County of Fairfax, Virginia

MEMORANDUM

DATE: July 12, 2021

TO: Board of Supervisors

FROM: Bryan J. Hill
County Executive

SUBJECT: Community-wide Energy and Climate Action Plan: Final Update

This memorandum provides an update on activities related to the Community-wide Energy and Climate Action Plan (CECAP) since the last update of June 1, 2021 and describes expected next steps as we transition to CECAP implementation.

Background

In June 2021, the members of the CECAP Working Group held their two final meetings and concluded their review of the CECAP draft report. With the planning process completed, the CECAP Working Group was disbanded. Over the last month, staff and the consultants have been updating the draft CECAP report to incorporate the comments of the Working Group and to finalize the draft report. Staff will present the final draft CECAP report to the Board of Supervisors Environmental Committee on July 20, 2021.

The CECAP Report

Consistent with Board direction, the CECAP report is a product of the Working Group, although produced with assistance from county staff and the consultants. It is the culmination of the CECAP planning process and includes all of the various elements considered by the Working Group. The Executive Summary of the CECAP draft report is provided as an attachment to this memorandum.

Key elements of the report include:

- Background information that addresses climate change issues and how they relate to Fairfax County specifically, details on the CECAP development process, a description of the methodology behind various technical analyses, and a detailed greenhouse gas (GHG) emission inventory for Fairfax County.
- CECAP goals, strategies and actions that the Working Group determined should be included to address GHG emission reductions.
- Information on current policies and programs and potential avenues for next steps, categorized by type of actor: (1) individuals and organizations, (2) the government of Fairfax County, (3) the government of Fairfax County requiring state-enabled legislation, and (4) the state and federal governments. Fairfax County government action was of particular interest to the Working Group members.

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Next Steps for the CECAP process

The CECAP report was not intended to address implementation. Instead, implementation is the next phase of the CECAP. Initial implementation of the CECAP is scheduled to begin in Fall of 2021 with three main components: (1) engaging in public education and outreach, (2) building on existing Fairfax County programs and policies, and (3) proposing areas of legislative change.

One of the major themes identified by both the public and the CECAP Working Group members is the need for extensive public education on issues surrounding climate change. Consequently, implementation will begin with targeted outreach and a public survey to gain information about public knowledge and attitudes that can be channeled into effective implementation planning and programs.

The draft CECAP report describes existing County policies, programs, and efforts that complement the proposed CECAP strategies and actions. As part of implementation, staff will develop recommendations to build on these existing efforts while also working to develop initiatives, programs or projects that encompass the entirety of the CECAP recommendations.

The third component pertains to the Working Group's recommended legislative activities for implementation. As discussed in more detail in the CECAP draft final report, areas of potential legislative activity include changes to building codes to increase energy efficiency, additional solar purchase options for tenants, and incentives regarding the purchase and installation of electric vehicles (EVs) and EV-ready charging infrastructure.

Staff will present the CECAP draft final report to the Board of Supervisors Environmental Committee meeting for discussion on July 20. At that time, staff will request Board direction on priorities for next steps and CECAP implementation. Staff anticipates that the final CECAP report will be considered for acceptance at a September Board of Supervisors meeting. Thereafter, staff anticipates returning to future Environmental Committee meetings regarding proposed implementation plans, to include work plans and funding strategies.

Staff will continue to periodically update the Board of Supervisors on the CECAP process. Supervisors who have any questions about this update or the CECAP should contact Kambiz Agazi at 703-324-1788 or at Kambiz.Agazi@fairfaxcounty.gov. Between updates, Supervisors and their staff can monitor CECAP progress and review documents at the OEEC CECAP website.

cc: Joseph M. Mondoro, Chief Financial Officer
Kambiz Agazi, Director, Office of Environmental and Energy Coordination

Attachment: CECAP Draft Report Executive Summary

Fairfax County Community-wide

Energy and Climate Action Plan

A Fairfax County, Va., publication

EXECUTIVE SUMMARY

Climate Change Impacts in Fairfax County

Key Points

- Climate change is a human-caused crisis affecting human health, livelihoods, and the environment.
- Climate change effects are already impacting the lives of Fairfax County residents.
- Fairfax County worked with local stakeholders to create a Community-wide Energy and Climate Action Plan (CECAP).
- CECAP sets several greenhouse gas reduction goals to combat climate change.
- CECAP provides many strategies and actions everyone can do to reduce their emissions.
- CECAP gives guidance on elective actions for community members to take to assist in reaching CECAP goals, as well as actions for county, state, and federal governments.

Climate change is an existential crisis that is affecting human health, the environment, infrastructure, and the lives of people around the world and in Fairfax County. Global temperatures have already increased 1.8 degrees Fahrenheit (°F) since the end of the 19th century and will continue to rise for the foreseeable future. This global warming has led to climate change, which includes various effects such as altered precipitation patterns, more frequent and intense storms, longer and harsher droughts, and much more.

In Fairfax County, the amount of snowfall has been decreasing for decades, the number of extremely hot days (95°F+) has increased seven days from 1970–2018, and the incidences of tick- and mosquito-borne diseases has been increasing in recent years due to longer warm seasons. Current climate models project that Fairfax County and the surrounding region will experience substantial increases in temperatures by 2100 (up to 7°F), increased levels of precipitation, and more droughts in summer. Other key potential impacts of climate change include:

- Increased flood risk due to sea level rise and tidal surges.
- Expansion of flood-prone areas and an increase in flood frequency due to changes in precipitation patterns.
- Increased failure of septic systems, contaminating groundwater.
- Increased health impacts due to excessive heat, and vector-borne and communicable diseases.
- Economic impacts due to extreme weather events.
- Potential reduction in the reliability of electrical systems and the grid due to heating and cooling needs.[1]

[1] Reston Association. 2020. Reston Annual State of the Environment Report (RASER). Available at https://www.reston.org/nature-environmental-overview.

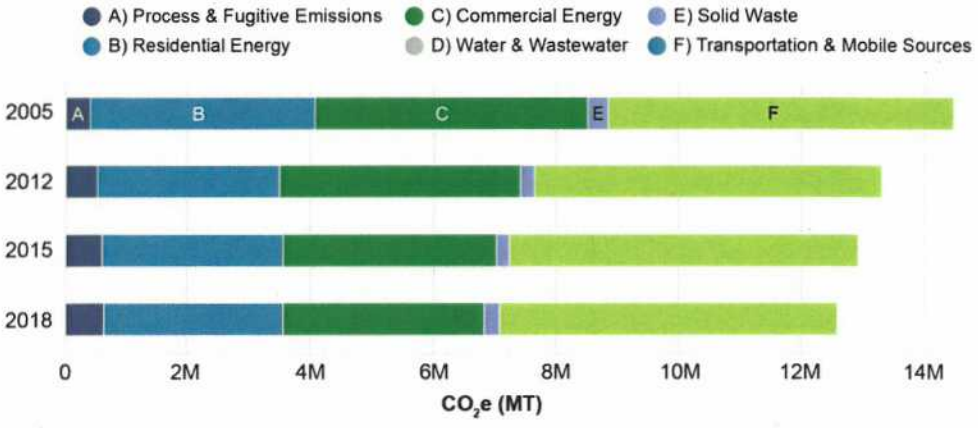
The scientific evidence demonstrating global climate change is clear and growing; human activities—such as burning fossil fuels, clearing undeveloped land, and managing waste poorly—are overwhelmingly responsible for causing climate change. These activities emit greenhouse gases (GHGs), such as carbon dioxide (CO_2), that enter the atmosphere and trap heat. Over time, the trapped heat slowly increases global temperatures, causing cascading climate effects that have significant effects on our lives and the environment. Global GHG emissions have been increasing since the 1800s, and unless we reverse this trend, the effects of climate change and the impacts on people and the environment will continue to increase as well.

How Does Fairfax County Contribute to Climate Change?

Community-wide GHG emissions have been tracked in Fairfax County since 2005 by creating an inventory of all GHGs emitted by various sources over one year. Different GHGs have different global warming potentials, so scientists created a measurement unit that converts the different potential to the equivalent amount of CO_2—this unit is called CO_2 equivalency, or CO_2e.

In 2018, Fairfax County emitted 12.6 million metric tons of CO_2e[2] (MMT CO_2e), which is equivalent to the emissions from the energy use of 1.5 million homes.[3] More than 90% of GHG emissions were the result of residential and commercial building energy consumption and transportation (see Figure ES-1). The other emissions are from other sources, including solid waste, wastewater treatment, and process and fugitive emissions (fugitive emissions are leaks and irregular releases). The main drivers of increased emissions in the county are primarily growth in population, increased commercial development, and use of synthetic refrigerants called hydrofluorocarbons. The main drivers of decreased emissions are improved energy efficiency, an increasingly less carbon-intensive electricity grid, and more fuel-efficient vehicles.

Figure ES-1: Fairfax County GHG Emissions by Activity Over Time



[2] CO_2 equivalent (CO_2e) is the basic unit of measure used to sum different GHGs by comparing their respective relative global warming effect to an index unit, namely the global warming effect of carbon dioxide.
[3] 2018 is the most recent year for available data for a GHG inventory for Fairfax County.

Between 2005 and 2018, the county population grew 15% to nearly 1.2 million people. Despite this growth, total GHG emissions decreased 13% from 14.52 MMT CO_2e in 2005 to 12.56 MMT CO_2e in 2018. Per capita emissions decreased 24% from 14.5 metric tons of CO2e (MT CO_2e) per capita in 2005 to 11.0 MT CO_2e per capita in 2018. These results show that we can reduce GHG emissions even as our community and economy grow. However, they also show that Fairfax County still emits a significant amount of GHGs and can reduce emissions further.

What Is CECAP?

In 2018, the Board of Supervisors Environmental Quality Advisory Council recommended that Fairfax County create CECAP to reduce GHG emissions. The Office of Environmental and Energy Coordination (OEEC) coordinated development of CECAP to:

- **Develop a roadmap** for Fairfax County to reduce GHG emissions and provide a way to engage the community in GHG emissions reduction efforts.
- **Provide citizens and local stakeholders a voice** in the climate planning process to ensure that the plan addresses local priorities and needs.

The plan gives a path for a **multi-level approach** to tackling climate change, which involves:

- **Community, individuals, and organizations**, which are specifically added to the climate change solution effort through CECAP.
- **Fairfax County government**, which can build on existing policies, programs, and planning processes to address climate change, as well as advocate for legislative change at the state level.
- **State and federal governments**, which both community members and the Fairfax County government can influence through collective advocacy.

CECAP is the first effort to involve the community in GHG emissions reduction efforts, and the first opportunity to add individual efforts to existing county, state, and federal emissions reduction efforts. CECAP is a community-driven plan that seeks the involvement of everyone across the county to take action to reduce GHG emissions.

How Was CECAP Developed?

There were five main steps in the CECAP development process (see Figure ES-2), each of which had a distinct purpose and included several supporting actions. The key contributors included the following:

- **The Office of Environmental and Energy Coordination (OEEC)** led the process, coordinated among all the various contributors, and provided content for the final CECAP report.

- **ICF** supported climate action planning, technical analyses, facilitation of meetings with the community, and the development of the final CECAP report.
- **The Metropolitan Washington Council of Governments (COG)** developed the GHG inventory, business-as-usual emission projections, and emissions reduction scenarios.
- **The CECAP Working Group** served as the community decision-making body.
- **The Board of Supervisors** provided key input on the process.

Figure ES-2: The CECAP Process

1. **Project initiation**—Community members were selected by the Board of Supervisors to serve on nine Focus Groups, a Task Force (subsequently called the Working Group after October 2020) was created, and the project began in January 2020.
2. **GHG reduction inventories, models, and goals**—COG developed the 2018 GHG inventory for Fairfax County, COG created emissions reduction scenarios at the direction of Fairfax County to estimate future emissions, and members of the Working Group provided input on CECAP goals.
3. **Emissions reduction planning and support**—ICF developed the initial list of emissions reduction strategies and actions, which was revised and edited by the Working Group. ICF then developed the accompanying analyses, and the Working Group evaluated the options and selected the final set of actions.
4. **Community engagement planning**—The county developed outreach and communications materials and hosted public meetings to collect and assess public opinions of CECAP.
5. **Develop final CECAP technical report**—The CECAP technical report is a product of the Working Group discussions and perspectives, with technical materials produced by ICF and COG, with input from the public. The report reflects the majority opinion. Occasionally, in matters of significant difference, minority perspectives are represented.

Ultimately, the iterative process between community groups, local organizations, and other stakeholders resulted in a roadmap for the community to achieve its GHG emissions reduction goals.

What Is in the Plan?

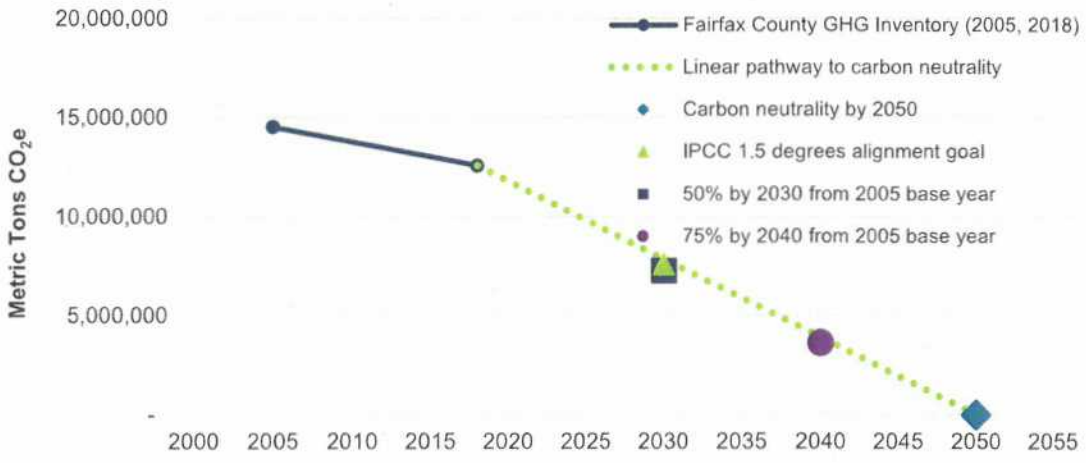
There is no comprehensive or immediate solution to reduce GHG emissions. Instead, we must implement multiple strategies, and all groups across society must commit to helping. CECAP sets forth GHG reduction goals, strategies, and their accompanying actions; the impacts of those actions; and activities for implementation for individuals and organizations, as well as county, state, and federal governments.

Greenhouse Gas Reduction Goals

CECAP is guided by a long-term emissions reduction goal, interim goals, and sector-specific goals. Fairfax County's long-term goal is to achieve carbon neutrality by 2050 from a 2005 base year, with at least 87% coming from GHG emissions reduction. The scenario modeling conducted by COG determined that a least an 87% reduction in GHG emissions was technically feasible given today's technologies and the additional opportunities future technologies may provide. It is for this reason that the community's long-term goal specifies at least an 87% reduction in actual emissions. Interim goals for 2030 and 2040 were established to help chart Fairfax County's path to carbon neutrality, as shown in Figure ES-3. The Working Group also established sector-specific goals for the Buildings and Energy Efficiency, Transportation, Waste, and Natural Resources sectors. See the Greenhouse Gas Reduction Goals section for more information on the goals of CECAP.

Fairfax County's long-term goal is to achieve carbon neutrality by 2050 from a 2005 base year, with at least 87% coming from GHG emissions reduction.

Figure ES-3: Fairfax County GHG Emissions Reduction Goals



CECAP Goals

- **Long-term target goal:** Fairfax County will aim to achieve carbon neutrality by 2050 from a 2005 base year, with at least 87% coming from GHG emissions reduction.
- **Interim year goal 2030:** Fairfax County will reduce GHG emissions by 50% by 2030, from a 2005 base year.
- **Interim year goal 2040:** Fairfax County will reduce GHG emissions by 75% by 2040, from a 2005 base year.
- **Sector-specific goals:** The sector-specific goals include two goals specific to the Building and Energy Efficiency sector, two goals specific to the Transportation sector, one goal specific to the Natural Resources sector, and one goal specific to the Waste sector.
  - All new, eligible buildings will have a commitment to **green building**.
  - Retrofit at least 100,000 housing units with **energy efficiency** measures by 2030.
  - Increase **transit and non-motorized commuting** to 30% (including teleworking) by 2030.
  - Increase plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs) to at least 15% of all light-duty vehicle registrations by 2030.
  - Expand the **tree canopy** to 60% with a minimum of 40% tree canopy coverage in every census block by 2030 and a minimum of 50% tree canopy coverage in every census block by 2050, prioritizing areas of highest socioeconomic need first.
  - Achieve **zero waste** by 2040, defined as at least 90% waste diverted from landfill/ incineration, in alignment with the definition by the Zero Waste International Alliance.

Emissions Reduction Strategies and Actions

In order to achieve those goals, CECAP encompasses strategies and actions needed to reduce GHG emissions in Fairfax County. Because more than 95% of all GHG emissions in the county come from sources other than government and school operations, CECAP describes what residents, businesses, and nonprofit organizations can do to be part of the solution. CECAP also describes what government at the county, state, and federal levels can do to reduce GHG emissions in the county. CECAP includes 12 strategies and 37 actions, presented in Figure ES-4. In the figure, each strategy is indicated with an "S" followed by the strategy number and each of the five sectors is identified by a different color.

Due to the ambitious nature of the GHG goals, **all strategies and actions must be part of the solution.**

Each strategy and its associated actions have different expected impacts, as well different activities for implementation recommended by the Working Group, all of which are described in detail in CECAP. Some actions are less expensive, easier, and faster to deploy than others. Some actions will have additional benefits, such as improved health outcomes

or increased equity. Some actions will reduce emissions a great deal, while others may reduce emissions to a lesser degree.

All of the actions described in CECAP will need to be undertaken in order to achieve emissions reduction goals. Still, Fairfax County residents, businesses, county government, and other stakeholders (e.g., organizations, commuters, state and federal governments) have diverse priorities and values that may lead to the selection of one action over another. To help community members and decision makers inside and outside of Fairfax County prioritize which actions to take, each action section describes the action's potential impacts in various categories.

The impact categories assessed include the following and are described further in the Impact Categories section:

- Greenhouse Gas (GHG)
- Public Health
- Environmental Resources
- Economic Opportunity
- Equity (i.e., One Fairfax)
- Payback
- Cost to Community Members
- Timeframe
- Other Considerations (e.g., climate adaptation, synergies with other strategies)

The expected GHG emissions reduction for each strategy are presented in Figure ES-5. Even with all strategies implemented by 2050, members of the Fairfax County community will need to rely on a portion of either emerging technologies or carbon offsets to meet the goal of carbon neutrality.

Together, the actions in CECAP can reduce emissions, slow climate change, and create a healthier and more just community.

Read the How to Use This Report and use the links to each strategy and action section in Figure ES-4 below.

Figure ES-4: Links to Strategies and Actions

S1: Increase energy efficiency and conservation in existing buildings

- 1a: Increase energy efficiency in residential buildings
- 1b: Increase energy efficiency in commercial buildings
- 1c: Increase energy efficiency in local government existing buildings and streetlights
- 1d: Develop and expand district energy and CHP systems
- 1e: Expand gas and electricity demand programs

S2: Electrify existing buildings

- 2a: Electrify existing residential buildings
- 2b: Electrify existing commercial buildings
- 2c: Reduce the use of high-GWP refrigerants

S3: Implement green building standards for new buildings

- 3a: Increase building code stringency for residential and commercial buildings
- 3b: Support all-electric new residential and commercial construction
- 3c: Support green building principles and practices
- 3d: Support the reuse of existing buildings

S4: Increase the amount of renewable energy in the electric grid

- 4a: Develop large offsite grid renewable energy
- 4b: Develop grid storage
- 4c: Maintain nuclear generation at the current levels

S5: Increase production of onsite renewable energy

- 5a: Expand solar PV on existing buildings
- 5b: Support solar PV in all new construction
- 5c: Support Community Solar
- 5d: Develop battery storage projects

S6: Increase energy supply from resource-recovered gas, hydrogen, and power-to-gas

- 6a: Expand the supply and use of resource-recovered gas, hydrogen, and power-to-gas

S7: Increase electric vehicle (EV) adoption

- 7a: Leverage county assets to expand EV use across on-road vehicles and off-road equipment
- 7b: Increase EV adoption by residents, businesses, and private fleets
- 7c: Install EV chargers in new buildings

S8: Support sustainable land use, active transportation, public transportation, and transportation demand management (TDM) to reduce vehicle-miles traveled

- 8a: Support the use and improvement of bicycle and pedestrian infrastructure
- 8b: Support the use and improvement of public transportation and commuter services
- 8c: Support smart-growth and transportation demand management (TDM) strategies

S9: Increase fuel economy and use of low-carbon fuels for transportation

- 9a: Support low-carbon fuels for transportation
- 9b: Support improvements to fuel efficiency
- 9c: Support low-carbon fuels for aviation

S10: Reduce the amount of waste generated and divert waste from landfills and waste-to-energy facilities

- 10a: Reduce overall waste generation
- 10b: Increase waste diversion from landfills and waste-to-energy facilities through recycling and composting

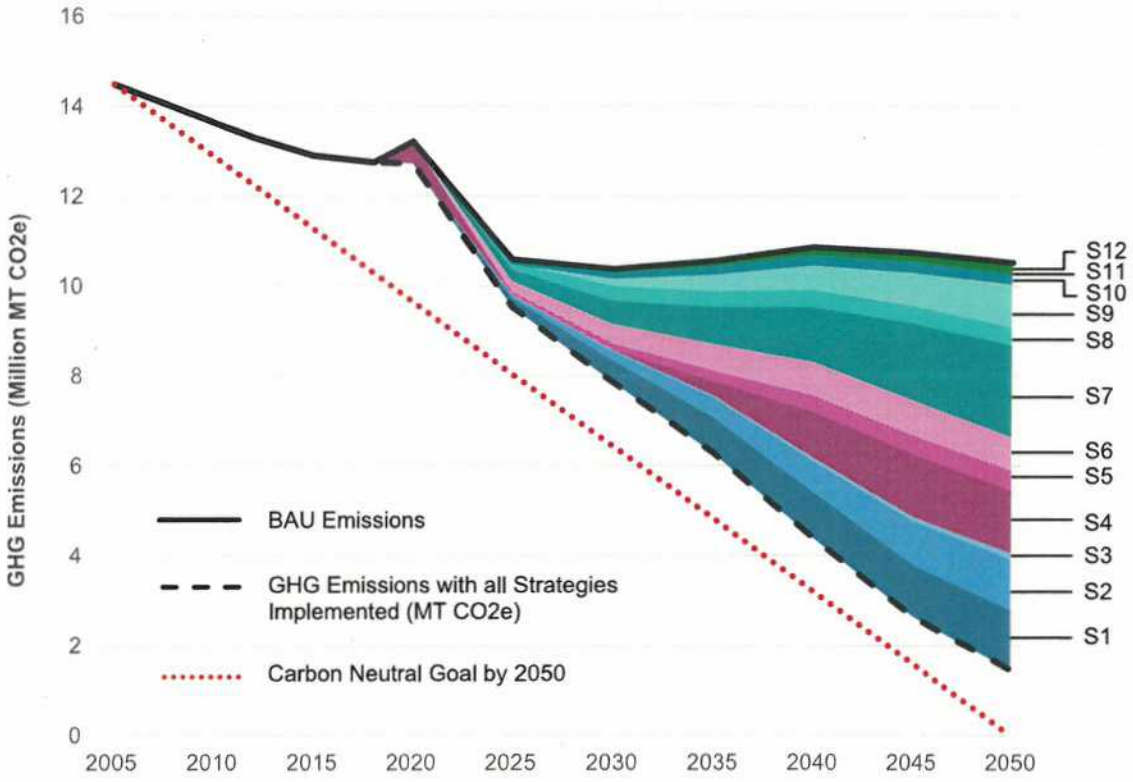
S11: Responsibly manage all waste generated, including collected residential and commercial waste, wastewater, and other items

- 11a: Capture and use energy generated at waste-to-energy facilities and landfills
- 11b: Explore alternative options for long-term waste management (landfill, waste to energy, and other options)
- 11c: Capture and use energy generated by wastewater treatment processes

S12: Support preservation, restoration, and expansion of natural systems, green spaces, and soil quality

- 12a: Conserve existing tree canopy, green spaces, and soil quality
- 12b: Expand tree canopy and green spaces, and improve soil management
- 12c: Create a cross-disciplinary county staff team to strengthen climate change and natural resources policies and programs

Figure ES-5: Modeled GHG Emissions Reduction by Strategy



S1: Increase energy efficiency and conservation in existing buildings
S2: Electrify existing buildings
S3: Implement green building standards for new buildings
S4: Increase the amount of renewable energy in the electric grid
S5: Increase production of onsite renewable energy
S6: Increase energy supply from resource-recovered gas, hydrogen, and power-to-gas
S7: Increase electric vehicle (EV) adoption
S8: Support sustainable land use, active transportation, public transportation, and transportation demand management (TDM) to reduce vehicle-miles traveled
S9: Increase fuel economy and use of low-carbon fuels for transportation
S10: Reduce the amount of waste generated and divert waste from landfills and waste-to-energy facilities
S11: Responsibly manage all waste generated, including collected residential and commercial waste, wastewater, and other items
S12: Support preservation, restoration, and expansion of natural systems, green spaces, and soil quality

Note that there are technical differences between the business-as-usual (BAU) scenario used by COG in the GHG inventory and the BAU used for the GHG emissions reduction modeling shown here. See Appendix D: GHG Modeling Methodology for details.

Working Group-Recommended Activities for Implementation

Recommended activities for implementation were developed by the Working Group in consultation with county staff and ICF. Each recommended activity for implementation is grouped into one of five categories, which indicate where the ability to impact change might exist.

These implementation categories were developed because Virginia is a Dillon Rule state. The Dillon Rule declares that state law is pre-emptive of local law unless the state confers the power to local government. The Dillon Rule is strictly interpreted so that if there is reasonable doubt about whether a power has been conferred to a local government, then it has not been.

Working Group-recommended activities for implementation may fall into one or more the following categories.

Recommended Activities for Implementation for All Actors: Actions that are applicable to all actors, including individuals and organizations, the county, state government, and federal government.

Recommended Activities for Implementation for Individuals and Organizations: Actions that individuals, businesses, and organizations can take now.

Recommended Activities for Implementation for the County: County measures and programs that the Fairfax County government can do right now. The recommended measures and programs in this category were specifically noted by the Working Group for action by the Fairfax County Board of Supervisors.

Recommended Activities for Implementation for the County Requiring State-Enabled Legislation: County programs and policies that the county might someday be able to do with state enabling legislation. The county and its stakeholders can advocate for items in this section at the state level.

Recommended Activities for Implementation for State and Federal Governments: State and federal measures and programs that the county will likely not have the authority to do on its own. The county and its stakeholders can advocate for these items at the state, regional, or federal level.

Working Group-Recommended Activities for the Board of Supervisors

This section summarizes the list of Working Group-recommended activities that the county government can begin to implement for each of the 12 strategies in CECAP. The Working Group wished to emphasize these specific recommendations for immediate consideration by the Fairfax County Board of Supervisors, as the Board can take immediate action without state-enabling legislation. Click on the links in the table below to go directly to these recommendations within each strategy section.

Strategy	Working Group-Recommended Activities for Implementation for the Board of Supervisors
Strategy 1: Increase Energy Efficiency and Conservation in Existing Buildings	Establish new energy efficiency and conservation incentive programs; Require energy code compliance requirements; Develop a county code enforcement officer training program; Create an energy audit program; Support businesses that support energy efficiency; Establish energy efficiency job training programs; Establish a local green bank, financing program, or Property Assessed Clean Energy (PACE) programs; Implement technology pilots in government buildings
Strategy 2: Electrify Existing Buildings	Establish incentive programs through grants, rebates, and tax credits; Expand existing financing programs to support electrification measures; Continue to support the Commercial PACE program; Support businesses providing electrification services; Support and educate installation contractors; Establish job training programs; Partner with building owners to conduct an analysis and work to reduce refrigerant emissions
Strategy 3: Implement Green Building Standards for New Buildings	Push for more stringent green building policies; Incorporate the county's own policies in planning and zoning guidelines; Develop a county code enforcement officer training program; Create an energy audit program within Fairfax Land Development Services; Encourage building commissioning; Establish new green building incentive programs; Expand incentives for homebuilders to build green and reuse existing buildings
Strategy 4: Increase Renewable Energy in Electric Grid	Support renewable energy projects and products (e.g., power purchase agreements, community solar); Enhance opportunities for renewable energy via zoning changes and partnerships in land use and transportation planning; Educate the community on efforts to make the regional grid more sustainable and how they can help; Develop county-wide renewable energy projects and/or programs, such as a green bank
Strategy 5: Increase Production of Onsite Renewable Energy	Implement programs that lower soft costs of solar PV; Support community solar projects; Amend local building codes to accommodate battery storage; Implement programs that connect with residents and private businesses to determine the best way to improve battery adoption; Build solar canopies at county owned sites; Provide financial incentives such as tax incentives or grants
Strategy 6: Increase Energy Supply from Resource-Recovered Gas, Hydrogen & Power-to-Gas	Subsidize the upfront costs of equipment for resource-recovered gas feedstock operators to provide an opportunity to encourage increased levels of adoption
Strategy 7: Increase EV Adoption	Electrify county and school fleet; Install EV charging at county facilities; Enact local policies to streamline EV charging permitting and inspection processes; Incentivize EV-ready charging infrastructure; Work with key industry and policy partners to integrate EV technologies in autonomous vehicles; Take advantage of federal grant and incentive programs for alternative fuel vehicles; Create equitable opportunities for EV adoption through low interest EV loans and rebates; Incentivize integrating EVs across carsharing programs, ride hailing services

Strategy	Working Group-Recommended Activities for Implementation for the Board of Supervisors
Strategy 8: Support Sustainable Land Use, Active Transportation, Public Transportation, and TDM to Reduce Vehicle-Miles Traveled	Expand and improve maintenance/safety of paths and bike lane networks; Install bike racks; Expand public transit routes; Conserve and plant trees along trails and sidewalks; Use zoning and land use codes to create dense, mixed-use development; Explore higher pricing schemes for parking at county-owned facilities; Modify parking minimums; Create local congestion fees, zero/low emission delivery zones, and pedestrian-only zones in densely populated areas; Allow telework options for county employees; Upgrade broadband infrastructure; Work with private companies to promote rental bikes and other micro mobility solutions; Support carpooling and vanpooling
Strategy 9: Increase Fuel Economy and Use of Low-Carbon Fuels for Transportation	Encourage the use of low-carbon fuels or the conversion to hybrid-electric retrofits of county-owned diesel powered medium and heavy-duty vehicles; Create financing programs for low/no carbon fuel technologies; Enact property tax credits for consumers purchasing higher fuel economy vehicles
Strategy 10: Reduce the Amount of Waste Generated and Divert Waste from Landfills and Waste-to-Energy Facilities	Expand education and outreach on source reduction, recycling and composting; Improve accessibility through education materials in alternate languages; Expand of composting operations (e.g., drop-off sites, curbside pick-up); Expand the glass recycling program; Provide for stricter enforcement of recycling; Implement a pay-as-you-throw program; Incentivize building deconstruction, rather than demolition, to salvage and reuse building material.
Strategy 11: Responsibly Manage Waste Generated	Ensure waste contracts align with best practices and best available technology for reducing emissions; Understand and clearly disclose impacts of existing waste-to-energy facilities; Reclaim treated wastewater and sewage sludge; Optimize trash pickup frequency; Develop plans to reduce litter and illegal dumping; Promote solar PV projects on closed landfills
Strategy 12: Support Preservation, Restoration, and Expansion of Natural Systems, Green Spaces, and Soil Quality	Strengthen county programs that conserve and expand green spaces and trees; Pursue the expansion of financial tools to include tree planting in private spaces; Use research and inventory data to conduct land use reviews and status checks; Require a higher density tree canopy replacement in development projects; Partner with homeowner's associations to promote additional trees and native vegetation; Incentivize more infill development; Reevaluate the existing Infill Development Review Process to incorporate best practices for preserving mature tree canopy; Incentivize or require conservation of tree canopies or green spaces in development projects and reduction of soil disturbance

In addition, Fairfax County government will continue to build on existing policies, programs, and planning processes to address climate change, as well as to advocate for legislative change at the state level. As described in the section above, recommended activities for implementation are also provided for individuals and organizations, and for state and federal governments.

Working Group Priorities

Of the six strategies in the Buildings & Energy Efficiency and Energy Supply sectors, the Working Group prioritized Strategy 1 and Strategy 4. Of the six strategies in the Transportation, Waste, and Natural Resources sectors, the Working Group prioritized Strategy 7, Strategy 8, Strategy 9, and Strategy 12. Working Group members noted that there are both synergies and tradeoffs between strategies, and that actions taken during implementation should seek to balance the strategies' varied tradeoffs and maximize synergies. See the Working Group Priorities textboxes throughout the report for more information and Appendix F: Results of the Working Group Prioritization Exercise.

Cost and Benefits Considerations

Throughout the development of CECAP, Working Group members emphasized the importance of analyzing the costs and benefits of the strategies and actions in CECAP. When a Working Group member raised a concern about the high costs or the need to conduct a detailed quantification of costs, another Working Group member countered with the need to also quantify the benefits of the climate actions and the cost of not taking action. The CECAP planning process and report were not intended to provide a quantitative cost-benefit impact assessment, but a key output of the CECAP process was the desire of the Working Group for a detailed quantification of costs and benefits from the strategies and actions, as part of CECAP implementation. See Costs and Benefits Considerations for more discussion on how costs were considered in this report and recommendations for future cost assessments.

Emerging Technologies

As the GHG modeling shows, emerging technologies will be needed to reach the goals set forth in CECAP. Through research and development efforts and innovative business practices, technologies continue to improve over time, and novel technologies emerge that can reduce GHG emissions further. Emerging technologies can help shift the current emissions-intensive energy paradigm to a green growth paradigm and can help "future-proof" long-term plans by overcoming existing economic and technological barriers and minimizing future systemic shocks or stresses. Some emerging technologies include advanced fuel cells and refrigerants, next generation heat pumps, microgrids, and electric cars, among others, and they will become more widespread and effective over time. See the Emerging Technologies section for more information.

Community Engagement

Since CECAP development began in earnest in 2019, the public has been engaged in the process in two distinct ways. First, the members of the CECAP Working Group are, essentially, public representatives. Several members represent their magisterial districts as individuals. All of them serve voluntarily on this public body to advise the Board of Supervisors. They represent the first tier of public engagement in CECAP, and their very invested and high level of engagement has made the creation of this report and all the substantive recommendations it contains possible.

Second, throughout the CECAP development process, county staff created opportunities for widespread public outreach, education, and engagement. Occurring in three phases over the course of 10 months, these engagement periods were designed to provide timely and relevant information to county residents and stakeholders about CECAP, and to invite their input on the goals, strategies, and actions likely to appear in this final plan. This portion of the report summarizes the public engagement tactics used to gather feedback and to raise county residents' awareness of the climate planning effort. See the Community Engagement section for more information.

Current Policies and Programs/Implementation

The county has existing policies, programs, and tools to help residents and businesses enact GHG reduction measures. Together with federal, state, and other local programs, existing initiatives provide a starting point for the strategies included CECAP. The Fairfax County community, including government, residents, businesses, and organizations, can continue to support additional programs and policies at the local level, while advocating for state and federal assistance to help make the goals of CECAP a reality. This section identifies the existing programs, policies, and tools that can help community members begin to adopt the CECAP strategies. Remaining challenges and implementation methods are summarized for future consideration. See the Current Policies and Programs/Implementation section for more information.

How to Use This Report

As CECAP is a community-driven plan, written by community members of Fairfax County, this is the first opportunity for community members, individuals, and organizations to get involved in addition to the existing efforts at the county, state and federal level. CECAP describes 12 strategies and 37 actions. Detailed descriptions of strategies and actions are provided in the Emissions Reduction Strategies and Actions section. **Use Figure ES-6: Strategy and Action Roadmap below to navigate the Strategy and Action sections of the report.**

A **strategy** is a broader set of actions or set of subsector work that can be modeled to understand emissions reduction. Each **strategy section** includes the following:

- A description of the strategy, including a list of actions included in the strategy.
- The GHG emissions reduction potential for each strategy by the year 2050. The percentage provided demonstrates the reductions needed from the 2050 business-as-usual projection to reach the county's carbon neutrality goal.
- Cost considerations for the strategy, such as whether the strategy is currently cost-effective or challenged by cost barriers.
- Working Group Priorities textbox, that summarizes the opinions and priorities of the Working Group to focus efforts during implementation of CECAP.

An **action** is a project or specific technology that impacts GHG emissions within a strategy. Each **action section** includes the following:

- A description of the action
- A rating for each impact category and a discussion of the rating

Finally, **Working Group-Recommended Activities for Implementation** are provided for each strategy for five categories: all actors, individuals/organizations, county government, county government with state-enabling legislation, and state and federal governments.

To be successful, CECAP needs the support of your fellow community members and you! To learn more about how to get involved, visit Fairfax County's CECAP Web page.

Figure ES-6: Strategy and Action Roadmap

A) Review Strategy Description and Associated Actions

BUILDINGS AND ENERGY EFFICIENCY

Strategy 1: Increase Energy Efficiency and Existing Buildings

Energy efficiency and energy conservation are cost effective and proven strategies that produce significant co-benefits while also improving the effectiveness of future strategies. Energy efficiency encompasses technology enhancements that improve building energy performance (that is, delivering the same services with fewer Btus). Energy conservation includes behavioral enhancements that improve building energy performance (that is, services are adjusted to reduce Btus). This strategy includes the following actions:

- Action 1a: Increase energy efficiency in residential buildings,
- Action 1b: Increase energy efficiency in commercial buildings,
- Action 1c: Increase energy efficiency in local government buildings and streetlights,
- Action 1d: Develop and expand district energy and combined heat and power (CHP) systems, and
- Action 1e: Develop and expand gas and electricity demand programs.

B) Review Emissions Reductions Associated with the Strategy

GHG Emissions Reduced by 2050

1,324,000 MT CO_2e

Emission Reduction Contribution Needed in 2050

C) Review each Action Description

Action 1a: Increase Energy Efficiency in Residential Buildings

This action supports energy efficiency and energy conservation in existing single-family and multifamily residential buildings.

Timeframe: Immediate. The technology is currently available and is being commercially deployed at significant scale.

Technology considerations: Building energy efficiency can employ many technologies and target various end uses depending on scope and budget. Efficiency measures can be sensitive to occupant behavior. In residential buildings, occupant comfort and preferences are very important to consider. Renters have less ability to make meaningful upgrades, while long-time homeowners can face significant energy cost burdens.

D) Review Impact Category Results

Public Health
+

Environmental Resource
+

Economic Opportunity
++

One Fairfax
=

Payback
3-7 years

Cost to Community Member
$$$

Timeframe
Immediate

E) Review Working Group-Recommended Activities for Implementation

Working Group-Recommended Activities for Implementation for Strategy 1

Implementation for this strategy may include a combination of incentive programs, financing tools, education and outreach, support for business growth, pilot programs, and regulations and other mandates. Recommended activities for implementation for this strategy were developed by the Working Group and include:

Recommended Activities for Implementation for All Actors

Education

Energy efficiency and, in particular, energy conservation will affect residents' interactions with the buildings they live in, work in, and visit. Individuals will need to learn how to use and maintain different building systems. Many of these interactions will be seamless, however educational programs can help earn broad understanding of the changes and why they are happening and may help to realize higher adoption rates. Education programs should leverage existing tools such as EPA's ENERGY STAR which including appliance labeling, and building and home performance tools. Additional educational programs include: