



ARLINGTON CENTRAL  
SCHOOL DISTRICT



# Arlington Energy Program

## Board of Education Update

### November 27, 2018

*Jacob Lawrence*

*Energy Education Specialist*

*AHS Science Teacher*



# Overview

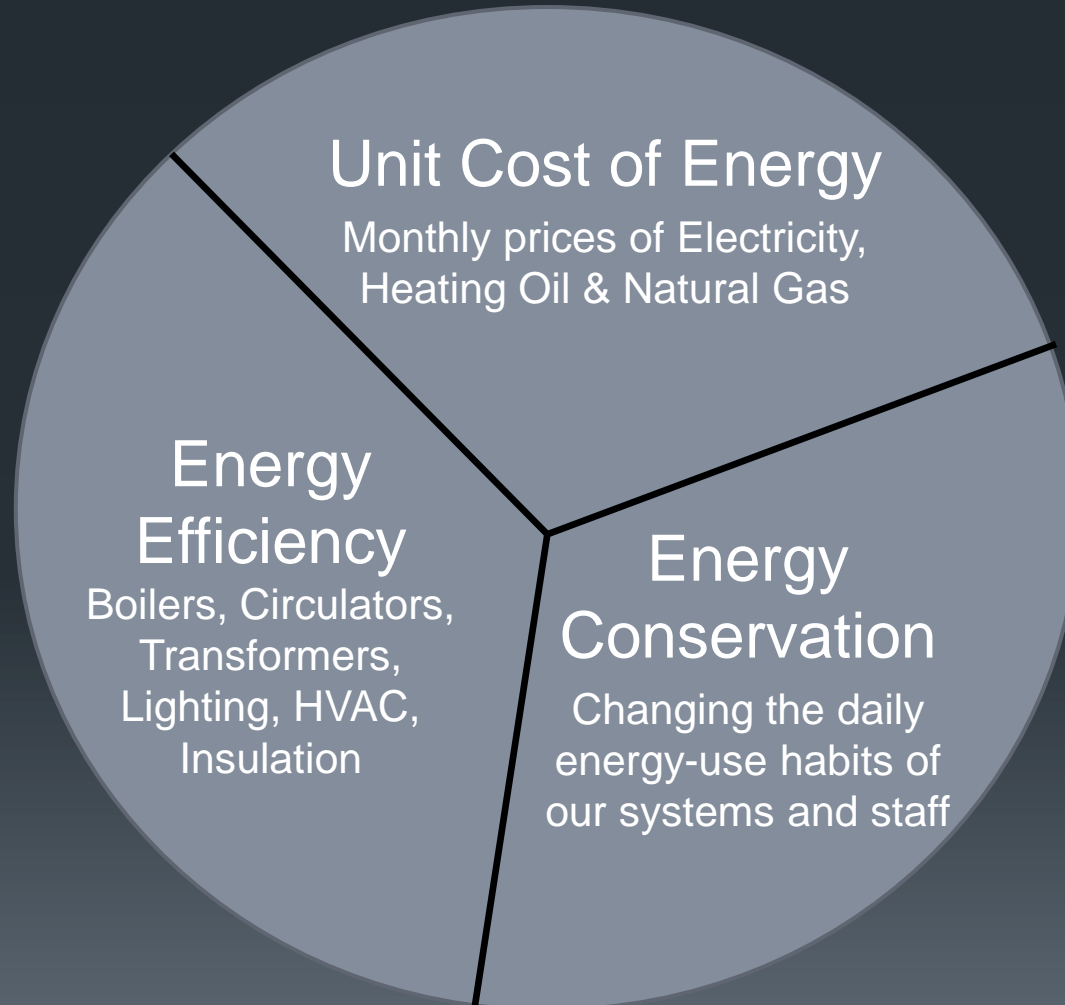


- My role – Energy Education Specialist
- Factors in the energy budget
- Energy Program – Before & After
- Arlington students in the Energy Program

# What does an Energy Education Specialist do?

- Record and analyze all district utility bills
  - Heating Oil, Natural Gas & Electricity
  - Incorporate the effects of weather on energy use
- Measure & Verify -- Conduct building audits (focusing on overnights, weekends and holiday breaks)
- Share observations and recommendations with the Department of Facilities
- Maintain our relationship with Cenergistic
- Work with our students, staff and community to promote energy awareness and a culture of energy conservation

# What affects our yearly energy budget?



# How much are we charged for using energy?

## July 2016 – June 2017

Electricity –10.2¢ per kWh

Natural Gas - \$0.75 per ccf

Heating Oil - \$1.88 per gal

## July 2017 – June 2018

Electricity –10.8¢ per kWh

Natural Gas - \$0.95 per ccf

Heating Oil - \$1.97 per gal

The overall cost of energy increased  
7.4% last year

# Before and After Implementation of the Energy Program

## Before the Energy Program (2009-11)

- Average yearly energy use -- 102,430 mmBTU
- Average yearly energy costs were \$2,224,784

## Since the Energy Program began (2011-18)

- Average yearly energy use is now 82,308 mmBTU
- Average yearly energy costs were \$1,745,106

# Energy Performance Contract

Improved infrastructure has led to more energy efficiency and the potential for more energy conservation.

- New Boiler Rooms
- Electricity Transformers
- Windows & New HVAC
- Heating & Ventilation Controls
- LED Lighting
- Switchover from oil to natural gas



# Hidden Savings

## Changing from Heating Oil to Natural Gas

In December of 2015, we switched 6 of our school buildings to using natural gas instead of heating oil. For the last three years, the lower price of natural gas has resulted in “hidden” savings on top of the savings we get from energy conservation.

Over the last three winters, we have saved a total of \$505,726 due to our switchover to natural gas!

Average Price of Oil: \$1.76/gal

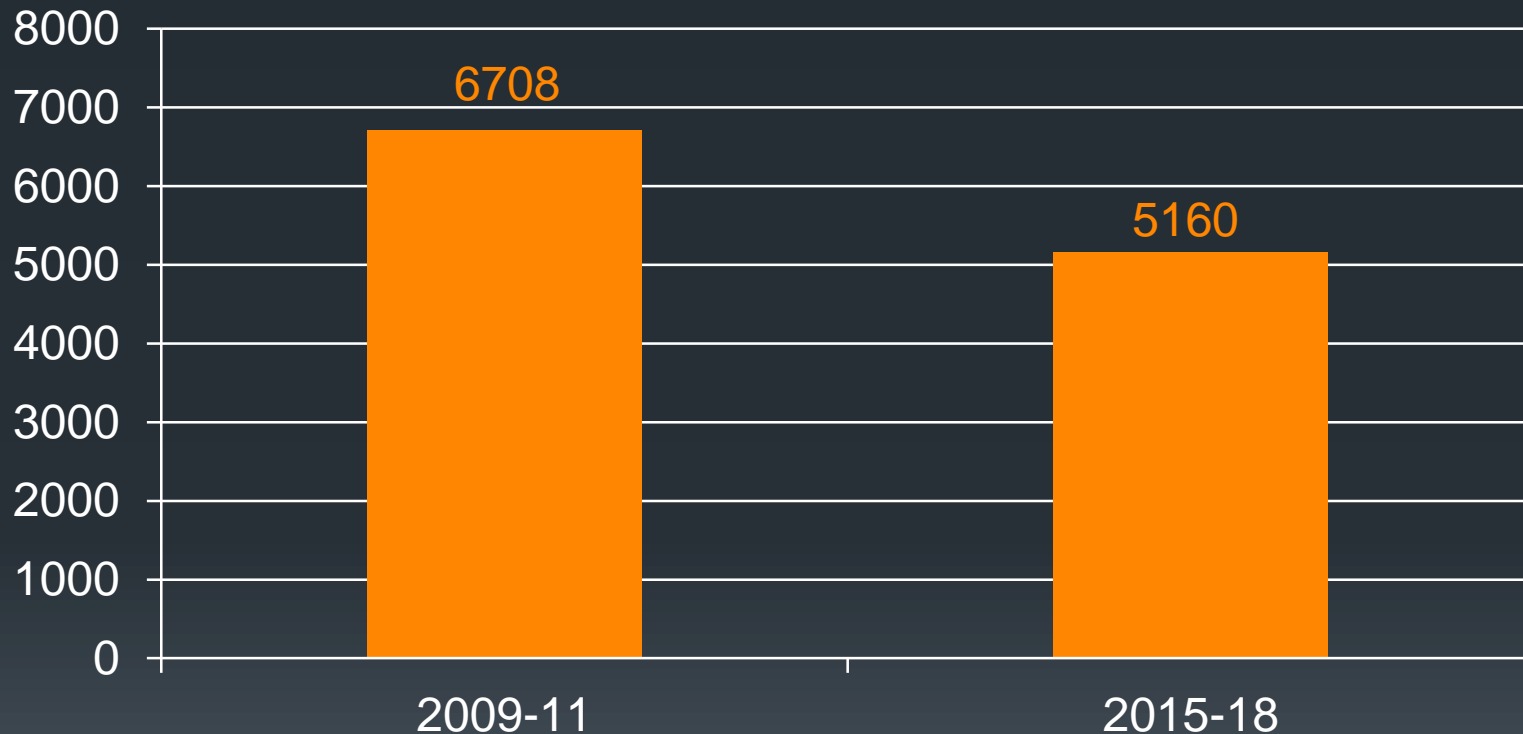
Equivalent Price of Gas: \$1.12/gal





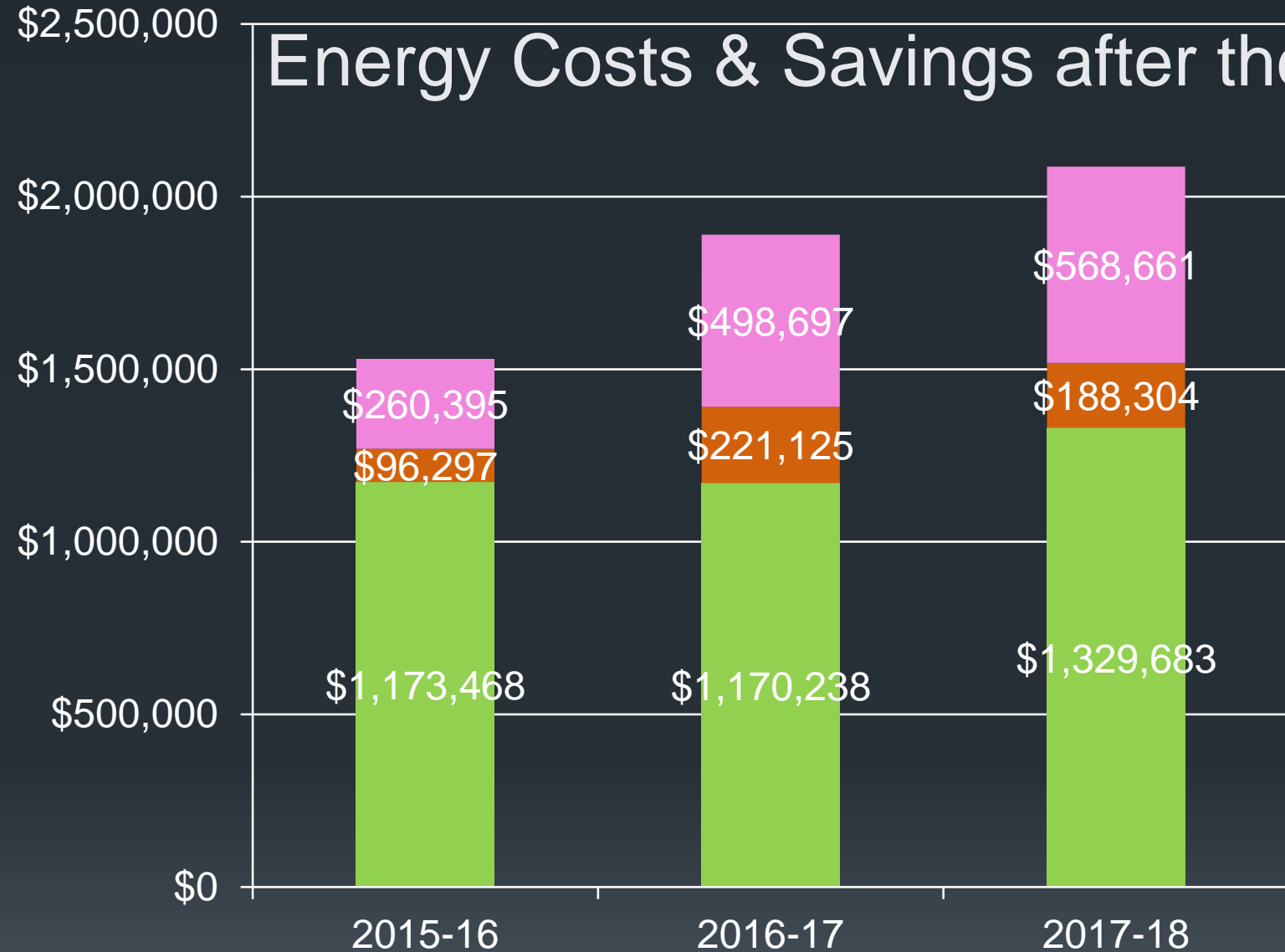
# Environmental Benefits

## ACSD Yearly Average Carbon Dioxide Emissions (Metric Tons of CO<sub>2</sub>)



For the last three years, our buildings are responsible for emitting an average of 23% less CO<sub>2</sub> into the atmosphere.

# Energy Costs & Savings after the EPC



**Yearly Energy Costs**

**Gas Savings**

**Efficiency & Conservation Savings**

# Total Energy Costs & Savings



Since the Arlington Energy Program began, we have spent a total of \$14,560,782 in energy costs.

Over that time, due to energy conservation, improved efficiency, and a change to natural gas, we have saved \$4,138,194.

28% cost avoidance



# Arlington's Students

# Energy Research Students

Our goal is to work with the students and staff at Vail Farm Elementary to raise awareness of our energy habits at home and within the school



# “De-Lamped” Light Fixtures



# Vail Farm Energy

Our goal is to work with the students and staff at Vail Farm Elementary to raise awareness of our energy habits at home and within the school



How much electricity does it use?





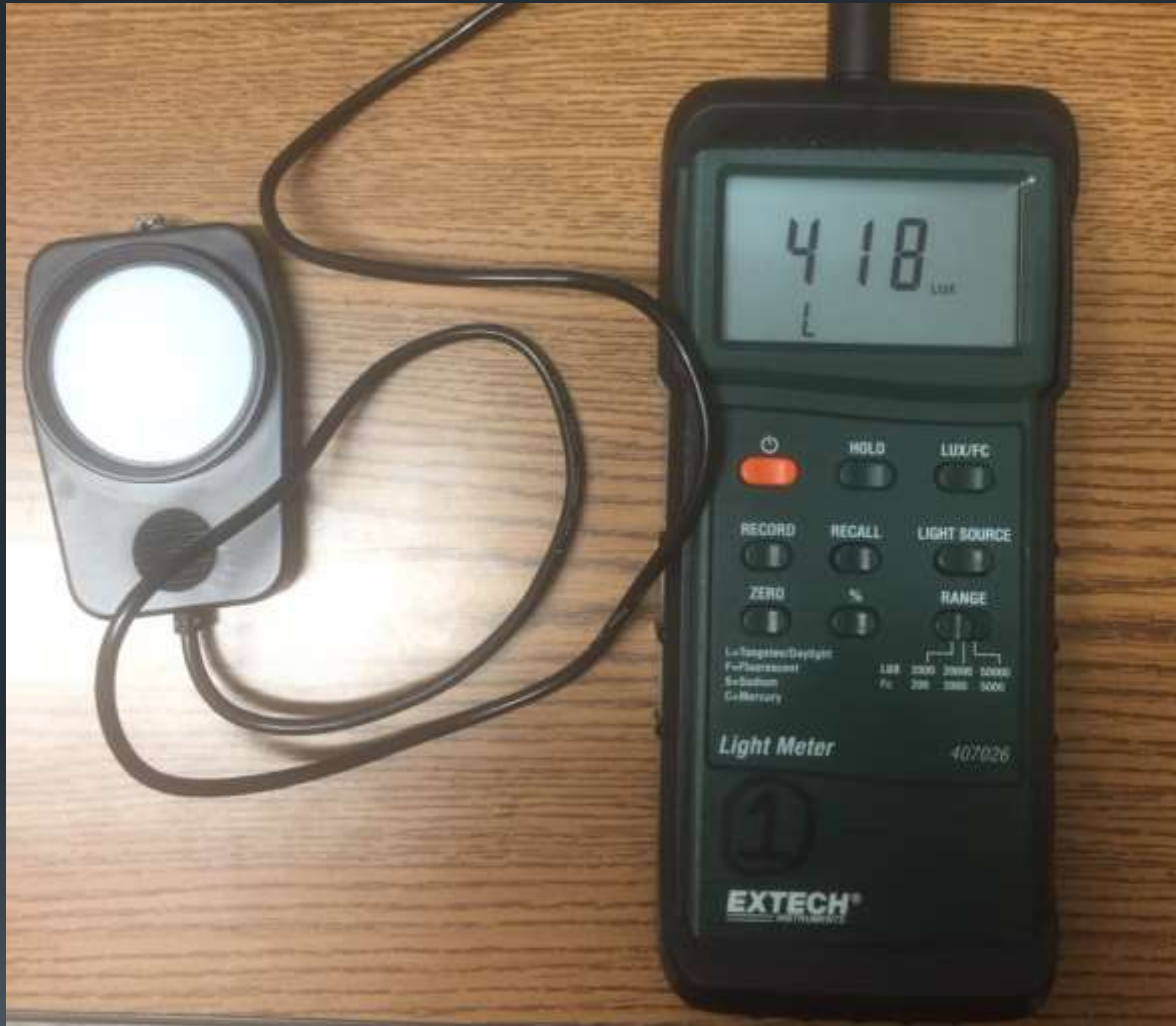
How much electricity does it use?



# Vail Farm's Energy Warriors



# Energy Measurement



How much light do we need for our daily activities?



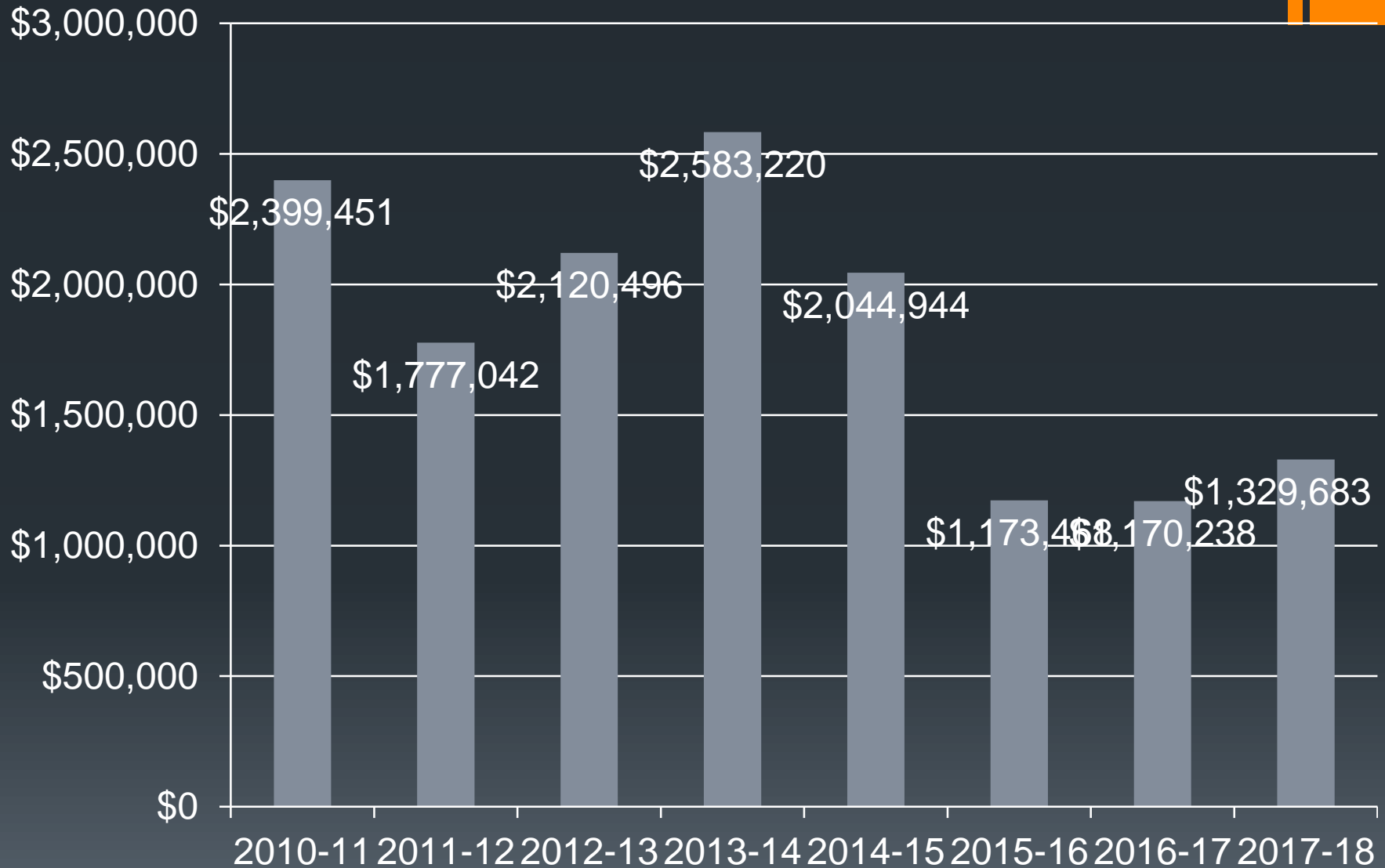
Thank you!

Questions?



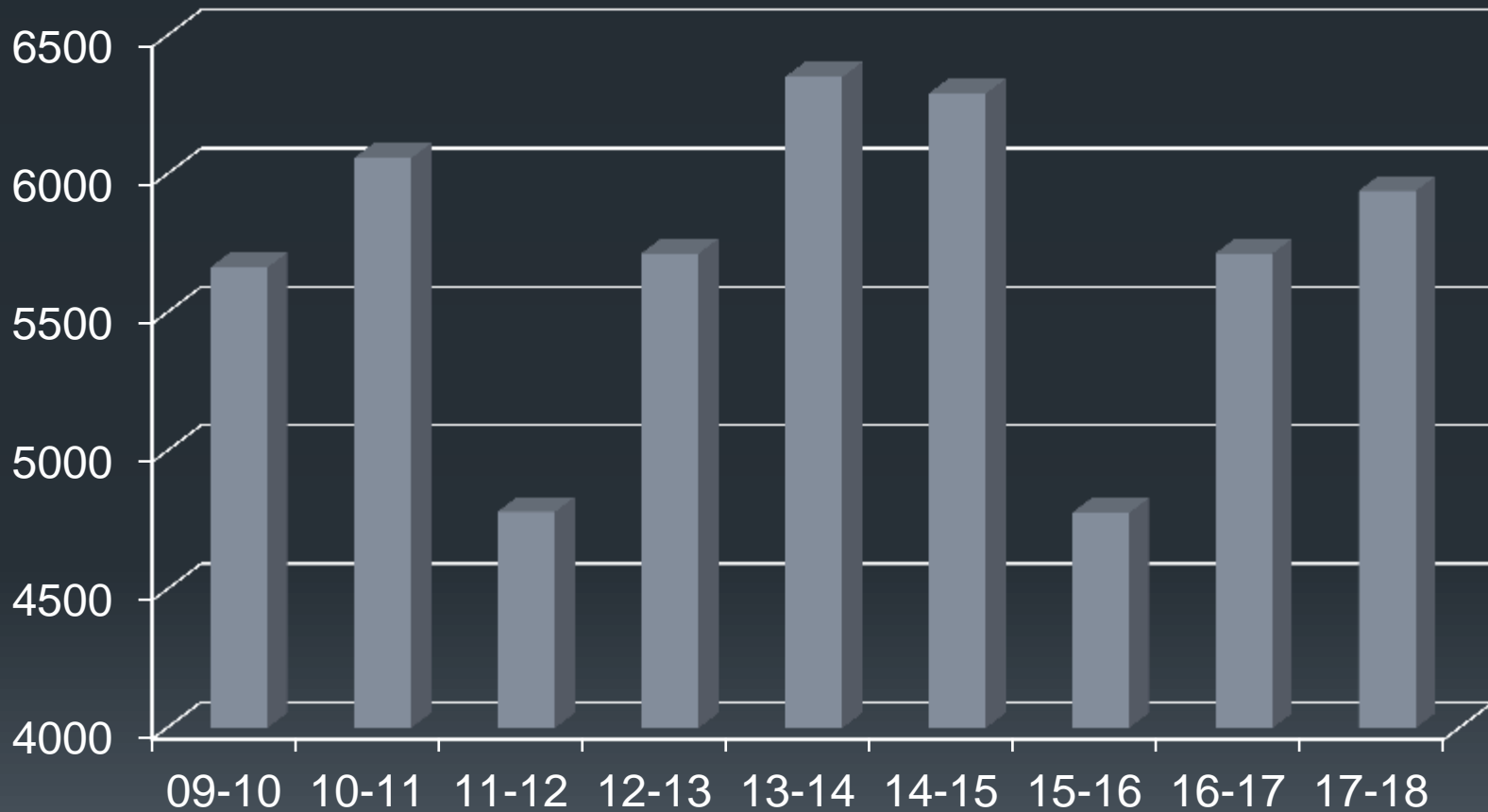
Appendix Slides to follow

# Total Energy Costs per Year



# Weather Variations

## Heating Degree Days



**Energy use varies with how much we need to heat during the winter, but weather varies greatly from year to year.**

# Strategies for Reducing Costs: Energy Setback Events

**Winter Break**

**Spring Break**

**Summer Vacation**

**July & August 2018**

**Electricity cost avoidance**

**\$42,151**