REGIONAL CLIMATE AND ENERGY ACTION PLAN - DRAFT

A Climate, Energy, and Environment Policy Committee plan to promote voluntary action and progress by local jurisdictions in metropolitan Washington

2017-2020 Plan

Metropolitan Washington
Council of Governments

REGIONAL CLIMATE AND ENERGY ACTION PLAN
Prepared by the Climate, Energy, and Environment Policy Committee
November 2016 *DRAFT*

ABOUT COG
The Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association that brings area leaders together to address major regional issues in the District of Columbia, suburban Maryland, and Northern Virginia. COG's membership is comprised of 300 elected officials from 23 local governments, the Maryland and Virginia state legislatures, and U.S. Congress.

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INTRODUCTION

The Metropolitan Washington Council of Governments (COG) is a center for partnerships to facilitate sustainable growth, a well-maintained transportation system, clean air, water, and land, safe and healthy communities, and a vibrant economy. This work is guided by COG's comprehensive Region Forward Vision, a commitment to bettering the region, shared by residents, business and nonprofit leaders, and elected officials across metropolitan Washington. These goals also encourage leaders to think about the regional impact of local decisions. The Region Forward goals include:[i]

Climate and Energy

- We seek a significant decrease in greenhouse gas (GHG) emissions, with substantial reductions from the built environment and transportation sector.
- We seek efficient public and private use of energy region-wide, with reliance upon renewable energy and alternative fuels for buildings, vehicles, and public transportation.

Environment

- We seek to maximize protection and enhancement of the region's environmental resources by meeting and exceeding standards for our air, water, and land.
- We seek preservation and enhancement of our region's open space, green space, and wildlife preserves.

Transportation

- We seek a broad range of public and private transportation choices for our region which maximizes accessibility and affordability to everyone and minimizes reliance upon single occupancy use of the automobile.
- We seek a transportation system that maximizes community connectivity and walkability, and minimizes ecological harm to the region and world beyond.

Land Use

- We seek the enhancement of established neighborhoods of differing densities with compact, walkable infill development, rehabilitation and retention of historic sites and districts, and preservation of open space, farmland, and environmental resource land in rural areas.
- We seek transit-oriented and mixed-use communities emerging in Activity Centers that will capture new employment and household growth.

Housing

- We seek a variety of housing types and choices in diverse, vibrant, safe, healthy, and sustainable neighborhoods, affordable to persons at all income levels.
- We seek to make the production, preservation, and distribution of affordable housing a priority throughout the region.

Economy

- We seek a diversified, stable, and competitive economy, with a wide range of employment opportunities and a focus on sustainable economic development.
- We seek to minimize economic disparities and enhance the prosperity of each jurisdiction and the region as a whole through balanced growth and access to high-quality jobs for everyone.

- We seek to fully recognize and enhance the benefits that accrue to the region as the seat of the national government and as a world capital.

Health and Human Services

- We seek communities in which every person enjoys health and well-being.

Education

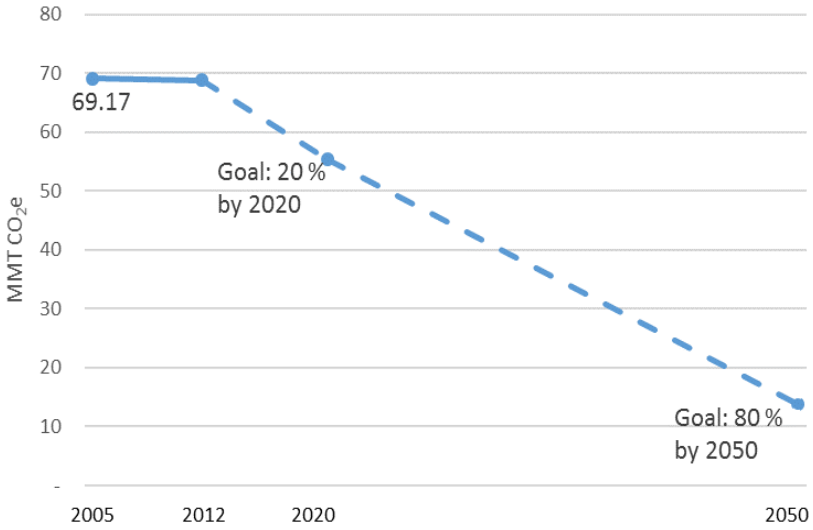
- We seek to provide greater access to the best education at all levels, from pre-kindergarten to graduate school.
- We seek to make our region a pre-eminent knowledge hub, through educational venues, workforce development, and institutional collaboration.

Public Safety

- We seek safe communities for residents and visitors.
- We seek partnerships that manage emergencies, protect the public health, safety, welfare, and preserve the lives, property, and economic well-being of the region and its residents.

Region Forward draws its climate and energy related goals from the 2008 *National Capital Region Climate Change Report*. The regional GHG emissions reduction goals include 10 percent below business as usual by 2012 (back down to 2005 levels), 20 percent below the 2005 levels by 2020, and 80 percent below 2005 levels by 2050. Figure 1 tracks the regional progress toward meeting these goals.[ii] The region met its first 2012 goal but there needs to be an immense undertaking to meet the 2020 and 2050 goals. This plan is a tool to help the region achieve its 2020 goal.

Figure 1: Progress Towards Metropolitan Washington's Greenhouse Gas Emissions Reduction Goals



In 2012, the region aimed to keep GHG emission levels stable at 2005 levels. Despite a 15% growth in population, overall emissions decreased by 0.5% and per capita emissions decreased 10% between 2005 and 2012.

This plan is a tool to help the region achieve its 2020 goal.

Source: COG 2005 and 2012 Metropolitan Washington Greenhouse Gas Inventories and COG 2016 Round 9.0 Cooperative Forecasts

Regional Climate and Energy Action Plan

COG's Climate, Energy and Environment Policy Committee (CEEPC) guides the region in taking action to meet regional GHG emission reduction goals. CEEPC supports the Region Forward Vision and Climate Change Report goals by providing leadership on climate change, energy, green building, alternative fuels, solid waste and recycling issues, and by supporting area governments as they work together to meet regional goals.[iii]

CEEPC includes representatives from COG's member governments, state environmental and transportation agencies, state legislatures, the Air and Climate Public Advisory Committee (ACPAC), federal and regional agencies, electric and gas utilities, environmental organizations, business organizations, and members of the academic community. Several subcommittees and technical working groups provide essential input and support to CEEPC.[iv]

CEEPC develops short-term Regional Climate and Energy Action Plans to help move the region toward achieving the regional GHG emission reduction goals. This document is the third edition of the Action Plan, focusing on implementation and outcomes for 2017-2020. The Action Plan offers a variety of voluntary and flexible options for local jurisdictions to implement, including options that directly address emissions from government operations and options that support community action. This Action Plan builds on and reflects current local action as well as national best practices.

This Action Plan is guided by the recommendations from the Multi-Sector Work Group (MSWG) on GHG emission reduction strategies. COG convened this group to conduct an extensive examination of potential implementable GHG reduction strategies in the energy/environment, land use and transportation sectors. The MSWG recommendations were developed to encourage COG members and committees to incorporate the strategies into local, regional, and state programs.[v]

CO-BENEFITS

Although the main purpose of the MSWG and this Action Plan is to reduce emissions, the actions identified in this plan naturally support a variety of other Region Forward goals. Table 1 notes each section of the report and what Region Forward goals it supports. Throughout this document the Region Forward symbols are a reminder of how climate action presents a tremendous opportunity to support Region Forward and foster a thriving metropolitan region.

Table 1: Climate Action Areas that Support Region Forward Goals

Climate Action Areas									
Reduce Energy Consumption	√	√			√	√		√	
Increase Share of Renewables	√	√			√	√		√	
Advance Sustainable Regional Mobility	√	√	√	√		√	√	√	
Increase Sustainable Urban Development	√	√	√	√	√	√	√	√	
Move Towards Zero Waste	√	√				√		√	
Build Regional Resilience	√	√	√	√	√	√	√	√	√
Protect Equity and Health	√	√	√	√	√	√	√	√	√
Grow the Regional Clean Economy	√	√	√	√		√		√	

GUIDING PRINCIPLES

Ten principles have been identified to guide the implementation process across the plan's climate action areas. These principles reflect CEEPC's commitment to environmental quality, economic prosperity, and social equity. As climate leaders, CEEPC is committed to the following principles:

1. **Collective Action**: We will continue to work together to leverage our impact and facilitate application at scale.
2. **Effective Partnerships**: We will continue to share best practices, learn together, and coordinate on implementation to advance regional transformation.
3. **Lead by Example**: We have a continued commitment to internal implementation of long-term solutions to reduce the climate impacts of our operations.
4. **Integration:** We understand climate action is inherently multidisciplinary and will promote cross-department coordination, including equity, health, and economic development.
5. **Flexibility**: We understand the need for flexibility in how our public agencies and stakeholders across the District of Columbia, Maryland, and Virginia work to achieve regional GHG goals.
6. **Transparency**: We will continue to measure and report progress in a manner easily understandable by all.
7. **Innovation**: We support a just transition to a clean energy economy through the application of innovative technology, policies, and processes by public and private sectors.
8. **Community Leadership**: We will continue to educate, motivate and empower climate action from our community's institutions, businesses, non-profits, and residents.
9. **Inclusive Engagement**: We commit to inclusive community engagement and equitable provision of climate and energy programs and services.
10. **Advocacy**: We will continue to support state and federal policies and programs that protect the human and environment health of our communities.

THIS PLAN

Each climate action area is represented by a section in this Action Plan. Each section of the plan describes the leading challenges and 2020 outcomes. The outcomes represent projected or desired outcomes to achieve by 2020 and progress towards the outcomes is tracked in each section. The plan sections also identify local actions that address the challenges and outcomes. Sections 1 through 5 directly work towards the regional GHG emission reduction goals and represent the traditional focus of COG and CEEPC's work. Sections 6 through 8 incorporate a variety of newer concepts that support holistic thinking around climate action and approaches to future-proofing from climate impacts, supporting equitable decision-making, protecting community health, and further supporting the clean economy.

SECTION 1

Reduce Energy Consumption

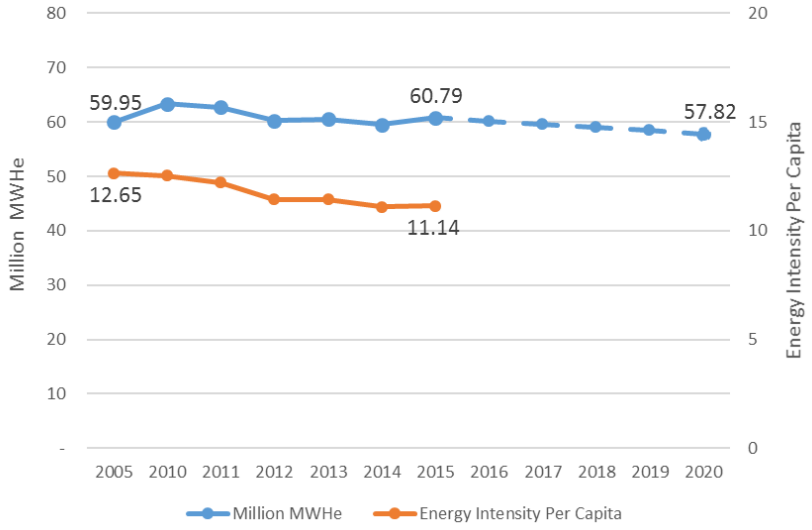
Challenge
- Energy consumption is the leading contributor to metropolitan Washington's GHG emissions, accounting for 51 percent of total emissions. [vi]

Outcome
- Reduce total energy consumption 5 percent from 2015 to 2020.
- Increase total high performance buildings in the region to 5,000.

ELECTRICITY AND NATURAL GAS CONSUMPTION

Sustained continuous reductions in energy consumption will be a crucial component of meeting the region's GHG emission reduction goals. Figure 2 features the trends in regional energy consumption, represented by the combined million megawatt hour equivalent (MWHe) of total annual electricity and natural gas consumption. Between 2005 and 2015, there has been only been a 1 percent increase in total consumption, despite a 15 percent growth in population. This is primarily attributable to reductions in natural gas usage. In the same timeframe, energy intensity per capita has decreased 12 percent.[vii]

Figure 2: Progress Towards Reducing Regional Energy Consumption



Between 2005 and 2015, there has only been a 1% increase in total annual energy consumption, despite a 15% growth in population.

In the same timeframe, energy intensity per capita has decreased 12%.

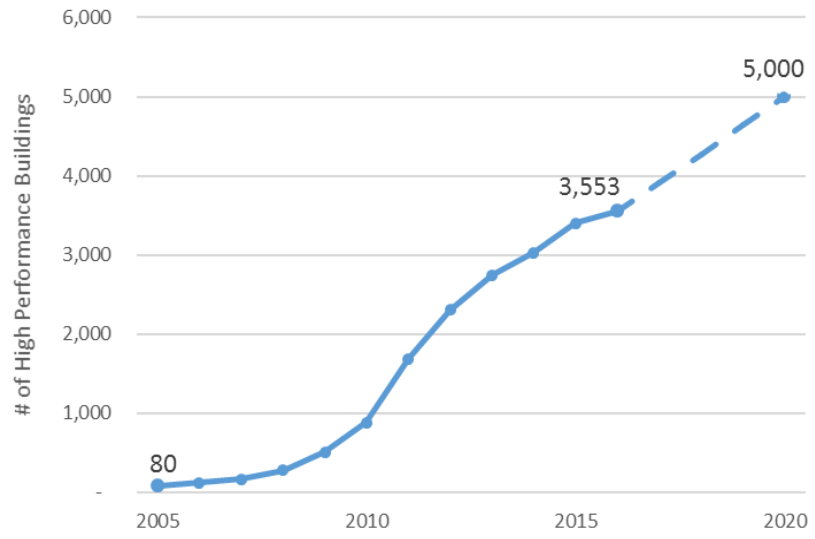
Note: This figure represents a combined MWHe of total annual electricity and natural gas consumption.

Source: COG 2016 Metropolitan Washington Annual Utility Data Survey Analysis

HIGH PERFORMANCE BUILDINGS

GHG emission reduction is supported by development that prioritizes energy efficiency. Buildings with a higher level of environmental performance are verified through programs such as LEED, ENERGY STAR, EarthCraft, and Passive House. Figure 3 shows the total number these certified high performance buildings in the region and the potential to achieve 5,000 by 2020 if current growth rates continue.[viii]

Figure 3: Progress Towards Increasing High Performance Buildings



Source: COG 2016 Metropolitan Washington High Performance Building Database

LOCAL ACTIONS

COG and its members will continue to work towards reducing energy consumption through actions that increase efficiency of public facilities and operations and actions that facilitate increased efficiency in the community. Table 2 includes a variety of voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020 (e.g., 100 percent of local government members are implementing the action).

Table 2: Local Actions to Reduce Energy Consumption

REDUCE ENERGY CONSUMPTION		%
	Increase Efficiency of Public Facilities and Operations	
1-a	Prepare GHG emission inventories and reduction plans for government operations.	100%
1-b	Regularly track/benchmark and publicly disclose energy performance at government facilities.	100%
1-c	Prepare an energy plan for local government facilities and operations.	100%
1-d	Perform walk-through energy audits of local government facilities and implement recommendations.	100%
1-e	Implement employee challenges or education programs on energy and sustainability policies and practices at work and home.	100%
	Facilitate Increased Efficiency in the Community	
1-f	Adopt a community energy, climate or sustainability plan which includes GHG emission reduction.	100%
1-g	Increase energy building code compliance.	100%
1-h	Support increased efficiency in codes at national, state, or local levels (only feasible where local jurisdiction has authority).	75%

1-i	Deploy energy efficient outdoor lighting requirements or initiatives (for streets, parking lots, parks, or signage).	75%
1-j	Provide local energy efficiency incentives to residents and businesses or promote federal, state, and utility incentives. Ensure opportunities are accessible by vulnerable populations. *	75%
1-k	Implement residential and commercial engagement programs (e.g., green business or home challenges, awards, etc.) to encourage energy efficiency.	75%
1-l	Offer innovative energy financing solutions for residential or commercial sectors (e.g., green bank, PACE, loan loss reserves, etc.).	50%
1-m	Continue to support and expand programs that implement energy efficiency improvements for affordable housing (e.g., Home Performance with ENERGY STAR, weatherization, etc.).	50%
1-n	Implement mandatory energy benchmarking requirements or promote voluntary benchmarking. Provide training or technical assistance on benchmarking tools such as ENERGY STAR Portfolio Manager.	50%
1-o	Incorporate community energy infrastructure needs, goals, and strategies in master plans, comprehensive plans, and small area plans.	25%
1-p	Analyze feasibility of deploying combined heat and power, district energy, microgrids, and geothermal systems. Promote reducing barriers and incentivize community deployment.	25%
	Increase Number of High Performance Buildings	
1-q	Incorporate high performance building goals and strategies in master plans, comprehensive land use plans, and small area plans.	50%
1-r	Enhance green building policies to require or encourage higher level of green construction standards (e.g., LEED Gold instead of LEED Silver).	50%
1-s	Offer incentives for commercial and residential buildings certified by a high efficiency building/green rating system (e.g., LEED, ENERGY STAR, Passive House, EarthCraft, Living Building Challenge, Net Zero, Well Standard, etc.).	50%
1-t	Provide education and training on new and advanced green construction standards (e.g., Living Building, Net Zero, WELL Standard, Designed to ENERGY STAR, etc.).	50%

* See Section 7 for more information on vulnerable populations.

SECTION 2

Increase Share of Renewables

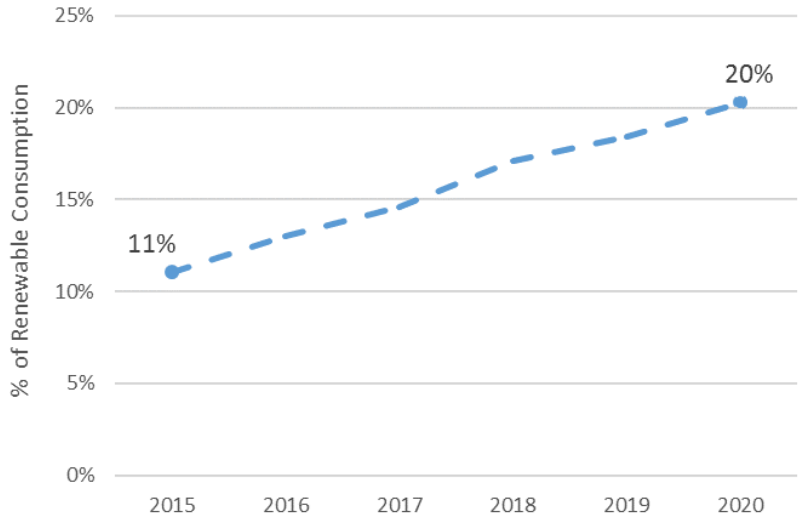
Challenge - Fossil fuels account for 60 percent of the fuel mix in the PJM territory, as of 2015.[1] [ix]

Outcome - Meet 20 percent of regional electric consumption with power from renewable sources by 2020 to reduce the GHG emissions from the energy sector.

RENEWABLE ENERGY CONSUMPTION

In addition to reducing energy consumption, switching to cleaner sources of energy will reduce the GHG emissions associated with the region's energy consumption. Estimates for metropolitan Washington's existing renewable energy consumption and the projected growth were analyzed as part of the Multi-Sector GHG Work Group Project. The analysis includes utility-scale renewables, large scale hydro, distributed generation, and additional green power purchases. A summary of the results in Figure 4 shows as of 2015, 11 percent of total regional energy consumption comes from renewables, with the potential to reach 20 percent by 2020. This equates to 6.7 million megawatt hours (MWHs) of renewables in 2015 and more than 12 million MWHs in 2020.[x]

Figure 4: Progress Towards Increasing Renewables as Percent of Total Energy Consumption



As of 2015, 11% of total regional energy consumption comes from renewables, with the potential to reach 20% by 2020.

This equates to 6.7 million MWHs of renewables in 2015 and more than 12 million MWHs in 2020.

Source: COG 2016 Multi-Sector Work Group Renewable Energy Supplemental Analysis

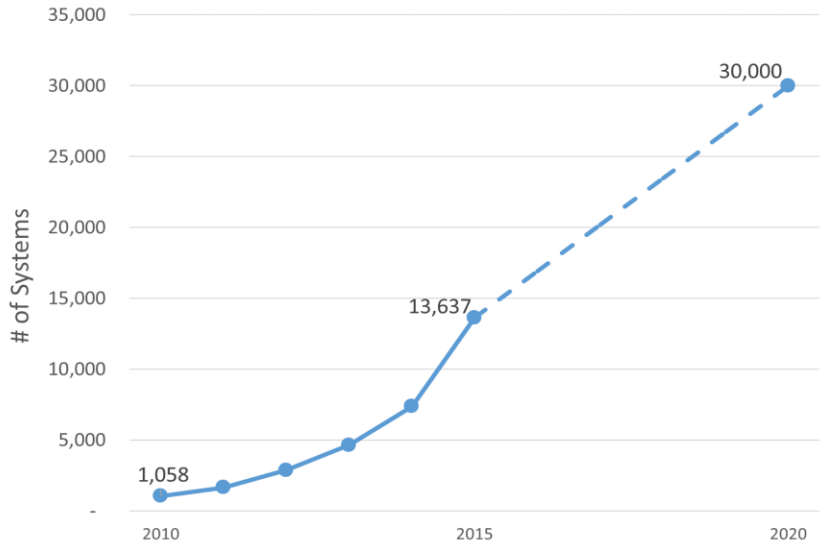
The leading driver of growth in metropolitan Washington's renewable energy consumption will be utility-scale projects resulting from mandatory Renewable Portfolio Standards (RPS) in Maryland and the District of Columbia. Another major driver will be voluntary green power purchasing by local public and private entities. Local initiatives to support increases in distributed on-site generation of renewables will also contribute to the growth of renewables.[xi]

[1] The PJM provides interconnected transmission infrastructure to coordinate the movement of electricity through the District of Columbia, Maryland, and Virginia as well as other surrounding states.

GRID CONNECTED RENEWABLES

Distributed on-site generation is tracked through data provided to COG by the region's energy utilities. Figure 5 shows the growth in grid-connected solar and wind systems in metropolitan Washington. As of 2015, the region has 13,637 grid-connected solar and wind systems, with a total generating capacity of 132.2 megawatts (MW). Distributed renewable energy deployment has grown at a tremendous rate since 2010. If this rate of growth continues through 2020, the region could have 30,000 or more grid-connected renewables.[xii]

Figure 5: Progress Towards Increasing Grid-Connected Renewables



As of 2015, the region has 13,637 grid-connected solar and wind systems, with a total generating capacity of 132.2 MW.

If the current growth rate continues through 2020, the region could have 30,000 or more grid-connected renewables.

Source: COG 2016 Metropolitan Washington Annual Utility Data Survey Analysis

LOCAL ACTIONS

COG and its members will continue to support actions to increase the share of renewables. Table 3 includes a variety of voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 3: Local Action to Increase Share of Renewables

INCREASE SHARE OF RENEWABLES		%
2-a	Install renewable energy systems on local government property.	100%
2-b	Provide or promote incentives for building-level renewable technologies or energy storage systems. Ensure opportunities are accessible by vulnerable populations. *	100%
2-c	Provide public education and outreach on renewable technologies.	75%
2-d	Support cost-effective renewable energy incentives and financing mechanisms for distribution generation at utility, state, and national levels.	75%
2-e	Continue to support strong state-level renewable portfolio standards and encourage Renewable Energy Credit (REC) markets.	75%
2-f	Achieve and maintain EPA Green Power Partnership for government operations.	75%
2-g	Adopt solar access, solar-ready, and similar ordinances to help facilitate local solar deployment.	50%

2-h	Facilitate and support establishment of cooperative community renewable systems and cooperative renewable energy purchasing.	50%
2-i	Encourage the purchase of RECs as an option to increase the regional use of energy sourced from renewables.	50%
2-j	Work with the community to achieve and maintain EPA Green Power Community Partnership.	25%
2-k	Adopt a net zero energy plan, policies, or initiatives.	25%

* See Section 7 for more information on vulnerable populations.

SECTION 3

Advance Sustainable Regional Mobility

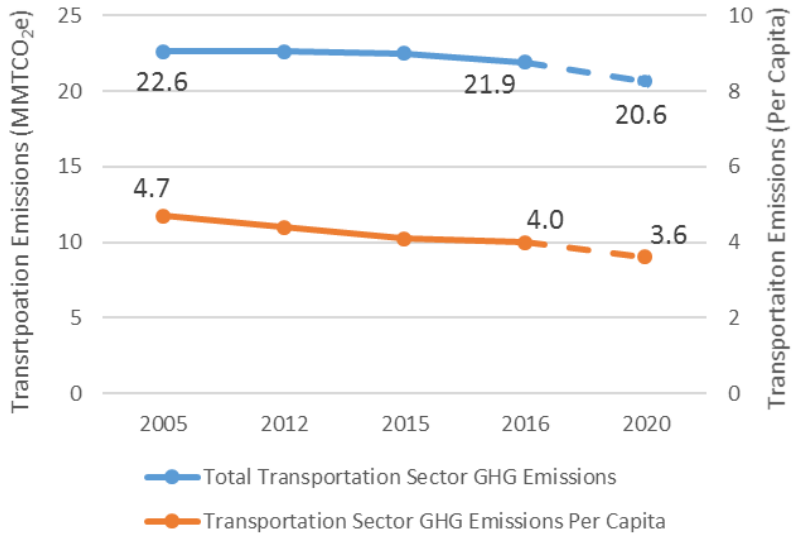
Challenges
- Mobile transportation is the second largest contributor to metropolitan Washington's GHG emissions, accounting for 34 percent of total emissions.[xiii]

Outcomes
- Reduce transportation sector GHG emissions 20.6 $MMTCO_2e$ by 2020.
- Increase total electric vehicle ownership to 10,000 and have 1,000 public EV charging stations in the region by 2020.
- Reduce vehicle miles travelled (VMT) and VMT per capita.

TRANSPORTATION SECTOR GHG EMISSIONS

Reducing transportation sector GHG emissions is essential to meeting the region's overall GHG emission reduction goals. Figure 6 shows that transportation sector emissions have remained relatively flat since 2005, despite a 15 percent growth in population. In the same timeframe, transportation per capita emissions decreased approximately 15 percent. Transportation GHG emissions are projected to drop by almost 9 percent between 2005 and 2020, down to 20.6 MMTCO2e, due to the improving fuel economy of vehicles and increasing alternative trip modes.[xiv]

Figure 6: Progress Towards Reducing Transportation Sector GHG Emissions



Transportation sector GHG emissions have remained relatively flat since 2005, despite a 15% growth in population.

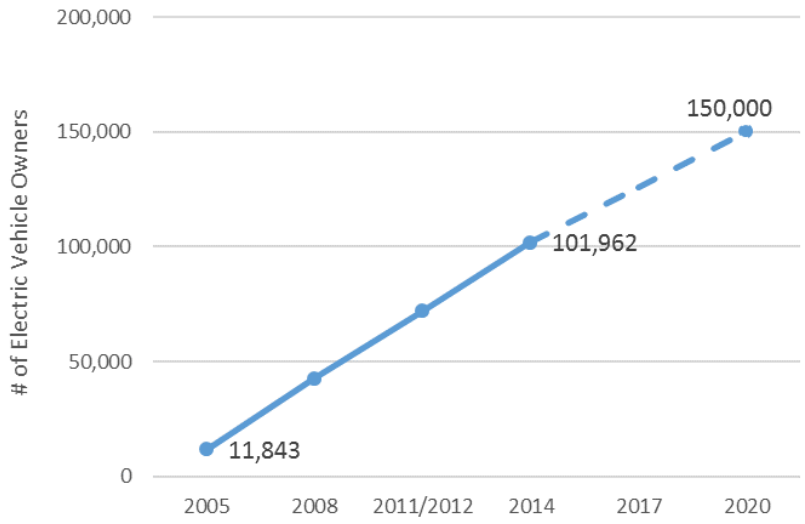
In the same timeframe, transportation per capita emissions decreased 15%.

Source: COG 2016 Financially Constrained Long-Range Plan for the National Capital Region, Amendment Summary Brochure

ELECTRIC VEHICLES AND INFRASTRUCTURE

Passenger cars and trucks account for more than half of regional transportation section emissions. Improving fuel economy will help reduce GHG emissions from passenger cars and trucks. Figure 7 shows the total growth of ownership of the most efficient vehicles, including hybrid electric vehicles (HEVs), plug-in hybrid electric (PHEVs), and all electric vehicles (EVs). In 2014, the 100,689 electric vehicles in the region still only account for 2.8 percent of all light duty vehicles. HEVs account for the vast majority with 96,982 and have seen significant growth since 2005. PHEV and EV ownership were first estimated in 2012 at 497 vehicles and increased to 3,707 by 2014.[xv]

Figure 7: Progress Towards Increasing Electric (HEV, PHEV, EV) Vehicle Ownership



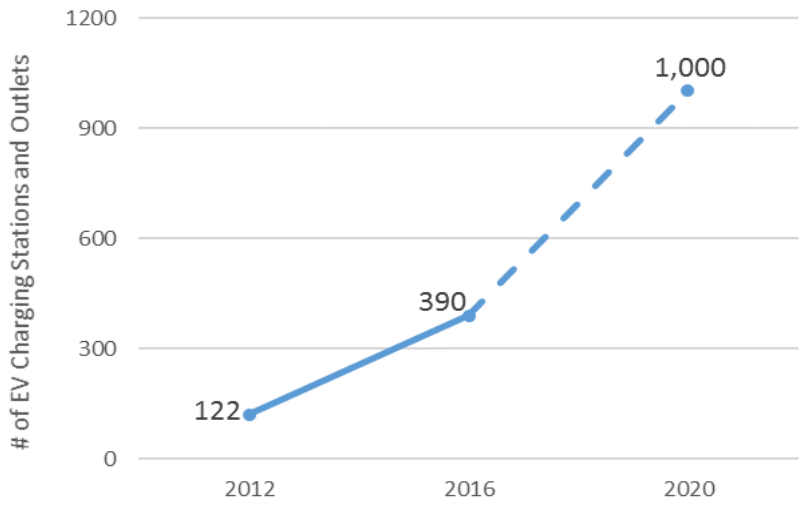
In 2014, the 100,689 electric vehicles in the region still only account for 2.8% of all light duty vehicles.

HEVs account for the vast majority with 96,982, while PHEVs and EVs account for 3,707 of the total.

Source: COG 2014 Metropolitan Washington Vehicle Registration Data Analysis

PHEVs and EVs can be charged through the plug-in connections at EV charging stations (HEVs cannot). Most charging is expected to occur at home and the workplace. PHEV and EV owners need to be supported with a robust network of workplace and public charging stations. Figure 8 shows that publicly accessible charging stations have more than tripled since 2012 to 390 stations.[xvi] The is potential for the region to have more than 1,000 stations by 2020.

Figure 8: Progress Towards Increasing Publicly Accessible Electric Vehicle Charging Stations

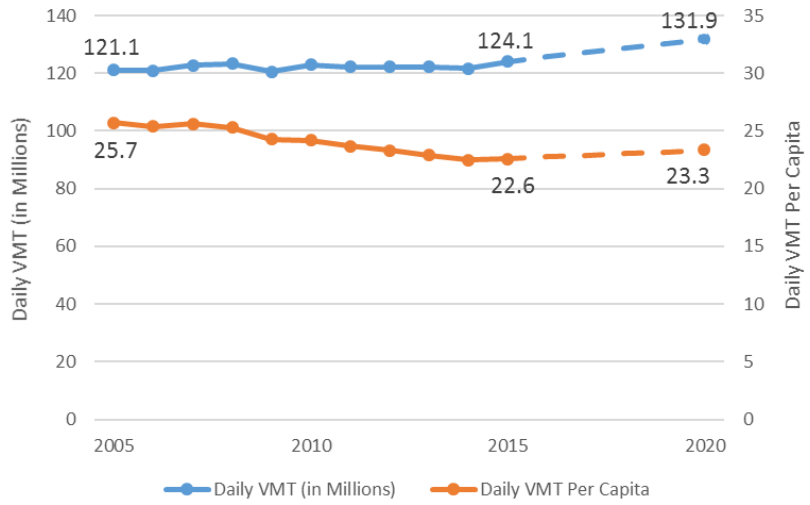


Source: COG 2016 Metropolitan Washington Electric Vehicle Charging Station Analysis

VEHICLE MILES TRAVELLED

Personal vehicle use is the largest source of transportation sector GHG emissions in the region and vehicle miles travelled (VMT) is a leading indicator. Eight in 10 trips in the region are made by private automobile and is likely not to change moving forward. Figure 9 shows the trend in VMT from 2005 to 2015 and the increases projected from 2015 to 2020. Getting people out of their private vehicles and increasing the share of alternative trip modes is a challenge, but important to reducing VMT and the associated GHG emissions.[xvii]

Figure 9: Progress Towards Reducing Vehicle Miles Travelled



Note: Total VMT and VMT per capita estimates for the analysis year 2020 are based on COG's 2016 Constrained Long Range Plan, Version 2.3.66 travel demand model, and COG's Round 9.0 Cooperative Forecasts.

LOCAL ACTIONS

COG and its members will continue to work towards advancing sustainable regional mobility through actions that increase efficiency of public sector fleets, improve local fuel economy, and provide improved trip alternatives through mobility management. Table 4 includes a variety of voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 4: Local Action to Advance Sustainable Regional Mobility

ADVANCE SUSTAINABLE REGIONAL MOBILITY		%
	Increase Efficiency of Public Sector Fleets	
3-a	Adopt a green fleet policy or fleet management plan aimed at improving fleet efficiency and reducing emissions of GHGs and other pollutants.	100%
3-b	Adopt anti-idling policies for public fleets and off-road equipment.	75%
3-c	Add alternative fuel and charging equipment (e.g., natural gas, biofuel, electric, hydrogen) to public sector fueling facilities. Retrofit garages and refueling facilities, as needed.	75%
3-d	Incentivize or encourage alternative trip modes for work trips as an alternative to expanding fleet (e.g., car share membership, bike sharing programs, transit incentives, etc.).	50%

3-e	Provide staff education and training for efficient use of and maintenance on all vehicle types in the fleet with a focus on alternative fuel vehicles.	50%
3-f	Implement innovative pilot initiatives to advance new technologies (e.g., vehicle-to-grid, solar powered charging stations, etc.).	25%
	Improve Local Fuel Economy	
3-h	Support expanding a system of publicly accessible EV charging stations and other AFV fueling stations.	75%
3-i	Support state and national incentives for low-emitting, efficient vehicles, infrastructure, and technology.	75%
3-j	Actively promote and enforce community-wide anti-idling regulations (adopted locally or by state).	75%
3-k	Update comprehensive, small area, and development plans to provide guidance for EV and other AFV infrastructure locations.	50%
3-l	Provide or promote incentives for electric vehicles and charging stations.	50%
3-m	Provide outreach and education on the benefits and availability of zero emission vehicles.	25%
3-n	Require new buildings to install EV charging stations or require them to be EV-Ready.	25%
3-o	Require space for bicycle and car sharing in development plans.	25%
	Mobility Management	
3-p	Offer a commute options program for government employees (e.g., telework, flex-time, alternative work schedule, car pool, van pool, guaranteed ride home, bike/pedestrian, or financial incentive).	100%
3-q	Provide or promote travel demand management programs (e.g., Commuter Connections) to encourage citizens to take alternative commute options and to help employers offer alternative commute options to their employees.	100%
3-r	Adopt a bicycle and pedestrian plan that works towards providing convenient accessibility and an interconnected system to reduce reliance on automobiles.	100%
3-s	Adopt a complete streets policy.	75%
3-t	Expand park and ride facilities to meet anticipated increase in rideshare and transit demand.	50%
3-u	Implement transit enhancements to increase capacity and improve services (e.g., enhanced commuter bus service, real-time bus schedule information, bus rapid transit, etc.). Place emphasis on increasing accessibility and expanded transit options to vulnerable populations. *	50%
3-v	Enhance system operational performance of roadways (e.g., signal retiming, intersection efficiency improvements, etc.).	50%
3-w	Implement transit fare reductions to vulnerable populations and other targeted audiences. *	50%
3-x	Achieve a Bike Friendly or Walk Friendly Community Designation.	25%

* See Section 7 for more information on vulnerable populations.

SECTION 4

Increase Sustainable Urban Development

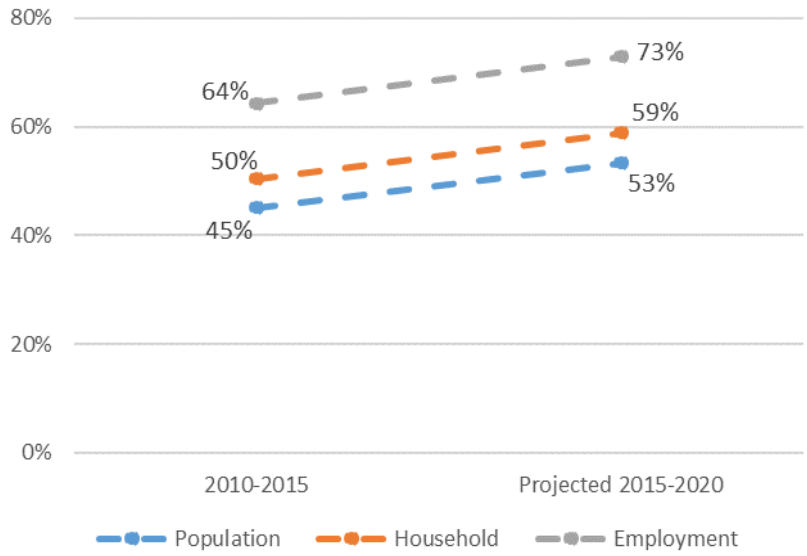
Challenge
- Approximately 16 percent of total U.S. GHG emissions is influenced by land management.[2] [xviii]
- Forest cover in metropolitan Washington decreases at the same rate that developed land increases and tree removal exceeds plantings.[xix]

Outcomes
- Increase population, household, and employment growth in Activity Centers to 53 percent, 59 percent, and 73 percent, respectively.
- Reduce loss of resource lands, canopy and vegetation from development.

SUSTAINABLE DEVELOPMENT PATTERNS

Metropolitan Washington's Activity Centers are the region's priority growth areas and include existing urban centers, suburban town centers, traditional towns, and transit hubs. How and where land is developed influences GHG emissions from VMT, residential and commercial development, and energy use. Therefore, encouraging compact, mixed use, and transit-oriented growth in Activity Centers supports the region in meeting its GHG emission reduction goals. Figure 10 shows the 2020 projected growth rates for population, household, and job within the region's Activity Centers.[xx]

Figure 10: Progress Towards Increasing Growth Rates in Activity Centers



Source: COG 2016 Round 9.0 Cooperative Forecasts

How and where land is developed influences GHG emissions from VMT, residential and commercial development, and energy use.

Therefore, encouraging compact, mixed use, and transit-oriented development in Activity Centers supports the region in meeting its GHG emission reduction goals.

[2] Note: The metropolitan Washington GHG inventories for 2005 and 2012 use an activities-based approach to account for GHG emissions of residential and business activity based in the region. It does not account for carbon sinks, such as CO_2 removed from the atmosphere by the regional tree canopy or greenfield preservation. The EPA Report *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices* analyzes U.S. GHG emissions inventory through a systems-based lens, looking across activities and sectors to apportion emissions to materials management, land management, and other systems. Unlike the metropolitan Washington inventories, it does account for carbon sinks.

LOCAL ACTIONS

COG and its members will continue to support actions to increase growth rates in Activity Centers; increase the number of high performance buildings; and reduce loss of resources lands, tree canopy, and vegetation from development. Table 5 includes a variety of voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 5: Local Action to Increase Level of Sustainable Urban Development

INCREASE SUSTAINABLE URBAN DEVELOPMENT		%
	Facilitate Sustainable Development Patterns	
4-a	Update comprehensive and small area land use plans, zoning, and urban design guidelines to allow for greater concentration of growth in activity centers.	100%
4-b	Implement pedestrian, bicycle, and transit improvements to accommodate growth around rail stations and other activity centers.	75%
4-c	Incentivize development in activity centers that are walkable, higher density, mixed use, mixed income, and transit-oriented. Identify, promote, and incentivize the redevelopment or innovative uses of vacant, underutilized, or brownfield sites.	50%
	Reduce Loss of Resource Lands, Canopy and Vegetation from Development	
4-d	Implement plan(s) to preserve and enhance ecologically valuable green spaces (such as forests, wetlands, stream buffers) in urban, suburban and rural areas (e.g., green infrastructure plan, natural resource management plan, or green space plan).	100%
4-e	Adopt a tree canopy/forest cover goal.	100%
4-f	Obtain and maintain Tree City USA designation. Designation requirements include having a tree board or department, tree care ordinance, an Arbor Day observance or proclamation, and a $2 per capita budget for public tree plantings and care.	100%
4-g	Promote planting, care of trees, and engage the community on tree planting.	100%
4-h	Establish or expand urban heat island mitigation programs.	100%
4-i	Install green roof(s) on government property.	75%
4-j	Provide support or incentives for urban agriculture (e.g., edible landscaping, school and community gardens, urban farming).	75%
4-l	Adopt green streets plan, policies, or initiatives.	50%
4-m	Require green infrastructure and tree canopy for new development and retrofits as part of the development review process. Expand the responsibility of developers to plant or maintain trees over an extended period of time.	50%
4-n	Provide or promote green infrastructure incentives (e.g., private property tree plantings, green roofs, permeable pavers, paved surface reduction, etc.).	50%
4-o	Utilize zoning, development and permitting regulations, and other tools to support local food production, processing, and distribution in urban, suburban, and rural communities (e.g., farmers' markets, community gardens, on-farm processing/working farmland, agri-tourism, etc.).	50%
4-p	Promote, incentivize, or apply to local jurisdiction projects concepts that compliment green building design through the provision of sustainable, ecologically-beneficial site design and landscaping practices.	50%

SECTION 5

Move Towards Zero Waste

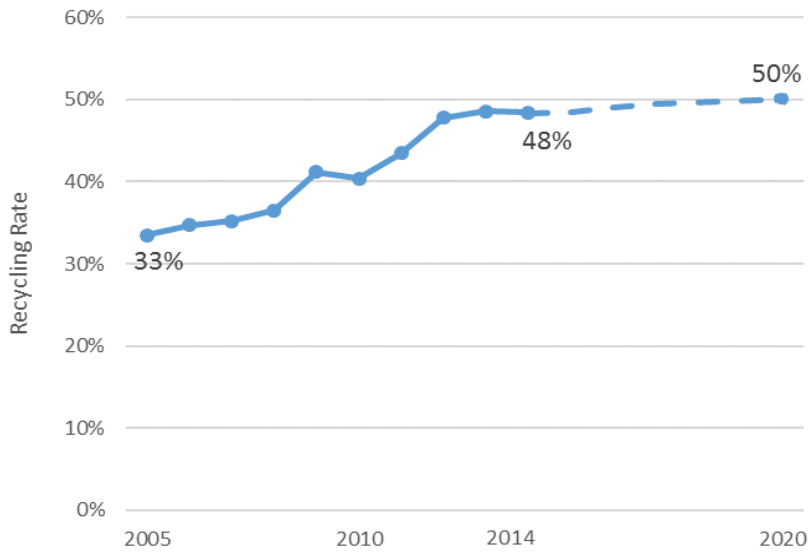
Challenge
- Solid waste treatment accounts for 1.2 percent of metropolitan Washington's GHG emissions, as of 2012.[xxi]
- Approximately 42 percent of U.S. GHG emissions are influenced by the life-cycle emissions of the goods and food we produce, buy, and dispose of.[3] [xxii]

Outcomes
- Increase regional recycling rate to 50 percent by 2020.
- Sustainable consumption activities are incorporated into local government decision-making.

THE ZERO WASTE VISION

Zero waste is a visionary goal to shift behavior and practices to mimic sustainable natural cycles. It means products and processes are designed and managed to avoid the volume and toxicity of materials and to become resources for other uses when discarded. This calls for society to use fewer resources as well as increase resource recovery, recycling, and composting. The regional recycling rate is one indicator to help track progress towards zero waste. Figure 11 shows the regional recycling rate has increased from 33 percent in 2005 to approximately 48 percent in 2014. Implementing zero waste strategies reduce emissions, saves energy, and extends landfill capacity.[xxiii]

Figure 11: Progress Towards Increasing Regional Recycling Rate



Source: COG 2016 Metropolitan Washington Waste and Recycling Trends Analysis

[3] Note: The metropolitan Washington GHG inventories for 2005 and 2012 use an activities-based approach to account for GHG emissions of residential and business activity based in the region. It does not account for upstream emissions impacts of material extraction, transportation, manufacturing of goods or life-cycle emissions of business production. The EPA Report *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices* analyzes U.S. GHG emissions inventory through a systems-based lens, looking across activities and sectors to apportion emissions to materials management (associated with the provision of goods and food), land management, and other systems.

LOCAL ACTIONS

COG and its members will continue to support actions towards zero waste. Table 6 includes a variety of voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 6: Local Action to Move Toward Zero Waste

MOVE TOWARD ZERO WASTE		%
Facilitate Zero Waste at Public Facilities and Operations		
5-a	Develop a sustainable consumption strategy.	25%
5-b	Implement zero waste procurement initiatives (e.g., avoid single-use products and packaging; buy in larger units to reduce packaging, buy reused, recycled, recyclable, and compostable products; buy durable goods; buy remanufactured equipment; lease, rent and share equipment; etc.).	25%
5-c	Implement initiatives to procure and manage materials and products on a life-cycle basis.	25%
5-d	Work with vendors to minimize the carbon intensity of their supply chain.	25%
5-e	Implement a sustainable food purchasing policy.	25%
5-f	Train employees on implementing zero waste workplace strategies.	25%
Facilitate Zero Waste in the Community		
5-g	Expand education and outreach initiatives to encourage sustainable consumption and resourcefulness, recycling, and composting.	100%
5-h	Expand zero waste infrastructure in the community and at events (e.g., locations for reuse, recycling, and composting; displaying signage with proper waste disposal techniques, etc.).	100%
5-i	Implement solutions for disposal of household hazardous waste and pharmaceuticals.	100%
5-j	Adopt and enforce recycling requirements for businesses.	100%
5-k	Adopt construction and demolition recycling policy or guidelines.	75%
5-l	Provide incentives for residential composting.	50%
5-m	Support siting of renewable energy generation equipment at landfills (e.g., wind, solar, methane collection).	50%
5-n	Develop a strategy for residential and commercial sector organics collections, including food composting and recovery initiatives.	25%
5-o	Adopt community zero waste plan, policies, or initiatives.	25%
5-p	Support community activities that promote repair, reuse, and sharing opportunities.	25%
5-q	Support initiatives that divert healthy food that might otherwise be wasted to charitable organizations.	25%
5-r	Establish or promote zero waste business programs.	25%
5-s	Encourage local businesses to implement take-back program services to take responsibility for the reuse, recycling or proper disposal of the products they sell.	25%
5-t	Promote food waste education for consumers and food service employees.	25%
5-u	Implement bans or fees on single-use products which are not readily recyclable, such as plastic bags and polystyrene containers.	25%

SECTION 6

Build Regional Resilience

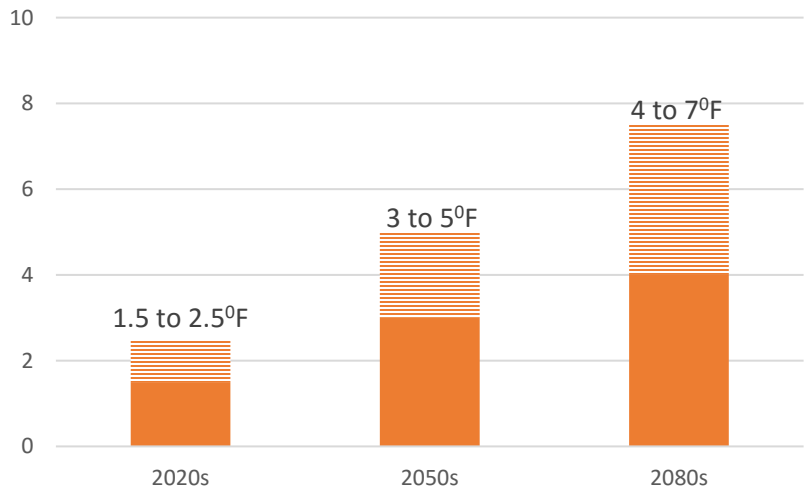
Challenges
- Average annual temperature has risen 4⁰ Fahrenheit over the last 100 years and is projected to continue to rise.[xxiv]
- Sea level rise has increased 10 inches over the last 80 years in the Washington DC and is projected to continue to rise.[xxv]

Outcome
- Increase the resiliency of the region's infrastructure, economy, communities, and environment to prepare for the unavoidable impacts of climate change.

PROJECTED CLIMATE CHANGE IMPACTS

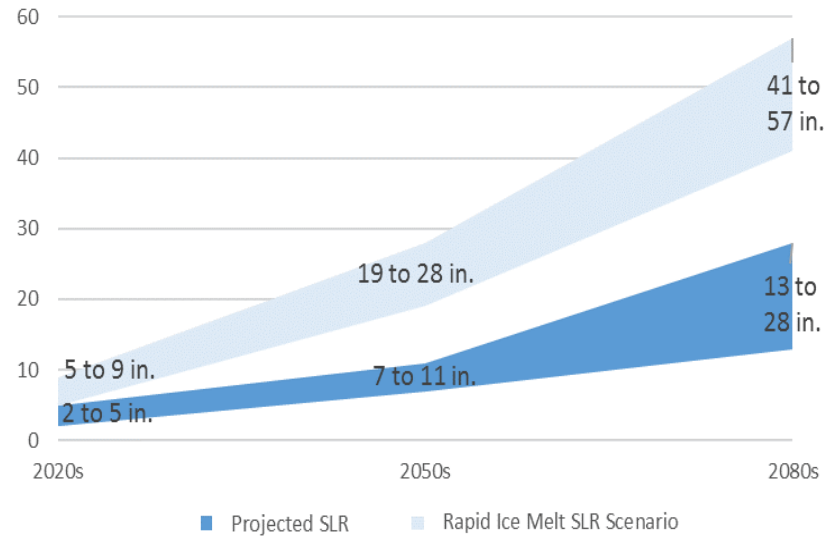
The region is experiencing the impacts of a changing climate. Taking practical, common sense steps to address climate change impacts today is in the best interest of future generations. In metropolitan Washington, average annual temperature and sea level in the Potomac River have been rising and will continue to rise. Figure 12 shows the projected increases in average annual temperature for the region. Figure 13 shows the projected increases in sea level rise as well as a high scenario in the case of rapid ice melt. There will likely be an increase in extreme events such as severe storms and heat waves. Changes in number of hot and cold days may affect energy usage patterns, infrastructure, health, and habitats.[xxvi]

Figure 12: Projected Increases in Average Annual Temperature for Metropolitan Washington



Source: NASA 2012 Adapting to Climate Change: Federal Agencies in the Washington D.C. Area

Figure 13: Projected Increases in Sea Level Rise (SLR) in Metropolitan Washington



Source: NASA 2012 Adapting to Climate Change: Federal Agencies in the Washington D.C. Area

LOCAL ACTIONS

COG and its members will continue to support actions to build regional resilience. Throughout this plan there are actions that mutually support mitigation and resilience. Table 7 includes a variety of additional voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 7: Local Action to Build Regional Resilience

BUILD REGIONAL RESILIENCE		%
6-a	Assess community vulnerabilities (social, ecological, economic, public health) to climate impacts.	50%
6-b	Adopt climate adaptation/resiliency plan, policies or initiatives.	50%
6-c	Implement local government energy assurance planning initiatives.	50%
6-d	Implement public education campaign on preparedness for citizens, commercial property owners, and small businesses.	50%
6-e	Assess vulnerability of critical infrastructure for transportation, communication, energy utility, water and wastewater utility systems assets.	25%
6-f	Update plans (comprehensive, small area, hazard mitigation, emergency response and recovery, public health, etc.) to address climate impacts and preparedness.	25%
6-g	Revise infrastructure design standards to be more resilient to heat, flooding, and other climate impacts.	25%
6-h	Incorporate climate resilience strategies into capital improvement plans and projects.	25%
6-i	Implement energy, water supply, flood, and heat protection measures at vulnerable critical facilities and infrastructure sites.	25%

6-j	Update zoning, building codes, ordinances, or the development review process to ensure new development is more resilient to local climate impacts.	25%
6-k	Design new public buildings to be more resilient to climate impacts and to continue operations during extended power outages.	25%
6-l	Direct assistance (technical and financial) and innovative solutions to vulnerable populations. *	25%
6-m	Restore and manage natural ecosystem functions to increase capacity to adapt to a changing climate.	25%

* See Section 7 for more information on vulnerable populations.

SECTION 7

Protect Equity and Health

Challenge - Vulnerable populations may have less ability to respond to or recover from climate impacts.[xxvii]

Outcome - Social equity, cultural sensitivity, and community health considerations are incorporated into local climate change planning, program, and policy decisions.

VULNERABLE POPULATIONS

Climate change will impact people and communities differently. Potentially vulnerable populations may include low-income, minority, people with limited English proficiency, elderly, children, people with chronic health problems, or disabled. As vulnerable populations may face greater risk, their consideration and inclusion in climate change planning can help ensure equitable distribution of benefits.[xxviii]

LOCAL ACTIONS

COG and its members will continue to support actions to protect equity and health. Throughout this plan there are actions that support equity and public health protection. Table 8 includes a variety of additional voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 8: Local Action to Protect Equity and Health

PROTECT EQUITY AND HEALTH		%
7-a	Identify the community's priorities for equitable environmental improvements. Provide data and resources to support decision-making of priorities.	25%
7-b	Conduct cumulative environmental and health impact assessments in underserved communities.	25%
7-c	Integrate equity and health considerations and strategies into climate and energy policies, plans, and programs. Identify impacts of policies and programs to underserved populations and communities and how to maximize positive impacts and minimize negative impacts.	25%
7-d	Develop a healthy food access or food security plan.	25%
7-e	Direct environmental incentives towards vulnerable populations.	25%
7-f	Provide training to local government staff on successful public engagement techniques, equity and diversity.	25%
7-g	Support community environmental monitoring programs to increase community participation in gathering and accessing community data (e.g., citizen science).	25%
7-h	Provide meaningful engagement forums and community leadership development opportunities to enhance citizen's knowledge on the local environmental planning process, how to influence environmental decision-making, and how to access data, technical assistance, and resources.	50%

SECTION 8

Grow the Regional Clean Economy

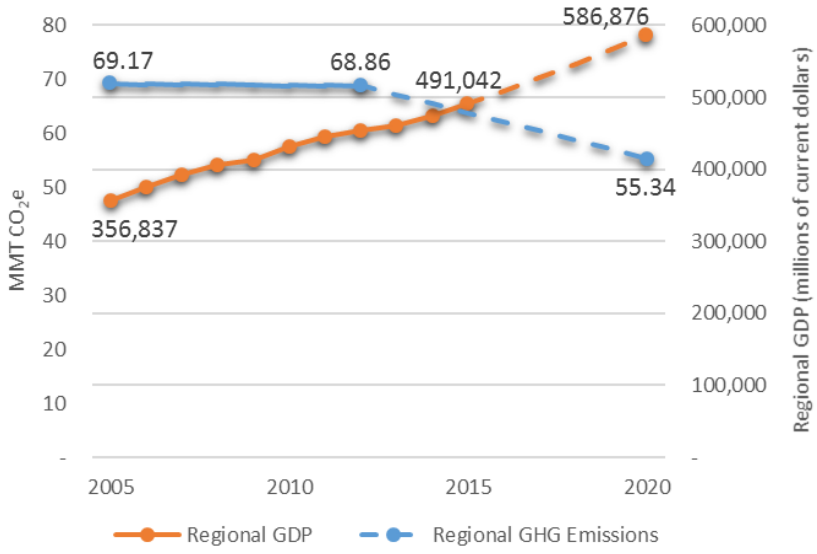
Challenge - Economic growth leads to greater investment that historically has resulted in increases in energy consumption, vehicle and air travel, resource use, and waste generation.[xxix]

Outcome - Metropolitan Washington Gross Domestic Product (GDP) continues to grow at least 2 percent annually, while meeting the 2020 GHG emission reduction goal, further decoupling economic growth from carbon emissions.

REGIONAL GROSS DOMESTIC PRODUCT

Increased energy efficiency, clean energy, and sustainable consumption strategies can support economic growth while reducing emissions. The Region Forward indicator for economic growth is GDP with the goal to have at least 2 percent growth annually. The regional GHG emission reduction goal for 2020 is 20 percent below 2005 levels. Figure 14 shows that while the metropolitan Washington economy continues to grow, GHG emissions have remained relatively flat. This means the grid is becoming more efficient and clean. A concerted effort is still needed to further decouple economic growth from carbon emissions and meet both the GHG reduction and economic growth goals.[xxx]

Figure 14: Progress Towards Reducing GHG Emissions While Increasing GDP



While the metropolitan Washington economy continues to grow, GHG emissions have remained relatively flat. This means the grid is becoming more efficient and clean.

A concerted effort is still needed to further decouple economic growth from carbon emissions and meet both the GHG reduction and economic growth goals.

Source: COG 2005 and 2012 Metropolitan Washington GHG Inventories and COG 2016 GDP Trends Analysis

Growth of the regional clean economy is highly dependent on private-sector leadership. However, public investment and local policies that support resource and energy efficiency, clean infrastructure investments, and enhanced innovation can help drive growth of the economy while reducing emissions. Investing public dollars on clean products, services, and technologies supports local demand and can scale up the market. Strong local policies can reduce market uncertainties and barriers as well as provide finance solutions and incentives that can spur private investment.[xxxi]

LOCAL ACTIONS

COG and its members will continue to support actions to grow the regional clean economy. Throughout this plan there are actions that support public investment, financing, and incentives. Table 9 includes a variety of additional voluntary action options and flexible implementation levels. The percent column refers to the percentage of COG member local jurisdictions undertaking this action by 2020.

Table 9: Local Action to Grow the Regional Clean Economy

GROW THE REGIONAL CLEAN ECONOMY		%
8-a	Adopt environmentally preferable purchasing policies to facilitate public purchasing of goods and services that reduce impacts to human and environmental health.	100%
8-b	Increase the percent of government spend on climate-friendly products or services.	100%
8-c	Encourage government vendors and businesses in the community to minimize the carbon intensity of their supply chain.	25%
8-d	Commit to divest in fossil fuels over the long-term.	25%
8-e	Support vocational training for the clean economy.	25%
8-f	Update economic development workforce plans/policies to incorporate strategies to support emerging green or clean tech industries.	25%
8-g	Develop a clean tech branding and marketing strategy.	25%
8-h	Provide shared space and develop incentives for green/clean tech businesses to locate within the jurisdiction.	25%
8-i	Expand opportunities for minority and women-owned businesses to participate in clean economy initiatives.	25%
8-j	Support innovative technology and infrastructure deployment to address current community challenges and needs.	25%
8-k	Support state and federal incentive programs for green and clean tech activities.	25%

CONCLUSION

Climate change is a major environmental issue affecting both human health and natural ecosystems. COG's Climate and Energy Program is one of the nation's first initiatives to address climate change on a regional level. The regional effort is led by the CEEPC and guided by this Action Plan. Communities in the region are already implementing renewable energy, energy efficiency, purchasing green power, facilitating electric vehicle adoption, and other programs to help reduce GHG emissions. This Action Plan further provides a roadmap for communities seeking more sustainable options for growth and development. COG will continue to work with its regional partners to meet the 2020 goal of reducing GHG emissions 20 percent below the 2005 level.

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