



Northern Virginia Greenhouse Gas Inventory - 2012

MWCOCG Built Environment
and Energy Advisory
Committee

May 15, 2014

GHGi Project Plan

- Numerous local governments have completed greenhouse gas inventories
- Lack uniform time frame or methodology
- Desire to establish common methodology and save costs with common implementation
- Requested NVRC to complete
- Coordinate with COG as template for National Capital Region

2012 ICLEI Community Protocol

- ICLEI 2012 *Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0, October 2012*
 - GHG emissions from activities within the locality's borders
 - Generation and transmission of electricity used within the locality
 - Use of fuels at stationary facilities within the locality
 - On-road and off-road mobile activities within the locality
 - Air travel by local residents and businesses
 - Collection and treatment of solid and liquid wastes; treatment and pumping of water

2012 ICLEI Community Protocol

- ICLEI 2012 *Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0, October 2012*
 - Does not include emissions from
 - Land use changes
 - Electricity generation inside the locality
 - Upstream extraction and manufacturing of goods and materials
 - Life-cycle emissions of goods and materials extracted or manufactured in the locality
 - Forestry practices
 - Calculations – ICLEI *GHG Inventory Tool, Version 0.9*



Northern Virginia GHGi

- Data sources
 - Electric and natural gas utility sales data from incumbent utilities
 - Statewide fuel data from EIA
 - Allocated to localities using US Census local population and employment data
 - On-road and off-road calculations from COG
 - Allocated to localities using Mobile 2010(a) and Off-Road models
 - Airline GHG emissions from
 - Allocated to localities using US DOT airline passenger miles per airport and COG Airport Survey originating passenger data
 - Water and wastewater data from localities and utilities
 - Solid waste data from NVRC Annual Recycling Report

Preliminary Alexandria Results

City of Alexandria Greenhouse Gas Emissions	
2012 Alexandria MT CO ₂ e	1,778,200
2012 Alexandria Population	146,294
2012 MT CO ₂ e per Capita	12.15
2005 Alexandria MT CO ₂ e	1,873,099
2005 Alexandria Population	135,856
2005 MT CO ₂ e per Capita	13.79

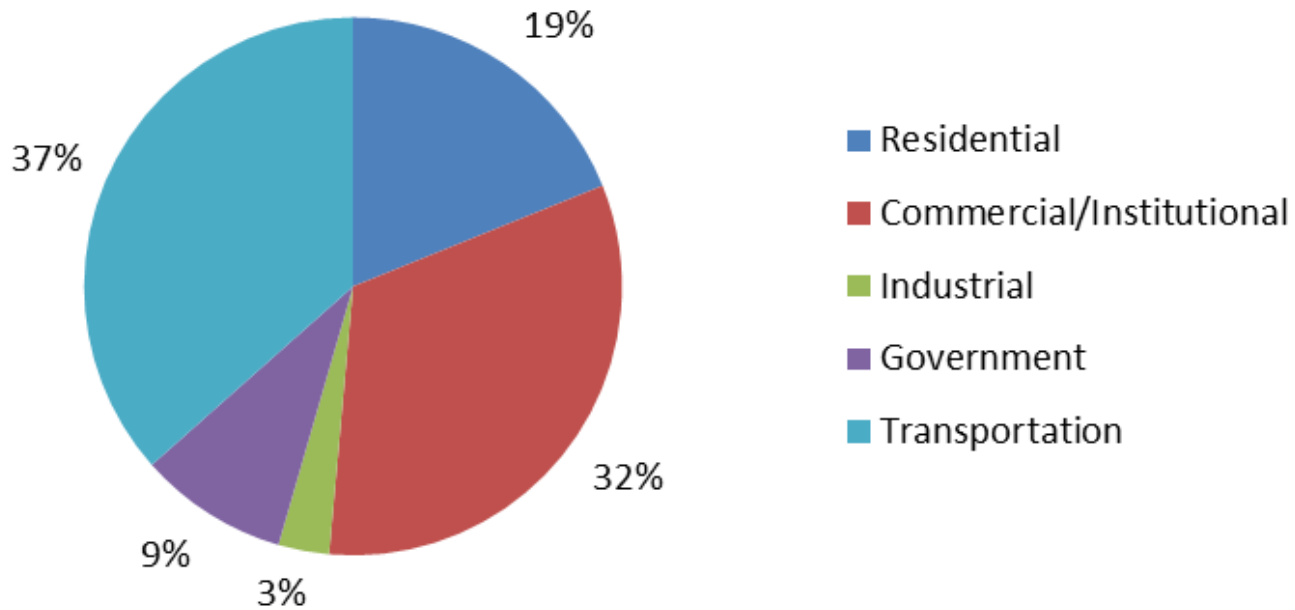
Changes – 2005 to 2012

- 5.8% decrease in total emissions
- 12.5% decrease in per capita emissions
- Lower emission factor for SERC Virginia/Carolina zone
- Lower electric and natural gas consumption
- Includes wastewater related emissions

Change in Greenhouse Gas Emissions from 2005 to 2012			
Emission Source	2005 Adj MT CO ₂ e	2012 MT CO ₂ e	Difference
Built Environment Electricity	905,865	830,243	75,622
Built Environment Natural Gas	257,586	201,545	56,041
Built Environment Fuels	53,770	75,894	(22,124)
Mobile	664,807	649,398	15,409
Non-Energy Resources (Waste)	4,869	21,120	(16,251)
Total	1,886,897	1,778,200	108,697

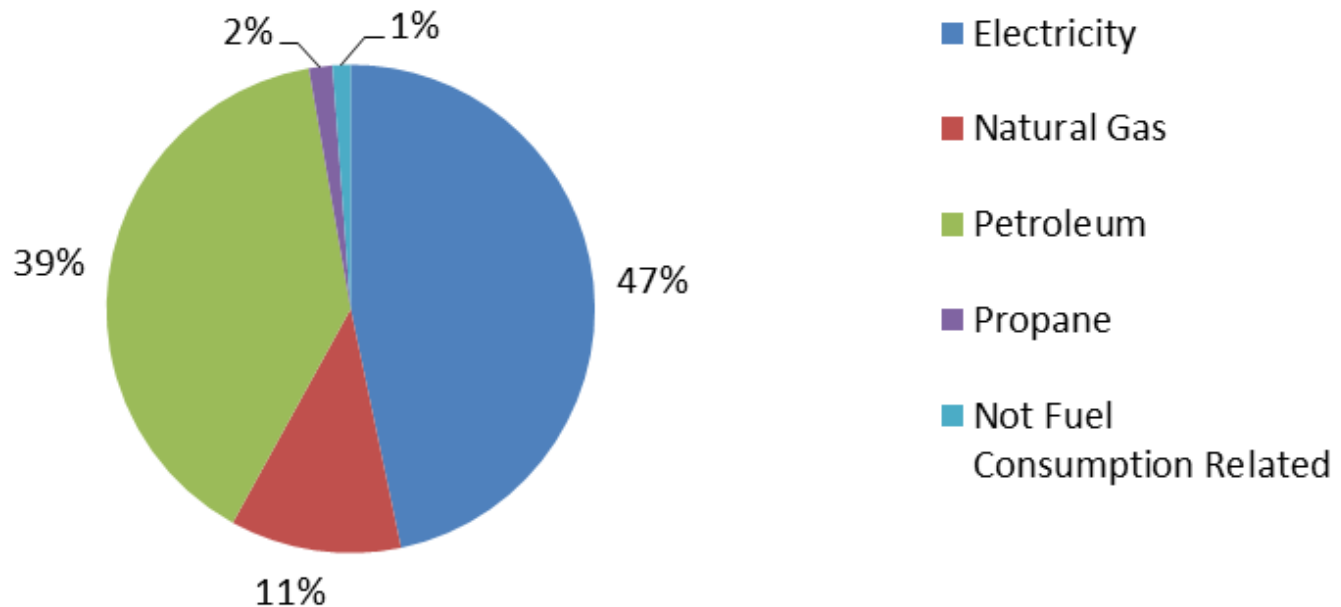
Preliminary Alexandria Results

Alexandria Greenhouse Gas Emissions 2012 by Sector - MT CO₂e



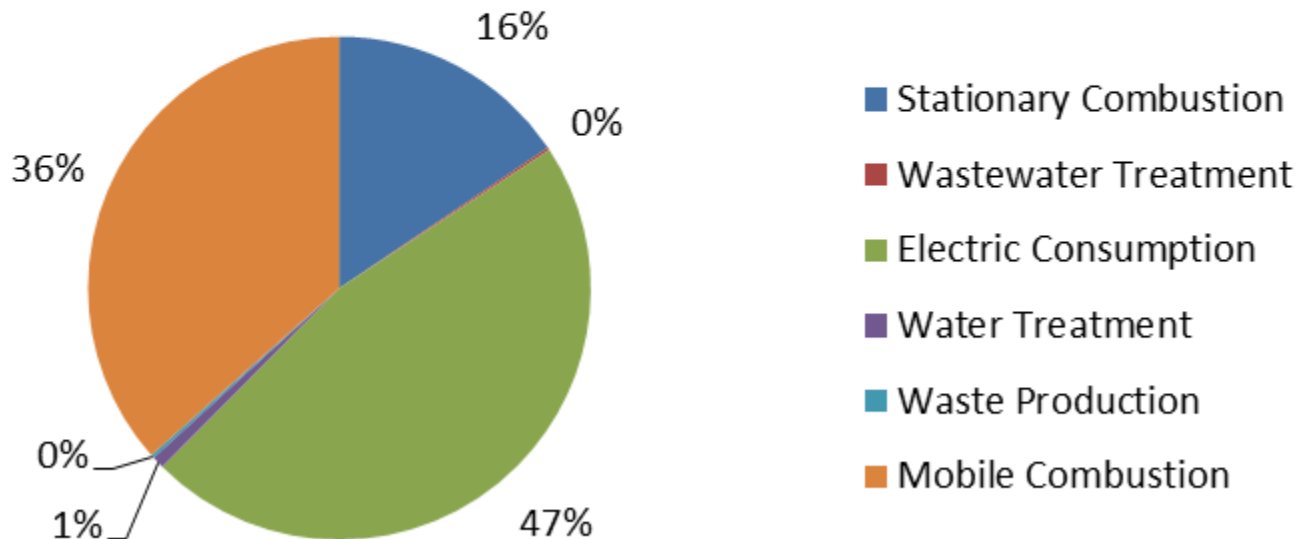
Preliminary Alexandria Results

Alexandria Greenhouse Gas Emissions 2012 by Fuel Type - MT CO₂e



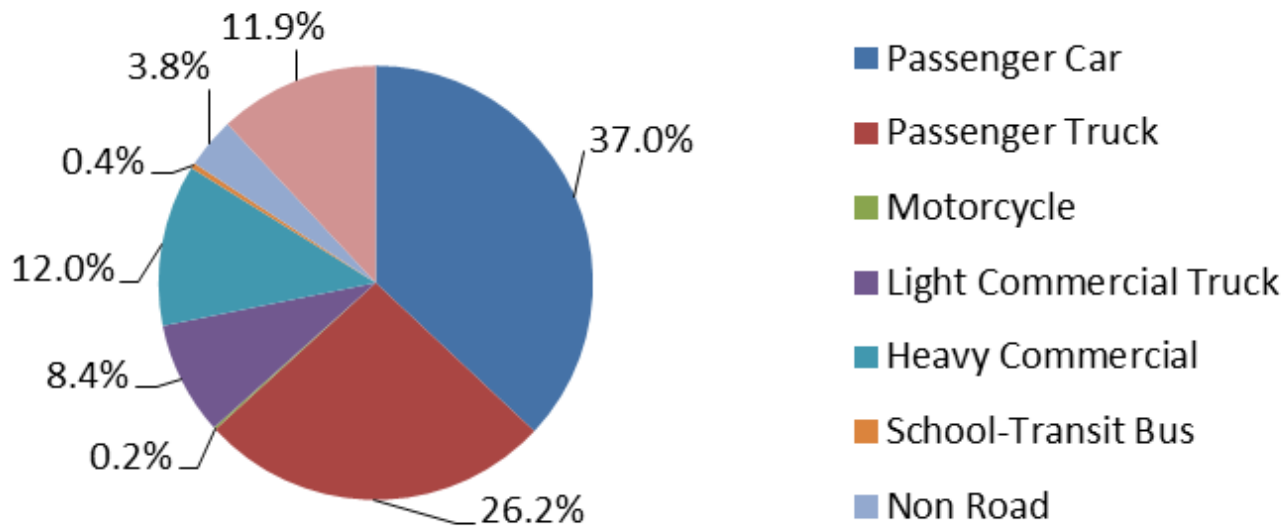
Preliminary Alexandria Results

Alexandria Greenhouse Gas Emissions 2012 by Activity - MT CO₂e



Preliminary Alexandria Results

Alexandria Transportation Greenhouse Gas Emissions



Conclusions

- Alexandria met the COG Climate Report Target to reduce 2012 emissions to 2005 level
- Protocol differences cause some differences in results
- Local, state, federal government not separated
- Includes emissions from sources not counted in 2005
 - Commercial air travel
 - Wastewater treatment

Issues

- Understanding the protocol required substantial time
 - Model limited to showing four sectors (residential; commercial; governmental; industrial)
 - Had to modify model output to show mobile sector
- Data challenges
 - Bulk fuel data only available on statewide level – challenge with allocation methodology
 - Water/wastewater treatment data not readily available for all utilities
- Includes emissions from sources not counted in 2005
 - Commercial air travel
 - Wastewater treatment
- Required adjustment of 2005 data for comparison purposes