Energy and the FM Sustainability Action Plan

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What is Sustainability to you?

- Sustainable to the earth
- Sustainable to budget
- Sustainable to customers

Items to Consider

- Buy-in from administration
  - Grants, other funding
- Cannot compromise service or reliability to gain sustainability ground.
- Some technologies may not be suited for all buildings.
  - Offices vs. residence halls
  - Labs vs. classrooms

Procurement of Energy/Utilities

- Sustainable procurement practices
  - Electric
  - Gas
  - Water/Sewer

No or Low Cost Energy Savings

- Changing setpoints
- Introducing schedules for buildings on campus.
- Automating Irrigation.
- Trending of start/off times to ensure equipment is not running when buildings are not in use.
- Demand ventilation

No or Low Cost Energy Savings

- Chiller Start-up Optimization – Student Success Center
  - Ability to adjust chilled water temperature based on outdoor air temperature or building load.

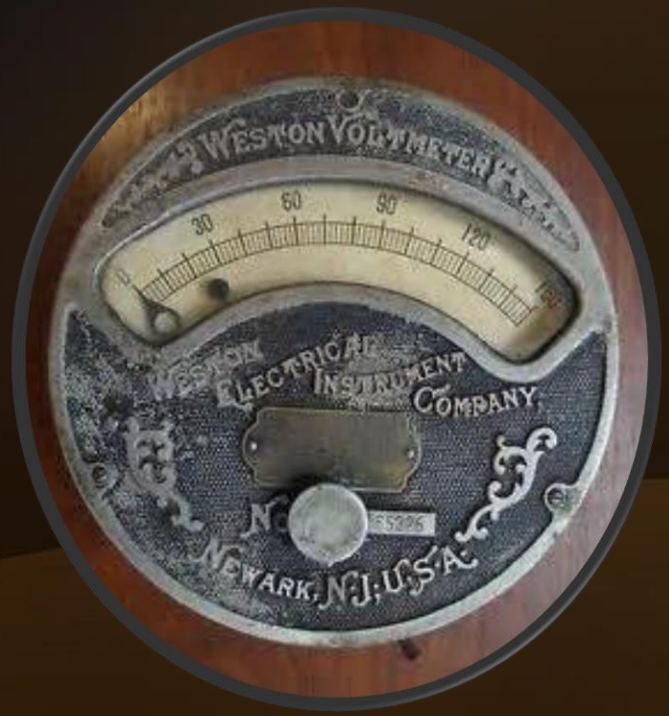
Building Automation

- 81 Buildings currently monitored by Building Automation.
- Continuous, retro and re-commissioning.
- Variable frequency drives
  - Approximately 350 drives on campus.

Preventive Maintenance

- Filters – Type and efficiency
- Coil and convector cleaning
- Steam trap surveys
- Boiler tuning

Measurement and Verification



Building Automation Meter Upgrades

- Began Summer of 2015.
- Metering hardware purchased for 27 University properties.
- 32 facilities have been upgraded and report utility data to the end user thru the BAS network infrastructure.

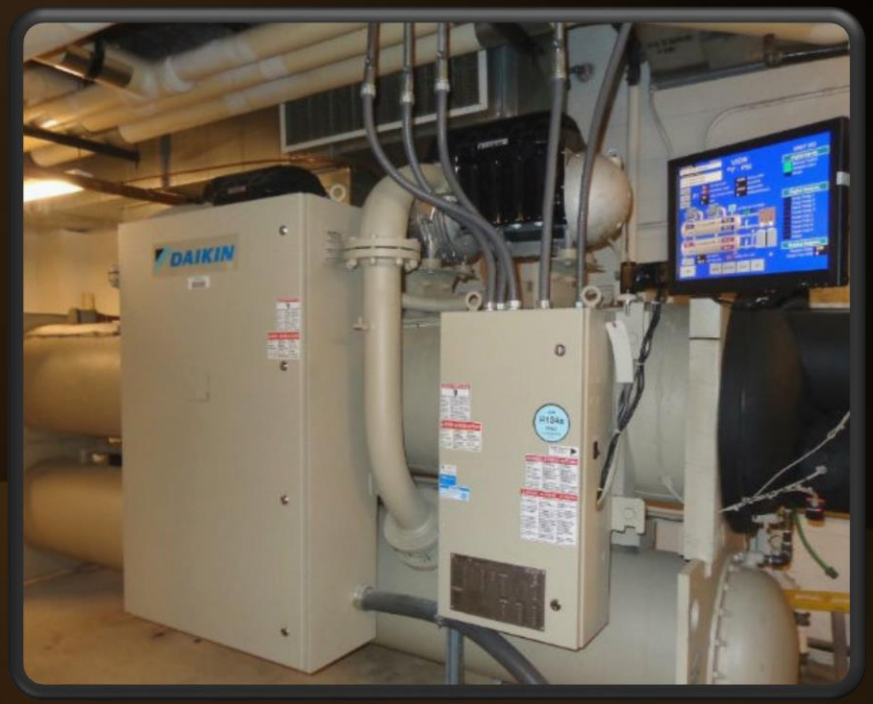
Building Automation Meter Upgrades

- Goals:
  - Continue upgrading obsolete electrical metering equipment.
  - Add water and steam utility data to automated reporting system.
  - Add metering equipment to energy generating equipment.

Projects

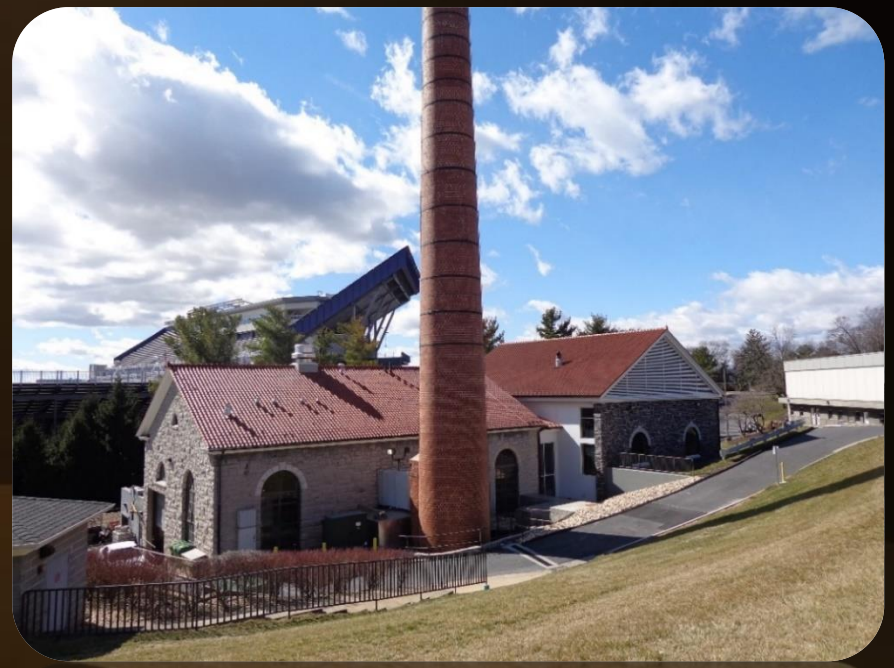
Equipment Replacement

- Magnetic bearing chillers –
  - University Services Building
  - Carrier Library
  - Zane Showker hall
    - Reduced energy consumption by 20% per building
- Motor replacement – NEMA premium efficiency



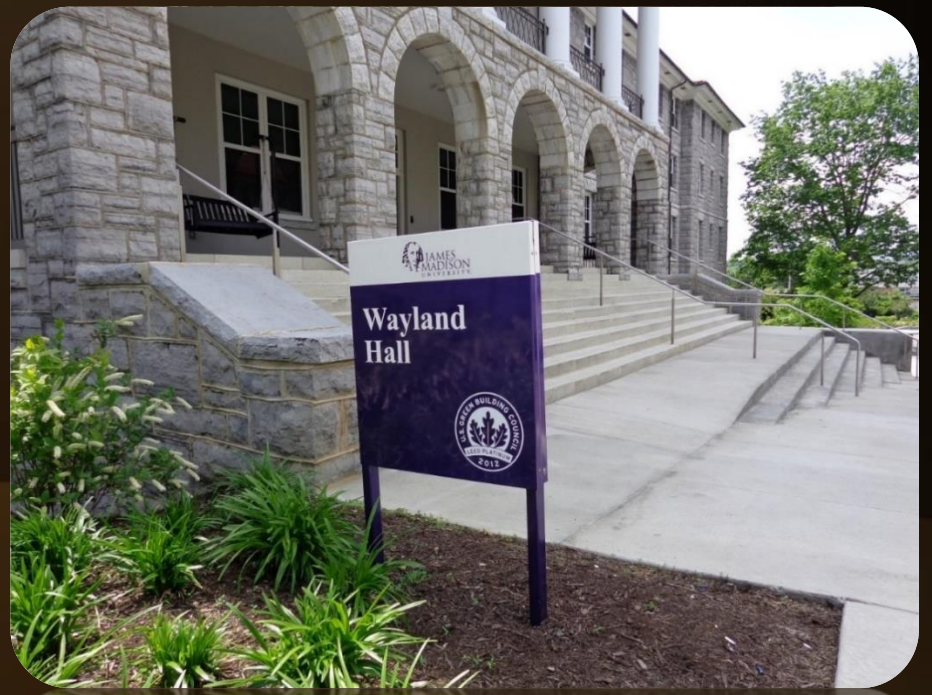
Boiler Replacement - West Power Plant

- Capacity – increased from 85,000 lbs/hr to 200,000 lbs/hr.
- Emissions - deceased 66% by the use of Low NOX burners, flue gas recirculation, and better quality fuels.
- Increased efficiency – 10 to 15%.
- Cost savings as it pertains to energy consumption - $300,000 to $450,000 annually.



Wayland Hall

- First renovated residence hall in the US to achieve platinum-level LEED certification.
- Has been named one of the "Ten Greenest Dorms in the World" by BestOnlineColleges.com.



Wayland Hall

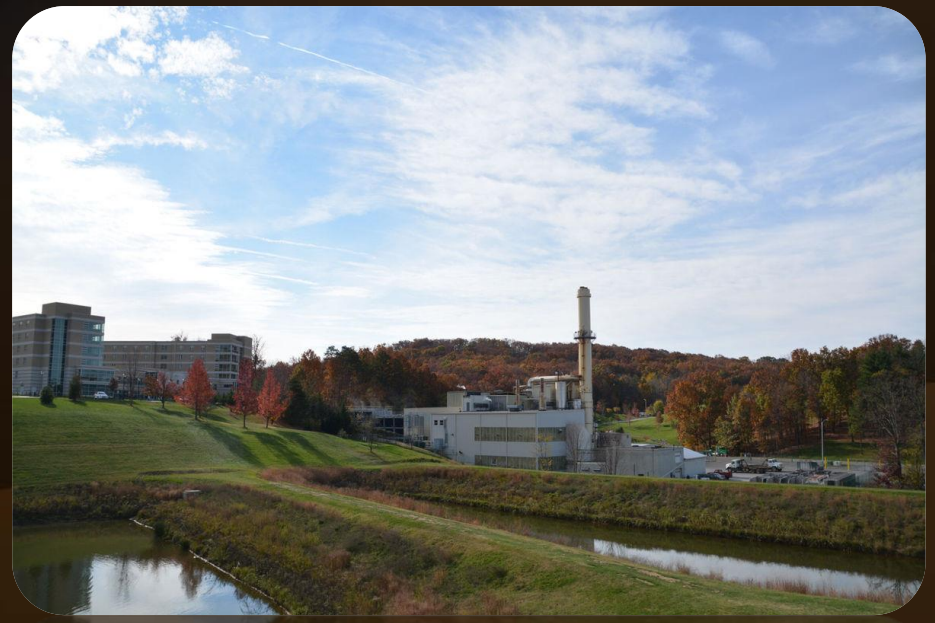
- Ground source "geothermal" heat system resulting in a 39% reduction in energy consumption.
- 10,000 gallon cistern harvests rainwater for toilet conveyance.
- ***http://www.jmu.edu/stewardship/_files/waylandhall.pdf***

U.S. GREEN BUILDING COUNCIL
LEED PLATINUM
2012

Proposed Projects

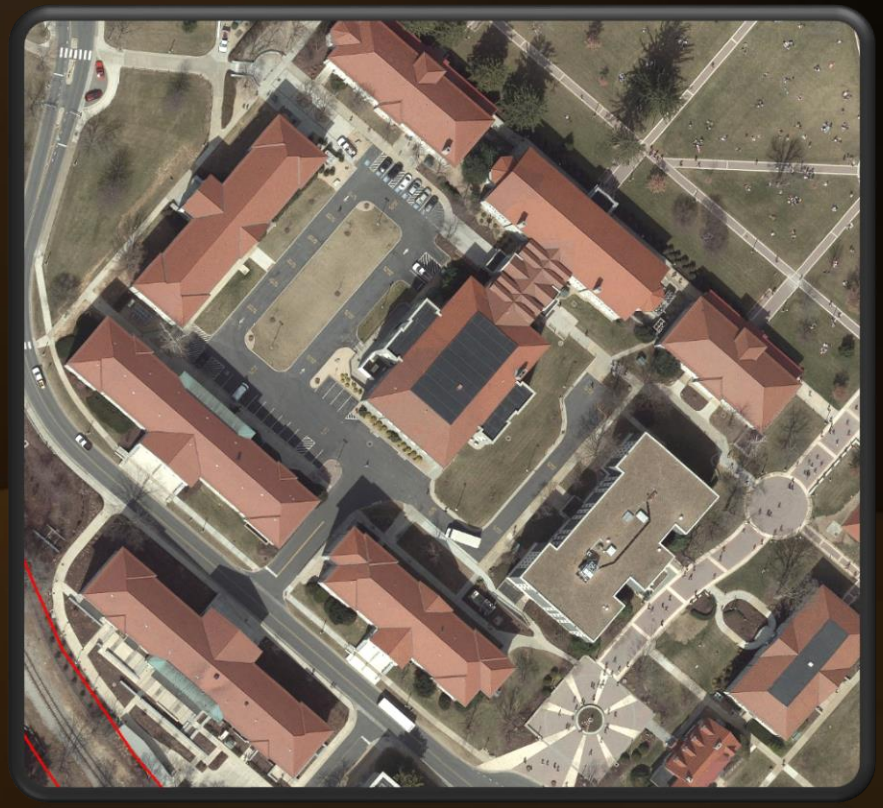
Co-Generation

East Campus Power Plant



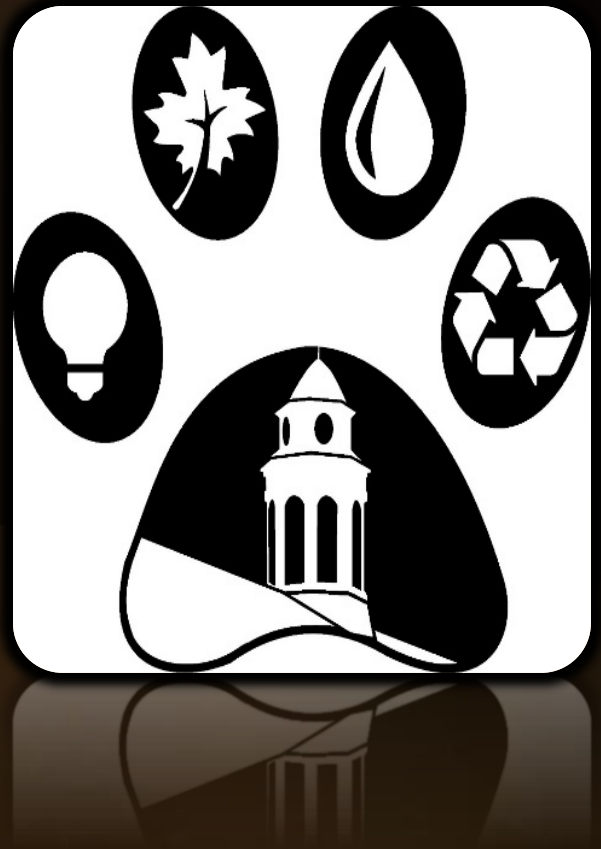
Chilled Water Cluster

- Installation of chilled water loop to seven buildings which have individual chillers.



Additional Sustainable Activities within JMU Facilities Management

- Recycling
- Housekeeping "Green products"
- Landscaping efforts
- Facility Footprint – Sustainable Action Plan



Questions