



CHARLOTTE

Strategic Energy Action Plan (SEAP) Update

January 8, 2024

Our City



Our Path



Our Charge



Our Mission

Charlotte will **lead as a global city** by continuously improving, protecting, and preserving **the environment, its community, and economy**, while ensuring **equity and resilience** - for today's and future generations.

Our Work



POWER DOWN THE CROWN

YOUR BUSINESS COULD SAVE MONEY AND THE PLANET

WE NEED YOUR ORGANIZATION'S HELP TO MAKE CHARLOTTE A LOW-CARBON CITY BY 2050.

Learn how at the last Power Down the Crown Program virtual workshop of the year.

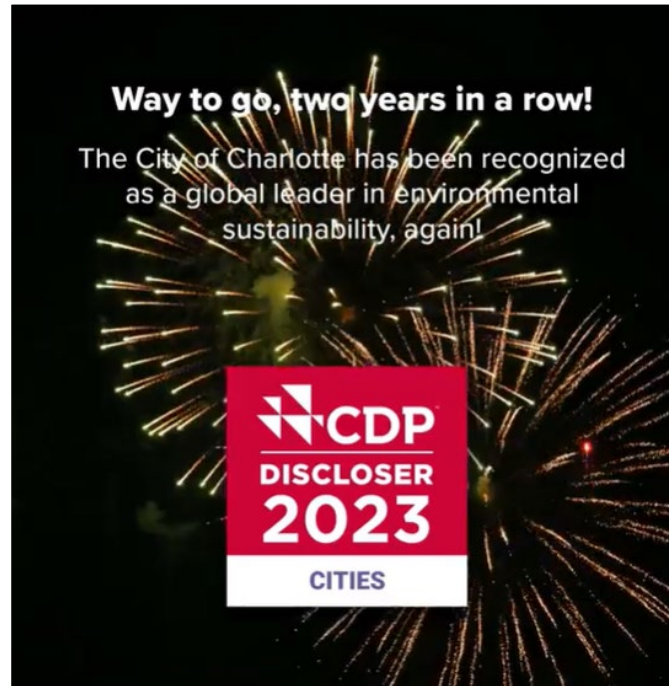
December 6, 10-11 a.m.

REGISTRATION IS **FREE!**

QR code

Crown logo

Launch Power Down the Crown

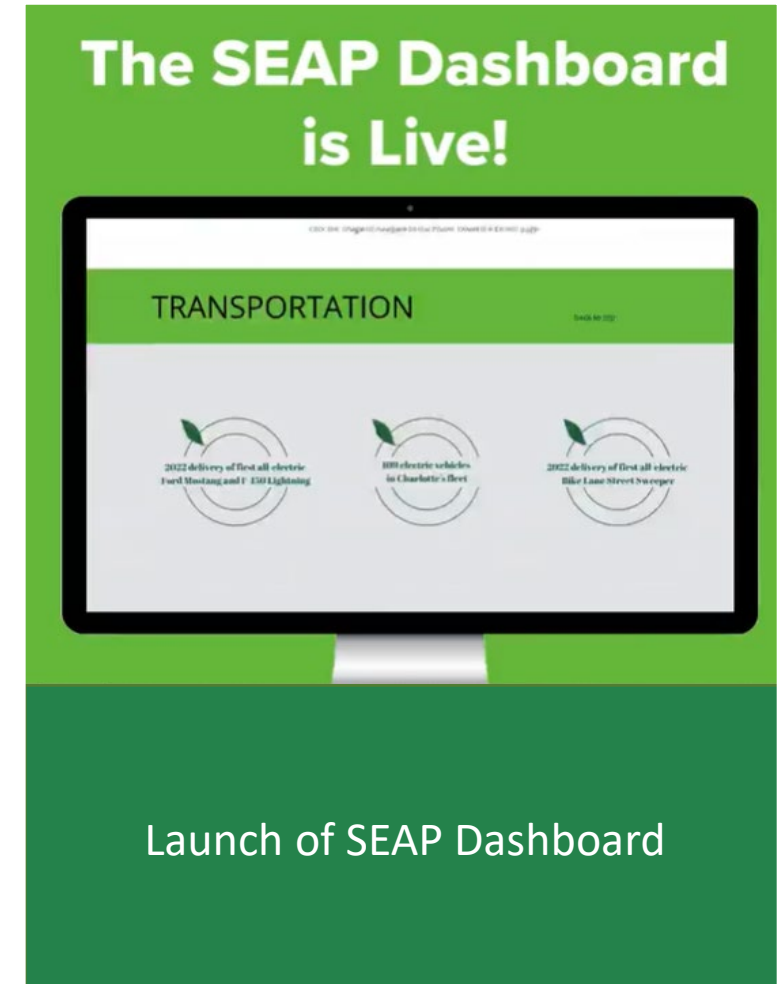


Way to go, two years in a row!

The City of Charlotte has been recognized as a global leader in environmental sustainability, again!

CDP DISCLOSER 2023 CITIES

Achieve "A-" score from CDP



The SEAP Dashboard is Live!

TRANSPORTATION

- 2022 delivery of first all electric Ford Mustang and 1 ESO Lightning
- 100 electric vehicles in Charlotte's fleet
- 2022 delivery of first all electric Bike Lane Street Sweeper

Launch of SEAP Dashboard



Purpose
***Duke Energy
Green Source
Advantage (GSA)
Bridge Program***

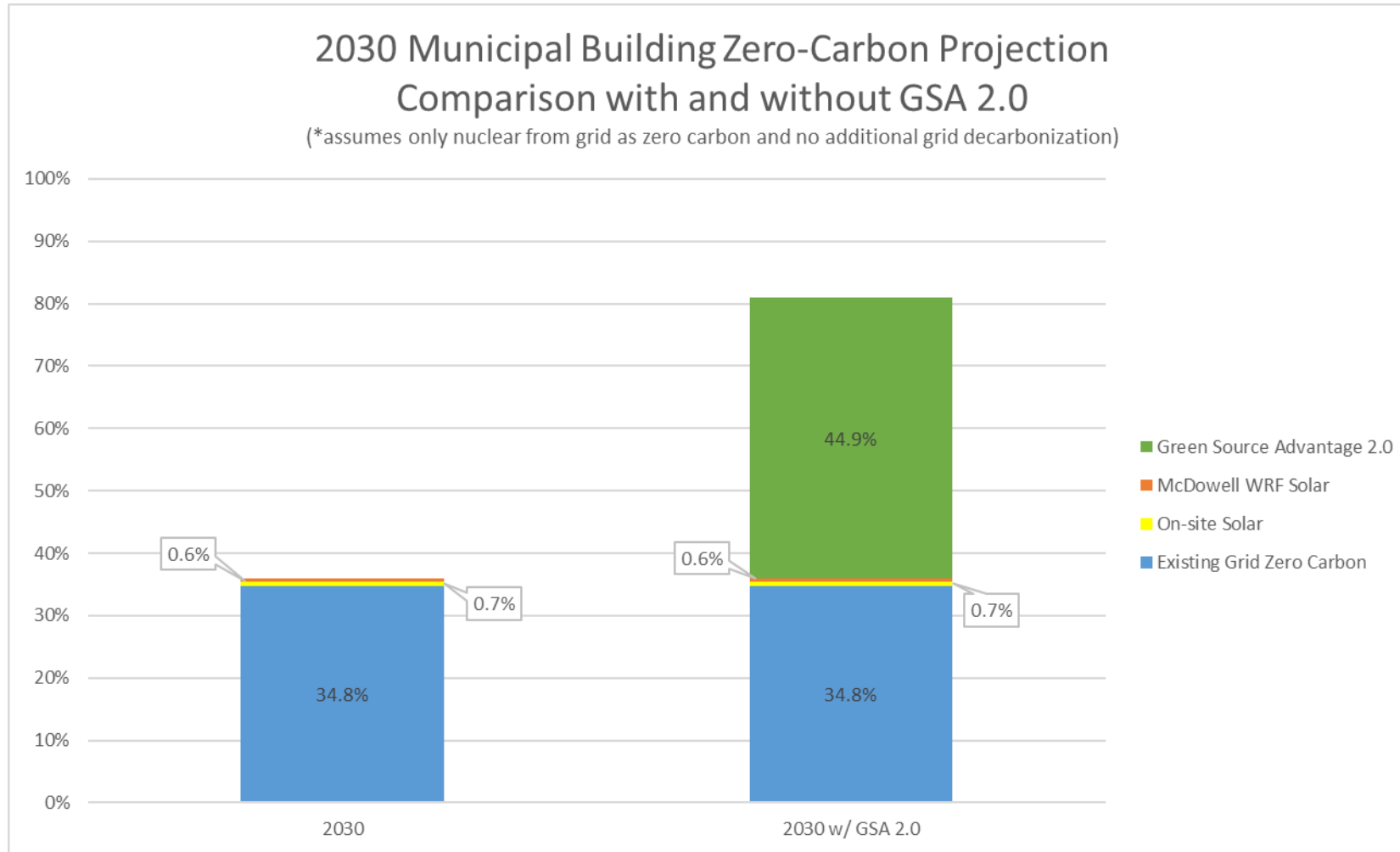
- **Council to vote on an opportunity to participate in a large-scale solar program, the GSA Bridge Program**

GSA Bridge Program: Information

	GSA Bridge
Size	80 MW
Distance from Government Center (miles)	49.5
Average Annual Cost	\$1.169M
Renewable Energy Certificate Cost per Unit	\$7.71
Contribution to SEAP 2030 Buildings Goal	~45 - 48%
Average Annual Avoided CO ₂ e (metric tons)	107,451
Equivalent Number of Homes Powered	13,542
Equivalent Trees Planted Annually	1,776,714
Cost to Build Equivalent On-site Solar Capacity*	236.8M

*Based on average per MW cost of solar that has been installed city property to date. Please note that there is not sufficient space on city property to build such sized facilities.

Towards Goal Achievement



➤ Brings city within 19% of hitting 2030 goal

➤ Helps local energy grid decarbonize faster – environmental and health impacts

➤ Invests in local clean energy economy

*Net-zero carbon is defined as using and producing as much as, or more, zero-carbon energy than total energy use. On-site and off-site solar along with the nuclear portion of Duke's grid mix are given zero-carbon consideration here.

Global Context



The planet is on track to hit **at least 2°** of warming



Cities generate up to **70%** of global emissions



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SEAP RECAP



SEAP

STRATEGIC ENERGY ACTION PLAN
CITY of CHARLOTTE

- June 2018, the Sustainable and Resilient Charlotte by 2050 Resolution
- December 2018, Strategic Energy Action Plan (SEAP)



Goal:

The City of Charlotte will strive to source 100% of its energy use in its buildings and fleet from zero carbon sources by 2030

This goal was established in accordance with the City's Sustainability and Resilient Charlotte by 2050 Resolution.



Goal:

The City of Charlotte will strive to become a low carbon city by 2050

This goal was established in accordance with the City's Sustainability and Resilient Charlotte by 2050 Resolution.



Our Path

2018 - Foundation

- Resolution
- SEAP

2019-2023 - Implementation

- Policy
- Projects
- Programs

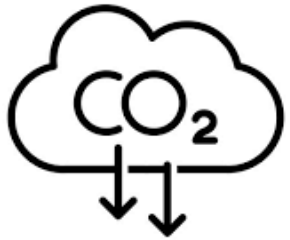
2024 - Alignment

- Latest Science
- Council Priorities



SEAP UPDATE

Connect to the latest science



Update and track project data



Re-evaluate goals to be ambitious



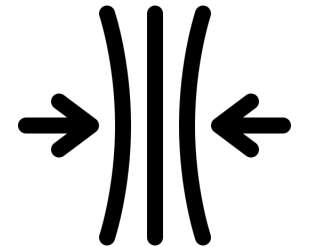
Address equity directly throughout the plan



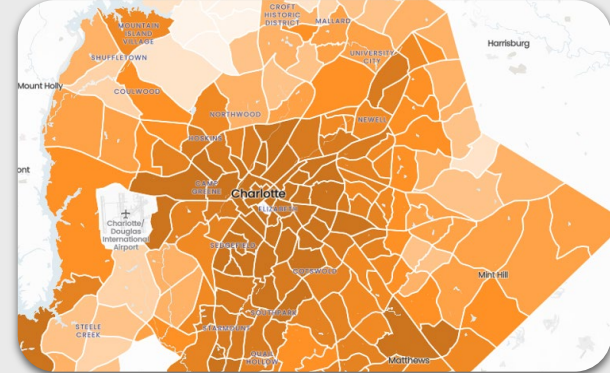
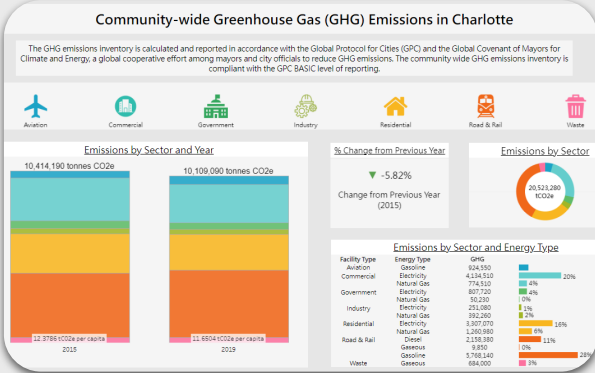
Highlight local efforts to date



Relate to Climate Resilience



TASKS



Update GHG Inventory

Updated SEAP document

Climate Risk Assessment



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NEXT STEPS



**RFQ submittals
Winter 2024**



**Commence work
Spring 2024**



**Finalize draft for
Council adoption
Winter 2024/2025**

***Council and public engagement will occur throughout the process.**

Thank you

GSA Background Slides

How much carbon is reduced by this project?

- **107,451 metric tons** of CO₂e annually. This is the equivalent of taking 23,911 cars off the road.

How does this cost compare to construction costs of onsite solar?

- The last 15 on-site solar projects have a **total capacity of 1.25 MW**, or **3.5% of the GSA project capacity**, cost **\$3.7 million to construct**.
- If we were to build the same size systems on municipal roofs and property, based on the cost of the last 15 projects, **3.7M**, the total construction cost would be **236.8M**.

How does this investment compare to investments in energy efficiency?

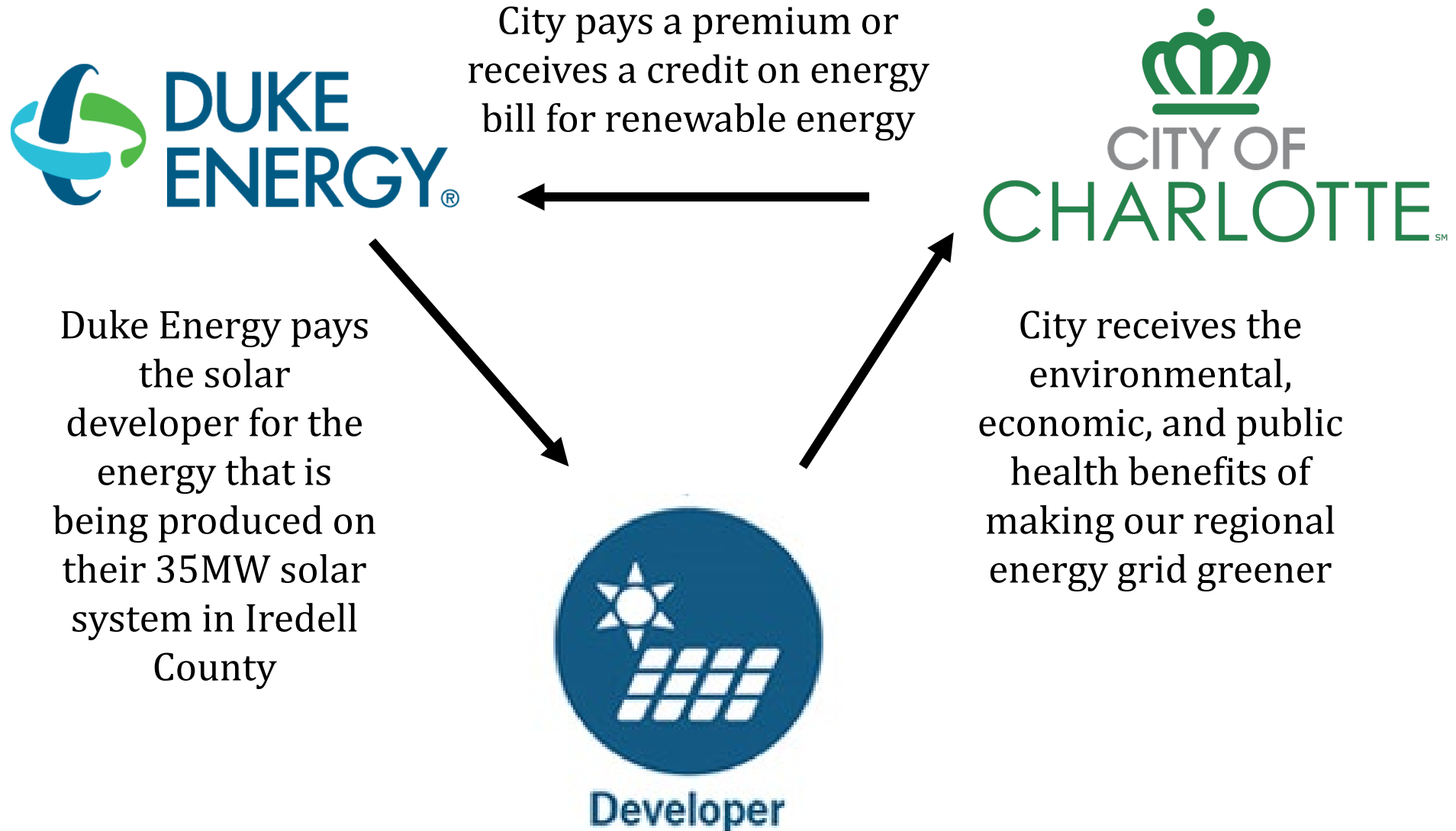
- In comparison, the GSA project will reduce CO₂e by 107,451 metric tons at an average annual cost of \$1.169M or **\$10.88 per metric ton of CO₂e reduced.**

How much more solar can we do on municipal rooftops?

- Based on *existing analysis, we have 16MW of capacity on our rooftops.

*Does not account for shading, rooftop equipment or Aviation property.

How does it work?



GSA Bill Structure

Standard Duke Energy Bill: kWh electricity consumption over service period
X electricity rate

+ GSA Product Charge: renewable energy production over service period X
PPA rate

- GSA Bill Credit: offsite RE production over service period X **Duke's**
AVOIDED COST RATE

= Total Bill Amount

Definitions:

*A **Power Purchase Agreement (PPA)** is an arrangement in which a third-party developer installs, owns, and operates an energy system on a customer's property the rate is fixed in the case of GSA*

****Avoided costs** means the incremental costs to an electric utility of electric energy, capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source.*



- A recently published article in the journal Science of the Total Environment found that differences in exposure to fine and ultrafine particle pollution could be reduced between 20% and 40% in 2050 if solar, wind and electric sources were used rather than fossil fuels.
- *Climate change disproportionately affects those who suffer from socioeconomic inequalities, including many people of color. Approximately 13.4% of African American children suffer from asthma as compared to 7.3% of White children.

Boone hits a goal many seek: 100% renewable energy in town buildings

WFAE | By David Boraks
Published January 27, 2022 at 4:07 PM EST



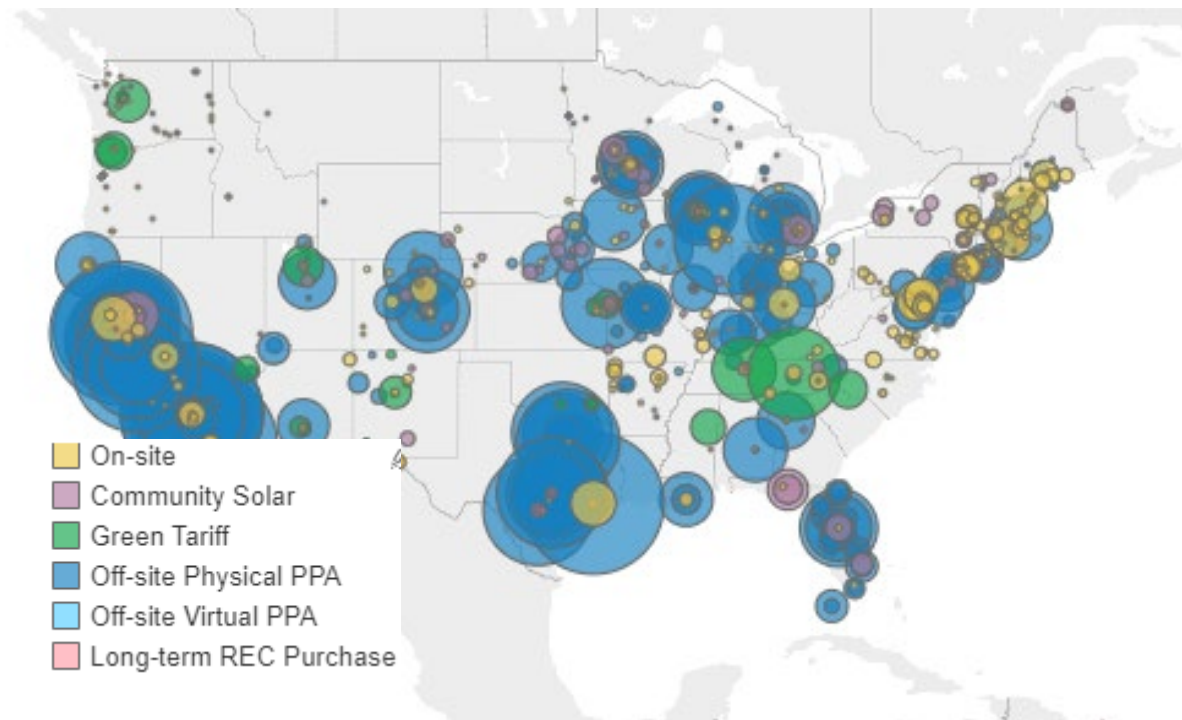
CASE STUDY:

CINCINNATI'S PATH TO A 100 MW SOLAR DEAL

Houston and Los Angeles signed the largest US city
renewable energy deals in 2020

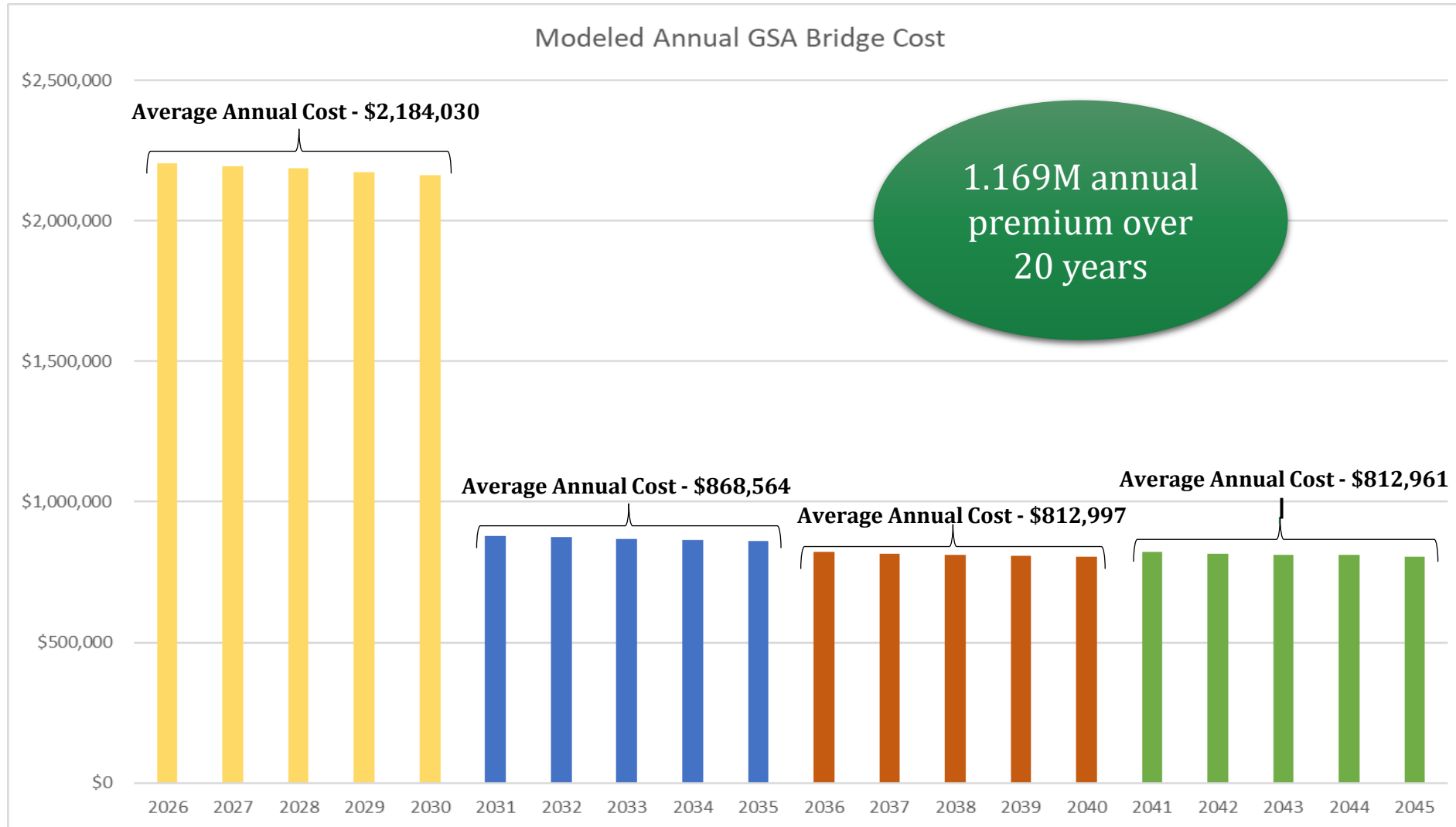
New Amazon-Arlington solar farm to
fulfill most of county's renewable pledges

Clean Energy Transactions as a Strategy



Represents the renewable energy transactions announced by cities, municipal utilities, counties, and community choice aggregations between January 1, 2015, and June 30, 2022. Note that the types of deals available may vary based on state level regulatory policies and, in some cases, local circumstances (e.g. the existence of a local, municipal utility or co-op) <https://cityrenewables.org/transaction-tracker/>

20 Year Premium Model



About Cypress Creek Renewables

- 12 gigawatts of solar developed to date and 4 gigawatts currently operating in the Carolinas

