DC'S BUILDING ENERGY PERFORMANCE STANDARDS for Metropolitan Washington Council of Governments

15 September 2022

DEPARTMENT OF ENERGY & ENVIRONMENT

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

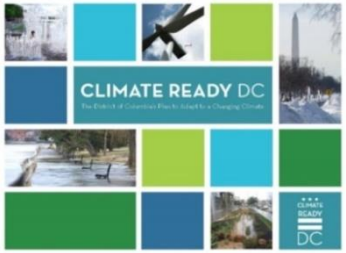
SUSTAINABLE DC VISION

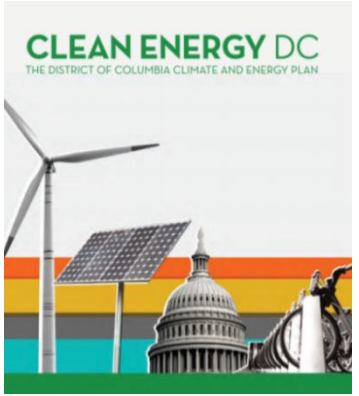
Make DC the healthiest, greenest, most livable city in the country.

GOALS: 2032

SUSTAIN ABLE DC

- ADAPT TO CLIMATE CHANGE
- CLIMATE READY BUILDINGS
- CUT ENERGY USE 50%
- 50% RENEWABLE ENERGY
- NET ZERO NEW BUILDINGS
- NET ZERO RETROFITS
- CUT GHG EMISSIONS 50%

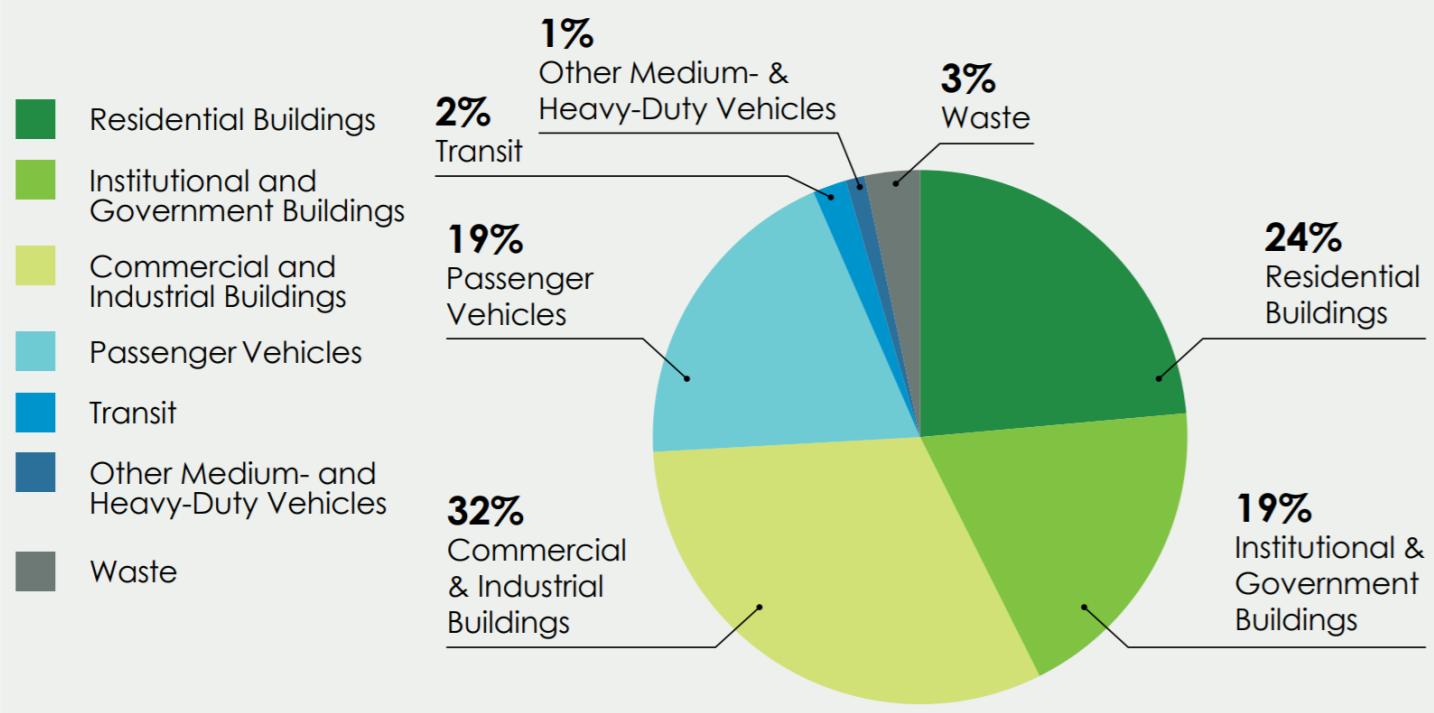




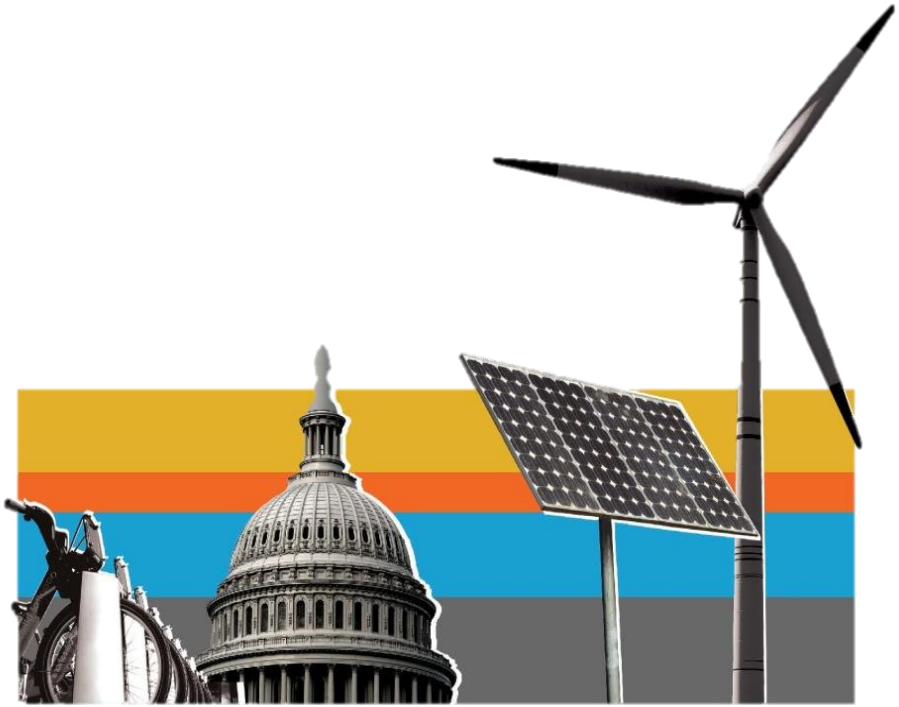
MAYOR BOWSER: COMMITTED TO ZERO CARBON BY 2050

ENERGY USE AND EMISSIONS IN DC

MODELED PROPORTION OF GHG EMISSIONS BY SECTOR



CLEAN ENERGY DC OMNIBUS AMENDMENT ACT OF 2018, TITLE III….



BENCHMARKING

Lowers minimum building square footage required to benchmark over time; Creates data verification requirements

ENERGY PERFORMANCE

Improves the performance of existing buildings by implementing a **Building Energy Performance Standard**

BENCHMARKING 101

Clean and Affordable Energy Act of 2008 requires all private and DC-owned buildings to report their calendar year (CY) energy and water use to the DOEE for public disclosure by April 1 annually.

Covered Buildings

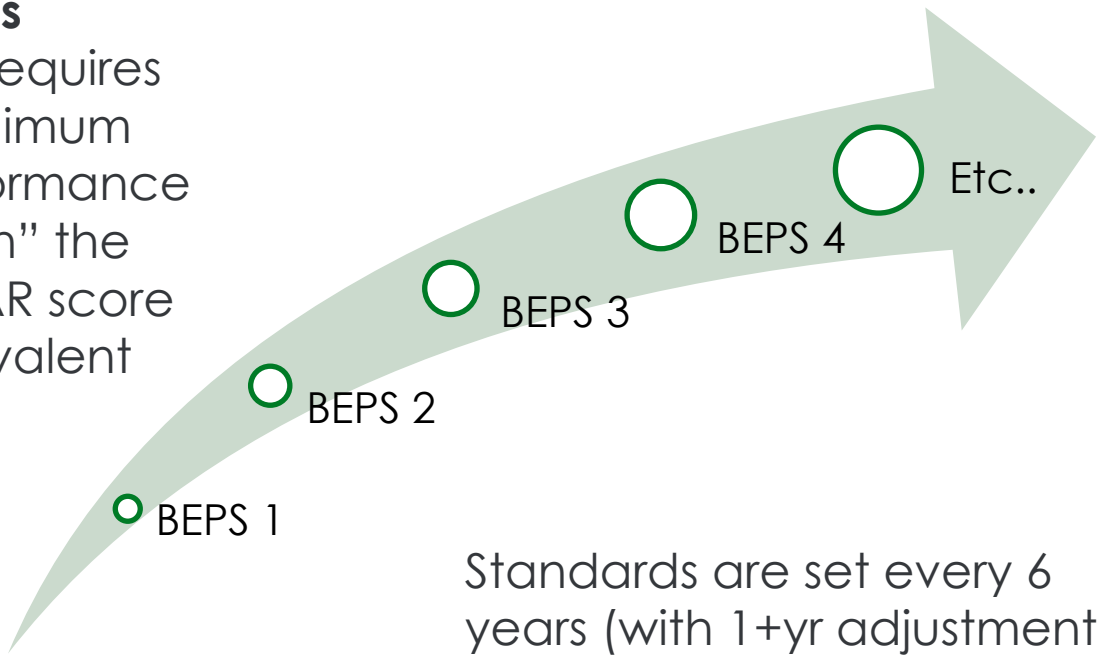
- 2010 and on – DC-owned buildings >10,000 sq. ft.
- 2014 and on – Private buildings > 50,000 sq. ft.
- 2022 and on – Private buildings > 25,000 sq. ft.
- 2025 and on – Private buildings > 10,000 sq. ft.

Third Party Data Verification Required

- Beginning 2024 and every three (3) years etc.

BUILDING ENERGY PERFORMANCE STANDARD 101

Clean Energy DC Omnibus Amendment Act of 2018 requires an establishment of a minimum threshold for energy performance that will be "no lower than" the local median ENERGY STAR score by property type (or equivalent metric).



Standards are set every 6 years (with 1+yr adjustment for COVID in Period 1).

BEPS APPLICABILITY

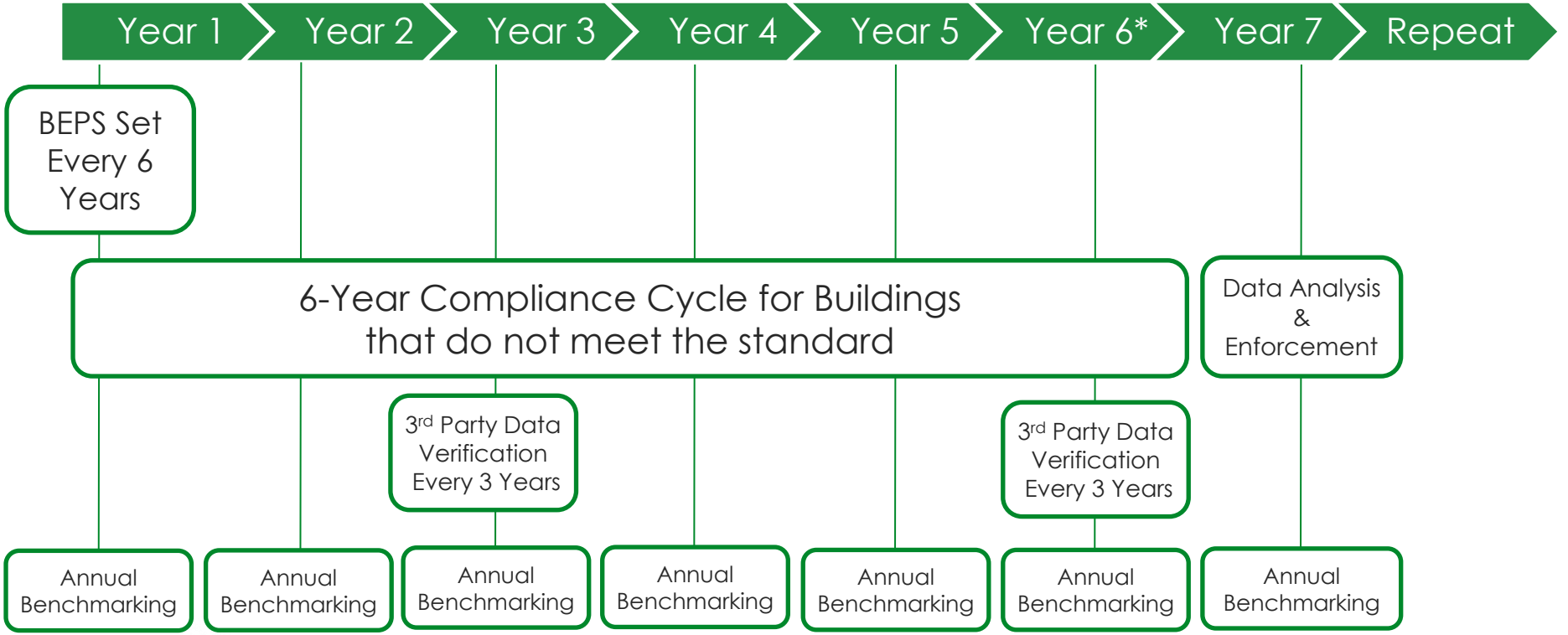
As the benchmarking requirements ratchet down in square footage over time, the buildings will be required to meet the BEPS in the following periods until all buildings 10,000 sq. ft. and over are following the performance standards.

BEPS 1:
Private buildings >50,000 sq. ft. and DC-owned >10,000 sq. ft.

BEPS 2:
Private buildings >25,000 sq. ft. and DC-owned >10,000 sq. ft.

BEPS 3:
Private buildings and DC-owned >10,000 sq. ft.

BEPS REVOLUTION – with COVID-19 PHE adjustment



* COVID-19 PHE adjustment – automatic 1-year delay of BEPS compliance cycle

STANDARD TABLE EXAMPLE

There are almost 40 different property types present in DC buildings over 50K SF!

Property Type	Metric	Standard Level	Standard
Multifamily Housing	ENERGY STAR Score	Local Median	66
Office	ENERGY STAR Score	Local Median	71
K-12 School	ENERGY STAR Score	Local Median	36
Hotel	ENERGY STAR Score	Local Median	54
Other - Public Services	Source EUI	Local Median	229.4
Residence Hall/Dormitory	ENERGY STAR Score	Local Median	56
Non-Refrigerated Warehouse	ENERGY STAR Score	Local Median	19
Retail Store	ENERGY STAR Score	Local Median	64
Self-Storage Facility	Source EUI	Local Median	21.2
Worship Facility	ENERGY STAR Score	Local Median	17
Medical Office	ENERGY STAR Score	Local Median	62
Fitness Center/Health Club/Gym	Source EUI	National Median	206.6
Hospitals	ENERGY STAR Score	National Median	50

BEPS METRICS

Standard Metrics

Performance Metric

ENERGY STAR Score

a number established by US EPA that allows comparison of energy use of a property with similar properties nationwide

Important for setting the standard!

Source Energy Use Intensity (EUI)

the total amount of energy required to operate a building, plus delivery and production losses, divided by the building's gross floor area (as defined by Portfolio Manager)

Important for setting the standard!

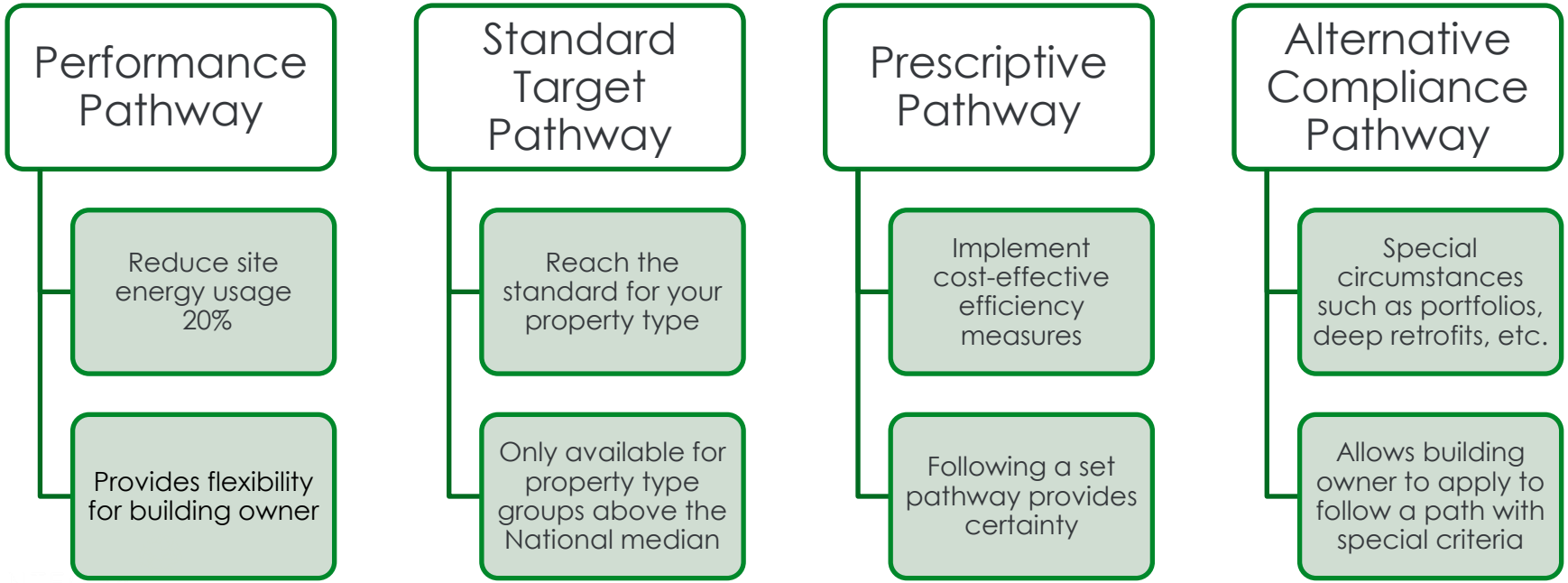
Site Energy Use Intensity (EUI)

the annual amount of all energy a building consumes on-site, as reported on a building's utility bills, divided by the building's gross floor area (as defined by Portfolio Manager)

Important for compliance evaluation!

COMPLIANCE PATHWAYS PERFORMANCE REQUIRMENTS

Building owners have a variety of pathways to choose from to bring their buildings into compliance:



ALTERNATIVE COMPLIANCE PENALTY

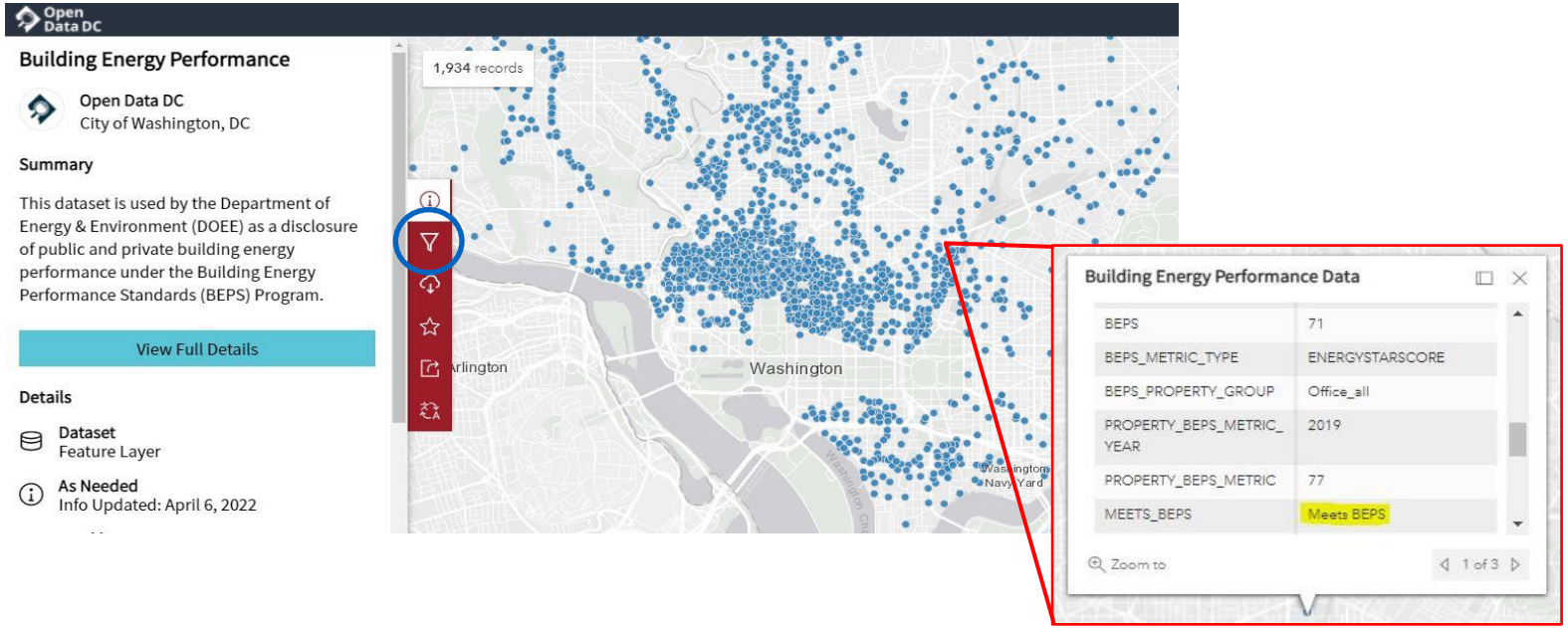
- Maximum penalty based on the gross floor area of the building ($10/ft^2) as reported in the building's most recent District Benchmark Results and Compliance Report.
- Adjusted proportionally based on the actual performance relative to its Pathway target.

ENVIRONMENT, HEALTH & SAFETY

- It is not acceptable for a building owner to implement energy efficiency measures, reduce ventilation, or take any other measures that pose a threat to the health and safety of a building occupant.

- Building owners will be subject to all applicable new construction DC Building Codes enforced by the Department of Consumer and Regulatory Affairs (DCRA) and the buildings meet requirements of the DC Property Maintenance Codes. Any owners found in violation of these codes will be liable for any fines, penalties, or other enforcement actions taken by DCRA.
- If DOEE becomes aware that a building owner has carried out a measure that harms the health, safety, or indoor environmental quality for occupants of a building, the case will be referred to DCRA for inspection and enforcement, and the building owner may be subject to the maximum alternative compliance penalty amount.

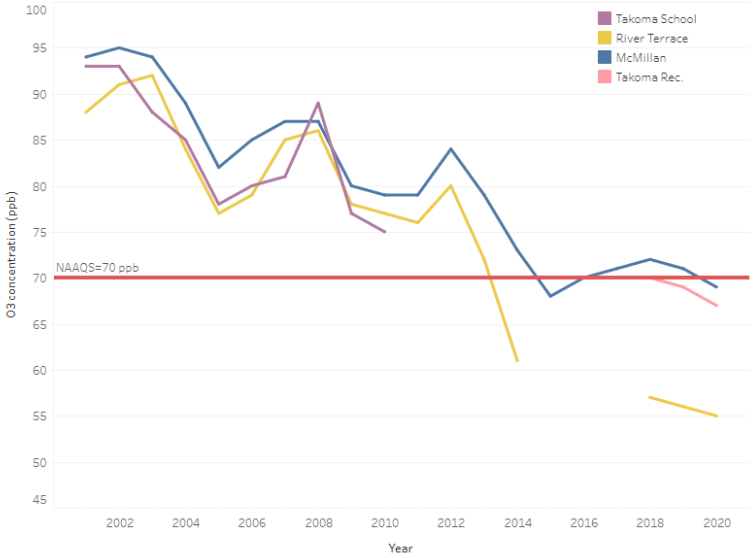
Data background
BEPS Energy Benchmark Disclosure



Disclosure Website: opendata.dc.gov/datasets/building-energy-performance
For more background about the BEPS Green House Gas study (TBP)-- you con view [BEPS Task Force](#) discussions from March/April 2020.

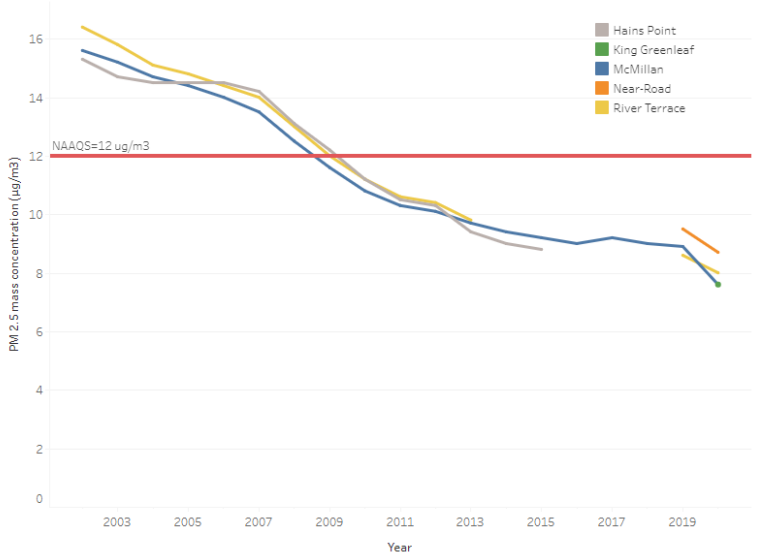
CURRENT AIR QUALITY IN DC – POLLUTANTS OF CONCERN

8-hour Ozone



- Created by a chemical reaction between precursor pollutants, volatile organic compounds (VOCs) and oxides of nitrogen (NO_x)
- Excessive ozone in the air can cause respiratory problems, trigger asthma, and reduce lung function

Annual $PM_{2.5}$



- Particulate matter (PM) is a mixture of airborne solid particles and liquid droplets at various sizes, with sizes less than 2.5 µm ($PM_{2.5}$) being considered very harmful
- Studies have linked $PM_{2.5}$ to premature death, nonfatal heart attacks, aggravated asthma, among other issues

AIR QUALITY ANALYSIS ASSUMPTIONS

General

- Energy usage would not change absent BEPS so 2019 data represents the counterfactual

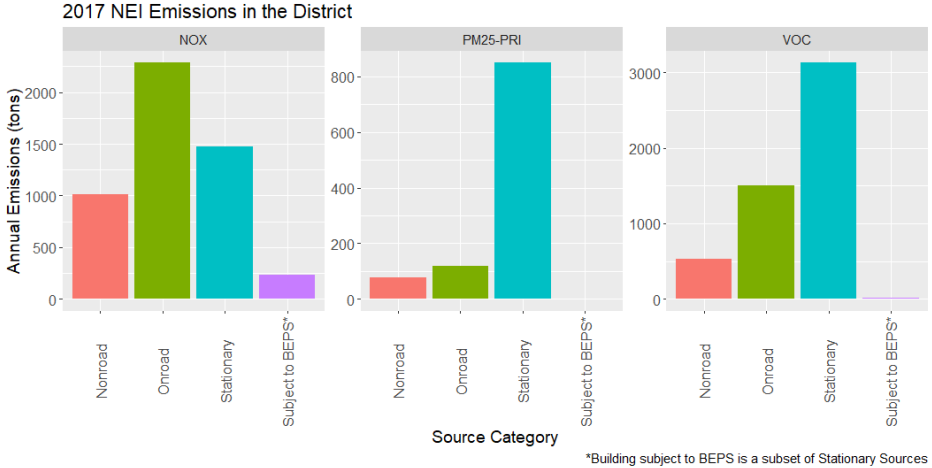
Local Air Quality

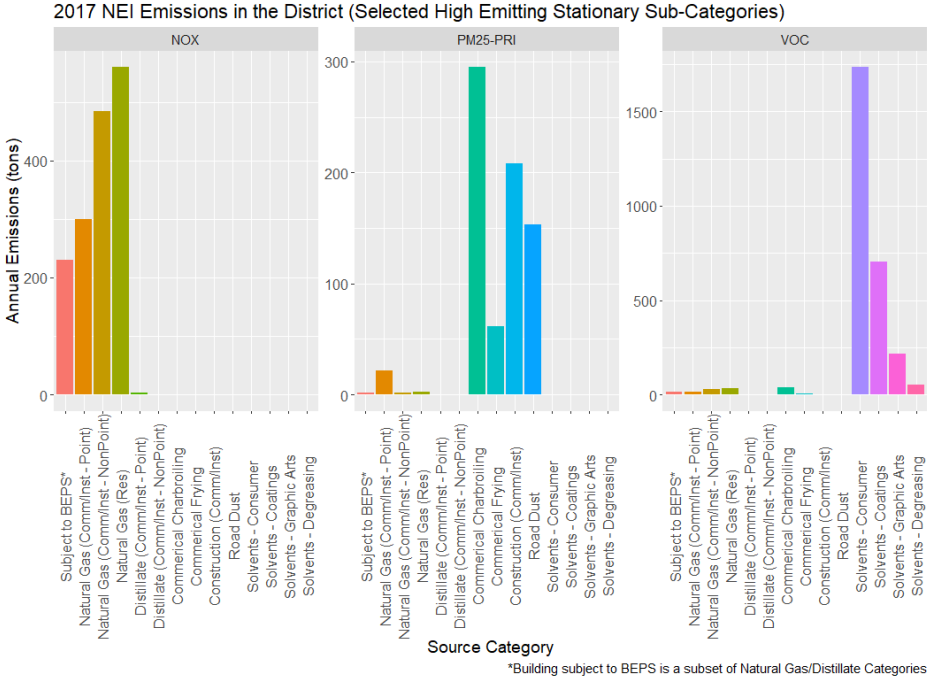
- Emission rates came from EPA's NEMOs for:
  - Residential Heating – Multi-unit housing
  - ICI Boilers – Other property types
- Distillate usage was evenly distributed across the months of October through March

Regional Air Quality

- All reductions would occur in AVERT Mid-Atlantic Region
- Reductions calculated for each month would be applied evenly across all hours of the month

TWO LOOKS AT THE DISTRICT CRITERIA POLLUTANT EMISSIONS INVENTORY

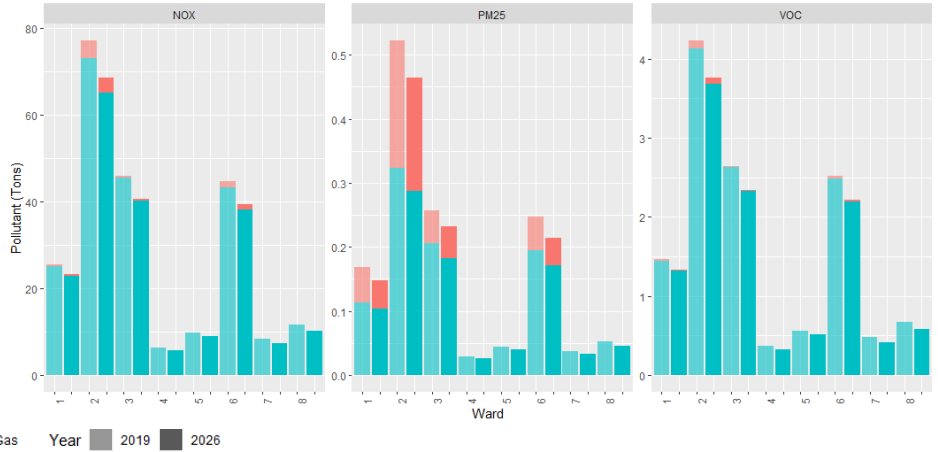




LOCALIZED AIR QUALITY RESULTS FROM BEPS PROJECTIONS

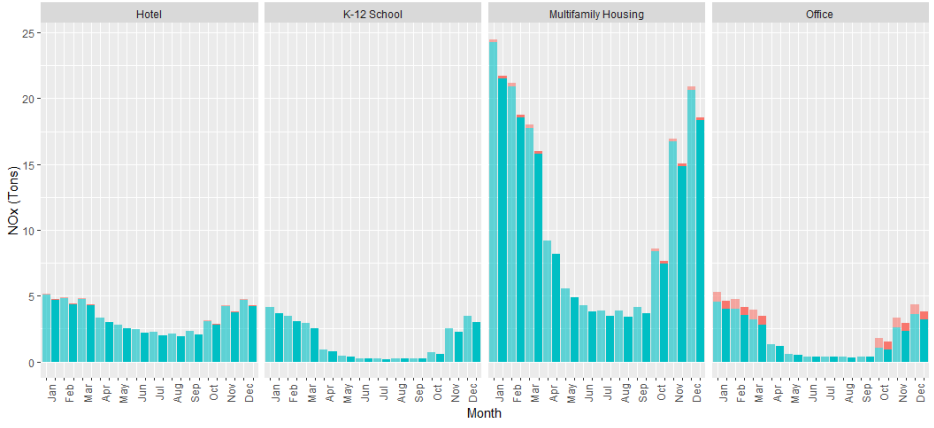
Monthly Distribution of Pollution by Fuel Type/Year

Ward Distribution of Pollution by Fuel Type/Year

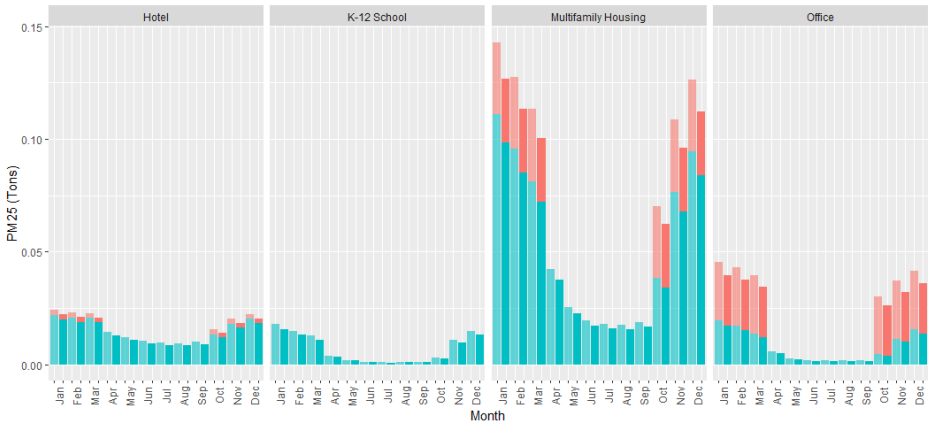


Fuel: Distillate, Natual Gas Year: 2019, 2026

Property Type Distribution of NO_X by Fuel Type/Year

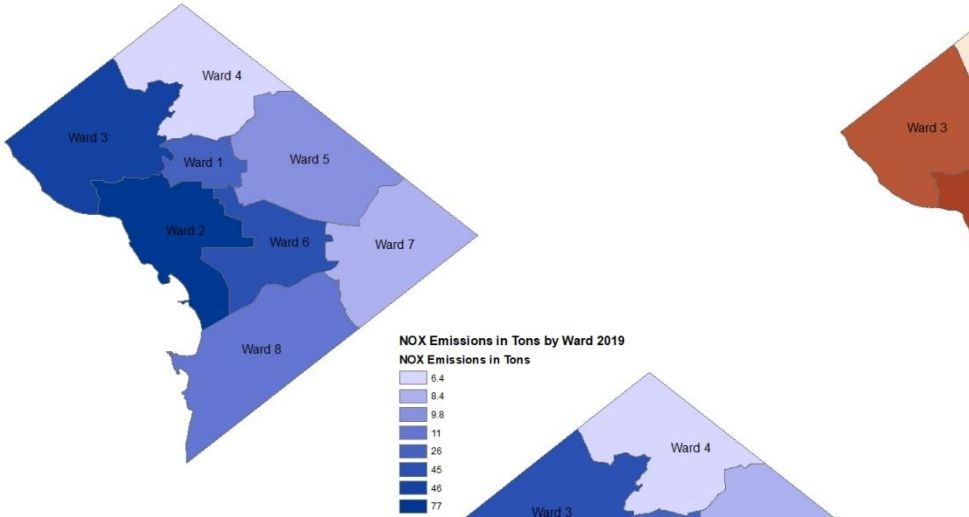


Property Type Distribution of $PM_{2.5}$ by Fuel Type/Year



GEOGRAPHIC AIR QUALITY RESULTS

Baseline NO_X Emissions (tons) by Ward 2019



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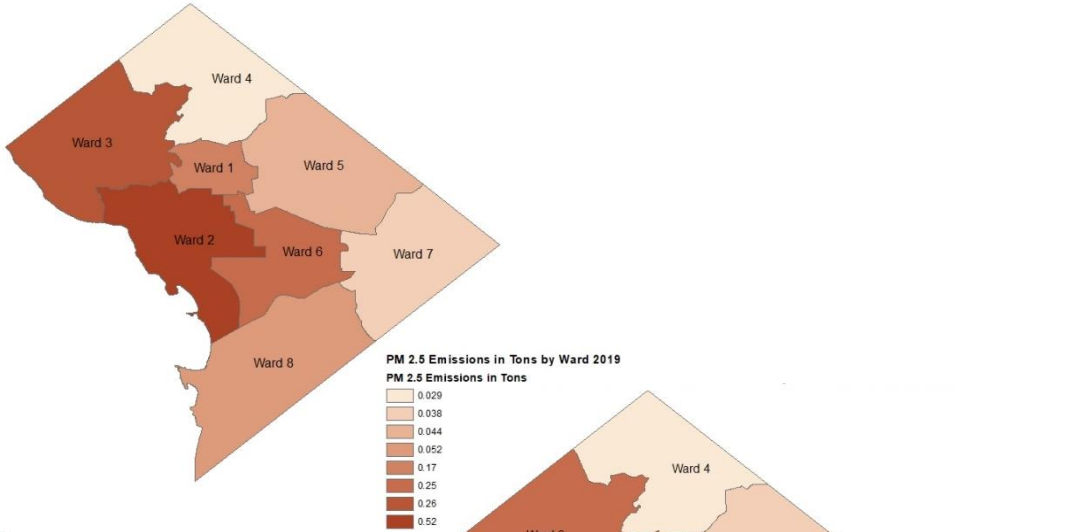
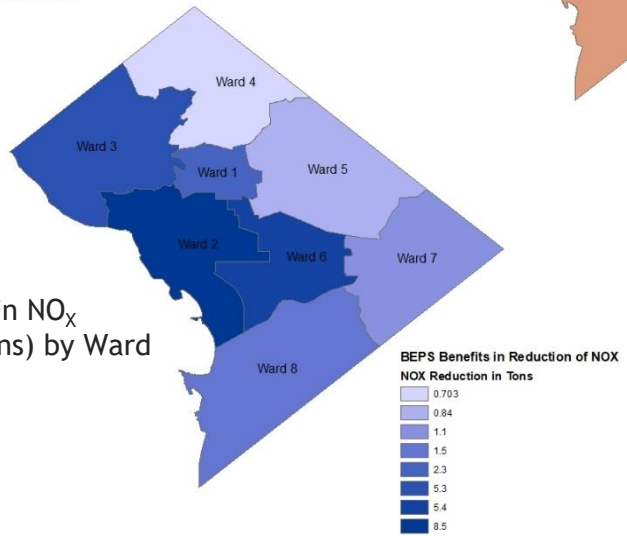


BEPS Benefits in NO_X Reductions (tons) by Ward 2016-2019



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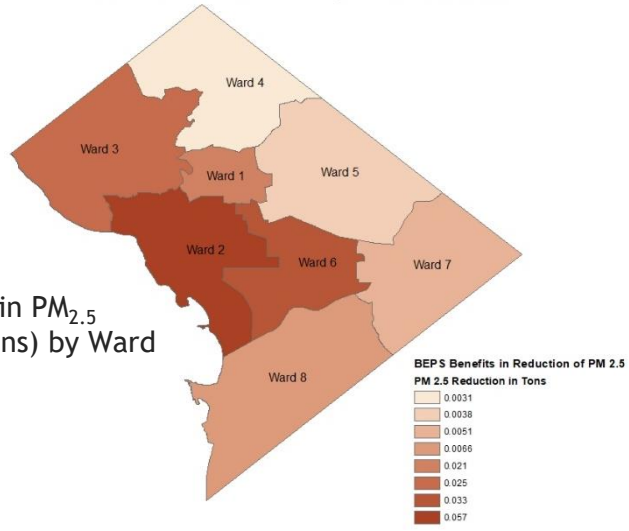
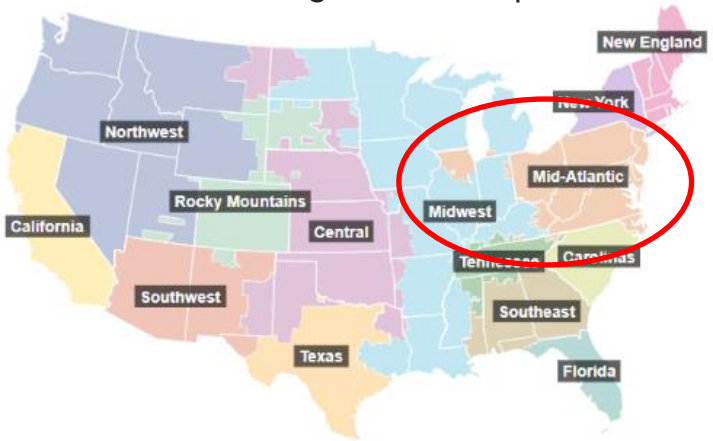
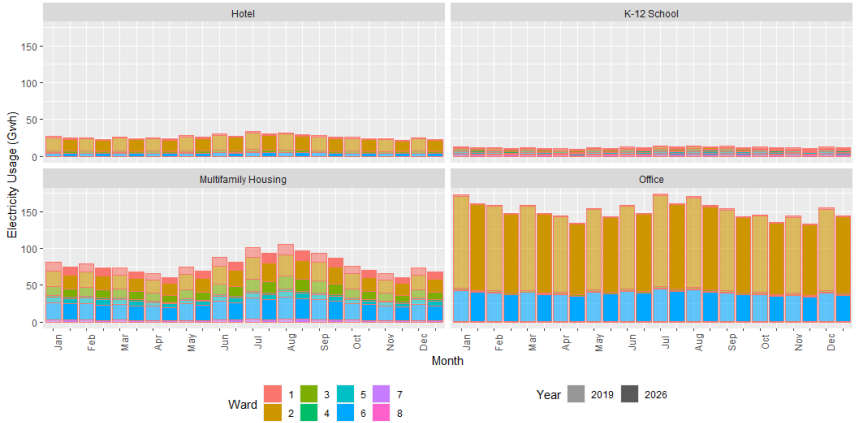


REGIONAL AIR QUALITY RESULTS FROM BEPS PROJECTIONS

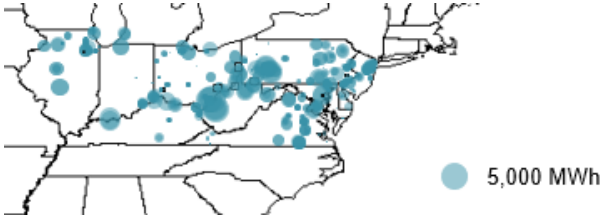
AVERT Regional Grid Map



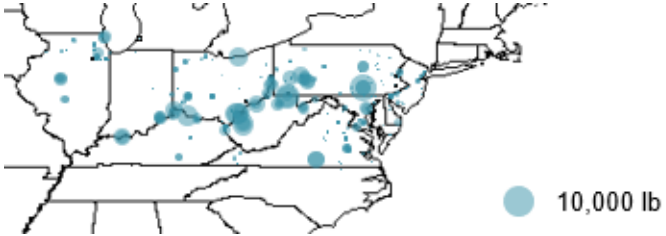
Electricity Use in BEPS Buildings by Property Type/Year/Ward



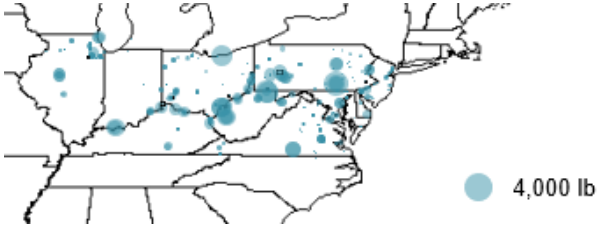
Annual Generation Change



Annual NOX Change



Ozone Season NOX Change



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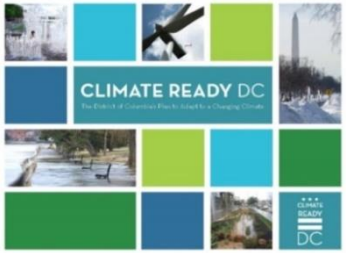

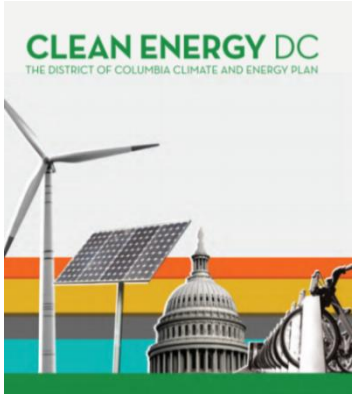

MAYOR BOWSER: COMMITTED TO ZERO CARBON BY 2050

QUESTIONS?

DEPARTMENT OF ENERGY & ENVIRONMENT

Contact the Building Performance and Enforcement Branch:

Website: dc.beam-portal.org/helpdesk

Email: building.performance@dc.gov

Important Resources:

Online Guidebook: dc.beam-portal.org/helpdesk/kb/BEPS_Guidebook

BEPS Disclosure: opendata.dc.gov/datasets/building-energy-performance