Multi-Sector Working Group: Greenhouse Gas Reduction Strategies in the Metropolitan Washington Region

Presentation to the Climate, Energy and Environment Policy Committee

October 28, 2015

Charge Given To Multi-Sector Working Group (MSWG)

TPB and MWAQC affirmed the region's greenhouse reduction goals and committed staff and resources to support MSWG convened by COG to:

- Identify viable, implementable local, regional, and state actions to reduce GHG emissions in four sectors (Energy, the Built Environment, Land Use, and Transportation)
- Quantify the benefits, costs and implementation timeframes of these actions;
- Explore specific GHG emission reduction targets in each of the four sectors; and
- Jointly develop an action plan for the region

MSWG Organization and Oversight

Transportation Planning Board (TPB)

COG Board of Directors

Climate, Energy & Environment Policy Committee (CEEPC)

Metropolitan Washington Air Quality Committee (MWAQC)

Multi-Sector Working Group

(Local Jurisdiction, Regional & State Agency Staff)

Energy/Environment Subgroup – Energy & Built Environment Sectors

Planning Subgroup – Land Use Sector

Transportation Subgroup – Transportation Sector

COG/TPB Committee Input

Region Forward Coalition
Planning Directors
TPB Technical Subcommittee
Built Environment Energy Advisory Committee (BEEAC)
MWAQC – Technical Advisory Committee

Additional Input from

Subject Matter Experts
Citizen Advisory Committees
General Public

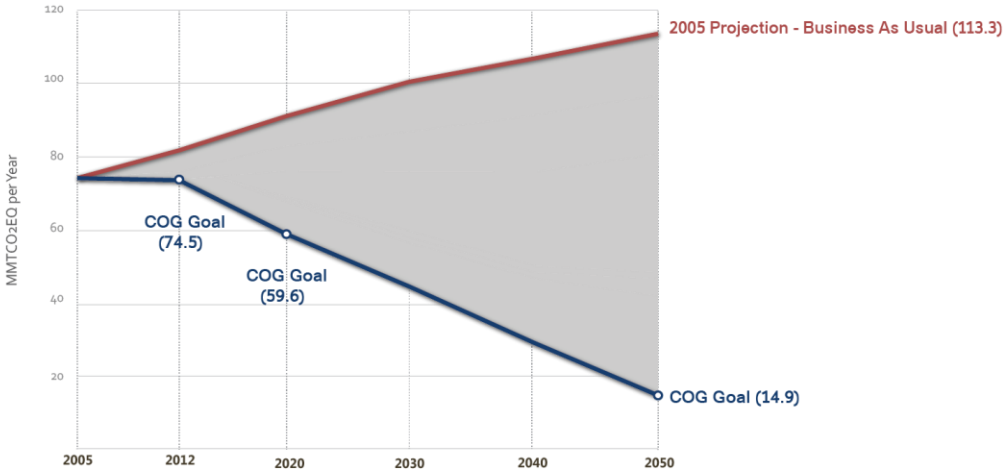
COG Staff Support

Consultant Support

Region's Voluntary GHG Reduction Goals

2005 - Baseline Emissions (74.5 MMT)

- **2012 – Reduce BAU emissions by 10%, to 2005 levels (74.5 MMT)**
- **2020 – Reduce emissions to 20% below 2005 levels (59.6 MMT)**
- **2050 – Reduce emissions to 80% below 2005 levels (14.9 MMT)**



Notes:
1. The goals were adopted by the COG Board in November 2008
2. MMT = Million Metric Tons of CO2 Equivalent (CO2e)

Current Policies are Making a Difference ≈ 1/3rd towards 2050 goal

Energy and Built Environment

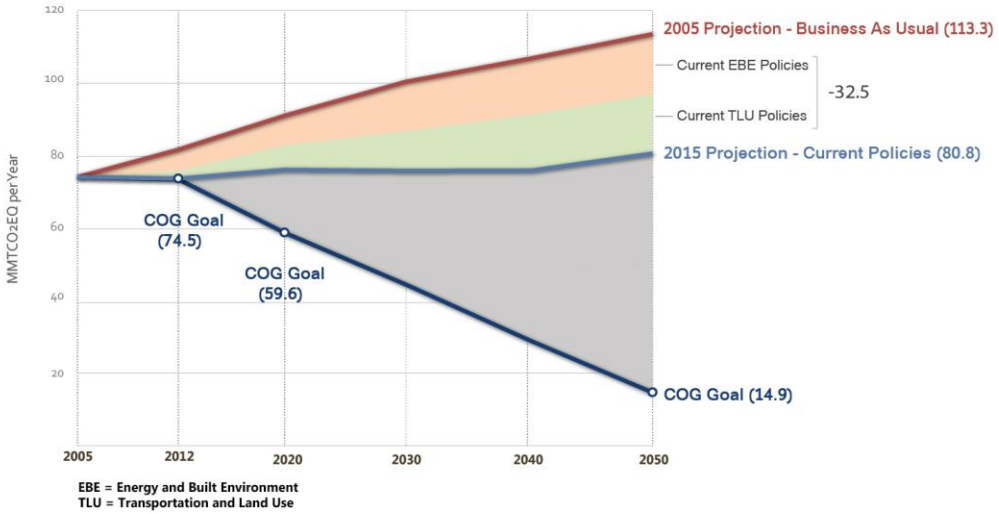
(16.1 MMT 14% towards 2050 goal)

- Improved electric generation
- Distributed solar
- Green Power Partners
- Renewable energy tax credits
- Renewable Portfolio Standards
- More stringent building codes
- Net-zero energy buildings
- Government energy efficiency
- Energy STAR and LEED

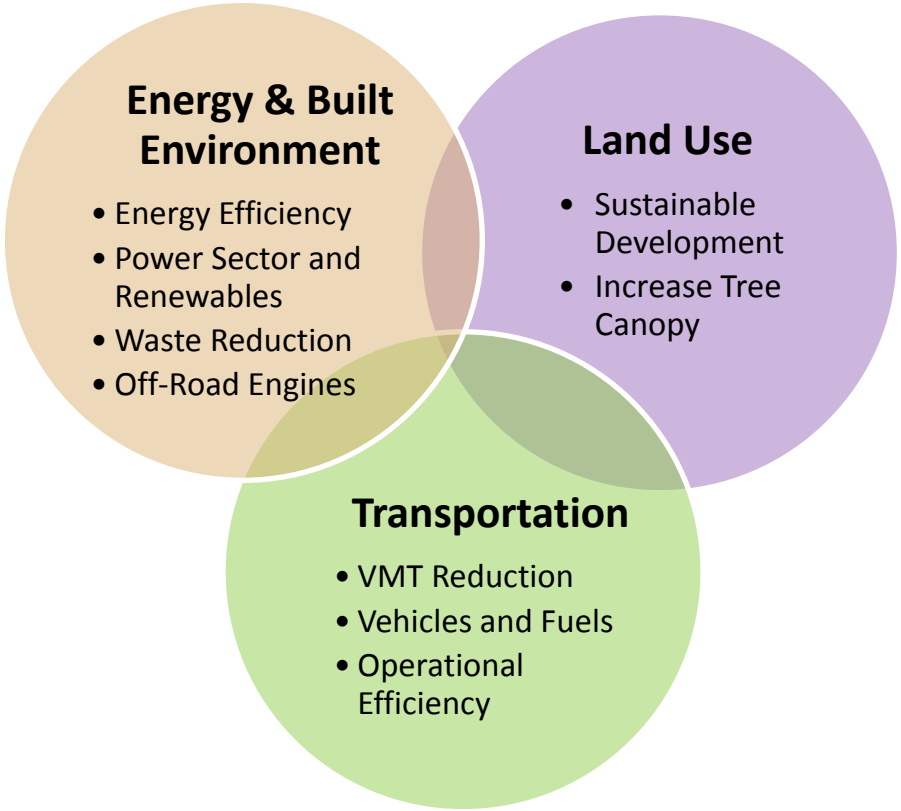
Land Use and Transportation

(16.4 MMT 15% towards 2050 goal)

- Future growth in transit oriented centers
- Transportation investments to support land use plans
- Provide more multimodal travel options
- Increased CAFÉ for light-duty vehicles
- Fuel efficiency standards for medium- and heavy-duty vehicles



22 Strategies Analyzed



75 Initial Brainstorm Ideas

38 Individual Strategies

22 Refined Strategies for Technical Review

5 Key Grouped Strategies

MSWG Analysis Considerations

- Benefits: Greenhouse gas emissions
- Co-Benefits : Reduced air pollution, reduced stormwater pollution, reduced congestion, safety, economic vitality, local jobs, resiliency

- Cost:
  - Low (up to $50 million)
  - Medium ($51 to $500 million)
  - High (+ $500 million)

- Implementation Actions: Deep building retrofits, Implement the Clean Power Plan, Reduced price transit passes, Convert to full electronic tolling, Expand tree canopy

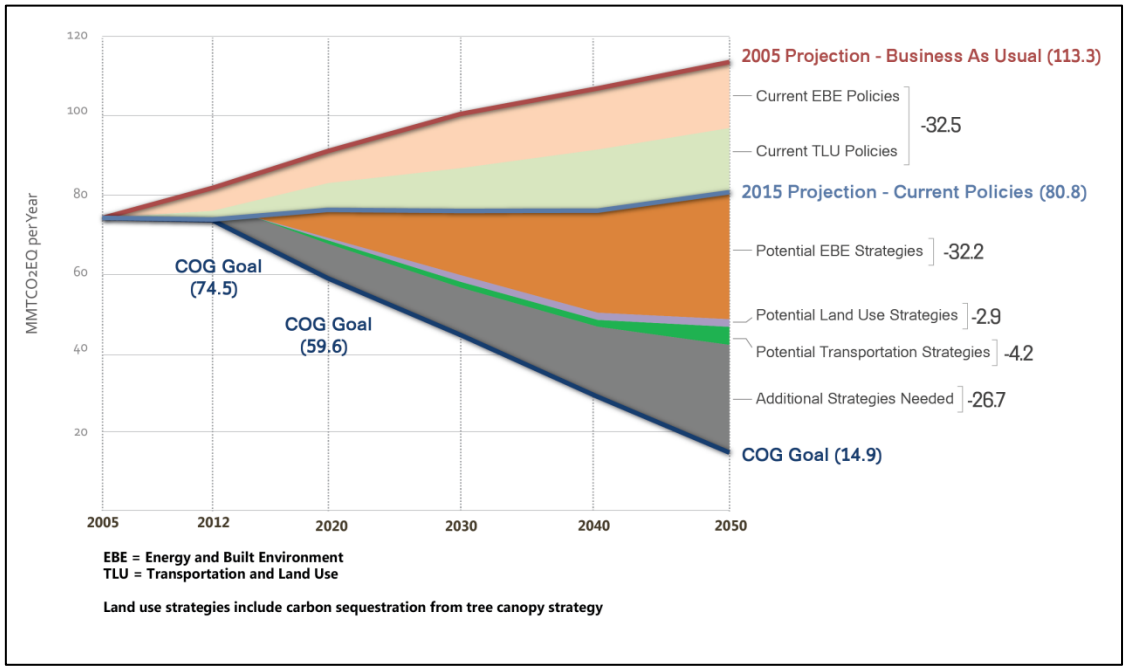
Viable and Stretch Levels of Grouped Strategies

Grouped Strategy	Key Element	Viable	Stretch
Building Energy Efficiency	2% Annual Reduction in Existing Buildings	Yes	Yes
	New Buildings w/ Net Zero Energy	50%	100%
Power Sector and Renewables	Clean the Power Sector	Clean Power Plan	Add carbon-free nuclear, offshore wind
	Increase Renewables	Maximize market growth	Solar offsets: 40% in MD, 20% in VA, DC
Land Use and Tree Canopy	Maximize Transit Oriented Development (TOD)	Development Shifts within Jurisdictions	Development Shifts Across Jurisdictions
	Tree Canopy Carbon Sequestration	Reduced tree loss from development pattern	Expand Region's Tree Canopy by 5%
Vehicles and Fuels	More Zero-Emission Vehicles	15% More Light Duty, Transit	25% More Light Duty, Transit
	Reduce Carbon in Fuels	10%	15%
Travel Demand Management	Commuter Subsidy	$50/ mo. by 80% of Employers	$80/mo. by 100% of Employers
	Parking Charge	$8 average in 90% of Activity Centers	$8 average in 100% of Activity Centers
	Reduce Transit Fares	20% regionally	40% regionally
	Downtown DC Cordon Charge	$5/vehicle entering	$5/vehicle entering
	Vehicle Mile Travel Charge	None	$0.10/mile

Definition of Viable and Stretch are based upon an interim technical assessment of implementation feasibility

Potential GHG Reductions at Viable and Stretch Levels

Grouped Strategy	Viable Percent Reduction 2050 Goal	Stretch Percent Reduction 2050 Goal
Building Energy Efficiency	15%	18%
Power Sector and Renewables	10%	14%
Land Use and Tree Canopy	2%	3%
Vehicles and Fuels	2%	4%
Travel Demand Management and Pricing	<1%	2%
Total	29%	40%



Reduce Emissions from New Buildings

- **Potential Impacts – Additional 5.1 MMTCO$_2$e in 2050**
  - Improved efficiencies in appliances, lighting, and equipment
  - Improved efficiencies in building thermal envelopes
  - Zero energy buildings research, development, and deployment
  - Department of Energy engagement in advancing building codes

Reduce Emissions from the Power Sector

- **Potential Impacts – Additional 13.6 MMTCO$_2$e in 2050**
  - Increased generation share from renewable, nuclear, and high-efficiency natural gas resources
  - Clean Power Plan successor rulemakings
  - Congressional climate change legislation
  - Federal Renewable Portfolio or Clean Power Standard
  - Continued/expanded tax incentives for renewable power production

Reduce Emissions from Existing Buildings

- **Potential Impacts – Additional 1.5 MMTCO$_2$e in 2050**
  - Improved efficiencies in appliances, lighting, and equipment
  - Advanced building retrofit technologies
  - More aggressive National Appliance Energy Conservation Act (NAECA) appliance and equipment standards rulemakings
  - Advanced voluntary labeling via ENERGY STAR

Reduce Emissions from Light-Duty Vehicles

- **Potential Impacts – Additional 7.6 MMTCO$_2$e in 2050**
  - 80% reduction in CO2 emissions per vehicle mile compared to 2012 levels; ≈ 99 mpg overall average fuel economy on-road
  - Significantly higher vehicle fuel economy standards
  - Most petroleum-based fuels replaced with fuels with low net GHGs
  - Supportive policies, such as “feebates”, taxes on low fuel-economy vehicles, higher fuel taxes
  - R&D investments related to fuel cells, batteries, biofuels, low-GHG production of hydrogen

Reduce Emissions from Medium-Heavy Duty Vehicles

- **Potential Impacts – 2.9 MMTCO$_2$e in 2050**
  - 55% reduction in CO_2 emissions per vehicle mile compared to 2012 levels; More than doubling of on-road fuel economy
  - More efficient internal combustion engines
  - Shifts to biodiesel and renewable diesel, as well as natural gas
  - Expansion of proposed Phase 2 regulations for medium-heavy-duty vehicles, which may reduce GHGs per mile by about 30% from 2012 levels by 2040-2050
  - Implementation of low carbon fuel standard

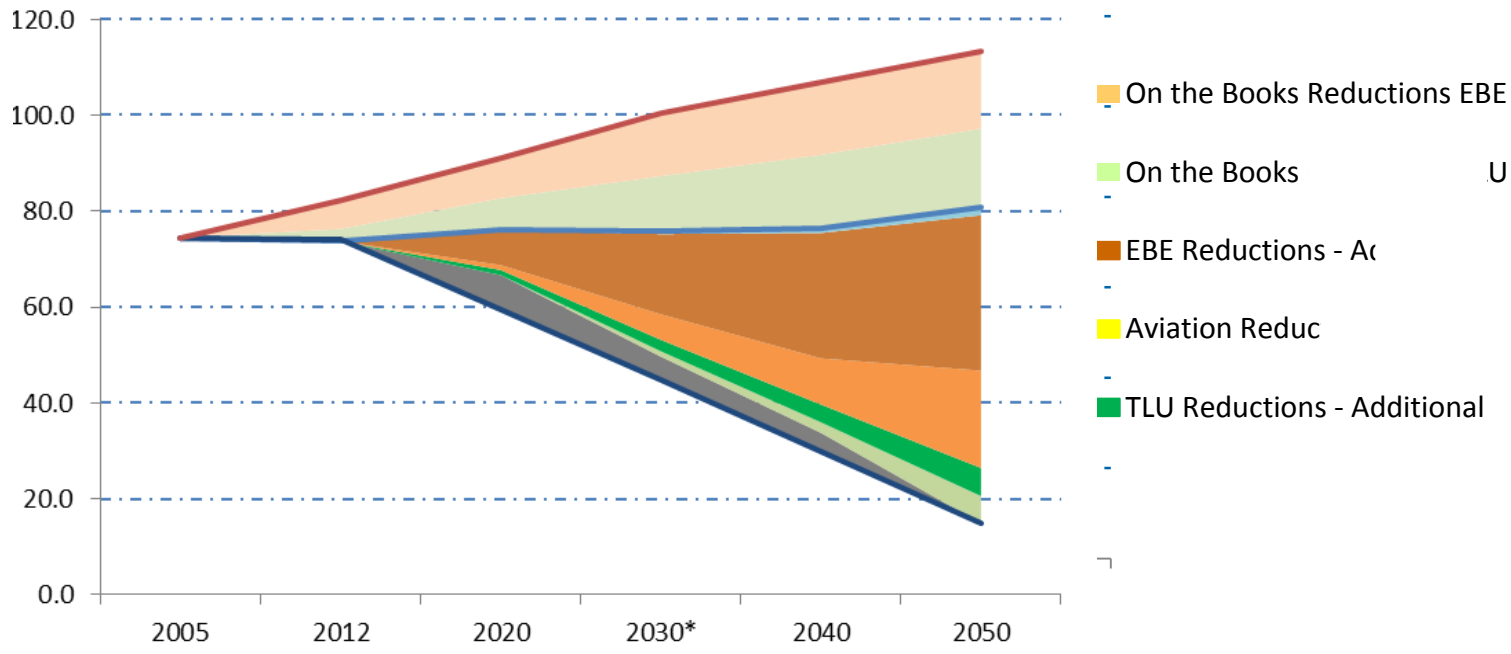
Reduce Emissions from Commercial Aviation

- **Potential Impacts – Additional 7.6 MMTCO$_2$e in 2050**
  - 50% reduction in CO_2 emissions to 2012 levels
  - Development of lighter weight aircraft materials
  - Increase in aircraft operation efficiency
  - Fuel composition moves towards sustainable alternative aviation fuels

Reduce Emissions from HFCs

- **Potential Impacts – 3.7 MMTCO$_2$e in 2050**
  - Up to 86% reduction in HFC emissions
  - Amendments to the Montreal Protocol schedule to phase down the production and consumption of HFCs

Estimated Potential Reductions to Meet 80% Reduction Goal



Options for Goals/Targets/Milestones

1. **Maintain 80% reduction goal by 2050; no specific sector targets**

2. **Maintain 80% reduction goal by 2050; Focus on supporting actions**
   (e.g., adapt policies to increase construction of net-zero-energy buildings; support expansion of Transportation Emissions Reduction Measures)

3. **Maintain 80% reduction goal by 2050; Recommend a list of consensus implementation actions with milestone goals for analysis**
   (e.g., create EV charging ready infrastructure code provisions by 2020; 2% per year existing building energy efficiency based reductions through 2030 – Maintain 20% reduction by 2020 milestone for analysis)

4. **Maintain 80% reduction goal by 2050; Recommend sectoral targets proportional to each sector's GHGs in 2005**
   (i.e., 80% reduction by 2050 in each sector)

Next Steps

November – January 2015

- COG policy level working group to develop consensus
  - Package of GHG emission reduction strategies for Regional Action Plan
  - Goals/targets/milestones
- Draft Final MSWG Report review by TPB, MWAQC, CEEPC

February 2016

- Final MSWG Report to COG Board
  - Strategies for inclusion in Action Plan
  - Goals/targets/milestones
  - Policy direction

2016 to 2019 Regional Action Plan