Campus Energy, Water, and Waste Reduction Policy

No. 5505

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9/26/2006

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Policy Owner:
Chris Kiwus

Policy Author: *(Contact Person)*
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Affected Parties:
Undergraduate
Graduate
Faculty
Staff

1.0 Purpose

The purpose of this policy is to guide the operations of the university to achieve the highest standards in energy/water usage and waste reduction with consideration of the impact on environmental quality and economic performance. To accomplish this goal, the university has established procedures to consider energy/water use and waste reduction in the design and operation of university facilities in the most economical and environmentally friendly manner possible, educate the university community on the use of energy/water and waste reduction, and consider energy/water usage and waste reduction in purchasing decisions, transportation, and travel. The benefits gained include, but are not limited to, protection of ecosystems, improvement of air and water quality, waste reduction, and conservation of resources.

2.0 Policy

University facilities shall, to the extent possible, be designed, constructed, renovated, operated, and maintained in accordance with the latest energy/water efficiency standards and in a manner consistent with the Virginia Tech Climate Action Commitment (https://www.facilities.vt.edu/sustainability/climate-action-commitment.html). Specifically, the university shall:

1. Ensure energy/water efficiency and conservation is a central consideration for business and operations.
2. Make decisions concerning investments for renovations or new construction of all facilities at the university based on total cost of ownership or life-cycle cost analysis.
3. Identify and strive to implement those strategies identified as being available and least costly.
4. Evaluate and compare alternative energy sources for short- and long-term costs while considering future projections for availability and price escalation of all energy sources.
5. Explore teaching and research opportunities to assist in evaluating energy/water usage and recommending potential conservation measures.

3.0 Procedures

3.1 Efficiency and Conservation

Virginia Tech will continue to develop and employ efficiency tools to reduce annual energy use and will report progress to the appropriate state agency and authority as directed. Specific recommendations include the following:

1. The university energy manager shall be "certified" as an energy manager by the Association of Energy Engineers (AEE).
2. The university will develop and implement energy/water efficiency and conservation strategies whenever practical.
3. The university will develop and implement strategies to encourage full participation of building occupants in energy/water efficiency and conservation programs. Strategies should include information dissemination and incentive programs.

3.2 Buildings and Construction

A new building entering the design phase of construction that is greater than 5,000 gross square feet in size, or the renovation of such a building where the cost of renovation exceeds 50 percent of the value of the building, shall meet the Virginia Department of General Services (DGS), Division of Engineering and Buildings, Virginia Energy Conservation and Environmental Standards for energy performance and water conservation. All such buildings shall conform to U.S. Green Building Council Leadership in Energy & Environmental Design (LEED) Silver standards, consistent with the Virginia Tech Climate Action Commitment. If constructing a new building or leasing space in a metropolitan area where public transportation is available, the university shall seek to build or lease within a quarter mile of a transit or commuter rail stop, and seek locations that are pedestrian and bicycle accessible.

This policy also incorporates the Virginia Tech Design and Construction Standards (https://www.facilities.vt.edu/planning-financing/design-and-construction-standards.html) latest edition, which, in turn, shall incorporate the latest energy/water standards and codes. Specific facility design recommendations include:

1. Review plans for construction, renovation, and maintenance of university-owned facilities and the installation of equipment within those facilities for compliance at each stage of the design and prior to finalizing bid documents.
2. Design, renovate, and operate building lighting, heating, and cooling systems to align space use and occupancy patterns with a goal of reducing energy use during unoccupied periods.
3. Review university facility control systems with the objective of establishing the ability to communicate with each other and with the goal of reducing energy costs.
4. Assuming performance criteria are met, set a minimum standard for all energy consuming equipment to be Energy Star® rated or better.
5. Set a minimum standard for all water-related equipment and fixtures to meet or exceed the Federal Energy Policy Act of 1992/2005 (EPAct) or EPA WaterSense requirements.
6. Properly commission all new buildings or significant renovations prior to substantial completion.
7. Incorporate as high a solar reflectivity as practical for the situation and application on all roofs.

3.3 Operation and Maintenance

The university shall strive to educate all building users and occupants concerning the use of campus buildings, with an emphasis on safety, energy, and resource efficiency. Recommendations for operation and maintenance include**:**

1. Set nominal temperature targets for occupied facilities to be 68°F in the winter and 74°F in the summer. Exterior windows and doors should be closed when heating and cooling systems are in operation. Reduce

heating and cooling system energy consumption during periods outside of normal office hours and for unoccupied facilities when practical.

2. Ensure that all computers at the university are Energy Star® rated, have Liquid Crystal Display (LCD) monitors/screens (or best performing equivalent) set to default to sleep mode after a period of 15 minutes or less of disuse, except in those cases where specific research, instruction, or office mission requirements demand otherwise. Power down computers when not in use.
3. Install occupancy sensors to de-energize room lighting after a period of 15 minutes or less of non-use in all suites, meeting rooms, classrooms, and other spaces used sporadically as per campus goal. For all spaces not controlled by occupancy sensors (for reasons of practicality), encourage occupants to take responsibility for turning off the lights when the space is not in use.
4. When leaving a facility, occupants are encouraged to turn off excess hallway and exterior lights that are not directly related to public safety and physical security.
5. Purchase or lease of Energy Star® rated appliances and equipment for all classification when designation is available, provided performance criteria are met.
6. The use of portable electric space heaters, window air conditioners, and refrigerators is discouraged. If there is a valid need for using the devices, they must be of a type approved by Environmental Health and Safety. Encourage the discarding or recycling of old and inefficient appliances.
7. To avoid the wasteful use of energy, the university should upgrade temperature control equipment.
8. Eliminate plumbing leaks.
9. Use low-flow faucets, shower heads, and toilets subject to the availability of funds.
10. Minimize the use of water for irrigation through reduced frequency of watering, timing of watering, and the selection of low-water-use landscaping such as drought-resistant grass, plants, shrubs, and trees.

3.4 Transportation and Travel

The university shall strive to increase fuel efficiency for transportation and reduce energy consumption for travel requirements. Specific recommendations include:

1. Purchase fuel-efficient and low-emission state-owned vehicles. Strive to achieve a passenger fleet vehicle average fuel efficiency of 30 miles per gallon or as appropriate to be consistent with Federal fuel efficiency guidelines.
2. Increase the number of flex fuel passenger vehicles available for use through Fleet Services.
3. Encourage the use of biofuel in state-owned vehicles.
4. Convert all other existing university vehicles to use biodiesel fuel whenever practical.
5. For leasing vehicle requirements, encourage the use of compact, fuel-efficient, and low-emission vehicles.
6. Continue to promote the use of the carpooling incentive program and alternative modes of transportation including, but not limited to, utilizing Blacksburg Transit, bicycles, walking, and alternatively fueled vehicles. Encourage the use of carpooling to meetings both on and off campus.
7. Promote the use of video conferencing and conference calls in lieu of in-person meetings.
8. Encourage telecommuting if and when practical. Specific guidelines are contained in University Policy 4325, Alternate Work Site and Telework Policy (http://www.policies.vt.edu/4325.pdf).
9. Encourage the use of "Virginia Green" certified facilities for conferences and other meetings.

3.5 Waste Reduction

The university shall strive to reduce the consumption of paper products and disposable supplies, and increase its recycling rate consistent with the goals established in the Virginia Tech Climate Action Commitment. The Division of Campus Planning, Infrastructure, and Facilities has overall responsibility for recycling and trash collection and will develop and implement a comprehensive waste management plan (CWMP). Surplus Property has responsibility for the collection, redistribution, and sale of excess university property. Environmental Health and Safety has responsibility for the recycling of non-functional electronic waste and any hazardous materials. Specific recommendations include:

1. Reduce the consumption of paper and other office supplies, and encourage the use of electronic transactions and publications.
2. Reduce the use of disposable materials and use only compostable or recyclable materials if available.
3. Recycle paper (white, mixed, cardboard, other), plastic, batteries, printer cartridges, aluminum, glass, tin/steel cans, and other related items.
4. Recycle electronic waste (computers, monitors, fax machines, etc.).
5. Recycle construction debris, carpet, ferrous and non-ferrous metals, fluorescent lamps, and ballasts.
6. Recycle oil, anti-freeze, and tires.
7. New copier, faxes, printers, and other such office equipment purchased or leased that use paper shall be recycled-paper compatible.
8. Purchase only recycled paper except where equipment limitations or the nature of the document preclude the use of recycled paper.
9. As much as practical, purchase materials and supplies with a minimum of packaging.
10. Encourage composting and food diversion programs.
11. Encourage the procurement of alternatives to, with the intent to phase out, plastic individual-serving-sized containers for use during normal operations. Plastic individual-serving-sized containers may be used in emergencies, or for safety or health reasons.
12. Durable products should be reused rather than disposed of whenever practical. Specific guidelines for the disposition of surplus property are contained in University Policy 3955, Management of Surplus Material, (http://www.policies.vt.edu/3955.pdf).

3.6 Billing

The university's records concerning energy/water usage shall be consolidated and current. Specific billing recommendations include:

1. Ensure that coordination for utility billing and payment processes for Educational and General (E&G) centralized facilities and investments in utility conservation measures occur through a combination of external and internal systems and entities.
2. Continue to operate the university's internal billing systems in the existing manner. The Vice President for Campus Planning, Infrastructure, and Facilities is assigned the responsibility for the payment of these utility charges, where appropriate, using centrally managed funds for each utility (electricity, gas, steam, chilled water, potable water, domestic hot water, and propane).
3. Maintain responsibility among decentralized operating units for billing processes and funding commitments associated with their facilities. This decentralized billing process shall apply to utility bills from external parties for service to outlying parts of the campus, as well as off-campus operations.

4. As metering is added to the current central distribution systems, billing based on actual use may be incorporated.

3.7 Point of Contact

The Vice President for Campus Planning, Infrastructure, and Facilities is the point of contact for this policy.

3.8 Energy and Sustainability Committee

The university's Energy and Sustainability Committee shall assist the Vice President for Campus Planning, Infrastructure, and Facilities with the implementation and revision of this policy.

3.9 University Departments and Regulatory Agency Contacts

The Office of the Vice President for Campus Planning, Infrastructure, and Facilities will coordinate with other university departments and outside regulatory agencies to develop and implement procedures to ensure full compliance of the design and execution of the work with applicable codes, standard permitting requirements, and other university concerns. Each of the university activities below should identify a lead person responsible to represent them and to support the Vice President for Campus Planning, Infrastructure, and Facilities to coordinate university wide sustainability initiatives. These contacts should include, but are not limited to:

- Academic Deans and Departments
- Department of Intercollegiate Athletics
- Environmental Health and Safety
- Student Affairs (Recreational Sports, Dining Services, Housing Services, Student Centers)
- Virginia Department of Environmental Quality
- Virginia Department of Mines, Minerals and Energy

3.10 Implementation and Compliance

Each department head or supervisor is requested to:

1. Communicate this policy to everyone under his/her supervision by providing access to the policy and discussing with his/her employees.
2. Identify all training requirements in this area that may apply to those individuals working in the organization and inform supervisors of the need for appropriate training.

4.0 Definitions

ASHRAE: American Society of Heating, Refrigeration, and Air Conditioning Engineers

Commissioning: A process which ensures that systems are designed, installed, functionally tested, and performing in conformity with the design intent.

Energy Star®: A program of the US Environmental Protection Agency including rating of appliances and equipment for energy/water efficiency.

Energy Policy Act (EPAct): Federal legislation governing permissible flow rates for water-consuming fixtures and appliances. Original legislation for most common fixtures was passed in 1992, with several updates in 2005.

Facility: Any portion of a building, structure or area, including the site on which the building, structure or area is located, wherein specific services are provided or activities are performed including all utilities, systems, and building service equipment associated with the facility.

HVAC: Heating, Ventilating, and Air Conditioning.

LEED®: A building rating system developed by the US Green Building Council, Leadership in Energy and Environmental Design; a voluntary, consensus-based national standard for developing high-performance, sustainable buildings with three versions of rating systems: LEED-NC (New Construction), LEED-EB (Existing Buildings), and LEED-CI (Commercial Interiors).

Maintenance: Work performed to a facility or the fixed systems and building service equipment therein, for the purpose of maintaining quality and function.

Portable: HVAC equipment used within a facility but without permanent connection to the building's utility services.

Renovation: Any work to a facility or the fixed systems and building service equipment therein which is done to improve the existing level of quality and function, or to accommodate a change in the nature of the use of a space within a building or facility.

Repair: The reconstruction of or renewal of any part of an existing facility for the purpose of maintenance or restoration of its state.

Retro commissioning: A systematic process for improving and optimizing an existing building's operations and supporting those improvements with enhanced documentation and operator training.

Utilities: Energy (electricity, steam, chilled water, domestic hot water, natural gas, and propane) and water (potable water/sewer).

WaterSense: A program of the US Environmental Protection Agency including rating of appliances and equipment for water efficiency.

5.0 References

ASHRAE 90.1 (Energy Standard for Buildings except Low-Rise Residential Buildings)
https://www.ashrae.org/resources--publications/bookstore/standard-90-1

National Appliance Energy Conservation Act, 42 USC, Ch. 77, Subch. III, Part A, §6291 et seq.
https://www.law.cornell.edu/uscode/text/42/chapter-77/subchapter-III/part-A

National Energy Conservation Policy Act, 42 USC, Ch. 91, §8201 et seq.
https://www.law.cornell.edu/uscode/text/42/chapter-91

U.S. Environmental Protection Agency, Safe Drinking Water Act, 42 USC, Ch. 6A, §300f et seq.
https://www.law.cornell.edu/uscode/text/42/chapter-6A/subchapter-XII

U.S. Environmental Protection Agency, Water Conservation Plan Guidelines,
https://www.epa.gov/watersense/water-conservation-plan-guidelines

Virginia Tech, Design and Construction Standards
https://www.facilities.vt.edu/planning-financing/design-and-construction-standards.html

Virginia Tech Climate Action Commitment
https://www.facilities.vt.edu/sustainability/climate-action-commitment.html

Virginia Tech, University Policy 3955, Management of Surplus Material
http://www.policies.vt.edu/3955.pdf

Virginia Tech, University Policy 4325, Alternate Work Site and Telework Policy
http://www.policies.vt.edu/4325.pdf

6.0 Approval and Revisions

Approved September 26, 2006 by Vice President for Business Affairs, Kurt J. Krause.

- **Revision 1**
  Significant revisions to enhance energy and water conservation and support university sustainability efforts.

  Approved by Energy and Sustainability Committee September 25, 2008.

  Approved January 14, 2009 by Vice President for Administrative Services, Sherwood G. Wilson.

- **Revision 2**
  Significant revisions to policy that enhance the university's responsibilities and guidelines – contained in "The Virginia Tech Climate Action Commitment Resolution" approved by the Virginia Tech Board of Visitors on June 1, 2009, and to include guidelines and directives contained in the Commonwealth of Virginia Governor's Executive Orders.

  Approved by the Energy and Sustainability Committee on December 13, 2010.

  Approved February 28, 2011 by Vice President for Administrative Services, Sherwood G. Wilson.

- **Revision 3**
  Technical updates to position and department titles as well as references and hyperlinks.

  Approved August 31, 2016 by Vice President for Administration, Sherwood G. Wilson.

- **Revision 4**
  Technical updates to position and organizational titles as well as references and hyperlinks.

  Approved September 27, 2022 by Vice President for Campus Planning, Infrastructure, and Facilities, Christopher H. Kiwus.