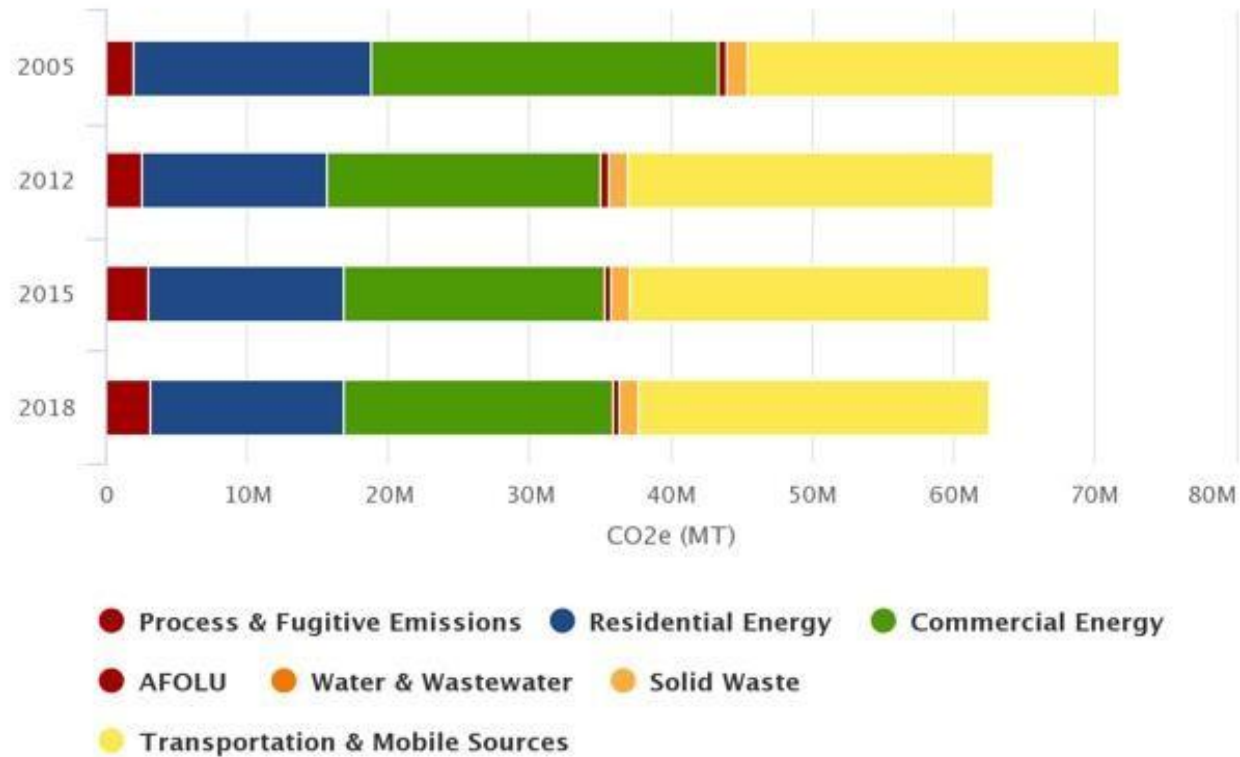# Loudoun's Growing Greenhouse Gas Emissions and Health Impacts

The criteria pollutants in greenhouse gas have a direct negative impact on human health. Discussion of this impact has been missing from data center discussions and must be considered as a critical element when reviewing data center applications.
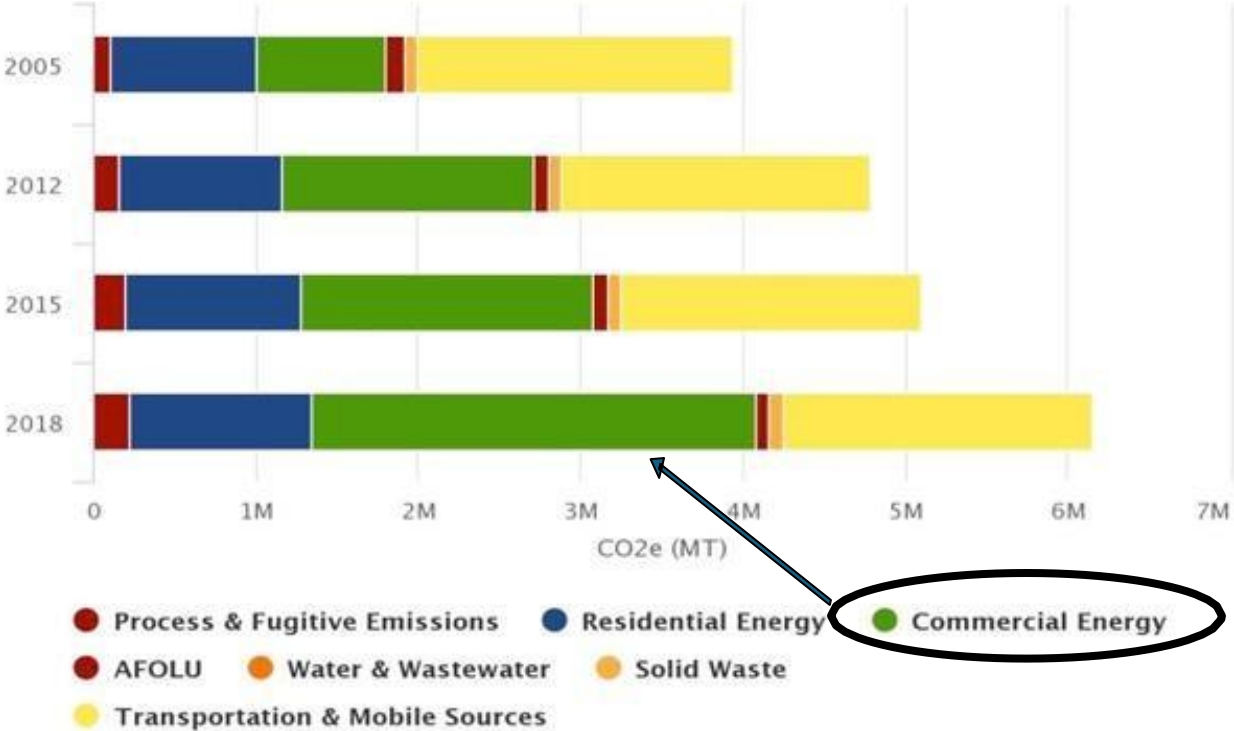
Slides put together by The Piedmont Environmental Council

Regional Greenhouse Gas Emissions Decreased 2005-2018

Regional GHG Emissions

Legend:
- Process & Fugitive Emissions
- Residential Energy
- Commercial Energy
- AFOLU
- Water & Wastewater
- Solid Waste
- Transportation & Mobile Sources

X-axis: CO2e (MT) — 0, 10M, 20M, 30M, 40M, 50M, 60M, 70M, 80M

Years: 2005, 2012, 2015, 2018

Metropolitan Washington
Council of Governments

Loudoun County Energy Strategy Workshop
September 29, 2021

12

Source: MWCOG Presentation to Board of Supervisors Energy Strategies Workshop – Sept 26, 2021

BUT Loudoun's Greenhouse Gas Emissions Increased Substantially from 2005 to 2018

Loudoun County GHG Emissions

CO2e (MT)

Legend:
- Process & Fugitive Emissions
- Residential Energy
- Commercial Energy
- AFOLU
- Water & Wastewater
- Solid Waste
- Transportation & Mobile Sources

Data Center Growth in Square Feet and Energy Use Per Square Foot were Major Drivers
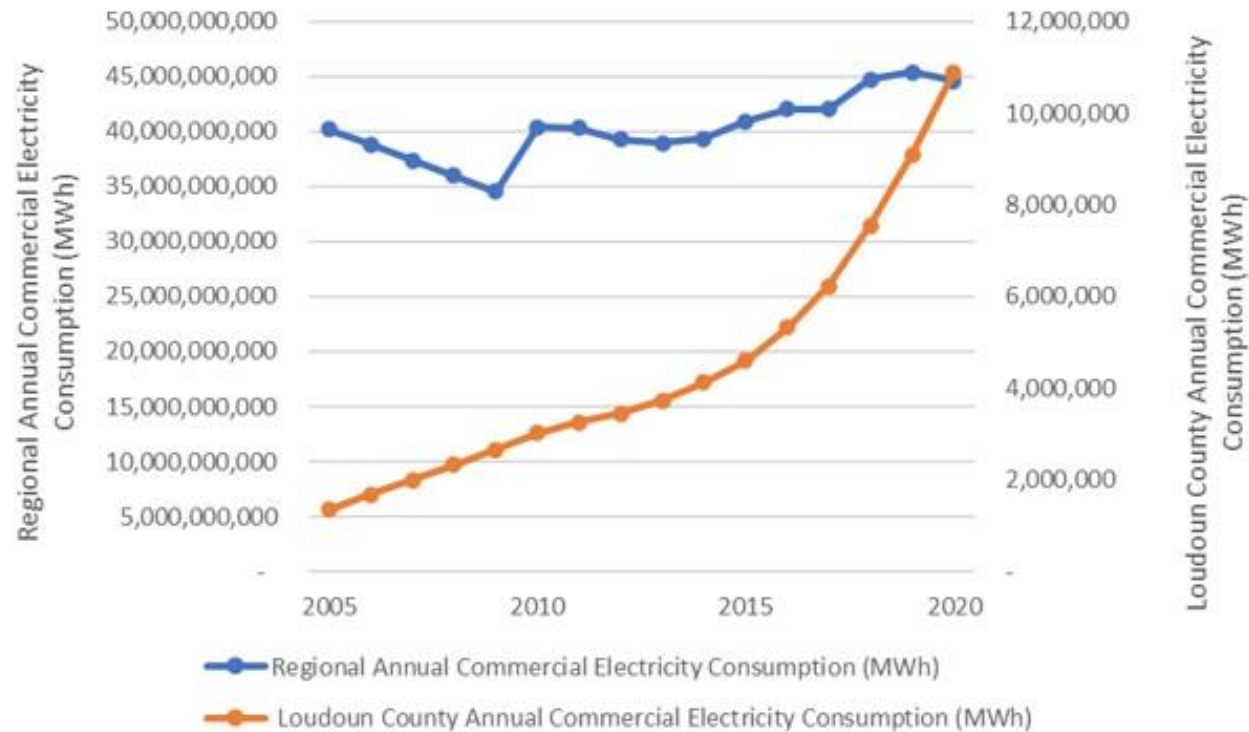

Loudoun Drivers of GHG Change
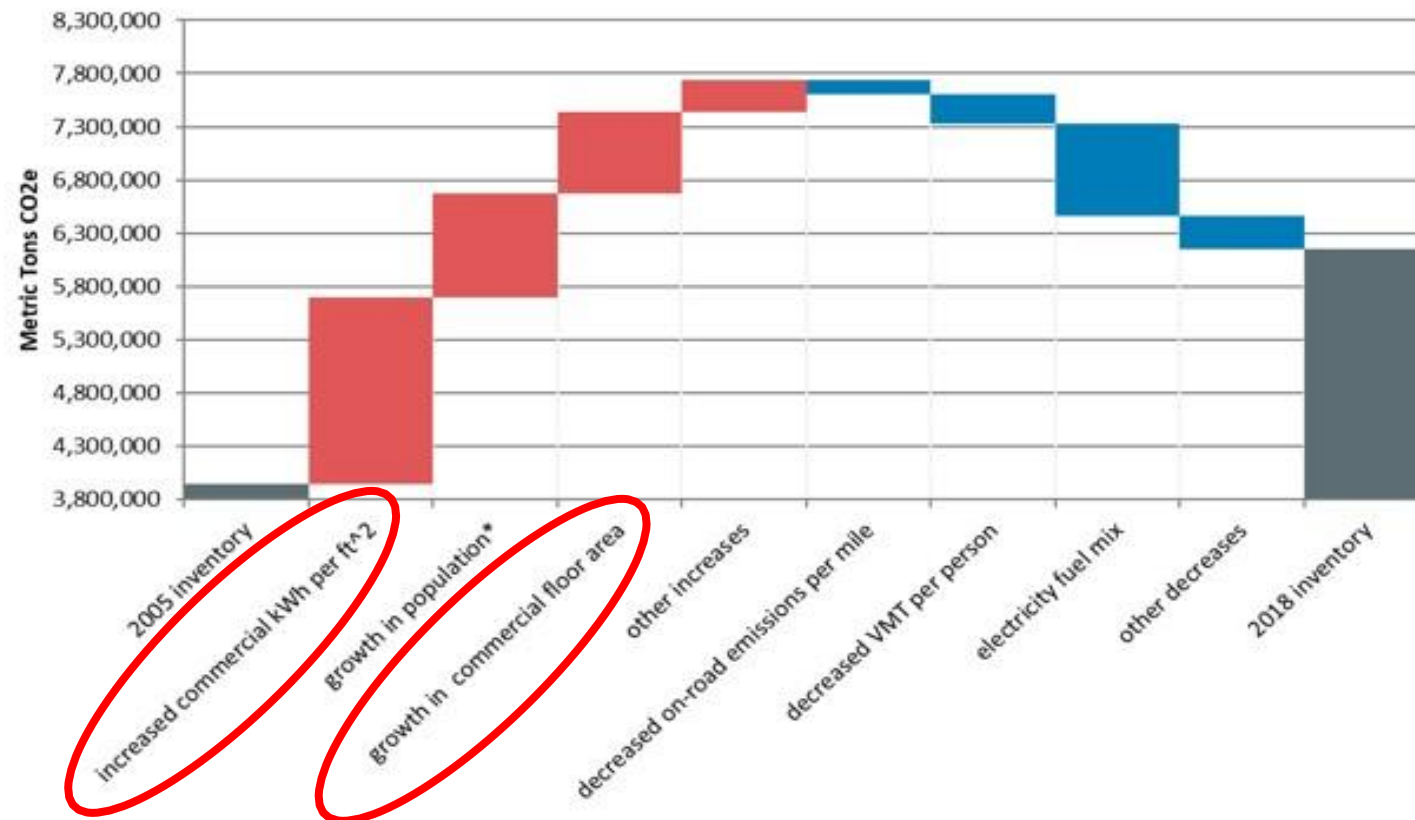
* Includes effects of population on residential energy, VMT and waste generation

Metropolitan Washington
Council of Governments

Loudoun's Commercial Electricity Increase Correlates with its Increase in GHG Emissions
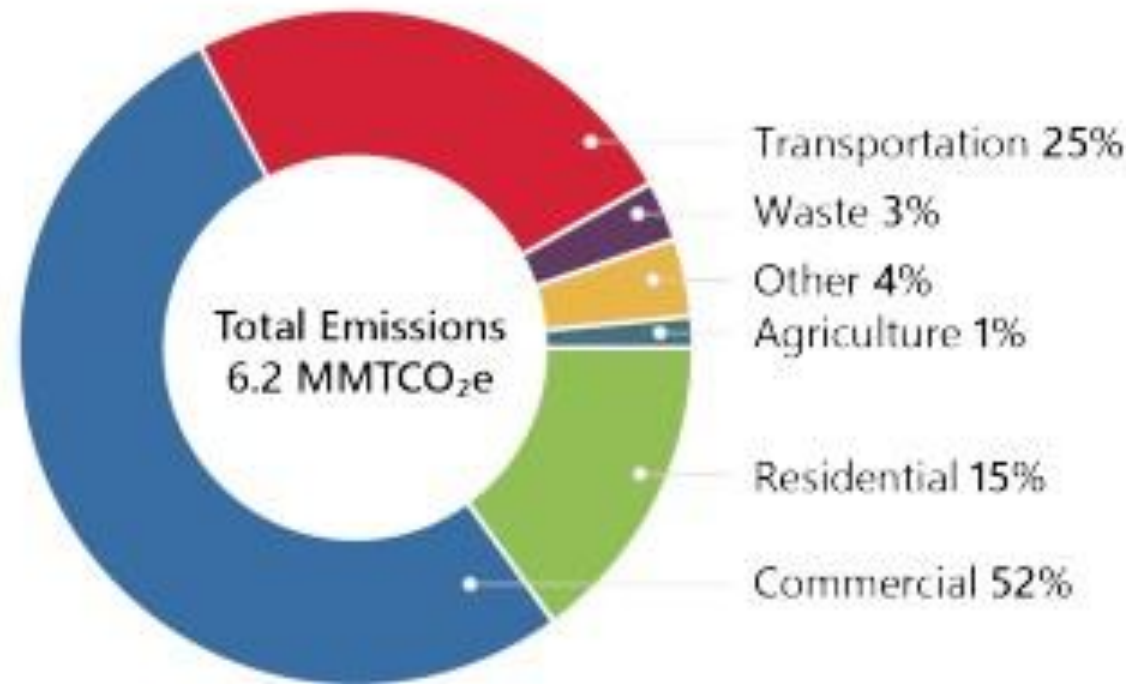

Note: 2020 data is currently draft and under final review

Loudoun County Energy Strategy Shows GHG Emissions by Sector as of 2020

Figure ES-2. Community GHG Emissions by Sector, 2020

Total Emissions 6.2 $MMTCO_2e$

Transportation 25%
Waste 3%
Other 4%
Agriculture 1%
Residential 15%
Commercial 52%

Source: 2023 Loudoun County Energy Strategy, Executive Summary, p.2

Missing from Discussions -- Public Health Impacts

(a) Health cost map

(b) CDF of county-wide health cost

(c) Top-10 counties by health cost

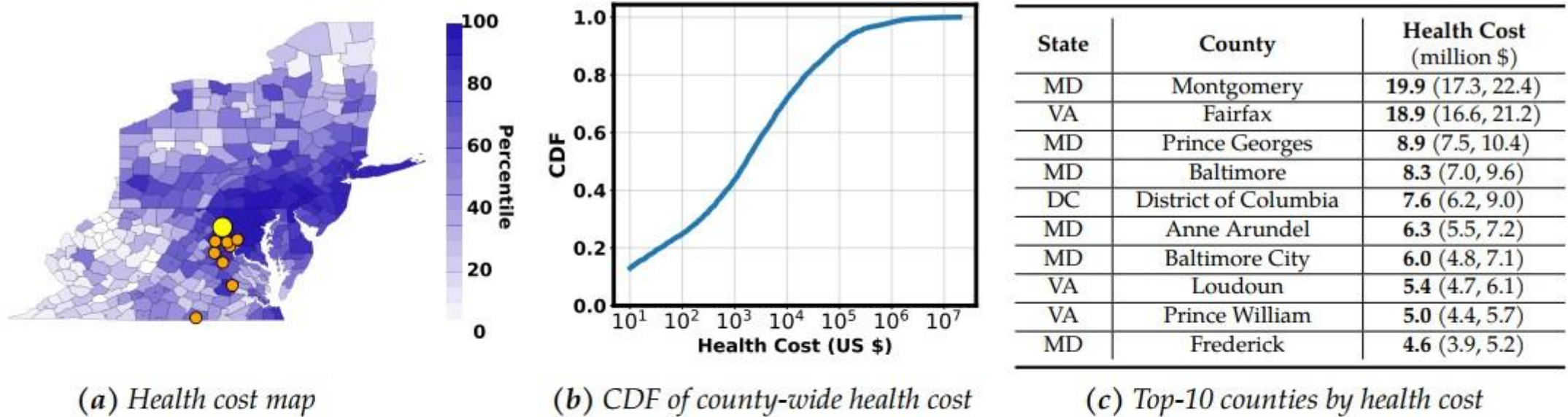| State	County	Health Cost (million $)
MD	Montgomery	**19.9** (17.3, 22.4)
VA	Fairfax	**18.9** (16.6, 21.2)
MD	Prince Georges	**8.9** (7.5, 10.4)
MD	Baltimore	**8.3** (7.0, 9.6)
DC	District of Columbia	**7.6** (6.2, 9.0)
MD	Anne Arundel	**6.3** (5.5, 7.2)
MD	Baltimore City	**6.0** (4.8, 7.1)
VA	Loudoun	**5.4** (4.7, 6.1)
VA	Prince William	**5.0** (4.4, 5.7)
MD	Frederick	**4.6** (3.9, 5.2)

Figure 1: *The county-level total scope-1 health cost of data center backup generators operated in Virginia (mostly in Loudoun County, Fairfax County, and Prince William County)* [57]. *The backup generators are assumed to emit air pollutants at 10% of the permitted levels per year. The total annual public health cost is $220-300 million, including $190-260 million incurred in Virginia, West Virginia, Maryland, Pennsylvania, New York, New Jersey, Delaware, and Washington D.C. (a) County-level health cost in Virginia, West Virginia, Maryland, Pennsylvania, New York, New Jersey, Delaware, and Washington D.C. Counties with data centers are marked in orange, except for Loudoun County (marked in yellow). (b) CDF of the county-level cost. (c) Top-10 counties by the total health cost.*

CDF stands for Cumulative Distribution Function