

# Energy Efficiency and Conservation

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# WHAT WE WILL COVER

- Why Loudoun County Public Schools (LCPS)?
- Energy Vision
- Policy
- Approach
- Energy Mission
- Four Critical Partnerships

# Why is LCPS a reliable source?



2018 ENERGY STAR Sustained Excellence for continued commitment to increasing energy efficiency through the creation of an energy-saving culture among students, staff members, and parents.



2014 Governor's Environmental Excellence Award for demonstrated commitment to the stewardship of Virginia's natural resources through sustainability initiatives.



VSBA 2014 Green School Division for implementation of specific environmental policies and practical actions that reduce the carbon emissions generated by both the local school division and the broader community.



2014 - First annual Metropolitan Washington Council of Governments Climate and Energy Leadership Award for outstanding efforts to reduce greenhouse gas emissions and increase energy efficiency.



Through its International Awards Program, the Association of Energy Engineers (AEE) acknowledges the important achievements being made in energy and shines the light on the work being done in energy by individuals, organizations, agencies, and corporations. **Loudoun County Public Schools was presented with the International Award for Institutional Energy Management in 2016.**

This award is presented to a public sector institution, agency, or organization such as City, County, State, or Federal; a University or K-12 (kindergarten through 12th grade, either public or private), etc. for outstanding accomplishments in developing, organizing, managing and implementing its comprehensive energy management program, and for superior service to the Association. There is only one winner of this award each year.

# LCPS Leadership – ENERGY VISION

**Senior Leadership** supports efficient use of resources allowing for a higher percentage of public funds to be devoted to instruction, rather than to operation of facilities.

**“EVERY DOLLAR THAT PAYS AN UNNECESSARILY HIGH ENERGY BILL COULD HAVE BEEN SPENT FOR A MUCH BETTER PURPOSE-TEACHING CHILDREN.”**

School district administration makes it clear in policy documents that effective use of natural resources is the responsibility of everyone connected with the school system.

# Loudoun County Public School Policy

## POLICY §6-41 Construction/Energy

### *High Performance Design and Construction for Energy Efficiency and Environmental Impact*

*Environmentally sustainable design, construction and operational practices benefit Loudoun County Public Schools facilities by increasing or improving energy efficiency, interior comfort and occupant productivity, as well as reducing operation and maintenance costs. The development of LCPS Best Practices is accomplished by assessing and integrating sustainable methods, building components and technologies into every aspect of a project's development and operational life cycle.*

*The Loudoun County School Board shall implement sustainable practices in environmental quality, water and energy consumption, products, materials, and waste management in new facilities and school renovation projects. Implementation of LCPS Best Management Practices (BMP) shall be consequent to continual evaluation of the dynamic industry guidelines and recommendations. Particular standards or practices may be applied or adopted in whole or in part as provided in publications such as:*

- 1. United States Environmental Protection Agency (EPA) - Energy Star Program*
- 2. United States Department of Energy - National Best Practices Manual for Building High Performance Schools*
- 3. Virginia Department of Education - Virginia Public School Facilities Guidelines*
- 4. American Society Of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) - Advanced Energy Design Guide for K-12 School Buildings*
- 5. Green Globe Design - Green Building Initiative*
- 6. LEED (Leadership in Energy & Environmental Design) - LEED for Schools*
- 7. The Collaborative for High Performance Schools - Best Practices Manual*

*Independent verification of LCPS BMPs shall be performed during the Pre-Construction, Construction and Post-Construction phases. An independent Commissioning Agent (Cx) shall verify incorporation of design parameters by architectural and engineering professional service contractors. Further, the Cx shall verify compliance with BMP design during construction. Facility operations and systems performance shall be monitored, measured and verified via the EPA Energy Star Program.*

# Loudoun County Public School Policy

## POLICY §6-42 Energy and Water Management/Conservation

The Loudoun County School Board is committed to the conservation of energy and water resources while maintaining safety, education, and productivity throughout the school system.

Reductions in energy and water consumption result in positive environmental impact, extend the life of equipment, produce reductions in utility costs and increase funds available for resources in the classroom.

It is the policy of the Loudoun County School Board to ensure that every effort is made to conserve energy and water resources while exercising sound financial management.

**The judicious use of all energy and water using systems of each campus will be the responsibility of all Loudoun County Public Schools facility users and all are expected to ensure that an efficient posture is maintained on a daily basis.**

# Loudoun County Public Schools Approach

## What is Energy Efficiency?

- **Energy Efficiency** is the ability to capitalize on new technologies and equipment that will accomplish desired outcomes while using less energy. Giving people more efficient tools allows those who are already conserving to use less energy when energy needs to be expended.
- It is essential to have the cooperation of **all students, staff, parents and other community members who make up the totality of individuals who utilize LCPS sites** for energy efficiency to be successful.

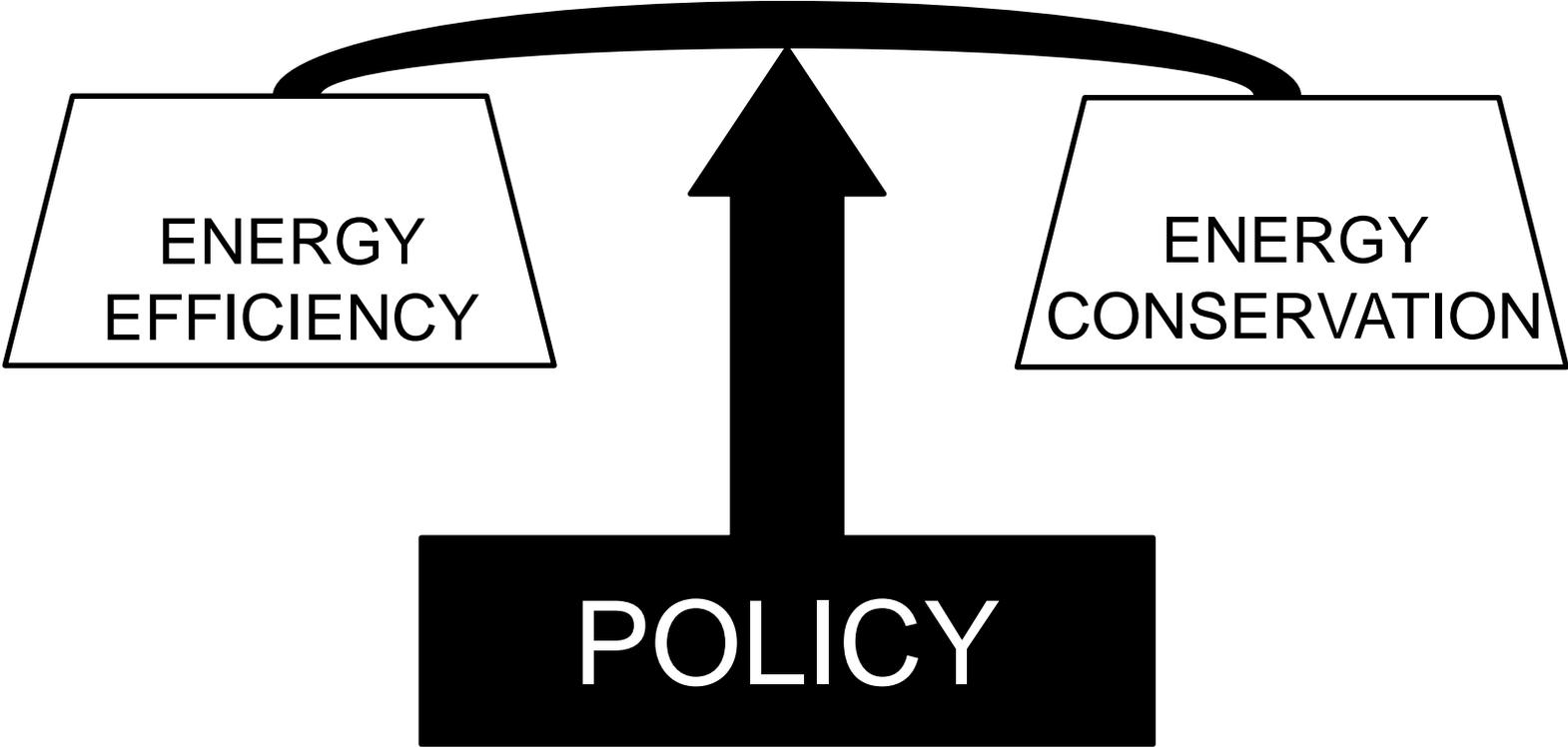
# Loudoun County Public Schools Approach

## What is Energy Conservation?

- **Energy Conservation** is the ability to capitalize on behavioral practices which allow LCPS to simply use less energy with existing resources. The tools used include: ingenuity, resourcefulness, discipline, procedures, volunteerism, and commitment.
- It is essential to have the cooperation of **all students, staff, parents and other community members who make up the totality of individuals who utilize LCPS sites** for energy conservation to be successful.

# Loudoun County Public Schools Approach

## STRUCTURE



Credit given to Kevin Lewis – Assistant Superintendent for Support Services, Loudoun county Public Schools

# POP QUIZ!

Identify the picture that represents ENERGY CONSERVATION.



# **LCPS Energy & Environment Team Mission**

The LCPS Energy & Environment Program will reduce the use of energy throughout the school system without impacting the educational environment while ensuring efficient and effective stewardship of public resources.

Education  
Safety and Security  
Productivity

One Core Objective: Develop and Maintain  
Professional and Industry Contacts

# ACTION: SECURE EXPERTISE

## Cenergistic™

The Energy Conservation Company

Cenergistic helps organizations reduce consumption of electricity, natural gas, fuel oil and water.

The Cenergistic approach to energy conservation optimizes infrastructure to reduce consumption, improves internal processes and changes behavior to ensure that savings endure.

- Provides a conduit for communication with other school system energy managers nationwide.
- Gives LCPS access to nationally recognized industry experts in all fields of energy conservation and efficiency.
- Makes LCPS aware of innovative techniques and technologies used in school systems throughout the US. Example is ENERGY STAR

LCPS partner since 1993

# Overall Program Cost Avoidance

Expected Energy Cost	\$282,970,397
Actual Energy Cost	\$202,296,746

Program Savings	\$80,673,651
Percent Savings	28.5%

Other Savings	\$848,131
Total Savings	\$81,521,782

Actual Energy Cost



## Expected Energy Cost

Anticipated expense without energy management.

Base year usage after adjustments for such variables as changes in weather, equipment, schedules, occupancy and prices.

## Actual Energy Cost

Actual utility costs for electricity, gas, water, sewer, etc. obtained directly from bills.

## Other Savings

Additional documented savings attributable to Program activities but not the direct result of usage reductions, such as rebates, refunds, tariff changes, etc.

## Program Savings

The difference between Expected and Actual Cost, calculated in accordance with the International Performance Measurement & Verification Protocol. Does not include savings attributable to reduced equipment maintenance and replacement costs and other collateral benefits. These savings can increase the program savings up to 20%.

## Cumulative Greenhouse Gas Reduction

**Energy Reduction Impact:** 4,223,679,526 KBTU

401,946 equiv. metric tons of CO<sub>2</sub>

This is equivalent to the following:

Passenger cars not driven for one year:	83,739
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Tree seedlings grown for 10 years:	10,306,314
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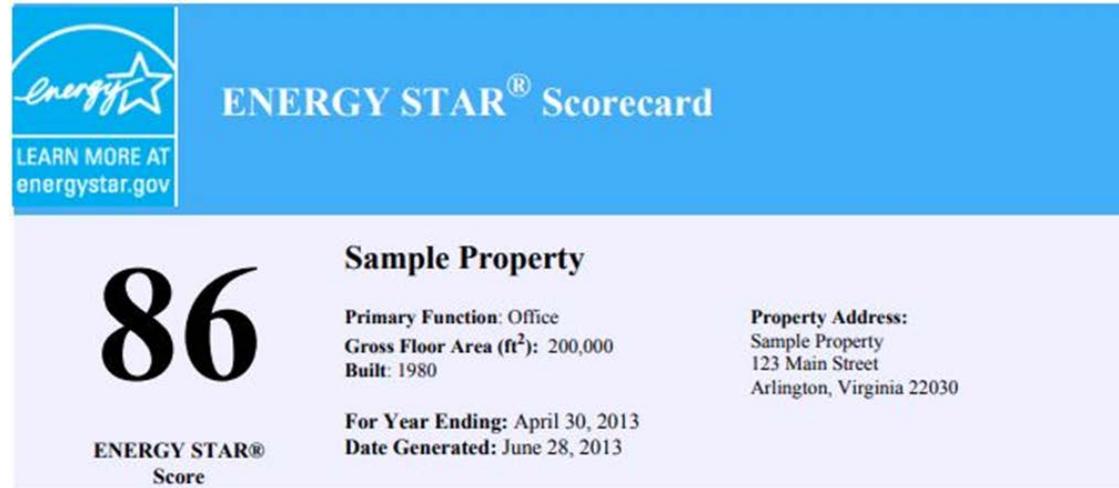
# ACTION: BECOME A ENERGY STAR PARTNER



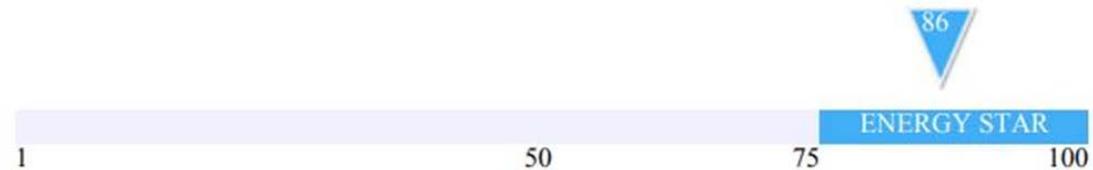
A building earning an ENERGY STAR Building Certification has met strict energy performance standards set by the EPA and uses less energy, is less expensive to operate and causes fewer greenhouse emissions. To qualify for ENERGY STAR Building Certification, a building must score in the top 25 percent based on the EPA's National Energy Performance Rating System.

LCPS partner since 1998

# ENERGY STAR Score Cards



For the year ending in April 2013, this building used 217 kBtu per square foot on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

# ACTION: UTILIZE ENERGY ACCOUNTING SOFTWARE



- Holds energy use information back to 1992.
- Allows for base line use comparisons
- Incorporates weather adjustments into data
- Creates a standard for performance measurement
- Produces detailed energy use & cost reports
- Provides M&V on the effectiveness of energy management activities within the district.
- Utilizes the IPMVP –international performance measurement and verification protocol.

LCPS partner since 1993

# 25 years of Energy Information

1993 - 27 Schools

2018 - 90 Schools

Over 11,000,000 Square foot of space

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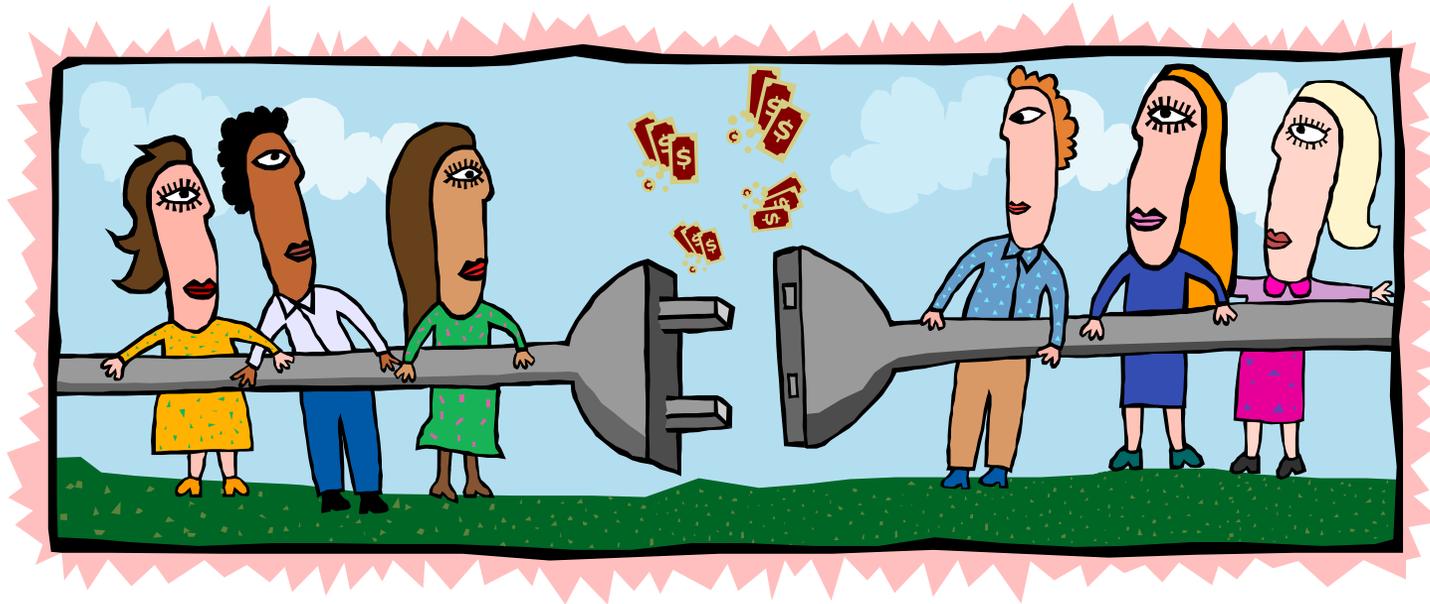
Cash Register

# ACTION: MAKE YOUR COMMUNITY YOUR PARTNERS

Internal and external stakeholders are  
our most important partners.

- Construction
  - Facilities Services
- Business & Financial Services
- Digital Innovation
- Planning & Legislative Services
- Transportation
- Food Service
- Safety & Security
- Staff
- Custodians
- Teachers
- Students
- Teachers
- Community Members
- Elected Officials

By having everyone take part in the energy conservation program, an empowering alliance in the organization is created that keeps energy costs within our control.



# STAKEHOLDERS/PARTNERS



**If you are not harnessing human ingenuity to efficiently use energy, you may find that it is harming your Energy Efficiency efforts!**

**HUMAN INGENUITY**

