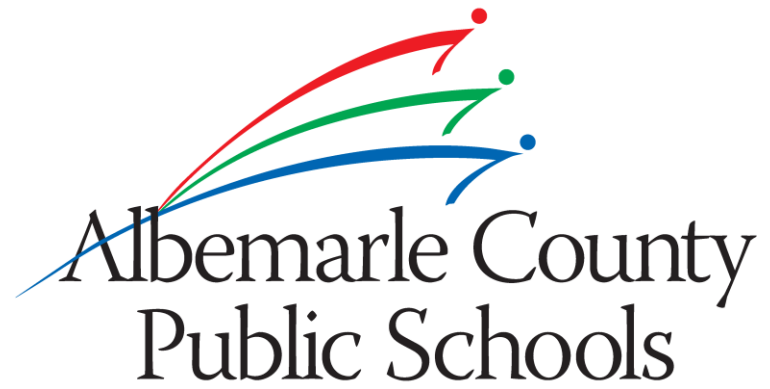




# **Energy Efficiency**

## **Planning, Funding, & Implementation**



- Charlottesville, Virginia
- 26 schools
- 13,697 students
- 726 square miles

# Energy Policy Background

- Policy FECBA, *Energy Efficient Construction* (1993)
- Policy EBAC, *Environmental Management* (2006)
- Policy FEH, *Energy Management and Conservation Policy* (2009)
- Board Clean Energy Resolution (2018)
- Climate Action Plan (October 2020): Target is to reduce greenhouse gas emissions in the community by 45% from 2008 levels by 2030 and to achieve zero net emissions by 2050.

# Energy Performance Contract (EPC)



- Energy savings!
- Ability to dim lighting
- No flickering and consistent color temperature

# EPC: Project Overview

- Focus – LED lighting in classrooms + controls
- Expanded scope to include high-efficiency plumbing fixtures, exterior lighting, and other interior lighting
- 22 schools
- 12-year payback on cumulative projects



# EPC: Detailed Project Timeline

- 2015: ACPS LED Lighting Pilot in 12 classrooms and feedback from teachers and students
- January 28, 2016: School Board voted to support the request for a Back-of-the-Envelope Audit for a division-wide LED lighting project
- August 2016: Back-of-the-Envelope Audit request sent to ESCOs
- September 30, 2016: Back-of-the-Envelope Audits received from ESCOs
- April – May 2017: MOU finalized with Ameresco and Investment Grade Audits
- May – June 2017: Pro Forma for proposed projects finalized and meetings with Local Government on financing mechanisms
- August 10, 2017: Financing RFP results presented to School Board
- September 14, 2017: Decision to proceed
- November 2017: Construction Begins
- July 2019: Enter Performance Period

# EPC: Lighting Fixtures & Controls

- Pilot rooms for color temperature and switching selection
- Retrofit kits, tubes in mechanical spaces/hallways





# EPC: Water Savings Impact

- High-efficiency fixtures installed and low-flow aerators on sinks
- Saving a monthly average of ~270,000 gallons
- Filling ~5 Olympic swimming pools per year





# Energy Performance Contract

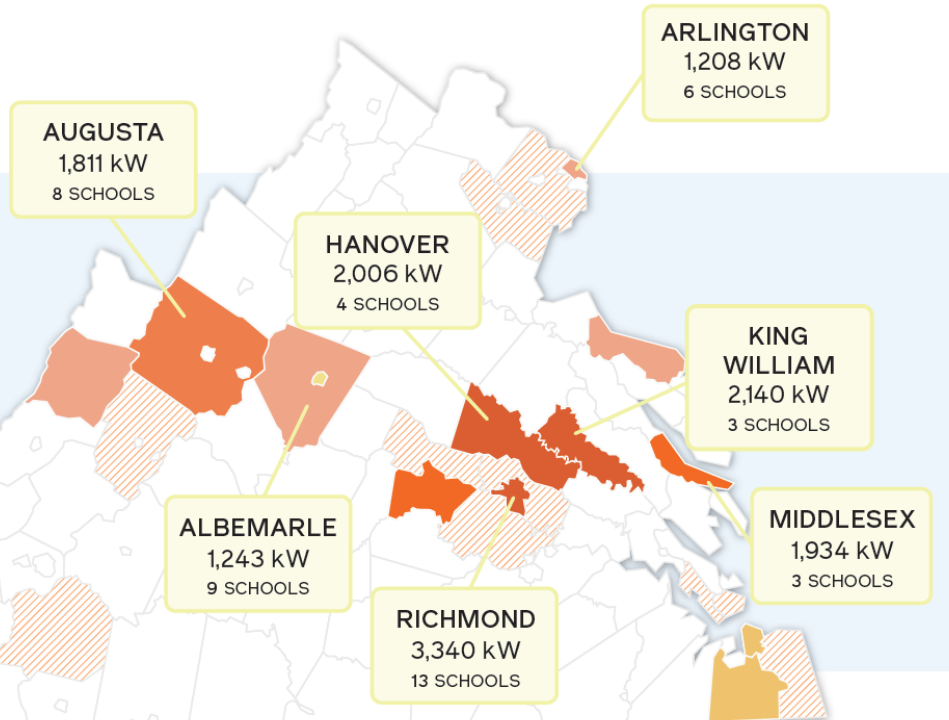
- Measurement & Verification phase for 3 years
- Annual Guaranteed Savings ~ \$700,000
- Performance period is aligned with fiscal year

# Solar Schools

## Solar Statistics on Albemarle County Public Schools

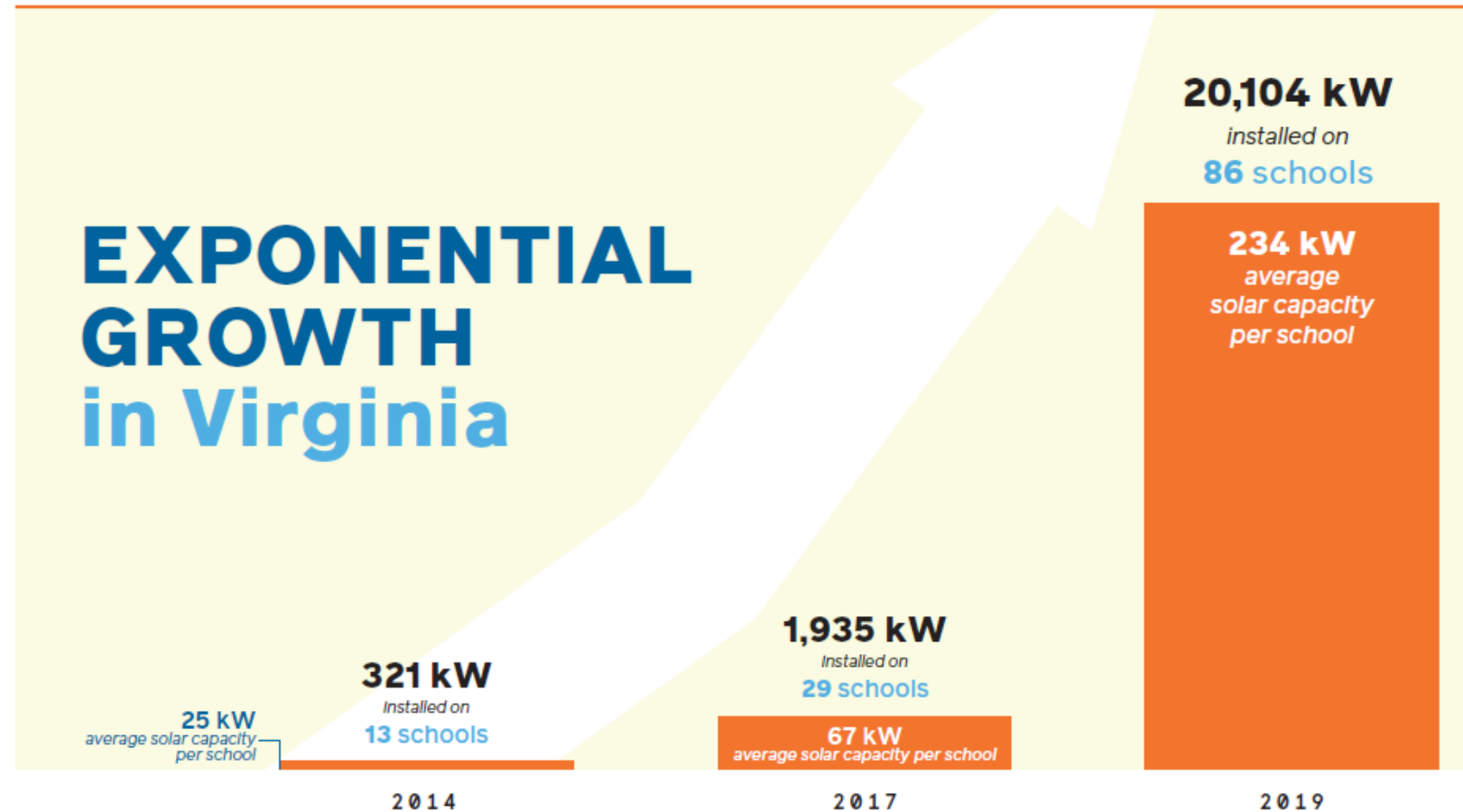
School	System size kW (DC)	Number of Solar Panels	Equivalent to Average American homes
Greer Elementary	75	216	9
Albemarle High	124	360	14
Brownsville Elementary	130	378	15
Baker-Butler Elementary	224	648	25
Monticello High	267	774	30
Sutherland Middle	279	809	32
<b>Total</b>	<b>1099</b>	<b>3185</b>	<b>125</b>

### INSTALLED SOLAR CAPACITY THROUGH 2019 (kW)



Source: Generation 180 Powering a Brighter Future Report; <https://generation180.org/solar-schools-2019-virginia-report/>

## Growth of Solar Schools in Virginia



Source: Generation 180 *Powering a Brighter Future Report*; <https://generation180.org/solar-schools-2019-virginia-report/>



# Solar Ownership

- Scottsville Elementary (203 kW)
- Red Hill Elementary (73 kW)
- Henley Middle (42 kW)





# Geothermal – Crozet Elementary



# ACES Formation

The Advisory Committee for Environmental Sustainability (ACES) is formed to advise and inform the School Board and Superintendent about measures to help Albemarle County Public Schools (ACPS) develop and reach sustainability goals and foster an integrated series of tools and knowledge for the growth of environmental awareness.



# Strategies, Actions, & Timeframe

**Strategy:** Increase community awareness about energy conservation and renewable energy.

**Action:** Develop a multi-media informational campaign

**Timeframe:**

Initiate planning

**Action:** Promote and encourage building design, construction, and performance rating and certification systems.

**Timeframe:**

Initiate planning

**Action:** Support community efforts to share information about conservation, energy efficiency, and renewable energy topics.

**Timeframe:**

Initiate planning

**Action:** Develop agreements with utility companies and other stakeholders to more effectively collect and share energy use data.

**Timeframe:**

Assess opportunities

**Action:** Increase informational programs on building energy efficiency, renewable energy generation, and climate change for public school staff.

**Timeframe:**

Initiate planning

# Strategies → SMART Goals

**Strategy:** Increase tree cover and native vegetation in urban areas, particularly adjacent to streets and parking areas.

**Action:** Promote the use of trees, shrubs, rain gardens, and native meadows in lieu of turf grass in landscape design and property management; encourage native species for additional benefits.

**Timeframe:** Assess Opportunities

## SMART Goal:

Reduce acreage mowed by 30% and allow to revert to natural state by 2024.



# ACPS Strategic Plan

Objective: ACPS will develop modern and environmentally sustainable facilities, infrastructure, and equipment.

Success Measure:

- Building carbon emissions are reduced





## ACPS Building Carbon Emissions

Indirect Emissions from utility companies, such as electricity, and direct emissions from fossil fuels burned onsite for heating.

Select a School

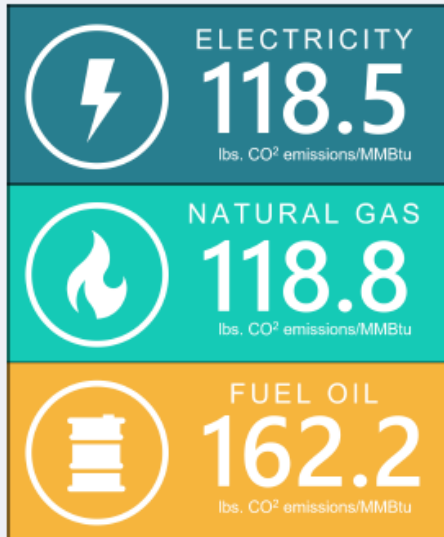
All

Select a Facility Type

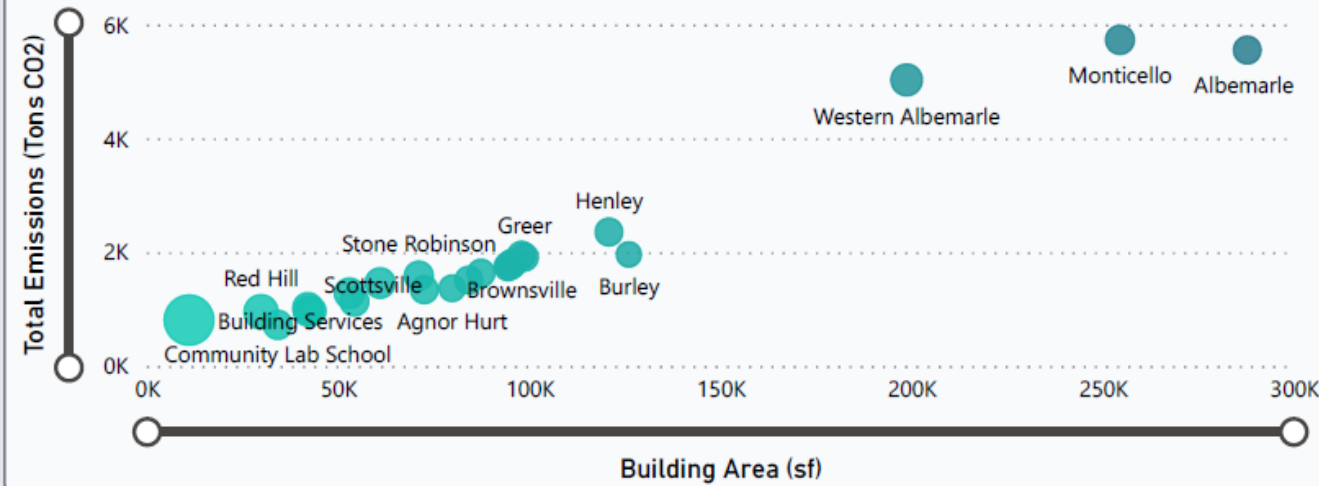
All

2017

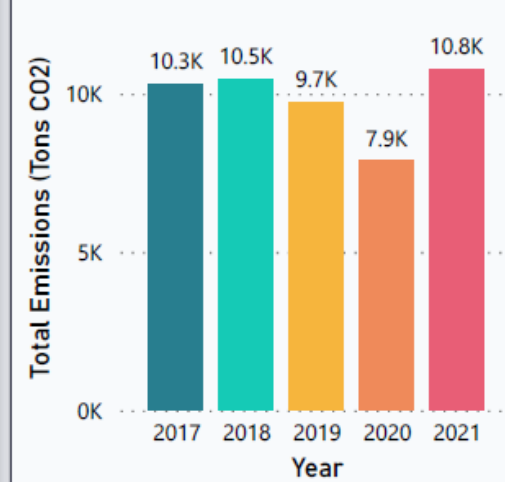
2021



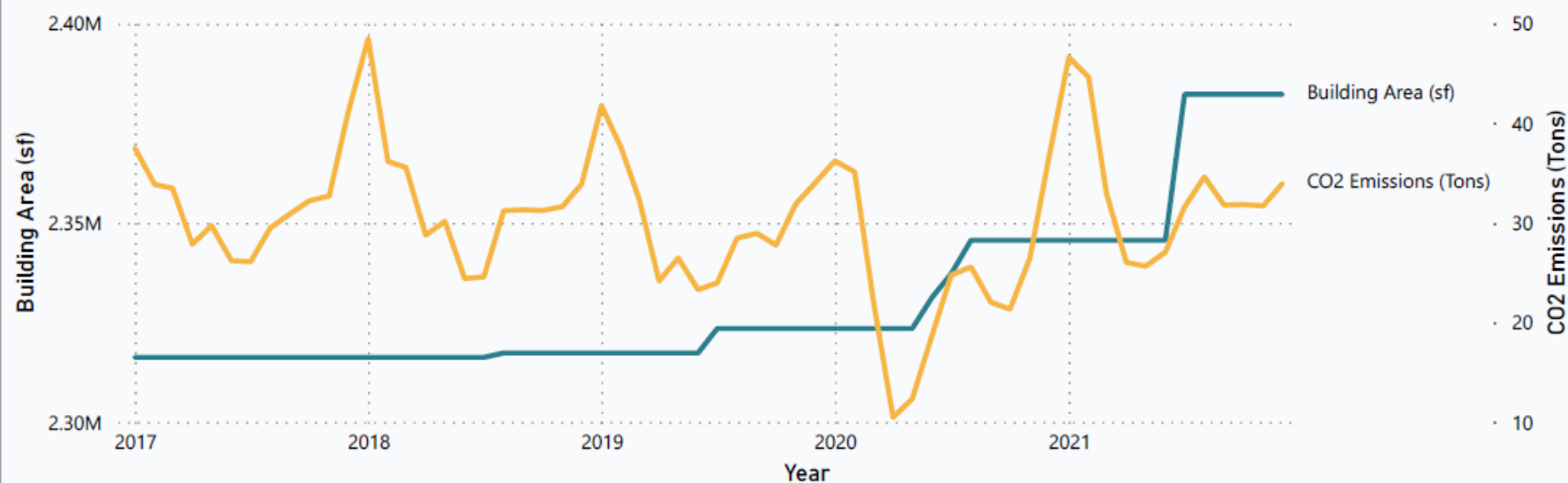
Emissions Intensity (Tons CO<sub>2</sub>/sf)



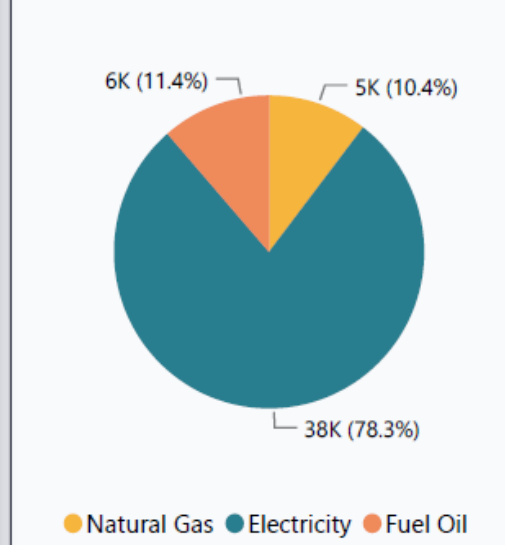
Total Emissions (Tons CO<sub>2</sub>/year)



Building Area (sf) and CO<sub>2</sub> Emissions (Tons)



Emissions by Energy Source





# Next Steps

- DOE Energy CLASS Grant
- DOE Renew America's Schools

