

# Perquimans County Schools

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## Strategic Energy Plan



**Perquimans County Schools – Strategic Energy Planning Committee**

**1/21/2010**

**Updated 1/28/2013**

## Executive Summary

Perquimans County School System is comprised of four schools, one administrative center, a transportation department building, and a maintenance department building, for a total of seven facilities. Our school system accounts for 1,800 students, and in the past has spent over \$625,000 per year on utilities, including water and sewer. In the recent fiscal year of 2011 – 2012 we spent \$560,055. The School Maintenance Department has been dedicated to monitoring the school system's energy usage. The Strategic Energy Planning Committee has been active, implementing energy procedures and educating staff and personnel. The Director of Maintenance, Construction, & Custodial Services of the school system is our informal Energy Manager. Our school system has already adopted energy procedures and implemented energy improvement projects.

- HVAC Controls Procedures
- Combined redundant utility meters
- Multiple HVAC equipment replacements
- Lighting retrofits
- Equipment replacements for water reduction
- Guidelines for Energy Savings
- Energy Audits

Perquimans County Schools recognizes the importance of controlling its energy usage and the school system has implemented numerous energy savings measures and projects. These proactive projects show our dedication to conserving energy use and finding ways to reduce utility costs throughout the Perquimans School System. Through the efforts of all staff, Perquimans County Schools has averaged nearly 31% in reduced utility bills since the baseline year 2009-2010. Our school system has been able to achieve this energy savings from the following energy savings measures and projects:

- Monitoring and tracking utility bills and electric rate schedules.
- Implementing energy programs and energy conservation guidelines.
- Educating/training staff and personnel.
- Upgrading HVAC Control System.
- Thermal blankets on electric water heaters.
- Implemented a limited preventive maintenance program.
- Implemented energy audit with checklists for custodial staff.

Perquimans School System has been implementing projects to save energy and water and the school district plans to continue to fund these types of projects in its capital and maintenance budgets when possible. Our school system is challenged to complete projects within our budgets but is considering a Performance Contract to fund some of the existing major energy savings projects.

Key Performance Indicator		FY 09-10	FY 10-11	FY 11-12
Energy per square foot per year	(kBtu/ft <sup>2</sup> /year)	69.21	58.36	49.35
Energy cost per square foot per year	(\$/ft <sup>2</sup> /year)	\$2.63	\$1.79	\$1.60
Energy per student per year	(kBtu/student/year)	22,176	13,850	11,409
Energy cost per student per year	(\$/student/year)	\$431.48	\$368.71	\$328.48
Gallons of water per square foot per year	(Gal/ft <sup>2</sup> /year)	7.70	6.42	11.96

## Supply Side (utility side of meter)

Since 2006, we have been tracking our utility data through spreadsheets and have worked very closely with our supply side utilities including Dominion Power and The Town of Hertford for electricity as well as other representatives from our other utilities: natural gas, water and sewer. In 2012, we began entering our utility data into EPA's Portfolio Manager, which is a database of the energy use of buildings. Our schools compare favorably with other educational facilities and we may apply for an "Energystar for Buildings" for our schools that qualify (school must be in the top 25% of energy intensity compared to the others in the database).

We have been utilizing spreadsheets to track utility consumption and cost data for all 30 of our accounts (each corresponding to our 7 facilities) with the data entered manually by the Maintenance Department from the bills.

## Supply Side Tactics Table

Past 24 months Activities (2010-2012)	Measurement	Savings	Assigned to	Funding Source
	Actual	Actual		
Track utilities	3730	TBD	Energy Manager	Salary
Optimize electric rate schedule	19	TBD	Energy Manager, Dominion Power & Town of Hertford Representatives	Salary
Combine utility accounts	8	TBD	Energy Manager	Salary

Next 24 months Activities (2012-2014)	Measurement	Savings	Assigned to	Funding Source
	Expected	Expected		
Continue tracking utilities	29	TBD	Energy Manager	Salary
Continuing optimize electric rate schedule	15	TBD	Energy Manager, Dominion Power & Town of Hertford Representatives	Salary
Continue combining utilities when appropriate	TBD	TBD	Energy Manager	Salary

## Demand Side (owner side of meter)

As a part of the energy program, the Perquimans County School System has also already developed a list of Energy Conservation Guidelines to follow. A brief list of these guidelines is provided below:

- During cooling season, thermostat controls will be set at 75 degrees (including mobile classrooms) except in gymnasiums and storage areas where settings may be higher.
- Adjust blinds to shield out heat from sun. Blinds should be slanted away from you. Close blinds when leaving classrooms or other areas of the building. Open blinds in the morning to allow sun rays to heat the building interior.
- The air conditioning system will be scheduled to switch to the night time setting (85 degrees) no more than 30 minutes after the end of the school day, except in administrative and meeting areas.
- During heating season, thermostats will be set at 73 degrees (including mobile classrooms) except in gymnasiums and storage areas where settings may be lower.
- The heating system will be scheduled to switch to the night time setting (62 degrees) no more than 30 minutes after the end of the school day, except in administrative and meeting areas.
- Use of electric space heaters is prohibited due to fire hazard.
- Keep all doors and windows to classrooms and offices closed when air conditioning or heating equipment is running.
- Do not block HVAC vents or thermostats with furniture, equipment, books, etc.
- Turn off lights, computer processors, monitors, smart boards, printers, copy machines, laminating machines, etc at the end of the school day.
- Make sure all equipment that has the hibernation function is set to hibernate when not in use (computers, printers, copy machines, etc.)
- Make sure vending machines are delamped.

It is also important to note that the Perquimans County School System upgraded their HVAC system in the Middle School in 2006 and upgraded the HVAC system in Hertford Grammar School in 2008. In addition, the school system has undertaken several energy savings projects in the past 24 months which are documented under the tactics tables. Most of these are funded through the capital and maintenance budgets. The current strategy is to continue these types of measures and pursue additional funding through utility energy efficiency programs and federal grant money, if possible. We are also considering a Performance Contract to fund some of the existing major energy savings projects.

## Demand Side Tactics Table - Includes Electrical and Water

SITE	2010-2011 PROJECTS	COST
PCHS/HGS/BOE	Thermal Blankets on 20-50 gallon Electric Water Heaters (10 total)	\$250.00
HGS	HVAC Controls Rezoning	\$2,940.00
HGS	Energy Assessment	\$2,500.00
PCHS	Energy Assessment	\$2,500.00
PCHS	Controls Upgrade & EMC Implementation, Including Chiller Demand Lighting	\$23,240.00
BOE	HVAC Controls Upgrade	\$13,500.00
PCHS	Stage Lighting Upgrade To Fluorescent	\$2,158.75
HGS	Blind Replacement in Media Center	\$402.67
BOE	Replace 400 watt Parking Lot Lights With LED Lights	\$862.00
HGS / PCS	Seal Voids In Walk-in Coolers & Freezers	\$328.14
ALL SITES	Purchased Thermal Imaging Scanner (1/2 Perq. Co. & 1/2 BOE)	\$3,678.60
	<b>Local Current Expense Total</b>	<b>\$52,360.16</b>
PCHS	Filled Voids Above Ceiling Tiles With Insulation	\$517.20
Transportation	Office Window Upgrade	\$1,308.13
PCMS	Replace Damaged Window Blinds	\$7,965.86
All Sites	Remove Lighting In All Vending Machines Located Inside Buildings	\$0.00
All Sites	Transition From Incandescent to Fluorescent Screw-in Lights	\$218.38

**Local Capital Outlay Total      \$10,009.57**

**10-11 GRAND TOTAL      \$62,369.73**

SITE	2011-12 PROJECTS	COST
HGS	Replace oil filters & gaskets on Chiller	\$1,410.00
PCHS	Auto Shut Off Faucets - Near Auditorium	\$2,106.61
PCHS	After thermal imaging the exterior of PCHS sealed multiple voids	\$61.43
PCHS	Removal of Electrical Meter for Scoreboard	\$1,580.86
PCMS	Replace oil filters & gaskets on chiller	\$1,497.00
PCMS	Replace all 3.5 & 4.5 gpf toilets in 7th grade gang restrooms with new 1.6 gpf toilets.	\$3,800.30
PCMS	Replace all 3.5 & 4.5 gpf toilets in 8th grade gang restrooms with new 1.6 gpf toilets.	\$3,482.19
PCS	School Zone Flashing lights replaced from 200watt to 18watt LED	\$0.00
PCS	Auto Flush Valves - 2nd Grade Gang Restrooms	\$1,985.55
Transp & PCHS Auto Shop	Rubber seals on bay roll-up doors	\$1,240.00
Transportation	Insulated two offices and restroom	\$530.00
PCHS	Building Automation System Maintenance Service Agreement	\$18,850.00
	<b>Local Current Expense Total</b>	<b>\$36,543.94</b>
PCHS	HVAC Controls Retrofit	\$42,640.00
PCS	HVAC Night Set Back Programming	\$127.00

**Local Capital Outlay Total      \$42,767.00**

**11-12 GRAND TOTAL      \$79,310.94**

Site	Proposed Energy Savings Project 2012-2014	Assigned To	Funding Source
BOE	Upgrade fluorescent T12 lighting to T8 throughout	Maint Dept	Performance Contract
BOE	Upgrade dimmable lighting in large conference room	Maint Dept	Performance Contract
BOE	Add exterior lighting control to Building Automation System	Maint Dept	Performance Contract
BOE	Install occupancy sensors in restrooms and conference rooms	Maint Dept	Performance Contract
Maint	Upgrade Fluorescent T12 lighting to T8 throughout	Maint Dept	Performance Contract
Maint	Replace 400watt high pressure sodium parking lot lighting with LED lighting	Maint Dept	Performance Contract
Maint	Replace inefficient packaged gas heat & A/C unit that serves office area	Maint Dept	Performance Contract
Maint	Combine 2 electrical services	Maint Dept	Performance Contract
Transp	Upgrade fluorescent T12 lighting to T8 throughout	Maint Dept	Performance Contract
Transp	Insulate wall between heated and non-heated bays	Maint Dept	Current Expense
Transp	Install waste oil heater to supplement heat in mechanics bays	Maint Dept	Performance Contract
Transp	Replace single pane windows in mechanics bays	Maint Dept	Capital Outlay
PCHS	Replace fluorescent T12 lighting to T8 in sections B, C & D	Maint Dept	Performance Contract
PCHS	Replace aging water source heat pumps with a 4-pipe fan coil / air handler system in sections B, C & D	Maint Dept	Performance Contract
PCHS	Upgrade exterior lighting	Maint Dept	Performance Contract
PCHS	Install automatic flush valves in 4 gang restrooms in section F	Maint Dept	Performance Contract
PCHS	Upgrade lighting in auditorium	Maint Dept	Performance Contract
PCHS	Install insulation above ceiling in auditorium	Maint Dept	Performance Contract
PCHS	Complete a combustion analysis on the main boiler & domestic water heater	Maint Dept	Performance Contract
PCHS	Replace single pane windows in Family & Consumer Science and Art Classrooms	Maint Dept	Current Expense
PCHS	Annual Building Automation System service contract with monthly site visits	Maint Dept	Current Expense
PCMS	Replace fluorescent T12 lighting to T8 throughout	Maint Dept	Performance Contract
PCMS	Replace 400 watt metal halide lights in gym & auditorium	Maint Dept	Performance Contract
PCMS	Install automatic flush valves in gang restrooms throughout	Maint Dept	Current Expense
PCMS	Upgrade exterior canopy lighting	Maint Dept	Performance Contract
PCMS	Retro-commission Building Automation System	Maint Dept	Performance Contract
PCMS	Complete a combustion analysis on the 3 main boilers & 3 domestic water heaters	Maint Dept	Performance Contract
HGS	Retro-commission Building Automation System	Maint Dept	Performance Contract
HGS	Chiller demand limiting added to Building Automation System	Maint Dept	Performance Contract
HGS	Replace Fluorescent T12 lighting in Buildings A, B, C & D	Maint Dept	Performance Contract
HGS	Complete a combustion analysis on the main boiler & domestic water heater	Maint Dept	Performance Contract
HGS	Install automatic flush valves in gang restrooms – Buildings B & D	Maint Dept	Performance Contract
HGS	Upgrade exterior lighting	Maint Dept	Performance Contract
PCS	Add humidity control to media center	Maint Dept	Capital Outlay
PCS	Consider humidity control throughout	Maint Dept	Performance Contract
PCS	Evaluate lighting levels & delamp where possible	Maint Dept	Performance Contract
PCS	Install automatic flush valves in gang restrooms (50% complete)	Maint Dept	Performance Contract
PCS	Complete a combustion analysis on the main boiler & 3 domestic water heaters	Maint Dept	Performance Contract
PCHS, PCMS, HGS	Annual Service contract for Chillers (PCHS, PCMS, HGS)	Maint Dept	Performance Contract

## Awareness and Training

In October 2010, under the direction of the Perquimans County Schools Strategic Energy Planning Committees' guidance, the guidelines for Energy Savings was approved and implemented. Currently, some teachers are working on programs with students mostly with recycling projects but this could be expanded into teaching about energy awareness.

Site	ONGOING AWARENESS & TRAINING TACTICS 2010 - 2014	Assigned To	Funding Source
All Sites	4-Day Work Week During the Summer	Administration	Salary
All Sites	Close monitoring of exterior lighting hours of operation	Maint Dept	Salary
All Sites	Adherence to the HVAC Controls for Perquimans County Schools	Maint Dept	Salary
All Sites	Turn off lights when not in use.	All Staff	Salary
All Sites	Report any water leaks (toilets running, sinks dripping, etc.) to the Maintenance Department immediately and follow up with a work order.	All Staff	Salary
All Sites	Adjust blinds (slanted away from you) to shield out heat from the sun.	All Staff	Salary
All Sites	Close blinds when leaving classrooms or other areas of the building.	All Staff	Salary
All Sites	Do not block HVAC vents or thermostats with furniture, equipment, books, etc.	All Staff	Salary
All Sites	At the end of the day turn off lights, televisions, computers processors, monitors, smart boards, printers, copy machines, laminating machines, etc. (using power strips when applicable).	All Staff	Salary
All Sites	Report voids in weather-stripping around windows and doors to Maintenance Department via work order.	All Staff	Salary
All Sites	No lamps, electric fans, or space heaters. Only refrigerators approved in the Appliance Usage Advisory.	All Staff	Salary
All Sites	Keep outside doors and windows closed at all times.	All Staff	Salary
All Sites	Break down cardboard boxes and put in the cardboard dumpster.	All Staff	Salary
All Sites	Dress appropriately for the building climate.	All Staff	Salary
All Cafeterias	Do not preheat ovens until ready to use.	Food Service	Salary
All Cafeterias	Cook with lids in place on pots and kettles when possible.	Food Service	Salary
All Cafeterias	Shut down exhaust hood fans when not required.	Food Service	Salary
All Sites	Only light sections of the building where cleaning/work is taking place.	Custodial Staff	Salary
All Sites	Ensure that all exterior doors are closed and locked (before arming the security system) and only essential lighting is left on.	Custodial Staff	Salary

## Water

The Perquimans County School System has been monitoring the schools water usage and we are considering several conservation projects. See **Demand Side Tactics Table - See Proposed Energy Savings Projects**



## Commitment

We recognize that energy and water consumption can be managed to our benefit. Energy and water management is a responsibility of the occupants at each facility, guided and supported by the Energy Manager and the Strategic Energy Planning Committee.

This plan outlines the activities and expenditures required to reduce energy and water consumption to achieve the goals of the program.

The Principals will review progress and results, and will support staff attendance at training in energy and water management.

### Strategic Energy & Water Plan – Goals

Reduce annual Total Energy Consumption by a minimum of 35 % of energy consumption per square foot by fiscal year 2013 – 2014 from a baseline fiscal year 2009 - 2010.

### Strategic Energy & Water Plan - Measures

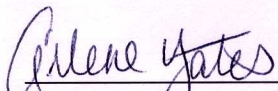
Our tracking measures will be the following Key Performance Indicators (KPI):

- Energy per square foot per year (kBtu/ft<sup>2</sup>/year)
- Energy Cost per square foot per year (\$/ft<sup>2</sup>/year)
- Energy per student per year (kBtu/student/year)
- Energy Cost per student per year (\$/student/year)
- Gallons of water per square foot per year (Gal/ft<sup>2</sup>/year)

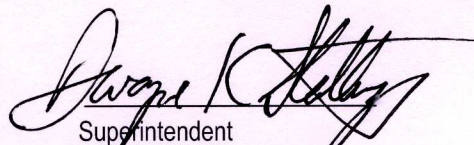
### Strategic Energy & Water Plan Commitment

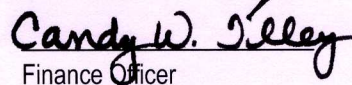
*I have read and support the Strategic Energy & Water Plan for Perquimans County Schools.*

Signed this 28 day of January, 2013.

  
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School Board Chair

  
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Director of Maintenance, Construction  
and Custodial Services

  
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Superintendent

  
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Finance Officer