 25 native hardwood shade trees on the north side of Holtzman Alumni Center Pond
- Wednesday: The Virginia Tech Active Commute Celebration, held on the drillfield to help faculty, staff, and students find more affordable commuting methods, and Farmer's Market Chef Roulette, where local chefs took on the Sustainability Week cooking challenge to cook an appetizer, main course, and dessert using only foods found at the Blacksburg Farmers Market.
- Thursday: Unveiling of the Blacksburg Transit Hybrid Bus and celebration of the Blacksburg Motor Company facility receiving its Platinum LEED designation.
- Friday: Ecotainment Fest 2010, eco-entertainment at the Blacksburg Market Square Park which showcased artists and musicians using sustainable materials or portraying an environmental message in their work.

- Saturday: Community Sustainability Fair held at the Blacksburg Community Center, including a sustainable transportation expo featuring energy efficient vehicles, a watershed open house providing education on stream ecology, children's activities, presentations, etc.



Game Day Tailgate Recycling



Active Commute Celebration

**Earth Week 2011** was hosted the week of April 18-22 by the Environmental Coalition student group, with support from the Office of Energy and Sustainability, College of Natural Resources and Environment, and several other student environmental organizations on campus. The weekend prior to Earth Week, 65 Hokies traveled to Washington DC for Powershift 2011, the nation's largest youth environmental conference and grassroots training event. On-campus highlights for the week included the following:

- "Sustainable Food Monday" featured a Farmer's Market at Graduate Life Center Plaza and a speech by Mark Winne, author of *Closing the Food Gap* and *Food Rebels*, *Guerrilla Gardeners* and *Smart Cookin' Mamas*.
- "Alternative Transportation Tuesday" featured lobby training, climate change discussion, a lively Scavenger Hunt, and a nighttime concert by entertainer Ben Folds.
- "Education & Awareness Wednesday" provided eighty-seven students from Harding Elementary School information about environmental stewardship and ecological importance, and the documentary *Electricity Fairy* was shown in Squires Student Center.
- "Think Global, Act Local Thursday" featured the ceremonial planting of 25 native hardwood trees near Slusher Wing accompanied by commemorative speeches from Commonwealth of Virginia Secretary of Natural Resources and VT alumnus Doug Domenech and President Steger (see page 11), a drillfield presentation by mountaintop removal activist Larry Gibson and a showing of the acclaimed film "Wasteland" at the Lyric Theater.
- "Earth Day Friday" concluded the week's events with an outdoor festival that included over 20 vendors, several businesses, silent art auction, and diverse musical entertainment.

celebrate

earth  week

Hosted by Environmental Coalition Week of Earth Day: April 22nd

Full Schedule at  
[EW2011.com](http://EW2011.com)

## Sustainability Communications

The university's first **sustainability newsletter** was made available by the Office of Energy & Sustainability. This newsletter will be distributed electronically on a quarterly basis and will include information about initiatives to help the university reduce its carbon footprint.<sup>26</sup>

Virginia Tech's College of Natural Resources and Environment Magazine **CNRE News** spring edition focused exclusively on sustainability, addressing a broad spectrum of topics that included sustainable coasts, sustainable water, sustainable climate, sustainable fish and wildlife, sustainable forests, sustainable land, sustainable leadership and engagement, sustainable world, sustainable business, sustainable courses, sustainable natural resources, and sustainable ecosystems.<sup>27</sup>

Transportation and Campus Services also publishes a newsletter **Transportation & Parking Update** which often provides additional information about alternative transportation options. The Summer 2011 Transportation & Parking Update newsletter highlights information about Virginia Tech's Vanpool program and the Commuter Challenge results.<sup>28</sup>

In the recently-issued summer 2011 edition of Virginia Tech magazine, President Steger in his **"Message from the President"** ("Campus makes sustainability gains"), recognized the "steady progress" being made towards VTCAC&SP goals and cited as examples the new student intern program, campus energy reduction accomplishments, LEED, sustainable dining and composting practices, and innovative alternative transportation solutions. At the same time, President Steger also raised the important question, "How will we support campus expansion in an environmentally and cost-conscious fashion?" and acknowledges that "hard decisions still remain in our future" regarding campus heating solutions, water resources, agricultural operations in an environment of "continual erosion of state (financial) support."<sup>29</sup>



## 6. Academic Programs

*"The university now boasts a comprehensive set of academic degrees, majors and minors related to sustainability..., including environmental engineering; environmental science; environmental policy and planning; landscape architecture; humanities, science, and humanities; as well as many related majors in agriculture, natural resources, and the sciences. In addition, the university hosts several research and outreach centers and institutes...that focus on specific aspects of environmental sustainability. These provide the foundation for sustainability-related research, but many faculty conduct such research outside of the center structure." (Virginia Tech Climate Action Commitment and Sustainability Plan)*

### Instruction and Learning

Virginia Tech defines sustainability in the curriculum generally as sustaining natural and human systems and their related economic, social, and environmental dimensions, consequences, and opportunities. This definition was created by the Ad Hoc Committee on Sustainability Programs, Subcommittee on Survey of Colleges. The ad hoc committee included students, faculty, a dean, and other administrators. Virginia Tech defines sustainability-focused courses as courses which use sustainability in the course title or syllabus and/or at least 50% of course content addresses long term environmental protection, social justice, and/or the relationship of the economy to environmental and social equity. Virginia Tech defines sustainability-related courses as courses in which at least 20%, but less than 50%, of course content addresses long term environmental protection, social justice, and/or the relationship of the economy to environmental and social equity.

Currently, the university offers 370 different sustainability-focused and 251 sustainability-related graduate and undergraduate courses for the upcoming 2011-2012 academic year,<sup>30</sup> or 14.8% of total courses offered. Fifty-seven departments out of a total of 81 offer at least one sustainability-related or -focused course.

<sup>26</sup> <http://www.vtnews.vt.edu/notices/070511-facilities-sustainabilitynewsletter.html>

<sup>27</sup> [http://cnre.vt.edu/cnr\\_pdf/cnre-newsletter-spring-2011.pdf](http://cnre.vt.edu/cnr_pdf/cnre-newsletter-spring-2011.pdf)

<sup>28</sup> <http://www.facilities.vt.edu/documents/unlinked/TPsum2011.pdf>

<sup>29</sup> <http://www.vtmagazine.vt.edu/sum11/president.html>



Virginia Tech's Hybrid Electric Vehicle Team of College of Engineering graduate and undergraduate students based in the College of Engineering's Joseph F. Ware Jr. Advanced Engineering Laboratory recently won the **International EcoCAR Challenge**, a three-year design competition that seeks to inspire science and engineering students to build more energy-efficient "green" automobiles. A total of 16 collegiate teams from across the United States and Canada participated in the competition, with 14 teams making it to the final day of competition in Washington, D.C. Awards were presented in Washington, D.C., after a two-week finale completion that had teams at General Motor's Milford Proving Grounds in Milford, Mich., and then the U.S. Department of Energy's headquarters in the nation's capital. In all, the team won 14 first place awards at the EcoCAR: The NeXt Challenge: Best Vehicle Testing Complete Presentation, Shortest Braking Distance, Lowest Fuel

Consumption, Best Dynamic Consumer Acceptability, National Instruments Most Innovative Use of Graphical System Design Award, Best Progress Reports and Fastest Autocross 'Fun Run' Time. They tied for Best AVL Drive Quality, and won second place or runner up for Battery Workmanship Award, Lowest Petroleum Energy Use, and Lowest Tailpipe Emissions.<sup>31</sup>

An innovative **community involvement class** in the Department of Urban Affairs and Planning that focuses on issues, concepts, and practices of citizen participation in the development of a community, provided some of its members the opportunity for hands-on learning about the local food system by volunteering at the Dining Services Garden at Kentland Farm. Students learned by weeding and harvesting the sustainable herbs and vegetables the garden produces. The Dining Services Garden at Kentland Farm has been in production since summer 2010 and has grown to almost two acres. Its fresh vegetables and herbs are served in dining centers across campus.<sup>32</sup>



Dining Services Garden Student Farm Manager Chelsea Graves

In a class called **Economic Development Studio @ Virginia Tech**, eight Virginia Tech graduate students conducted a market analysis of small town community Floyd County's assets and proposed new green business opportunities for government economic developers to support and that entrepreneurs could nurture and adopt. The class of began with and then worked to define good-fit business opportunities. They came up with four green business ideas: (1) wood pellet manufacturing; (2) a micro dairy; (3) flooring and countertops manufacturing; and (4) a "sustainable living" training-and-education center.<sup>33</sup>

### Research and Discovery

Virginia Tech's 2006-2012 Strategic Plan Update affirms the university's commitment to achieving excellence as a comprehensive land-grant university that makes innovative contributions in learning, discovery, and engagement. The Discovery Scholarship Domain<sup>34</sup> outlines the university's commitments to research and creative scholarship in strategically important areas, drawing upon established strengths and building resources in order to capture opportunities and produce quality research. Sustainability research definitions are embedded within the four strategic priorities of the Discovery Scholarship Domain as follows:

1. Energy, Materials, and Environment
2. Social and Individual Transformation
3. Health, Food and Nutrition

<sup>30</sup> [http://www.facilities.vt.edu/sustainability/courses\\_research.asp](http://www.facilities.vt.edu/sustainability/courses_research.asp)

<sup>31</sup> <http://www.vtnews.vt.edu/articles/2011/06/062111-engineering-hevtcarwins.html>

<sup>32</sup> <http://www.vtnews.vt.edu/articles/2011/02/022111-dsa-farmvolunteers.html>

<sup>33</sup> <http://vtnews.vt.edu/articles/2010/12/121510-outreach-gradstudentsfloyd.html>

<sup>34</sup> <http://www.president.vt.edu/strategic-plan/discovery.html>

#### 4. Innovative Technologies and Complex Systems

Of the 1,748 Virginia Tech faculty who are engaged in research, 636 or 36.4% are engaged in sustainability research; they also represent 54 of 70 total academic departments that conduct research.<sup>35</sup>

The July 14 issue of *Science*, the world's leading journal of original scientific research, featured the findings of a global team of cellulose researchers that includes Professor Barry Goodell, head of Virginia Tech's Department of Wood Science and Forest Products in the College of Natural Resources and Environment. The researchers studied how woody plants evolve and how fungi, the primary decomposers of wood in the forest, work symbiotically with them in order to better understand several important issues ranging from the development of cellulosic biofuels to the cycling of carbon in the environment. Understanding the cell wall degrading machinery is key to isolating the basic building blocks of cellulose sugars, which can then be used to **sustainably produce renewable biofuels and chemicals**. The research team, which also included students who studied under Goodell, summarized its collective findings in the paper, "Plant cell wall decomposing machinery underlies the functional diversity of forest fungi."<sup>36</sup>

A consortium of southern land-grant institutions that included Virginia Tech, was awarded a five-year Coordinated Agricultural Grant by the National Institute of Food and Agriculture (NIFA) to study the effects of **climate change on southern pine forests**. Virginia Tech's Department of Forest Resources and Environmental Conservation will receive a \$3.4 million portion of the grant, which aims to develop the knowledge needed to sustainably manage southern pine forests in the face of changing climate.<sup>37</sup> NIFA also awarded a \$9.28 million grant to Dr. Brett Tyler and scientists at the Virginia Bioinformatics Institute and Virginia Tech's College of Agriculture and Life Sciences to address global food security concerns through **improved soybean production**. The research team will use new diagnostic tools and genetic information to identify genes that restrict the potential for pathogens to cause disease.<sup>38</sup> The goal of the project will be to create new disease management technologies to improve the sustainability of soybean production and improve soybean yields.<sup>39</sup>

On September 30, Virginia Tech released its full version of the **Smart Grid Information Clearinghouse Web portal**. The Virginia Tech Advanced Research Institute was awarded a \$1.25 million five-year contract by the Department of Energy in October 2009 to develop the portal with assistance from the IEEE and the EnerNex Corporation. The Web portal provides a platform for direct sharing and dissemination of relevant smart grid information, and is designed to serve as the first stop for smart grid related information and acts as the essential gateway that connects the community to various information sources scattered on the worldwide web. On its release date, the portal contained background and in-depth information on more than 200 smart grid projects in the United States and more than 50 projects overseas.<sup>40</sup>

Virginia Tech's Interdisciplinary Center for Applied Mathematics was named a partner along with 11 other academic institutions in the \$122 million **U.S. Department of Energy (DOE) Energy Innovation Hub** which will be led by Pennsylvania State University. The mission of the partnership is to research, develop, and demonstrate new technologies to make both new and existing buildings more energy efficient. Technologies include computer simulation and design tools, advanced combined heat and power systems, building-integrated photovoltaic systems, HVAC systems with integrated indoor air quality management and sensor and control networks to monitor building conditions and optimize energy use.<sup>41</sup>

#### Outreach and Engagement

The **Virginia Tech Center for Student Engagement & Community Partnerships (CSECP)** is "a facilitator for relationships between students, faculty, and community members around the world;" through service, they "encourage both individuals and groups to contribute to their community, both local and global, in meaningful ways."<sup>42</sup> This year the CSECP initiated the "Seasons of Service" to foster the idea that service / engagement can and should be as natural as the seasons themselves, now and throughout one's life. Three programs that illustrate this initiative deserve special mention:

- "Local Food, Global Hunger: Sharing, Learning, Serving," a three-day event facilitated by CSECP in partnership with the local community and two international nonprofit organizations (Stop Hunger Now and Why Hunger)<sup>43</sup>, culminated in a "Fall Day of Service," during which more than 2,000 people, ages 4 to 81, packing over 285,000 meals for the people of Haiti displaced by that nation's recent earthquake.

<sup>35</sup> [http://www.facilities.vt.edu/sustainability/courses\\_research.asp](http://www.facilities.vt.edu/sustainability/courses_research.asp)

<sup>36</sup> <http://www.vtnews.vt.edu/articles/2011/07/071511-cnre-celluloseforbiofuels.html>

<sup>37</sup> <http://www.vtnews.vt.edu/articles/2011/03/030311-cnre-nifagrant.html>

<sup>38</sup> [http://www.nifa.usda.gov/newsroom/news/2011news/03281\\_vt\\_soybean.html](http://www.nifa.usda.gov/newsroom/news/2011news/03281_vt_soybean.html)

<sup>39</sup> <http://www.vtnews.vt.edu/articles/2011/03/032911-vbi-usdaaward.html>

<sup>40</sup> <http://vtnews.vt.edu/articles/2010/09/093010-ncr-finalsmartgridportallaunch.html>

<sup>41</sup> <http://vtnews.vt.edu/articles/2010/08/083110-research-doehubgrant.html>

<sup>42</sup> <http://www.vtserves.vt.edu/CSECP/About/>

<sup>43</sup> <http://www.vtnews.vt.edu/articles/2010/09/092210-outreach-3dayevent.html>

- 2011 Virginia Tech Relay for Life: Sponsored by the VT Student Government Association, involved nearly 5,500 participants and raised more than \$600,000 for cancer research; Virginia Tech is currently ranked the No. 1 university in terms of online fundraising, according to American Cancer Society reports.<sup>44</sup>
- 2011 Big Event: Virginia Tech's largest day of service event, enlisted 6,731 volunteers to complete 950 different projects addressing community needs throughout the New River Valley.<sup>45</sup>

Virginia Tech researchers are involved in a five-year project, titled "**A Conservation Agricultural Production System for the Central Plateau**" which hopes to use conservation agriculture to bring about a rebirth of productive farming in the Central Plateau highlands region of Haiti. The team, in partnership with Haitian governmental and charitable organizations is working with local farmers in three separate locations to implement conservation agriculture techniques such as minimal tillage, cover crops, and crop rotation that minimize soil disturbance and environmental impact. At each of the three locations, a small-farm resource and teaching center will be built. Researchers are also conducting trials to see if they can find varieties of beans that might be more productive and better suited for the harsh conditions of Haiti. One hope in conducting the project in rural areas is that if the venture succeeds, people will be encouraged to return to the countryside and relieve some of the population pressure on Haiti's overcrowded cities.<sup>46</sup>

Virginia Cooperative Extension and Virginia Tech's Kentland Farm hosted the fifth annual **New River Valley Agriculture Field Day** on Tuesday, August 17, at Kentland Farm in Montgomery County, Virginia. With support from Extension agents in the New River Valley and surrounding counties, the event provided sustainability learning opportunities for livestock, crop, and horticulture producers such as a soil profile workshop to help producers understand soil relationships, irrigation systems for home and commercial vegetable growers, sustainable vegetable production updates, and farm food safety through the Good Agricultural Practices program.<sup>47</sup>



New River Valley Agriculture Field Day Fencing Demonstration

The **Catawba Sustainability Center** continues to be a showcase for researchers and students from Virginia Tech to engage with the local community – a place to practice, demonstrate, learn, and teach about sustainability issues (from green building and construction to low-input agricultural production to water quality to onsite energy production to community-based business development) that affect not only the world today but the future as well.<sup>48</sup> On November 6, the Center hosted a planting day in which 50 Virginia Tech students along with several community members planted over 200 native and edible trees and shrubs funded through a United States Department of Agriculture National Agroforestry grant.<sup>49</sup> Virginia Tech students have also been involved in generating creative ideas for further development of the 377-acre center's facilities, a former dairy farm.<sup>50</sup>

Working in conjunction with the Catawba Sustainability Center is **VT EarthWorks**, a business-acceleration program for land-based sustainable businesses and part of Virginia Tech's Outreach and International Affairs. VT EarthWorks helps growers, farmers, and other businesses in the startup or expansion phases by providing access to markets, land-lease arrangements, innovative technology, and research. Last summer VT EarthWorks helped publish the *Roanoke Valley Locavore Directory* for people committed to eating foods produced or grown locally. The comprehensive directory includes everything from vegetables, meat, and cider, to restaurants, markets, and bakeries.<sup>51</sup> "Field to Fork", a meet and greet event on March 13, was sponsored by VT Earthworks and the Catawba Sustainability Center for local community members to meet and interact with local farmers and food producers.

<sup>44</sup> <http://www.vtnews.vt.edu/articles/2011/05/052611-dsa-relay.html>

<sup>45</sup> <http://www.vtbigevent.org/>

<sup>46</sup> <http://vtnews.vt.edu/articles/2010/12/121310-oired-workinhaiti.html>

<sup>47</sup> <http://www.vtnews.vt.edu/articles/2010/08/081210-cals-nrvfieldday.html>

<sup>48</sup> <http://www.catawbalandcare.org/going-on/csc-earthworks/>

<sup>49</sup> <http://www.vtnews.vt.edu/photo-galleries/plantingdaygallery.html>

<sup>50</sup> <http://vtnews.vt.edu/articles/2010/12/122010-outreach-catawbastudents.html>

<sup>51</sup> <http://vtnews.vt.edu/articles/2010/07/072810-outreach-locavore.html>

## Conclusion and Future Steps

President Steger in the recently-issued summer 2011 Virginia Tech magazine's "Message from the President" ("Campus makes sustainability gains"), states "The university has made steady progress toward goals enumerated in the Virginia Tech Climate Action Commitment and Sustainability Plan adopted in 2009. Improving the environmental stewardship and reducing the carbon footprint of this enterprise—equivalent to a small city—is no small task."<sup>52</sup> Virginia Tech's recent receiving of a AASHE STARS "silver" rating in only 3+ years since President Steger's April 25, 2008 charge to develop a Virginia Tech Climate Commitment and Sustainability Plan certainly affirms both his and the university community's sincere commitment and dedication to Virginia Tech becoming a leader in Campus Sustainability. Yes, much progress has been made, but much work remains and many more opportunities and challenges lie ahead.

While many within the Virginia Tech community will be contributing to furthering campus sustainability in the upcoming 2011-2012 fiscal year, specific areas of focus within the Office of Energy and Sustainability will be to

- Coordinate the completion of as many remaining open VTCAC&SP Immediate term (2009-2012) action items as possible and begin to address Midterm (2013-2025) action items;
- Strive to meet the 2012 interim GHG emissions target of 295,000 tons CO<sub>2e</sub> through aggressive energy conservation, utility supply efficiency improvement projects, and phased-in implementation of renewable fuel and energy sources for campus utilities;
- Begin implementation of recommended action items in the new Comprehensive Waste Management Plan for Virginia Tech to enable the university to reach its VTCAC designated 2025 benchmark of 50% waste reduction;
- Continue to expand and enhance the OES Student Internship program to both help implement campus sustainability initiatives and to increase student personal and professional development;
- Continue to coordinate and/or participate in campus and community sustainability-enhancing events such as New Student Orientation, Gobblerfest, Game Day Recycling, Sustainability Week, RecycleMania, Earth Week, Ytoss, etc.;
- Assess the recent comprehensive AASHE STARS submittal information and data and identify improvement opportunity areas and generate strategies to improve;
- Coordinate a second wave of the "Green RFP" process to fund student-generated ideas and proposals that advance campus sustainability;
- Support Dining Service's continued growth of its composting program throughout campus dining facilities;
- Improve communications and reporting of campus sustainability goals, metrics, performance and successes;
- Assess past water conservation audits and analyses and develop an updated campus water conservation strategy.

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<sup>52</sup> <http://www.vtmagazine.vt.edu/sum11/president.html>

## APPENDIX G: 2012 SUSTAINABILITY ANNUAL REPORT

### Virginia Tech Sustainability Annual Report 2011-2012

The Virginia Tech Office of Energy and Sustainability is pleased to present the Virginia Tech Sustainability Annual Report for 2011 - 2012. The purpose of this report is to provide a summary status of implementation of the Virginia Tech Climate Action Commitment and Sustainability Plan (VTCAC&SP).

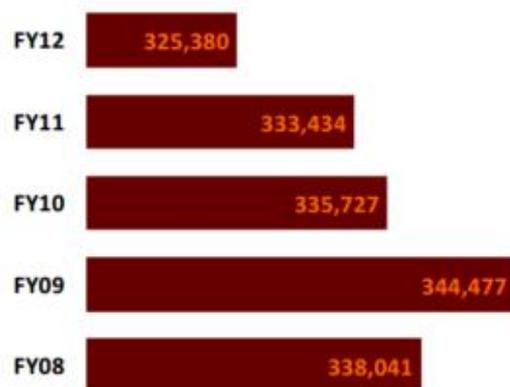
#### A. KEY SUSTAINABILITY METRICS

1. **Greenhouse Gas (GHG) Emissions:** "Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level by 2050..." (VTCAC&SP)

##### Comments

- FY2012 results were lower due in part to moderate winter and summer temperatures, but also to Central Power Plant switching over to 100% natural gas in April due to its historical low cost
- University GHG emissions are primarily driven by coal-generated purchased electricity from Appalachian Electric Power Company (56.7% of FY2012 total emissions)
- Three successful biofuel/coal co-firing trial burns were completed in Central Power Plant boilers during FY2012

##### Total GHG Footprint (Tons CO<sub>2e</sub>)

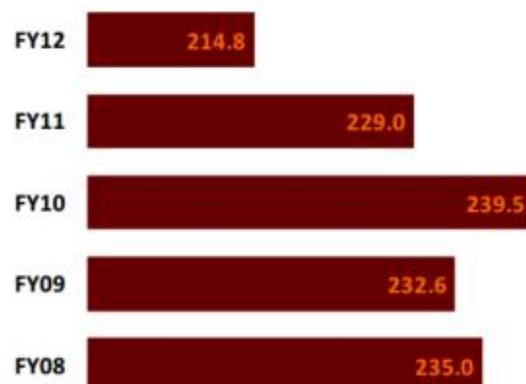


2. **Energy Use Intensity (kbtu's/GSF):** "Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations..." (VTCAC&SP)

##### Comments

- 5.9% reduction from FY2011 due in part to moderate winter and summer temperatures
- Phase 1 of the Performance Contract program (ESCO) approved for \$5.33 million of energy reduction projects across five campus buildings; project on track for 3/13 completion
- Distribution of monthly electricity reports to all Residence Halls and Dining Facilities began in September 2011

##### Energy Use Intensity (EUI) (kbtu's / GSF)

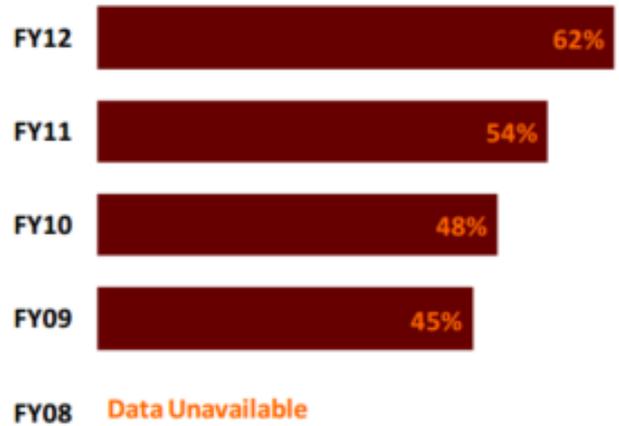


3. **Alternative Transportation Use:** "Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and **alternative transportation** policies..." (VTCAC&SP)

**Comments**

- Virginia Tech was again among 15 employers nationwide recognized with a "Race to Excellence" award by The Best Workplaces for Commuters, a program managed by the National Center for Transit Research and designed to encourage sustainable transportation innovation
- Virginia Tech's Director of Transportation and Campus Services, Steve Mouras, received a 2012 Governor's Award for Innovation for increasing efficiency and productivity of Virginia Tech's parking, fleet, and alternative transportation services

**Alternative Transportation (%)**

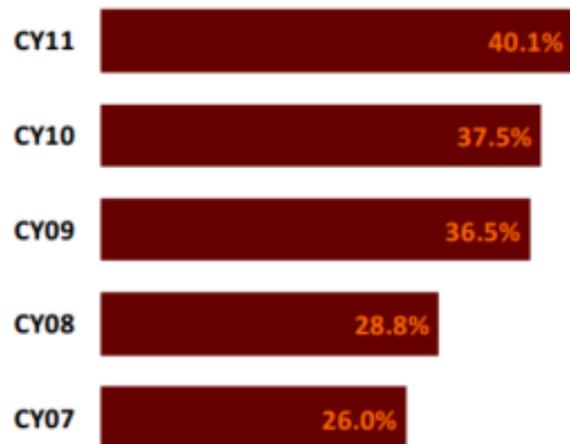


4. **Recycling:** "...Virginia Tech Recycling will adopt a goal of 35% recycle rate by 2012 and 50% by 2025." (VTCAC&SP)

**Comments**

- Calendar-year 2011 result of 40.1% marked the third consecutive year to surpass 2012 goal of 35% recycle rate
- New outdoor mixed paper recycling containers near residence halls, coupled with increased emphasis on paper recycling across campus, resulted in a nearly 10% increase in paper recycling from the previous year
- Dining Services food waste composting increased by 25% to a record 406 tons
- RecycleMania 2012 collected over 381,000 pounds of primary recyclable material, a 33% increase from the previous year

**Overall Recycle Rate (%)**



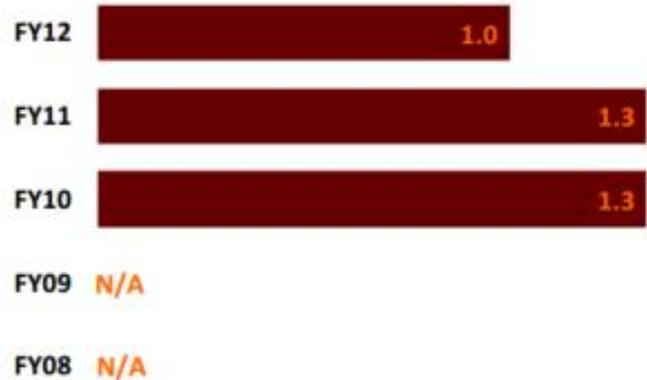
5. **Student Intern Teams:** "Virginia Tech will establish an Office of Sustainability to...manage a **campus-wide student internship and undergraduate research program** using the campus as a sustainability laboratory" (VTCAC&SP)

**Comments**

The recently redesigned student intern teams program is ready for implementation beginning fall semester 2012:

- Steering and Curriculum committees staffed for ongoing program development
- Advisory Teams of faculty and staff members created for each project team
- Professional development component expanded for academic year 2012-13
- Six teams totaling 30 students are assigned for academic year 2012-2013

**OES Student Intern Project Teams**  
(Average No. Per Semester)

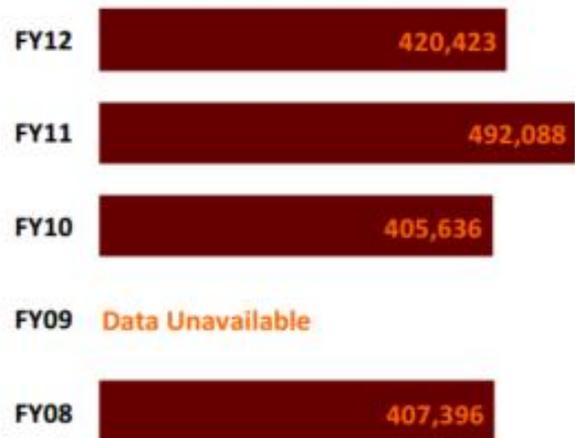


6. **Water Consumption:** "Virginia Tech will engage students, faculty and staff through education and involvement to reduce consumption of energy, **water**, and materials in academic and research buildings, dining and residence halls, and other facilities." (VTCAC&SP)

**Comments**

- Xeriscape landscaping techniques continue to be used, including the selection of drought tolerant plants. The Virginia Tech Campus Design Principles document specifies many drought-resistant trees and shrubbery native to the Appalachian Mountains for use on campus
- The three campus areas, including the Virginia Tech Golf Course, are irrigated using non-potable water from the Duck Pond. The Inn @ Virginia Tech uses a rain sensor to automatically adjust its irrigation schedule.

**Water Consumption**  
(Thousands of Gallons)



## B. OTHER FY2012 SUSTAINABILITY HIGHLIGHTS

- Virginia Tech continued to demonstrate its commitment to being a leader in campus sustainability by: (1) achieving a silver rating from AASHE “Sustainability Tracking Assessment & Rating System” (STARS); (2) being selected by the *Princeton Review* as one of 16 colleges and universities achieving the “Green Honor Roll”; and (3) by winning the Arbor Day Foundation’s Tree Campus Spring Event.
- The Virginia Tech Climate Action Commitment and Sustainability Plan was referenced and supported in “A PLAN FOR A NEW HORIZON: Envisioning Virginia Tech 2012-2018” approved by the Virginia Tech Board of Visitors on June 4, 2012.
- The Institute for Critical Technology and Applied Sciences-II (ICTAS II) received US Green Building Council LEED Gold Certification; ICTAS II is the first LEED certified research building on campus.
- Virginia Tech’s first major solar photovoltaic power system, located on the top level of the Perry Street Parking Garage on the Blacksburg campus, was commissioned spring 2012 and is expected to generate 136,000 kilowatt-hours of solar-generated electricity, or approximately 13 percent of the annual energy use of the parking garage.
- Gobblerfest, Sustainability Week, RecycleMania, Earth Week, and Ytoss - five highly visible sustainability events sponsored by the university engaged a high level of staff, student and community participation.
- Eco-Olympics, the annual inter-Residence Hall electricity usage and water consumption reduction competition was again conducted in the spring with high participation levels.
- The “Student Organization Sustainability Initiatives Program” (Green RFP) was funded, with \$37,070 dedicated for student-initiated campus sustainability-related projects
- A Sub-Committee of the university Energy and Sustainability Committee began in March to review and reassess the Virginia Tech Climate Action Commitment Resolution and accompanying Sustainability Plan; specific Sub-committee objectives include:
  1. Analyze and report on progress toward accomplishment of the fourteen goals identified in the Virginia Tech Climate Action Commitment Resolution
  2. Evaluate and recommend updates to the Climate Action Commitment and Sustainability Plan to reflect current technologies and best practices
  3. Establish interim goals to measure and verify progress toward the fourteen targeted goals stated in the CAC Resolution at periodic intervals of 3-4 years
  4. Identify resources needed for successful implementation of the fourteen targeted CAC goals

# Virginia Tech Sustainability Annual Report

## 2012 - 2013



Office of University Planning - Sustainability

September 9, 2013

## Virginia Tech Sustainability Annual Report 2012-2013

The Virginia Tech Office of Energy and Sustainability is pleased to present the Virginia Tech Sustainability Annual Report for 2012 - 2013. The purpose of this report is to provide a summary status on implementation of the Virginia Tech Climate Action Commitment and Sustainability Plan (VTCAC&SP).

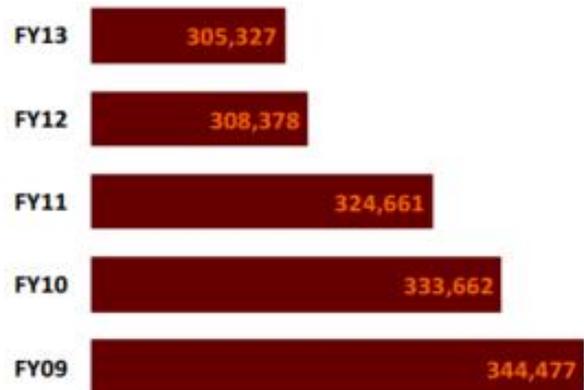
### A. KEY SUSTAINABILITY METRICS

1. **Greenhouse Gas (GHG) Emissions:** "Virginia Tech will establish a target for reduction of **campus GHG emissions** to 80% below 1990 emission level (**38,000 tons**) by 2050..." (VTCAC&SP)

#### Comments

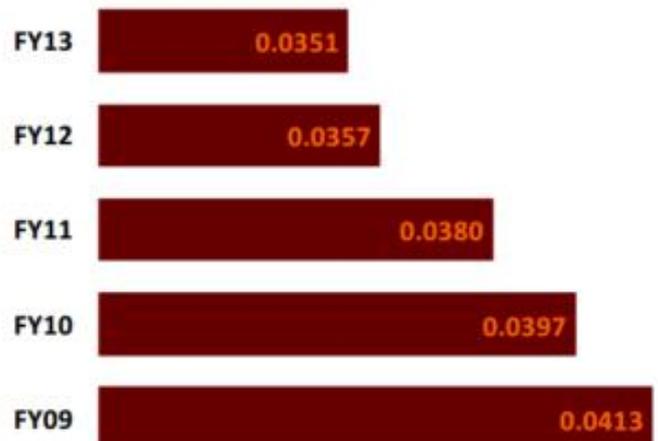
- **Slight overall reduction** (1%) from FY2012:
  - 13.8% reduction in boiler fuel-related GHG emissions due to increased natural gas (and comparably less coal) consumption
  - Reduction achieved despite continued full-year unavailability of VT turbine-generator
  - **Reduction achieved despite a much more severe winter** (22% increase in Heating Degree Days)
  - Favorable purchased electricity GHG emissions coefficient due to less coal-heavy APCO fuel mix

**Total GHG Footprint**  
(Tons CO<sub>2e</sub>)



- GHG emission percentages by fuel source:
  - Purchased Electricity 58.0%
  - Coal 23.2%
  - Natural Gas – Steam Plant 6.9%
  - Commuting 5.6%
  - Natural Gas – Buildings 3.2%
  - All Others 3.2%

**GHG Footprint - Normalized**  
(Tons CO<sub>2e</sub> / GSF)

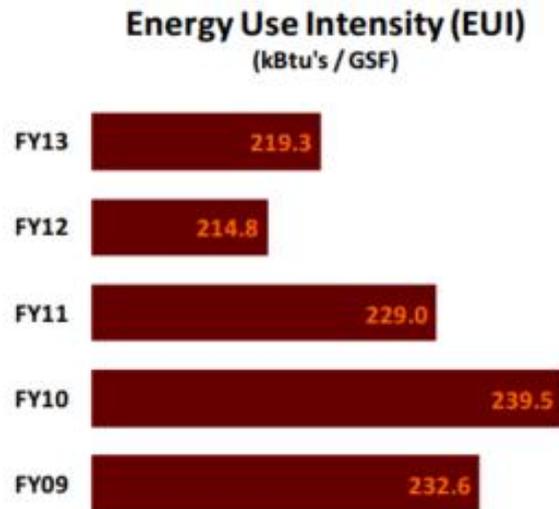


**Virginia Tech Sustainability Annual Report  
2012-2013**

2. **Energy Use Intensity (kbtu's/GSF):** "Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations..." (VTCAC&SP)

**Comments**

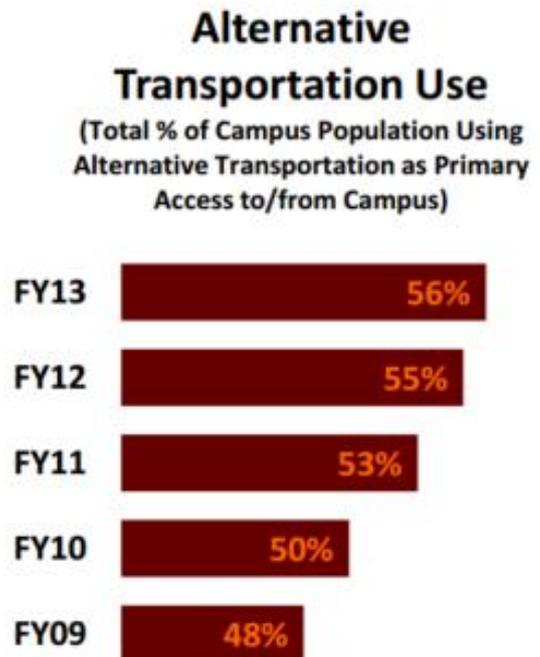
- 2.1% increase over FY2012:
  - Boiler fuel held flat despite a 22% increase in Heating Degree Days
  - Slight reduction (1.4%) in overall campus electricity consumption
  - Full-year **unavailability of VT turbine-generator estimated to have negative impact** of 7.9 kbtu/GSF
- ESCO Performance Contract project (\$5.33 million for energy reduction projects across five campus buildings) approximately 80% complete at fiscal year-end



3. **Alternative Transportation Use:** "Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and **alternative transportation** policies..." (VTCAC&SP)

**Comments**

- Virginia Tech again recognized nationwide with a **Gold "Race to Excellence" award** by The Best Workplaces for Commuters; a program managed by National Center for Transit Research and designed to encourage sustainable transportation.
- Virginia Tech among 58 colleges and universities in 30 states designated a **bicycle friendly university**. This recognition was given by League of American Bicyclists, which designated Virginia Tech at the Bronze Level for the commitment to promoting and providing a more bicycle friendly campus.
- The percentage of faculty & staff that use AT for FY 13 is 22% and the percentage of undergrad and graduate commuter students that use AT is 72%.



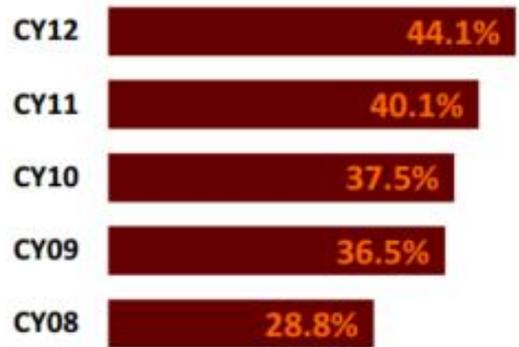
## Virginia Tech Sustainability Annual Report 2012-2013

4. **Recycling:** “...Virginia Tech Recycling will adopt a goal of 35% recycle rate by 2012 and 50% by 2025.” (VTCAC&SP)

**Comments**

- Calendar Year 2012 achieved a 44.1% Final Recycling Rate which marks **the fourth consecutive year of surpassing the 2012 goal** of a 35% recycle rate.
- Principal Recyclable Materials (PRMs) increased 15.4% to a record 2,341 tons.
- Dining Services food waste **composting increased by 43%** to a record 548 tons.
- Waste Diversion Rate (percentage of waste material kept out of the local landfill) was 84%.
- Trash was reduced by 103 tons (2.8%)

### Overall Recycle Rate (%)

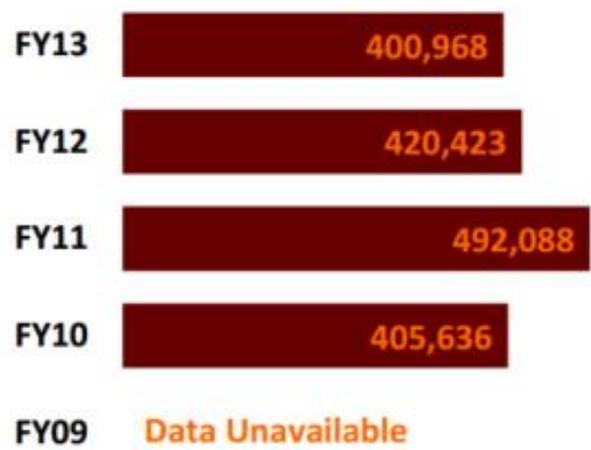


5. **Water Consumption:** “Virginia Tech will engage students, faculty and staff through education and involvement to reduce consumption of energy, **water**, and materials in academic and research buildings, dining and residence halls, and other facilities.” (VTCAC&SP)

**Comments**

- Xeriscape landscaping techniques continue to be used, including the selection of **drought tolerant plants**. The Virginia Tech Campus Design Principles document specifies many drought-resistant trees and shrubbery native to the Appalachian Mountains for use on campus
- The three campus areas, including the Virginia Tech Golf Course, are irrigated using non-potable water from the Duck Pond. The Inn at Virginia Tech uses a rain sensor to automatically adjust its irrigation schedule.

### Water Consumption (Thousands of Gallons)



**Office of Energy & Sustainability  
2013 Highlights**



**2013**  
**SUSTAINABILITY**  
*Annual Report*





## Virginia Tech Climate Action Commitment and Sustainability Plan

Energy & Sustainability Committee

*Revised May 9, 2013*

*Sustainability Annual Report to be provided per:  
Presidential Policy Memorandum No. 262 Revision 1  
May 9, 2013*

### VTCAC&SP Incorporates Three Objectives:

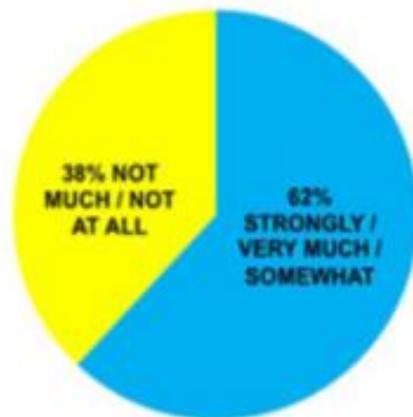
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1. Statement of Virginia Tech's Climate Action Commitment **specific to the university**
2. Action plan to **achieve the goals of commitment**
3. Action plan to **enhance sustainability programs & culture**

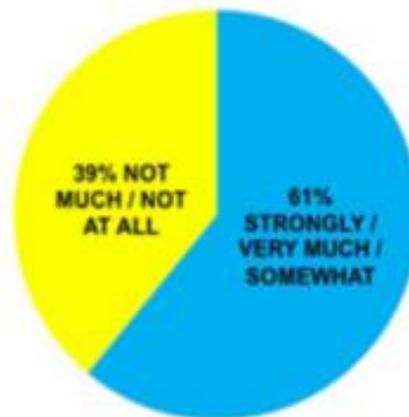
Excerpt from *The Princeton Review's* 2013 "College Hopes and Worries Survey"

If you (your child) had a way to compare colleges based on their commitment to environmental issues (from academic offerings to practices concerning energy use, recycling, etc.), how much would this contribute to your (your child's) decision to apply to or attend a school?

Students



Parents



Among respondents overall (students and parents combined), a solid majority, 62%, said having such information would contribute "Strongly," "Very Much," or "Somewhat" to their decisions while 38% of them said it would contribute "Not Much" or "Not at all." Students have placed higher value in knowing about colleges' commitments to the environment than parents have.

## Students Care

# GOVERNOR'S ENVIRONMENTAL EXCELLENCE AWARD



## 2013 GOVERNOR'S ENVIRONMENTAL EXCELLENCE AWARD

Virginia Tech

WHEREAS, Article XI of the Constitution of Virginia states that "it shall be the Commonwealth's policy to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth;" and

WHEREAS, the Commonwealth seeks to recognize those who have demonstrated leadership, innovation, and commitment to implement pollution prevention practices to reduce environmental impacts and improve our natural environment; and

WHEREAS, pollution prevention is a cost-effective and environmentally sound approach to environmental management that strives to eliminate or reduce pollution at its source by minimizing the use of energy, water, and other natural resources through increased efficiency and conservation;

NOW, THEREFORE, I, Robert F. McDonnell, Governor, do recognize Virginia Tech as a Gold Medal recipient of the 2013 Governor's Environmental Excellence Award for its demonstrated commitment to the stewardship of Virginia's natural resources through its Sustainability Program.

  
Governor

  
Secretary of Natural Resources



Award recognizes **Environmental & Conservation Leadership** in 2 categories:  
**Sustainability & Land Conservation.**

Selection based on: **Environmental Benefit, Stakeholder Involvement, Public Outreach, Transferability, & Innovation.**



Governor's Environmental Excellence Awards

## VIRGINIA TECH'S BRAGGING RIGHTS

- **Score increased** from its first rating in 2011, **just missing a Gold Rating by < 2 points**
- VT is in the **top 20%** of all 267 reporting universities
- Score is the **highest achieved to date by any college or university in Virginia**
- Score is the **3rd highest among Atlantic Coast Conference institutions**



### What is STARS?

A transparent, self-reporting tool for colleges and universities to

**MEASURE SUSTAINABLE PROGRESS** in the following areas:

**Education & Research, Operations, Planning, Administration & Engagement, and Innovation**



# 2013 LEED CERTIFICATIONS



**Virginia Tech Research Center -- Arlington**  
LEED Gold Certified (Core and Shell) 2012  
LEED Silver Certified (Interior) 2013



**Lavery Hall -- Blacksburg**  
LEED Silver Certified (New Construction) 2013



**Veterinary Medicine Instruction Addition**  
LEED Silver Certified (New Construction) 2013



# SUSTAINABILITY EVENTS

**EARTH WEEK 2013**  
**COMING AT YOU APRIL 22-26**  
 Brought to you by the Environmental Coalition @ Virginia Tech  
**GO GREEN!**

**Sustainability Week**  
 VirginiaTech *Invent the Future*  
 Blacksburg *a special place*  
 Sustainable BLACKSBURG

**EARTH WEEK 2013**  
**APRIL 22-26**

*The Environmental Coalition @ Virginia Tech Proudly Presents*

All 2013-2014 Fall events on the 2013-2014 weekly day, listing locations of classes & fields, studios by the building, Program, and location.

Monday, April 22 (EARTH)	Tuesday, April 23 (WATER/PLANTATION)	Wednesday, April 24 (TODAY)	Thursday, April 25 (ENVIRONMENTALIST)	Friday, April 26 (CLIMATE)
<p>Monday, April 22 (EARTH)</p> <p>10:00-11:00 AM: Earth Week Kick-off at the Drillfield</p> <p>11:00-12:00 PM: Earth Week Lunch at the Drillfield</p> <p>1:00-2:00 PM: Earth Week Movie at the Drillfield</p> <p>2:00-3:00 PM: Earth Week Presentation at the Drillfield</p> <p>3:00-4:00 PM: Earth Week Presentation at the Drillfield</p> <p>4:00-5:00 PM: Earth Week Presentation at the Drillfield</p> <p>5:00-6:00 PM: Earth Week Presentation at the Drillfield</p> <p>6:00-7:00 PM: Earth Week Presentation at the Drillfield</p> <p>7:00-8:00 PM: Earth Week Presentation at the Drillfield</p> <p>8:00-9:00 PM: Earth Week Presentation at the Drillfield</p> <p>9:00-10:00 PM: Earth Week Presentation at the Drillfield</p>	<p>Tuesday, April 23 (WATER/PLANTATION)</p> <p>10:00-11:00 AM: Earth Week Presentation at the Drillfield</p> <p>11:00-12:00 PM: Earth Week Presentation at the Drillfield</p> <p>1:00-2:00 PM: Earth Week Presentation at the Drillfield</p> <p>2:00-3:00 PM: Earth Week Presentation at the Drillfield</p> <p>3:00-4:00 PM: Earth Week Presentation at the Drillfield</p> <p>4:00-5:00 PM: Earth Week Presentation at the Drillfield</p> <p>5:00-6:00 PM: Earth Week Presentation at the Drillfield</p> <p>6:00-7:00 PM: Earth Week Presentation at the Drillfield</p> <p>7:00-8:00 PM: Earth Week Presentation at the Drillfield</p> <p>8:00-9:00 PM: Earth Week Presentation at the Drillfield</p> <p>9:00-10:00 PM: Earth Week Presentation at the Drillfield</p>	<p>Wednesday, April 24 (TODAY)</p> <p>10:00-11:00 AM: Earth Week Presentation at the Drillfield</p> <p>11:00-12:00 PM: Earth Week Presentation at the Drillfield</p> <p>1:00-2:00 PM: Earth Week Presentation at the Drillfield</p> <p>2:00-3:00 PM: Earth Week Presentation at the Drillfield</p> <p>3:00-4:00 PM: Earth Week Presentation at the Drillfield</p> <p>4:00-5:00 PM: Earth Week Presentation at the Drillfield</p> <p>5:00-6:00 PM: Earth Week Presentation at the Drillfield</p> <p>6:00-7:00 PM: Earth Week Presentation at the Drillfield</p> <p>7:00-8:00 PM: Earth Week Presentation at the Drillfield</p> <p>8:00-9:00 PM: Earth Week Presentation at the Drillfield</p> <p>9:00-10:00 PM: Earth Week Presentation at the Drillfield</p>	<p>Thursday, April 25 (ENVIRONMENTALIST)</p> <p>10:00-11:00 AM: Earth Week Presentation at the Drillfield</p> <p>11:00-12:00 PM: Earth Week Presentation at the Drillfield</p> <p>1:00-2:00 PM: Earth Week Presentation at the Drillfield</p> <p>2:00-3:00 PM: Earth Week Presentation at the Drillfield</p> <p>3:00-4:00 PM: Earth Week Presentation at the Drillfield</p> <p>4:00-5:00 PM: Earth Week Presentation at the Drillfield</p> <p>5:00-6:00 PM: Earth Week Presentation at the Drillfield</p> <p>6:00-7:00 PM: Earth Week Presentation at the Drillfield</p> <p>7:00-8:00 PM: Earth Week Presentation at the Drillfield</p> <p>8:00-9:00 PM: Earth Week Presentation at the Drillfield</p> <p>9:00-10:00 PM: Earth Week Presentation at the Drillfield</p>	<p>Friday, April 26 (CLIMATE)</p> <p>10:00-11:00 AM: Earth Week Presentation at the Drillfield</p> <p>11:00-12:00 PM: Earth Week Presentation at the Drillfield</p> <p>1:00-2:00 PM: Earth Week Presentation at the Drillfield</p> <p>2:00-3:00 PM: Earth Week Presentation at the Drillfield</p> <p>3:00-4:00 PM: Earth Week Presentation at the Drillfield</p> <p>4:00-5:00 PM: Earth Week Presentation at the Drillfield</p> <p>5:00-6:00 PM: Earth Week Presentation at the Drillfield</p> <p>6:00-7:00 PM: Earth Week Presentation at the Drillfield</p> <p>7:00-8:00 PM: Earth Week Presentation at the Drillfield</p> <p>8:00-9:00 PM: Earth Week Presentation at the Drillfield</p> <p>9:00-10:00 PM: Earth Week Presentation at the Drillfield</p>

**Events on the Drillfield All Day! 10-3pm**

**Get In The Game: Recycle**  
**Feb 3 - Mar 30, 2013**  
 Sponsored By:  
 Office of Energy & Sustainability SGA  
 Division of Student Affairs Environmental Coalition

VISIT:  
[www.facilities.vt.edu/sustainability](http://www.facilities.vt.edu/sustainability)

VirginiaTech *Invent the Future*

**YTOSS: 2013**

A student-led sustainability program of the YMCA at Virginia Tech

Be a part of the largest student-led sustainability event on campus!

**VOLUNTEER. DONATE. LIVE SUSTAINABLY.**

- Eco-Olympics
- OES Internship Program
- Game Day Recycling
- Gobblerfest
- Power Down Lights Out
- Sustainability Guide for New Students
- New Student Orientation Leaders

# SUSTAINABILITY ANNUAL REPORT

Virginia Tech: Office of University Planning

## GREEN RFP PROGRAM

The intent of the Green RFP program is to direct a variety of existing university financial resources to **Student Driven Sustainability Initiatives** each year to promote sustainability at Virginia Tech.

- **22 student proposals totaling more than \$155,000** since FY 2012
- **10 student proposals totaling more than \$92,000** for FY 2013 = **60% > previous year**
- **Preference is given to proposals** that support the Virginia Tech Climate Action Commitment and Sustainability Plan and **that produce achievable savings.**



**QUESTIONS OR COMMENTS?**



## APPENDIX I: STARS CROSS-WALK WITH VTCAC&SP SPREADSHEET

EDUCATION AND RESEARCH (ER)						
Fall Semester 2013						
STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Co-Curricular Education</b>						
ER-1 Student Sustainability Educators Program	5	0	Not Pursuing	#45, 60		Could claim points if a "Sustainability Advisors/Eco Rep" peer-to-peer program is initiated
ER-2 Student Sustainability Outreach Campaign	5	5	Pursuing	#10, 72		
ER-3 Sustainability in New Student Orientation	2	2	Pursuing	#46		
ER-4 Sustainability Materials and Publications	4	4	Pursuing	#47, 50		May need to reinstate newsletter to claim full points in future
Tier2-1 Student Group	0.25	0.25	Pursuing			
Tier2-2 Organic Garden	0.25	0.25	Pursuing			
Tier2-3 Model Room in Residence Hall	0.25	0	Not Pursuing	#61		Could pursue in the future
Tier2-4 Themed Housing	0.25	0	Not Pursuing			Could pursue in the future
Tier2-5 Sustainable Enterprise	0.25	0	Not Pursuing			Could pursue in the future
Tier2-6 Sustainability Events	0.25	0.25	Pursuing	#33		
Tier2-7 Outdoors Program	0.25	0.25	Pursuing			
Tier2-8 Themed Semester or Year	0.25	0.25	Pursuing			Have claimed in past w/ "Common Book Project" (09-10 and 10-11). Will need new program or common book that emphasizes sustainability to claim these points in the future
<b>Curriculum</b>						
ER-5 Sustainability Course Identification	3	3	Pursuing	#78		Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-6 Sustainability-Focused Courses	10	8.83	Pursuing	#78	13	Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-7 Sustainability-Related Courses	10	2.00	Pursuing	#78	13	Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-8 Sustainability Courses by Department	7	5.47	Pursuing	#78		Course inventory will need to be updated, currently dated Summer 2012 (can cover 1, 2, or 3 years)
ER-9 Sustainability Learning Outcomes	10	6.46	Pursuing	#78		Currently calculated from AY 09-10. Will need to be updated
ER-10 Undergraduate Program in Sustainability	4	4	Pursuing	#79		
ER-11 Graduate Program in Sustainability	4	4	Pursuing			
ER-12 Sustainability Immersive Experience	2	2	Pursuing	#77		
ER-13 Sustainability Literacy Assessment	2	0	Not Pursuing			Could pursue in the future
ER-14 Incentives for Developing Sustainability Courses	3	0	Not Pursuing			Could pursue in the future
<b>Research</b>						
ER-15 Sustainability Research Identification	3	3	Pursuing	#82		Research inventory will need to be updated
ER-16 Faculty Involved in Sustainability Research	10	10	Pursuing	#82		Research inventory will need to be updated
ER-17 Departments Involved in Sustainability Research	6	6	Pursuing	#82		Research inventory will need to be updated
ER-18 Sustainability Research Incentives	6	6	Pursuing	#82		
ER-19 Interdisciplinary Research in Tenure and Promotion	2	2	Pursuing	#82		
<b>Total</b>	<b>100</b>	<b>75.01</b>				
<b>VT Unique Items</b>						
			I	#81		Promote new research in energy efficiency and sustainability using undergraduate research and the university campus as a living laboratory.
			O	#85		Career Services provides information on Green Jobs to career counselors.

**OPERATIONS (OP)**

**Fall Semester 2013**

STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Buildings</b>						
OP-1: Building Operations and Maintenance	7	0	Not Pursuing		6	Could pursue credit if any building(s) become LEED for Existing Building Operations & Maintenance certified
OP-2: Building Design and Construction	4	168	Pursuing	#19	6, 7	
OP-3: Indoor Air Quality	2	0.21	Pursuing		NA	
<b>Climate</b>						
OP-4: Greenhouse Gas Emissions Inventory	2	2	Pursuing		3, 13	
OP-5: Greenhouse Gas Emissions Reduction	14	0	Pursuing	#4, 5, 6, 7, 8, 9, 11, 12, M-1, M-2, M-3, M-4, M-5, M-6, M-7, M-17, M-18, M-20, M-22, M-23, L-1, L-2, L-3, L-4, L-5	3, 4	Continued GHG reductions and related projects may help gain points for this credit; points are heavily impacted by 2005 baseline calculation
Tier2-1: Air Travel Emissions	0.25	0.25	Pursuing		4	
Tier2-2: Local Offsets Program	0.25	0	Not Pursuing		4	Could pursue in the future
<b>Dining Services</b>						
OP-6: Food and Beverage Purchasing	6	0.82	Pursuing	#65		
Tier2-3: Trayless Dining	0.25	0.25	Pursuing	#62		
Tier2-4: Vegan Dining	0.25	0.25	Pursuing			
Tier2-5: Trans-Fats	0.25	0.25	Pursuing			
Tier2-6: Guidelines for Franchisees	0.25	0	Pursuing			Marked as "pursuing" because Dining Services' has informal system to require franchisees to be sustainability. Could pursue credit if official sustainability guidelines are created
Tier2-7: Pre-Consumer Food Waste Composting	0.25	0.25	Pursuing	#64		
Tier2-8: Post-Consumer Food Waste Composting	0.25	0.25	Pursuing			
Tier2-9: Food Donation	0.25	0.25	Pursuing	#63		
Tier2-10: Recycled Content Napkins	0.25	0.25	Pursuing			
Tier2-11: Reusable Mug Discounts	0.25	0.25	Pursuing	#59		
Tier2-12: Reusable To-Go Containers	0.25	0	Pursuing			Marked as "pursuing" because Dining Services conducted a pilot program in 2011. Could pursue credit if program is created (in the works?)
<b>Energy</b>						
OP-7: Building Energy Consumption	8	0	Pursuing	#5, 6, 7, 8, 9, 11, 12, 22, 29, 36, 55, 57, M-4, M-5, M-6, M-7, M-17, M-18, M-20, M-22, M-23, L-3, L-4, L-5	7	Continued energy efficiency projects may help gain points for this credit; points are heavily impacted by 2005 baseline calculation
OP-8: Clean and Renewable Energy	7	0.08	Pursuing	#4, 16, M-1, M-2, M-3, L-1, L-2	4, 5	
Tier2-13: Timers for Temperature Control	0.25	0.25	Pursuing	#28	7	
Tier2-14: Lighting Sensors	0.25	0.25	Pursuing	#21	7	
Tier2-15: LED Lighting	0.25	0.25	Pursuing	#22	7	
Tier2-16: Vending Machine Sensors	0.25	0.25	Pursuing		7	
Tier2-17: Energy Management System	0.25	0.25	Pursuing		7	
Tier2-18: Energy Metering	0.25	0.25	Pursuing		6, 7, 8, 13	

**OPERATIONS (OP)**

**Fall Semester 2013**

STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Grounds</b>						
OP-9: Integrated Pest Management	2	0.32	Pursuing			
Tier2-19: Native Plants	0.25	0.25	Pursuing			
Tier2-20: Wildlife Habitat	0.25	0.25	Pursuing			
Tier2-21: Tree Campus USA	0.25	0.25	Pursuing	#25		
Tier2-22: Snow and Ice Removal	0.25	0.25	Pursuing			
Tier2-23: Landscape Waste Composting	0.25	0.25	Pursuing			
<b>Purchasing</b>						
OP-10: Computer Purchasing	2	1.50	Pursuing			
OP-11: Cleaning Products Purchasing	2	1.27	Pursuing	#38		
OP-12: Office Paper Purchasing	2	0.95	Pursuing	#37	10	
OP-13: Vendor Code of Conduct	1	0	Not Pursuing			Note from STARS v 1.2: "As a public institution it is not clear that we have the latitude to adopt a policy that may be in conflict with our legal requirements to conduct competitive procurement."
Tier2-24: Historically Underutilized Businesses	0.25	0.25	Pursuing			
Tier2-25: Local Businesses	0.25	0	Not Pursuing			Note from STARS v 1.2: "As a public institution we are prohibited by law from granting any preferences in our purchasing activities."
<b>Transportation</b>						
OP-14: Campus Fleet	2	0.06	Pursuing	#39, 40, 41	11	
OP-15: Student Commute Modal Split	4	2.52	Pursuing		11	
OP-16: Employee Commute Modal Split	3	0.57	Pursuing		11	
Tier2-26: Bicycle Sharing	0.25	0	Not Pursuing			Could pursue in the future
Tier2-27: Facilities for Bicyclists	0.25	0.25	Pursuing			
Tier2-28: Bicycle Plan	0.25	0.25	Pursuing			
Tier2-29: Mass Transit	0.25	0.25	Pursuing			
Tier2-30: Condensed Work Week	0.25	0.25	Pursuing	#44		
Tier2-31: Telecommuting	0.25	0.25	Pursuing	#44		
Tier2-32: Carpool/Vanpool Matching	0.25	0.25	Pursuing			
Tier2-33: Cash-out of Parking	0.25	0	Not Pursuing			Could pursue in the future (but unlikely)
Tier2-34: Carpool Discount	0.25	0.25	Pursuing			
Tier2-35: Local Housing	0.25	0	Not Pursuing			Could pursue in the future (but unlikely)
Tier2-36: Prohibiting Idling	0.25	0	Not Pursuing			Could claim point in future if an official policy to prohibit idling is created.
Tier2-37: Car Sharing	0.25	0.25	Pursuing			
<b>Waste</b>						
OP-17: Waste Reduction	5	1.61	Pursuing	#34, 58, 71	9	
OP-18: Waste Diversion	3	2.52	Pursuing			
OP-19: Construction and Demolition Waste Diversion	1	0.90	Pursuing			
OP-20: Electronic Waste Recycling Program	1	1	Pursuing			
OP-21: Hazardous Waste Management	1	1	Pursuing			
Tier2-38: Materials Exchange	0.25	0.25	Pursuing			
Tier2-39: Limiting Printing	0.25	0.25	Pursuing			
Tier2-40: Materials Online	0.25	0.25	Pursuing			
Tier2-41: Chemical Reuse Inventory	0.25	0	Not Pursuing			Not pursuing. EHSS concerns with trying to implement "chemical reuse program."
Tier2-42: Move-In Waste Reduction	0.25	0.25	Pursuing			
Tier2-43: Move-Out Waste Reduction	0.25	0.25	Pursuing			

**OPERATIONS (OP)**

**Fall Semester 2013**

STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Water</b>						
OP-22: Water Consumption	7	0	Pursuing	#23, 68, 69		Continued water efficiency projects may help gain points for this credit; points are heavily impacted by 2005 baseline calculation
OP-23: Stormwater Management	2	2	Pursuing	#26, 27		
Tier2-44: Waterless Urinals	0.25	0.25	Pursuing			
Tier2-45: Building Water Metering	0.25	0.25	Pursuing			
Tier2-46: Non-Potable Water Usage	0.25	0.25	Pursuing			
Tier2-47: Xeriscaping	0.25	0.25	Pursuing			
Tier2-48: Weather-Informed Irrigation	0.25	0.25	Pursuing			
<b>Total</b>	<b>100</b>	<b>30.76</b>				
<b>VT Unique Items</b>						
				#14	I	Develop demand side energy efficiency and load management on campus and in VTES municipal service area.
				#15	I	Reduce electricity and energy consumption per gross square foot and per enrolled student.
				#16		Develop plan for future VTES electricity that includes on-campus and VTES municipal service area demand side management, smart grid infrastructure, and sources.
				#17, #18, #30, #31	I	Continue enhancements and upgrades to central chilled water system to improve efficiencies.
				#43	O	Blacksburg Transit should continue replacing old buses with more fuel-efficient buses to reduce their dependency on fossil fuels.
<b>Completed</b>	<b>C</b>					
<b>Implemented/On-going</b>	<b>O</b>					
<b>In progress</b>	<b>I</b>					
<b>On Hold/Cancelled</b>	<b>H</b>					

**Planning, Administration and Engagement**

**Fall Semester 2013**

STARS Credit Number and Title	Points Possible	STARS v 1.2 Rating 3/19/2013	Credits Pursued STARS v 1.2	VTCAC&SP Status Report Item	VTCAC Component No.	Comments: Credit maintenance or new programs needed to claim points in future STARS Report(s)
<b>Coordination and Planning</b>						
PAE-1 Sustainability Coordination	3	3	Pursuing	#1	3	
PAE-2 Strategic Plan	6	6	Pursuing		2	
PAE-3 Physical Campus Plan	4	4	Pursuing			
PAE-4 Sustainability Plan	3	3	Pursuing			
PAE-5 Climate Plan	2	2	Pursuing			
<b>Diversity, Access, and Affordability</b>						
PAE-6 Diversity and Equity Coordination	2	2	Pursuing			Consider including social sustainability components into updated Sustainability Plan?
PAE-7 Measuring Campus Diversity Culture	2	2	Pursuing			*
PAE-8 Support Programs for Under-Represented Groups	2	2	Pursuing			*
PAE-9 Support Programs for Future Faculty	4	4	Pursuing			*
PAE-10 Affordability and Access Programs	3	3	Pursuing			*
Tier2-1 Gender Neutral Housing	0.25	0.25	Pursuing			*
Tier2-2 Employee Training Opportunities	0.25	0.25	Pursuing			*
Tier2-3 Student Training Opportunities	0.25	0.25	Pursuing			*
<b>Human Resources</b>						
PAE-11 Sustainable Compensation	8	7.12	Pursuing			Sustainable compensation data will need to be updated, existing figures from 2011
PAE-12 Employee Satisfaction Evaluation	2	2	Pursuing		12	
PAE-13 Staff Professional Development in Sustainability	2	2	Pursuing	#56		
PAE-14 Sustainability in New Employee Orientation	2	2	Pursuing	#53		
PAE-15 Employee Sustainability Educators Program	5	2.43	Pursuing			Data will need to be updated, existing figures from 2011
Tier2-4 Childcare	0.25	0.25	Pursuing			
Tier2-5 Employee Wellness Program	0.25	0.25	Pursuing			
Tier2-6 Socially Responsible Retirement Plan	0.25	0.25	Pursuing			
<b>Investment</b>						
PAE-16 Committee on Socially Responsible Investment	2	0	Not Pursuing			Additional investment credits to pursue in the future?
PAE-17 Shareholder Advocacy	5	0	Not Pursuing			*
PAE-18 Positive Sustainability Investments	9	0.43	Pursuing			
Tier2-7 Student-Managed SRI Fund	0.25	0	Not Pursuing			*
Tier2-8 Socially Responsible Investment Policy	0.25	0	Not Pursuing			*
Tier2-9 Investment Disclosure	0.25	0	Not Pursuing			*
<b>Public Engagement</b>						
PAE-19 Community Sustainability Partnerships	2	2	Pursuing	#2		
PAE-20 Inter-Campus Collaboration on Sustainability	2	2	Pursuing	#2		
PAE-21 Sustainability in Continuing Education	7	7	Pursuing	#2		
PAE-22 Community Service Participation	6	4.29	Pursuing	#2		
PAE-23 Community Service Hours	6	2.18	Pursuing	#2		
PAE-24 Sustainability Policy Advocacy	4	4	Pursuing	#2		
PAE-25 Trademark Licensing	4	2	Pursuing			
Tier2-10 Graduation Pledge	0.25	0	Not Pursuing	#52		Could pursue in the future
Tier2-11 Community Service on Transcripts	0.25	0	Not Pursuing			Could pursue in the future
Tier2-12 Farmers' Market	0	0	Not Applicable			
<b>Total</b>	<b>99.75</b>	<b>72.13</b>				
<b>VT Unique Items</b>						

## APPENDIX J: VT SUSTAINABILITY PLAN UPDATE WITH PROGRESS TO-DATE

### 2014 Update of 2009 Virginia Tech Sustainability Plan (Organized by the 14 Points of the Virginia Tech 2013 Climate Action Commitment)

This 2014 Update of the 2009 Virginia Tech Sustainability Plan integrates the goals, objectives and strategies of the 2013 Update to the Virginia Tech Climate Action Commitment (VT CAC) (Presidential Policy Memorandum No. 262, Revision 1) and adopts the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment, and Rating System (STARS) program as its primary monitoring and management tool. It also includes Plan goals, objectives and strategies (GOS) that go beyond the STARS protocol, what we call VT-Unique GOS.

This section presents the Plan, organized by the 2013 VT CAC. The section shows how STARS credits and VT-Unique GOS relate to the 14 points of the VT CAC. Relevant STARS credits are listed under each CAC point; in parentheses are given the VT 2013 v.1.2 STARS results as a percentage of possible points. More detailed STARS strategies and metrics are found in the Virginia Tech AASHE STARS documentation. VT-Unique GOS are given for each VT CAC point, including updated elements of the 2009 Plan (marked with \* below) as well as new elements (marked with \*\* below). A summary of progress is also given for each CAC point, based on the March 2013 STARS submission or current (March 2014) status of VT-Unique GOS.

### The Virginia Tech Climate Action Commitment Update 2013 Presidential Policy Memorandum No. 262 (Revision 1)

**15. Virginia Tech will be a Leader in Campus Sustainability. Sustainability is an integral part of the fabric of the university as it pursues enhanced economic stability and affordability, diversity and inclusion, environmental stewardship, expansion of knowledge, and education of future leaders.**

- STARS Credits
  - All Planning, Administration, Engagement (PAE) Sub-Categories:
    - Coordination and Planning (100% of possible 18 points)
    - Diversity, Access, Affordability (100% of 13.75 points)
    - Human Resources (83% of 19.75 points)
    - Investment (2.5% of 16.75 points)
    - Public Engagement (75% of 31.5 points)
  - Operations: Grounds
    - OP-9 Integrated Pest Management (16% of 2 points)
    - Tier 2-19 to 23: Native plants, Wildlife habitat, Tree Campus USA, Snow removal, Landscape waste composting (100% of 1.25 points)
  - Operations: Water
    - OP-22 Water Consumption: (0% of 7 points)
    - OP-23 Stormwater Management: (100% of 2 points)
    - Tier 2-44 to 48 Waterless urinals, Water metering, Non-potable water use, Xeriscaping, Weather-informed irrigation (100% of 1.25 points)
  - Operations: Dining Services
    - OP-6 Food and Beverage Purchasing: (14% of 6 points)



**17. Virginia Tech will establish a target for reduction of campus GHG emissions to 80% below 1990 emission level of 188,000 tons by 2050, and interim targets from 2006 emissions of 316,000 tons for 2012, 295,000 tons (on path to 2025 target); for 2025, 255,000 tons (2000 emission level); and for 2050, 38,000 tons (80% below 1990 emission level).**

- STARS Credits:
  - Operations (OP) OP-5 (GHG reductions) (0% of 14 points)
- VT-Unique GOS:
  - \*Continuing progress toward GHG target
- Progress:
  - 2013 STARS VT overall OP-5 GHG: (0% of 14 points)
  - GHG Emissions: 2012: 295,000 tons; 2013: 305,000 tons (down from peak 2009 344,000 tons)

**18. Virginia Tech will work toward these emission reduction targets through improved energy efficiency, reduction of energy waste, replacement of high-carbon fuels, and other measures identified in the VTCAC&SP.**

- STARS Credits: Operations
  - OP-7 Building Energy (0% of 8 points)
  - OP-8 Clean and Renewable Energy (1.1% of 7 points)
  - Tier 2-13 to 2-18: Timers, sensors, metering, LED lighting, energy management (100% of 1.5 points)
- VT-Unique GOS:
  - \*a. Reduce electricity and energy consumption per gross square foot and per enrolled student.
  - \*b. Continue enhancements and upgrades to central chilled water system to improve efficiency.
  - \*\*c. Employ Energy Service Company (ESCO) contracts, based on experience with current 5-building contract, to improve energy efficiency of campus buildings.
  - \*\*d. Replace high-carbon coal and fuel oil in the steam plant with lower-carbon natural gas and biomass fuels.
  - \*e. Develop demand-side energy efficiency and load management programs on campus and in VTES municipal service area.
  - \*f. Develop plan for future VTES electricity that includes on-campus and VTES municipal service area demand-side management, smart grid infrastructure, and distributed sources.
  - \*g. Implement Policy 5505: Campus Energy, Water and Waste Reduction
- Progress:
  - 2013 STARS overall OP Energy credits: (10% of 15 points)
  - a. Energy use per GSF: 2009: 233 kBtu/GSF; 2013: 219 kBtu/GSF
  - b. More efficient Centralized Chiller upgrades and additions continue.
  - c. ESCO Performance Contract project (\$5.33 million) 80% complete in 2013
  - d. VT-ATMOS Energy have an agreement for construction of larger 8-inch natural gas pipeline to the central steam plant to provide fuel flexibility to reduce cost and emissions.

Even before the new pipeline, from FY12 to FY13 steam plant purchases of coal dropped 30% and natural gas increased 250%.

- e. & f. VTES is a collaborating partner in Solarize Blacksburg and the Town of Blacksburg's Georgetown University Energy Prize competition. VTES may consider adopting an energy efficiency program once APCO program approved (APCO DSM programs to be submitted March and July 2014 for State Corporation Commission approval with January 2015 start date)

**19. Virginia Tech will maintain a sustainability office to:**

- f. Coordinate programs for campus sustainability;**
- g. Oversee implementation of the VTCAC&SP;**
- h. Monitor annual electricity and other energy use and GHG emissions;**
- i. Working with faculty and departments, manage a campus-wide student internship and undergraduate research program using the campus as a sustainability laboratory; and**
- j. Coordinate communication regarding campus sustainability initiatives and programs to the university community and external audiences.**

- STARS Credits: Planning, Administration, and Engagement (PAE)
  - PAE-1 Sustainability Coordination (100% of 3 possible points)
  - PAE-3 Physical Campus Plan (100% of 4 points)
  - PAE-4 Sustainability Plan (100% of 3 points)
  - PAE-5 Climate Plan (100% of 2 points)
- VT-Unique GOS:
  - \*Campus-wide student internship and undergraduate research program
  - \*Maintain University Sustainability Website
- Progress:
  - 2013 STARS VT overall PAE Coordination/Planning 100% of 12 points
  - Sustainability Office has three full-time staff plus GRA plus interns
  - Internship program is in its fourth year
  - Sustainability Website is effective, but portal to academic programs is needed

**20. Virginia Tech will improve the sustainability of its built environment by:**

- c. Achieving LEED Silver certification or better for all eligible and applicable new buildings and major renovations;**
- d. Evaluating the feasibility of LEED for Existing Buildings certification for its existing buildings.**

- STARS credits:
  - OP-1 Building Operations and Maintenance: (0% of 7 points)
  - OP-2 Building Design and Construction: (42% of 4 points)
  - OP-3 Indoor Air Quality: (10% of 2 points)
- VT-Unique GOS:
  - \*Implement LEED Silver or better certification for new buildings and major renovations
  - \*\*Conduct pilot program for pursuing LEED for Existing Buildings certification for one or more buildings

- Progress:
  - 2013 STARS VT overall OP Buildings score: (15% of 13 points)
  - 16 LEED registered projects: 8 projects are completed and certified (3 Gold, 4 Silver, 1 Certified), 3 projects are completed and awaiting certification, 3 projects are under construction, and 2 projects are in design.
  - LEED for Existing Buildings has yet to be evaluated.

**21. Virginia Tech will improve electricity and heating efficiency of campus facilities and their operations by:**

- c. Exceeding the most current version of ASHRAE 90.1 energy performance by 10% for all new buildings and major renovations. Capital budgets should account for future energy price, life cycle cost of building operation, and environmental benefits of achieving this level of performance;**
- d. Improving the heating and cooling infrastructure and operation, lighting efficiency, equipment efficiency, and metering and controls of its existing buildings.**

- STARS credits:
  - OP-1 Building Operations and Maintenance: (0% of 7 points)
  - OP-2 Building Design and Construction: (42% of 4 points)
  - OP-3 Indoor Air Quality: (10% of 2 points)
  - OP-22 Water Consumption: (0% of 7 points)
  - Tier 2-44 to 46 Waterless urinals, Water metering, Non-potable water use (100% of 0.75 points)
- VT Unique GOS:
  - \*Explore means to integrate life-cycle economic and environmental operating costs in capital budgets
  - \*In addition to LEED certification, evaluate energy performance of new buildings and major renovations to exceed ASHRAE 90.1 energy performance standard by 10% or more.
  - \*Improve water-use efficiency of new and existing buildings
- Progress: 3/2014
  - 2013 STARS VT overall OP Building & Building Water: 13% of 20.75 points
  - Not yet undertaken: exploring integrating life-cycle costs in capital budgets; evaluating energy performance of new buildings to exceed ASHRAE 90.1

**22. Virginia Tech will minimize waste and achieve a 50% recycle rate by 2020.**

- STARS Credits:
  - Dining Services Waste Tier 2-3,2-7 to 2-12: Trayless dining, Pre-consumer food waste compost, Post-consumer food waste compost, Food donation, Recycled content napkins, Reusable mug discounts, Reusable to-go containers (86% of 1.75 points)
  - OP-17 Waste Reduction: (32% of 5 points)
  - OP-18 Waste Diversion: (84% of 3 points)
  - OP-19 Construction/Demo. Waste Diversion (90% of 1 credit)
  - OP-20 Electronic Waste Recycling (100% of 1 credit)
  - OP-21 Hazardous Waste Management (100% of 1 credit)

- Waste Tier 2-38 to 2-43 Materials exchange, Limiting Printing, Materials on-line, Chemical reuse inventory, Move-in waste reduction, Move-out waste reduction (83% of 1.5 points) VT-

Unique GOS:

- \*a. Achieve 50% recycle rate by 2020
- \*b. Participation and recognition in national Recycle-Mania competition
- \*c. Enhance quality and recognition of Dining Services Sustainability waste minimization
- \*d. Implement Policy 5505: Campus Energy, Water and Waste Reduction
- \*e. Work with the YMCA at Virginia Tech and other groups to complement VT Recycling with move-in/move-out reuse programs like Y-Toss.
- Progress:
  - 2013 STARS VT Waste Reduction to include Composting: (69% of 14.25 points)
  - a. 2013 Recycle Rate: 44%.
    - 2013 Waste diversion rate (waste kept out of landfill): 84%.
    - In 2013, 600 tons of food waste composted (1/4 of all recycled material) with collection from all 12 Dining Facilities and The Inn at Virginia Tech.
    - In 2014, deployed 100 Big Belly Solar Trash Compactors and Recycling Containers on campus.
  - b. In 2014, VT participated in Recycle-Mania for the 9<sup>th</sup> consecutive year, and had the nation's highest participation rate in the pledge drive.
  - c. Full-time Dining Services Sustainability Manager; 2013 compost tonnage: xx

### 23. Virginia Tech will:

- c. **Require purchase or lease of Energy Star rated equipment and maximum practicable recycled content paper, in accordance with University Policy 5505, with exceptions for special uses;**
- d. **Consider a product's life cycle cost and impact when making purchasing decisions.**
- STARS Credits:
  - OP-10 Computer Purchasing (75% of 2 points)
  - OP-11 Cleaning Products Purchasing (64% of 2 points)
  - OP-12 Office Paper Purchasing (48% of 2 points)
  - OP-13 Vendor Code of Conduct (0% of 1 credit)
  - Tier 2-24,25 Historically Underutilized Businesses, Local Businesses (50% of 0.5 points)
- VT-Unique GOS:
  - \*Implement Policy 5505: Campus Energy, Water and Waste Reduction
  - \*Make sustainability a priority in the procurement department
- Progress:
  - 2013 STARS VT overall OP Purchasing: 53% of 7.5 points
  - Implementation of Policy 5505 depends on active participation of department leaders.
  - The Director of Materials Management has made sustainability a priority in the procurement department (e.g. Surplus Property program and the HokieSwap office supply & equipment reuse program)
  - As part of its 10-year "Pouring Rights" contract, Coca-Cola provides funding to campus sustainability initiatives.

**24. Virginia Tech will engage students, faculty, and staff through education and involvement to develop and implement innovative strategies for efficient and sustainable use of energy, water, and materials in all university-owned facilities.**

- STARS Credits:
  - Planning, Administration, Engagement (PAE)-1 Sustainability Coordination (100% of 3 points)
  - PAE-13 Staff Professional Development in Sustainability (100% of 2 points)
  - PAE-14 Sustainability in New Employee Orientation (100% of 2 points)
  - PAE-15 Employee Sustainability Educators Program (49% of 5 points)
  - PAE-20 Inter-Campus Coordination on Sustainability (100% of 2 points)
  - PAE-22 Community Service Participation (72% of 6 points)
  - PAE-23 Community Service Hours (36% of 6 points)
  - PAE-24 Sustainability Policy Advocacy (100% of 4 points)
  - Education and Research (ER)-2 Student Sustainability Outreach Campaign (100% of 5 points)
  - ER-3 Sustainability in Student Orientation (100% of 2 points)
- VT-Unique GOS:
  - \*Develop and implement programs to engage students, faculty and staff in the implementation of the VTCAC and Sustainability Plan
- Progress:
  - 2013 STARS VT overall PAE and ER Engagement overall: 78% of 37 points
  - Conducted Green Campus Challenge in 2010 to engage all departments

**25. Virginia Tech will improve transportation energy efficiency on campus through parking, fleet, and alternative transportation policies and practices. The university will continue to implement programs that encourage the use of alternative transportation methods and will continue to implement programs and services that promote eco-responsible fleet management.**

- STARS Transportation Credits:
  - OP-14 Campus Fleet (3.3% of 2 points)
  - OP-15: Student Commute Modal Shift (63% of 4 points)
  - OP-16: Employee Commute Modal Shift (19% of 3 points)
  - Tier 2-26 to 2-37 Bike sharing, Bicyclists facilities, Bicycle plan, Mass transit, Condensed work week, Telecommuting, Carpool/vanpool matching, Cash-out of parking, Carpool discount, Local housing, Prohibiting idling, Car sharing (75% of 3 points)
- VT-Unique GOS:
  - \*Continue to promote Alternative Transportation Program to reduce commuting vehicle miles traveled and related emissions.
  - \*\*Develop multi-modal transportation facility on campus
  - \*Blacksburg Transit should continue replacing old buses with more fuel-efficient buses to reduce their dependency on fossil fuels.
- Progress:
  - 2013 STARS VT overall OP Transportation: 43% of 12 points

- For three years in a row, VT has received the gold award for “Best Workplaces for Commuters” by the National Center for Transit Research and a bronze award for being a “Bicycle Friendly Campus.”
- The university has a 56% Alternative Transportation participation rate.
- The planned multi-modal transportation facility will centralize transit transfers and serve multiple modes of alternative transportation.
- In 2010, Blacksburg Transit acquired nine replacement hybrid buses, and it operates two test vehicles using B20 biodiesel.

**26. Virginia Tech will continue to develop and implement innovative sustainability-related academic programs in instruction, research, and outreach, and will coordinate and communicate these programs to the university community and external audiences.**

- STARS Education, Research and Outreach Credits
  - ER-1 Student Sustainability Educators (0% of 5 points)
  - ER-2 Student Sustainability Outreach (100% of 5 points)
  - ER-3 Sustainability in New Student Orientation (100% of 2 points)
  - ER-4 Sustainability Material & Publications (100% of 4 points)
  - Tier 2-1 to 2-8 Student group, Organic garden, Model residence room, Themed housing, Sustainable enterprise, Sustainability events, Outdoors program, Themed semester or year (63% of 2 points)
  - ER-5 Sustainability Course Identification (100% of 3 points)
  - ER-6 Sustainability-Focused Courses (88% of 10 points)
  - ER-7 Sustainability-Related Courses (20% of 10 points)
  - ER-8 Sustainability Courses by Department (78% of 7 points)
  - ER-9 Sustainability Learning Outcomes (65% of 10 points)
  - ER-10 Undergraduate Program in Sustainability (100% of 4 points)
  - ER-11 Graduate Program in Sustainability (100% of 4 points)
  - ER-12 Sustainability Immersive Experience (100% of 2 points)
  - ER-13 Sustainability Literacy Assessment (0% of 2 points)
  - ER-14 Incentives for Developing Sustainability Courses (0% of 2 points)
  - ER-15 Sustainability Research Identification (100% of 3 points)
  - ER-16 Faculty Involved in Sustainability Research (100% of 10 points)
  - ER-17 Departments Involved Sustainability Research (100% of 6 points)
  - ER-18 Sustainability Research Incentives (100% of 2 points)
  - PAE-19 Community Sustainability Partnership (100% of 2 points)
  - PAE-21 Sustainability in Continuing Education (100% of 7 points)
- VT-Unique GOS:
  - \*a. Promote new research in energy efficiency and sustainability
  - \*b. Use undergraduate research, the university campus and the surrounding community as a living laboratory
  - \*c. Continue to develop innovative sustainability related academic courses and programs
  - \*d. Career Services provides information on Green Jobs to career counselors
  - \*e. In community outreach and engagement, continue to work with, surrounding jurisdictions, especially the Town of Blacksburg, and community organizations to promote common interests in advancing sustainability.

- Progress: 3/2014
  - 2013 STARS VT overall Instruction, Research, Outreach: (75% of 102 points)
  - a. Energy Research Initiatives in Office VP for Research and Sustainable Energy and Water program director in Institute for Critical Technologies and Applied Science (ICTAS)
  - b. Sustainability Internship program in OES; programs in CNRE, CALS, COE, CAUS, COS utilize campus grounds and facilities and the surrounding community for instruction and research.
  - c. Colleges/ departments continue to develop sustainability related programs, led by CNRE.
  - d. Career Services offers information on jobs related to sustainability.
  - e. The University continues to co-sponsor the annual Sustainability Week (now Celebrate Sustainability), Earth Week, and other activities with Town government, the community organization Sustainable Blacksburg, and other groups. In 2014, the University is partnering with the Town on two initiatives: Solarize Blacksburg and the Georgetown University Energy Prize.

**27. Virginia Tech will monitor energy use and GHG emissions as well as changing internal and external conditions, prepare an annual 'report card' showing progress towards targets, and periodically re-evaluate targets, making adjustments to targets as appropriate based on changing internal and external conditions and evolving technologies.**

- STARS Credits: None Applicable
- VT-Unique GOS:
  - \*a. Monitor progress in all 14 VTCAC elements and produce an annual report for presentation to the campus community and Board of Visitors
  - \*\*b. About every five years, re-evaluate the VTCAC and Sustainability Plan and update as needed.
  - \*\*c. Utilize STARS as a sustainability management tool to monitor progress.
  - \*\*d. Accommodate STARS updated versions and submit new data as appropriate.
- Progress:
  - a. Sustainability Annual Report presented to BOV each year
  - b. In 2013 the Energy & Sustainability Committee updated the 2009 VTCAC (Presidential Policy Memorandum No. 262 Revision 1).
  - b. The 2009 VT Sustainability Plan is being updated in 2014.
  - c. 2014 VT Sustainability Plan Update proposes STARS as management tool
  - d. VT submitted STARS v.1.1 data in August 2011 and the v.1.2. data in March 2013

**28. Virginia Tech will work to provide funding to support sustainability programs. With regard to all the items in this resolution, major personnel and investment decisions, including capital projects, associated with implementing the VTCAC&SP will be based on a joint review of costs and benefits by university financial and facilities staff and be subject to availability of funds.**

- STARS Credits: None Applicable
- VT-unique GOS:
  - \*\*Work to integrate life-cycle costs into both capital and operating budgets, especially for building efficiency and energy systems to better manage long term costs.

- **\*\*Grow annual Green RFP funding to support student-initiated proposals for sustainability-related projects consistent with this Sustainability Plan.**
- **Progress:**
  - Since academic year 2010-11, the Green RFP program has funded 22 student proposals with over \$156K. The AY 2013-14 Green RFP program has 8 proposals being considered for funding.