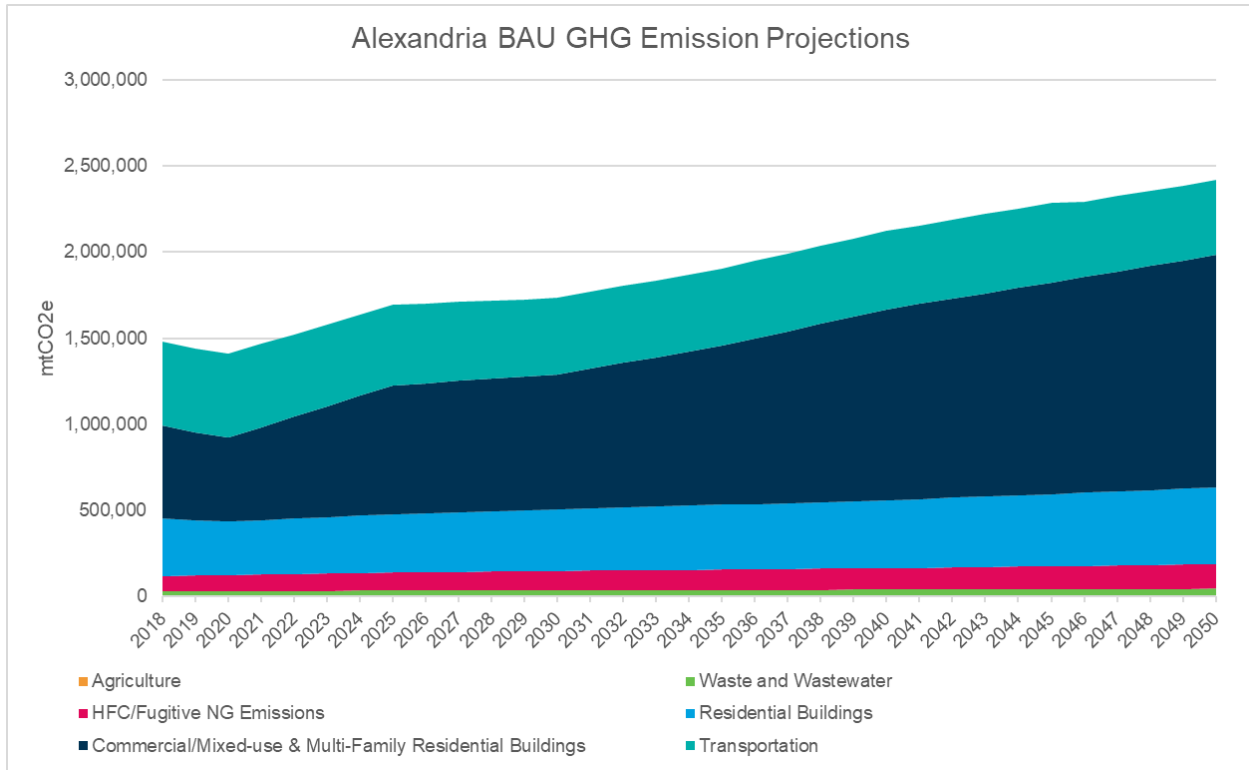


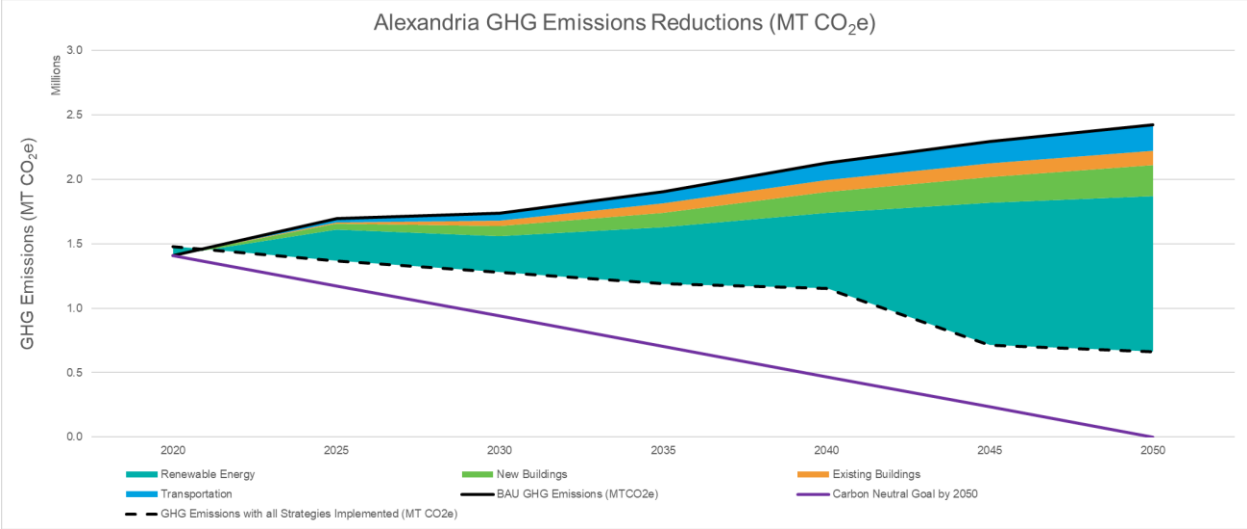
Climate Mitigation Actions / Strategies

Overview for Discussion



Notes:

- In 2018, Alexandria's total greenhouse gas (GHG) emissions were 1.48 million metric tons of carbon dioxide equivalent (MMtCO₂e). The majority of emissions (59%) came from the building sector. Transportation was the next highest, accounting for 33% of overall emissions.
- By 2050, Alexandria's GHG emissions are expected to grow to 2.42 MMtCO₂e, driven by an increase in building sector emissions due to projected population and job growth rates.



Notes:

- Transportation includes mode shift and VMT reduction
- Existing buildings and new buildings reflect energy efficiency and energy reductions
- Renewable energy includes:
 - Transportation electrification
 - Building electrification

Transportation

Goals from EAP2040

- By FY2023 reduce VMT by 1% per year
- By FY2023 increase transit, walking, and biking by 15% over 2018
- By FY2030, double dedicated bus lanes to 1.5 miles

Existing City Plans & Programs

- Alexandria Transit Vision Plan (DASH Bus Network)
- Potomac Yard Metro Station
- Alexandria Mobility Plan Implementation
- Bike network implementation
- Bus Rapid Transit (BRT) Implementation
- Electric Vehicle Charging Infrastructure Readiness Strategy (EVRS) Implementation
- DASH Battery Electric Bus Implementation
- Vision Zero

GHG Emission Reductions

- Transportation Planning Board (TPB) Climate Change Mitigation Study of 2021
 - Shifts to EVs [TPB VT.1]
 - 50% of new light-duty [LD] vehicle sales are EVs in 2030, with 100% by 2040;
 - 30% of new medium/heavy-duty [M/HD] truck sales are EVs in 2030, with 80% by 2050;
 - 50% of buses on the road are EVs in 2030, 100% in 2050 (DASH + WMATA)
 - Biodiesel/renewable diesel makes up 10% of diesel fuel use in 2030 and 20% in 2050
 - Mode Shift/VMT Reduction [TPB MS.1]
 - Land use changes focused on redistribution of future growth to activity centers and areas better served by transit across jurisdictions and 77,000 new households in the region by 2030 and 126,000 new households in the region by 2050 to support jobs housing balance; enhanced bike/pedestrian/micromobility environment; transit fares reduced 50% by 2030 and 75% in 2050; all workplace parking in activity centers priced by 2030; transit enhancements (10% reduction in transit travel time by 2030 and 20% by 2050); 25% telework
 - Transportation System Management and Operation (TSMO) [TPB MS.1]
 - Optimized operations through intelligent transportation systems (ITS) including ramp metering, incident management, active signal control, and

active transportation demand management; assumed operational benefits from connected/automated vehicles (CAVs) in 2050

Strategies/Actions

- **T-1: Reduce vehicle miles**
 - T-1.1: Implement Alexandria Transit Vision and Mobility Plan recommendations supporting increasing public transportation use and reduction of vehicle miles traveled
 - T-1.2: Land use changes focused on redistribution of future growth to activity centers and areas better served by transit across jurisdictions
 - T-1.3: Promote opportunities for increased pedestrian, bicycle, and e-mobility options
 - T-1.4: Advocate for reduced transit fares and parking pricing in workplaces
 - T-1.5: Support telework policies
 - T-1.6: Promote a job/housing balance by focusing on-site affordable housing units near transit, jobs, and amenities
- **T-2: Accelerate the deployment of electric and alternative fuel vehicles**
 - *T-2.1*: Implement EVRS recommendations to support EV charging infrastructure development, including addressing gaps in meeting charging demand (e.g., opportunity charging, residents without driveways/garages, multifamily dwelling residents); enhancing communication and awareness; strengthen zoning, building codes, and permitting; advocating in state government or with Dominion Energy; building successful business models for chargers; and working to secure funding (e.g., federal).
 - *T-2.2*: Provide education and outreach to the community about EVs and available state and national incentives
 - *T-2.3*: Advocate with Dominion and regulators for fee-based EV charging
 - *T-2.4*: Transition public fleets to electric (DASH)
 - *T-2.5*: Connect private fleets with partners and opportunities to educate and incentivize electrification
- **T-3: Reduce City fleet fuel consumption and increase alternative fuel use in line with the City Alternative Fuel Policy**
 - *T-3.1*: Reduce vehicle size of City fleet
 - *T-3.2*: Increase average fuel economy of City fleet
 - *T-3.3*: Reduce VMT through various best practices (i.e., teleconferencing, limited idling, alternative modes of transportation, optimized routes, centralized meeting locations)
 - *T-3.4*: Purchase vehicles with highest emissions certification standards
 - *T-3.5*: Increase use of alternative fuel vehicles and equipment (i.e., electric and hybrid vehicles)

Buildings Energy

Goals from EAP2040

- Improve energy efficiency for City-owned facilities 25% by FY2027 over FY2018

Existing City Plans & Programs

- Green Building Policy

GHG Emission Reductions (Baselines)

- Utilizes ICF CO₂Insight Model
 - Existing buildings modeled using a regional building stock compilation model with representation of facility types and numbers characteristic of Alexandria
 - Includes equipment rollover model for building systems and energy savings and electrification potential
 - Building Heating and Cooling
 - Building Envelope
 - Cooking and Hot Water
- Baseline calibration:
 - Existing Buildings
 - Commercial / Mixed-use / Multi-family
 - ~5% of existing building sqft / year (turnover + renovation) reduce EUI by up to 20%, including ~1% compliance with International Energy Conservation Code (IECC results) (~38% EUI reduction)
 - ~5% of existing building sqft / year electrification
 - Residential
 - ~5% of existing building sqft / year (renovation) reduce EUI by up to 20%
 - ~5% of existing building sqft / year electrification
 - New Construction
 - Commercial / Mixed-use / Multi-family
 - Green Building Policy compliance
 - 100% Compliance with 2018 International Energy Conservation Code Outcomes (~38% EUI reduction)
 - All major building systems electrified (allows for some non-core building systems to allow for natural gas).
 - Residential
 - 100% electrified

Strategies/Actions

- B-1. Support decarbonizing existing buildings in the City of Alexandria
 - B-1.1: Analyze and evaluate implementation of City or regional green bank to support energy efficiency and electrification financing options
 - B-1.2: Enhance/accelerate implementation CPACE financing program

- B-1.3: Implement building energy efficiency and electrification technical resource program
- B-1.3: Develop and implement building electrification/thermalize partnership/programs
- B-1.4: Develop and implement building energy efficiency program, including options for supporting through technical services or other resources.
 - Include specific programs for low-to-moderate income
 - Consideration to establish incentive programs that encourage green building renovations for existing buildings, such as encouraging property owners and leasing agents to participate in a Green Lease Leader program (EAP 3.1.8).
- B-1.5: Expand use of state Weatherization Assistance Program (WAP) funding and programs
- B-1.6: Promote use of Dominion Energy demand side management and energy efficiency programs
- B-2: Require the development of new construction for green buildings policy
 - B-2.1: Green Building Policy considerations per the EAP
 - Evaluate regulatory incentives linked to specific green building performance measures for new private development: (EAP 3.1.9)
 - Establishing a City-wide Green Zoning Overlay (e.g., incentivizing solar panels and wind turbines through additional building height or allowing floor area exclusions to accommodate passive design elements) or options for adopting local stretch green building codes, including advocate for local building code authority to create, implement, and enforce a local green building code.
 - The feasibility of permitting bonus building height and density (once affordable housing bonuses are first exhausted) for applying green building practices above those outlined in the new Green Building Policy.
 - Feasibility study and methods to achieve net zero energy in existing building renovations, including the ability to achieve LEED Zero for LEED certified buildings or other applicable net-zero certifications. (EAP 3.1.10)
 - Schedule future administrative updates to the Green Building Policy to coincide with changes in third-party certification, the revisions to the state Building Code and the implementation of programs established through the EAP actions, with major updates for City Council every 5-7 years as needed. To maintain alignment with the intent of this Policy, Performance Points may be adjusted over time to correspond with updates to the rating systems, revisions to the building code, and/or updates to state, federal, or other City policies. (EAP 3.1.15)
 - B-2.2: Support adoption of updated IECC codes in Virginia Uniform Statewide Building Codes

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- B-3: Consider voluntary benchmarking and disclosure, and building energy performance standard programs
 - Mandatory for City government buildings
 - Consider as model for advocating at state for mandatory programs

Clean and Renewable Energy

Goals from EAP2040

- 100% renewable offset of City-owned facilities electrical use by 2020

Relevant federal or state programs

- Virginia Clean Economy Act, 100% clean electricity by 2050
- Regional Greenhouse Gas Initiative

Existing City programs

- Solarize Alexandria
- Solar Equipment Tax Exemption

GHG Emission Reductions

- Assume the results of the Virginia Clean Economy Act (VCEA) is met (*note, that the emission factor does not go to 0 due to imports and exports). Need to account for implications of Virginia not participating in RGGI.
- Do not assume there is a federal power plant standard or carbon price.
- Estimated ~10% maximum Alexandria electricity use offset by onsite solar within City boundaries.

Strategies and supporting actions

- **RE-1: Support implementation/acceleration of the VCEA by increasing solar deployment within the City**
 - RE-1.1: Increase on-site renewable deployment within the City through Solarize Alexandria, Solar Equipment Tax Exemption, Green Building Policy (new construction), and low- and moderate-income programs
 - Also includes notes on state and federal funding and programs available
 - Include education and technical assistance component
 - RE-1.2: Support deployment of battery storage through promoting community ownership, incentives, and pairing with onsite renewables
 - RE-1.3: Pursue Community Choice Aggregation opportunities to expand community access to renewable energy resources
 - RE-1.4: Encourage large-scale offsite renewable energy through working with businesses and other organizations within the City to procure through PPAs
- **RE-2: Transition all applicable Alexandria government facilities to 100 percent renewable energy for all energy-use needs**

- RE-2.1: Direct purchasing of offsite renewable electrical energy accounts for at least 50 percent of electrical energy use at all City-operated facilities. The remainder will be made up by REC purchases and onsite renewable electrical energy generation to achieve a 100 percent renewable energy supply. (EAP 2.1.3)
- RE-2.2: Develop an electrification and renewable energy supply transition plan for the City’s non-electricity energy use including the conversion of natural gas and other fossil fuel use in facilities and operations that can be supported by renewable energy supply. (EAP 2.1.4)
- RE-2.3: Ensure that direct purchasing of offsite renewable electrical energy accounts for at least 80 percent of electrical energy use at all City-operated facilities. Ensure it is from a regional source that contributes to the growth of renewable energy capacity in the region. Onsite renewable electricity generation and REC purchases will make up the remainder, to achieve a 100 percent renewable electrical energy supply. (EAP 2.1.5)
- RE-2.4: Ensure that onsite renewable electrical generation and direct purchasing of offsite renewable electrical energy, are from a regional source and add to the supply of renewable energy available, increases to 100 percent of electrical energy use at all City-operated facilities. (EAP 2.1.7)

Additional Sectors & Emissions to Address

Buildings

Miscellaneous Building Energy Use (e.g. Gas use for amenities, emergency generation, etc.)

Strategy/Actions

- Renewable natural gas opportunities

Transportation

Aviation Emissions

Offroad Vehicles

Waste

Wastewater Treatment

Solid Waste

Agricultural

HFCs

Natural Gas Fugitive Emissions