

City of Charlottesville Fiscal Year 2023 Annual Energy and Water Performance Report - CCS Executive Summary



The City of Charlottesville’s Energy and Water Management Program (EWMP) monitors and manages energy and water usage at all municipal and school sites. It has continued its strong partnership with Charlottesville City Schools (CCS) set in place by the energy and water saving goals in the 2019 Resolution for Charlottesville City Schools Energy and Water Performance. This summary highlights notable actions and findings for CCS from the [City of Charlottesville FY2023 Annual Energy and Water Performance Report \(LINK\)](#).

New Performance Targets and Reduction Goals

The City’s utility usage performance targets are now represented as Energy Use Intensity (EUI) and Water Use Intensity (WUI). These metrics are seen as a standard for comparing building performance as they normalize against facility square footage, thereby allowing different size facilities to be compared with others of the same



Greenhouse Gas Goal

45% Reduction in GHG by FY2030



Energy Goal

30% Reduction in EUI by FY2030



Water Goal

30% Reduction in WUI by FY2030

building type and would allow the portfolio to be compared to itself overtime, no matter the fluctuation in total square footage. Consistent with the City’s established Climate Action Plan and greenhouse gas reduction commitments, the EWMP has set municipal targets to support the City in meeting their reduction goals within the committed timeline.

FY2023 Key Performance Findings

The City’s performance for FY2023 provides a clear view of building performance post COVID-19. **In FY2023, the school portfolio spent \$1.37 million on energy and water utilities** (Figure 1), accounting for 37% of Charlottesville municipal utility spending. The increase in utility costs is associated with rising utility rates, facilities being run with higher ventilation rates, and overall increased utility usage. When compared to the portfolio’s baseline year of FY2011, there was a 35% increase in total utility costs. With respect to utility consumption, there was a 2% decrease in electricity, a 6% increase in natural gas, and 11% decrease in water.

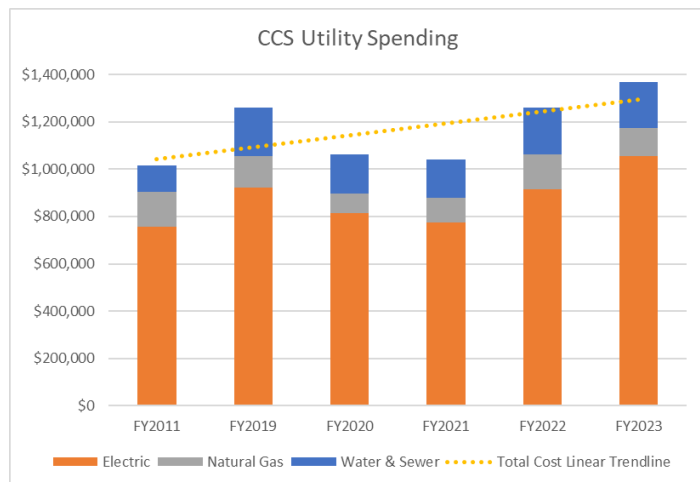


Figure 1: Charlottesville City School’s utility spending for the past 5 fiscal years and FY2011 (baseline year) for each commodity type across all school facilities.

Many CCS school buildings had, on average, an energy use intensity (EUI) and water use intensity (WUI) in FY2023 close to the regional average school buildings.

- For FY2023, **CCS buildings had an average EUI of 51.5 kBtu/sq.ft. which is nearly the same EUI as the FY2011 baseline.** Therefore, schools need to reduce their EUI by 30% (across all schools) to reach the 2030 reduction goal of 35 kBtu/sq.ft. (Figure 2).
- Overall, **there has been a 4% reduction in WUI when comparing FY2023 to FY2011 baseline year.** CCS needs to reduce its WUI an additional 26% by 2030 to reach the 30% reduction goal of 8.2 gal/sq.ft. (Figure 3). It is anticipated that replacing any water wasting fixtures with water efficient specifications will help CCS reduce usage by 18%, meaning that the remaining savings will need to come from behavioral changes to save water.
- An ENERGY STAR score of 75 is needed to apply for ENERGY STAR certification. In FY2023, **two out of ten schools have reached the 75 score** (Table 1). Our goal is to have all ten schools reach a 75 score by 2030.

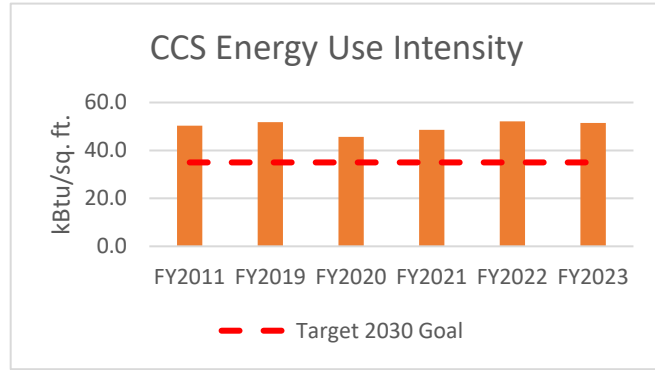


Figure 2: Annual municipal weather-normalized EUI. Red dashed line notes the FY2030 target of 30% reduction from the baseline year, FY2011.

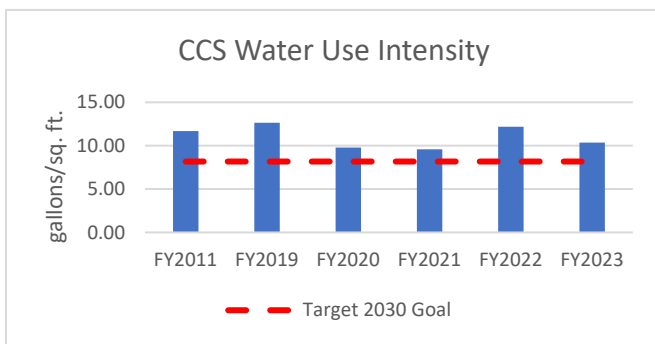


Figure 3: Annual municipal WUI. Red dashed line notes the FY2030 target of 30% reduction from the baseline year, FY2011. **Note:** irrigation accounts were omitted.

The CCS portfolio had seen a downward trend in greenhouse gas (GHG) emissions since the FY2011 baseline.

With major reductions seen in energy usage at CCS facilities in 2020 due to COVID-19, GHG emissions saw a sharp decline (28.0%). The portfolio then saw a gradual increase in GHG emissions in FY2021 (1.4%) and then a larger increase in FY2022 (8.9%) as facilities returned to more normal occupancy levels. In FY2023, the portfolio saw a decline in GHGs (1.1%) from FY2022 and has essentially returned to operations that are similar to before the pandemic, so GHG emissions now give a more accurate portrayal of performance in schools than previous years. The EWMP will continue to monitor this in FY2024.

School Facilities	ENERGY STAR Score*		
	FY2015	FY2022	FY2023
Buford Middle School	43	34	34
Burnley-Moran Elementary School (<i>ES Cert. 2009</i>)	33	72	68
Charlottesville High School (<i>ES Cert. 2009</i>)	71	57	57
Clark Elementary School (<i>ES Cert. 2009</i>)	37	38	28
Greenbrier Elementary School (<i>ES Cert. 2009</i>)	51	60	64
Jackson-Via Elementary School (<i>ES Cert. 2009</i>)	65	50	48
Johnson Elementary School (<i>ES Cert. 2009</i>)	71	78	75
Lugo-McGinness Academy	82	84	86
Venable Elementary School	52	55	48
Venable School Annex	1	21	14
Walker Upper Elementary School	40	20	19

Table 1: CCS benchmarked facilities and Energy STAR scores for FY2015, FY2022, and FY2023.

FY2023 CCS Program Actions and Highlights

Operational Actions

- Conducted monthly meetings of EWMP and CCS staff to discuss operations and utility performance of CCS facilities.
- Continued to implement **demand-side management** of the facilities building automation systems (BAS) and **review HVAC schedules** to ensure buildings were operating efficiently.
- At Charlottesville High School (CHS), the Facilities Maintenance team implemented an **alternative operation strategy** of the two chillers, running both in parallel but at lower capacity so the chillers can run closer to optimal, more efficient levels.

Technological Actions

- Finalizing the agreement of an **energy performance contract (EPC)** that includes all schools and identifying initial projects.
- Continued to **replace lighting, replace HVAC equipment, and make improvements to building envelope** across various facilities including the start of a roof replacement at Charlottesville High School.
- Specifically, as part of a renovation in Greenbrier Elementary library, **lighting was upgraded to LED and occupancy sensors, vacancy sensors, and photosensors** were installed to control the on/off functionality and light levels.

Behavioral Actions

- Continued **Energy and Water Management Campaign at CCS** through announcements and activity sheets for students and staff, light switch reminders, and helpful checklists for staff to use before going away on long breaks.
- Performed direct outreach efforts in the classroom including providing **330 Climate Action Kits** to all 5th graders at Walker Upper Elementary in collaboration with Community Climate collaborative and the Virginia Discovery Museum.
- Visited Greenbrier Elementary's 4th Grade Global Guardians Conservation Showcase focused around "**Think Global, Act Local**" water and energy saving actions.

FY2024 Outlook

The EWMP plans to continue to work towards meeting their energy and water reduction goals to help CCS make progress to meeting the City's greenhouse gas emissions reduction goals and Climate Action Plan commitments.

Looking to FY2024, there are a number of projects and initiatives planned:

- Lighting contactors/wiring replacement at CHS, replacement of water source heat pumps at Greenbrier, and cooling tower replacement at Jackson-Via.
- Mirror clings targeting water saving behaviors in all school restrooms and development of materials for the CCS Science Pacing Guide that include energy and water conservation activities.

A Dashboard of all the data included in the FY2023 City Annual Performance Report with interactive options and detailed data can be viewed at [EnergyCAP FY2023 City Performance Report Dashboard](#).