EPA CLIMATE POLLUTION REDUCTION GRANT PROGRAM

Comprehensive Climate Action Plan (CCAP) Update: Data Centers

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Built Environment & Energy Advisory Committee (BEEAC) Meeting
Agenda Item 5

June 12, 2025

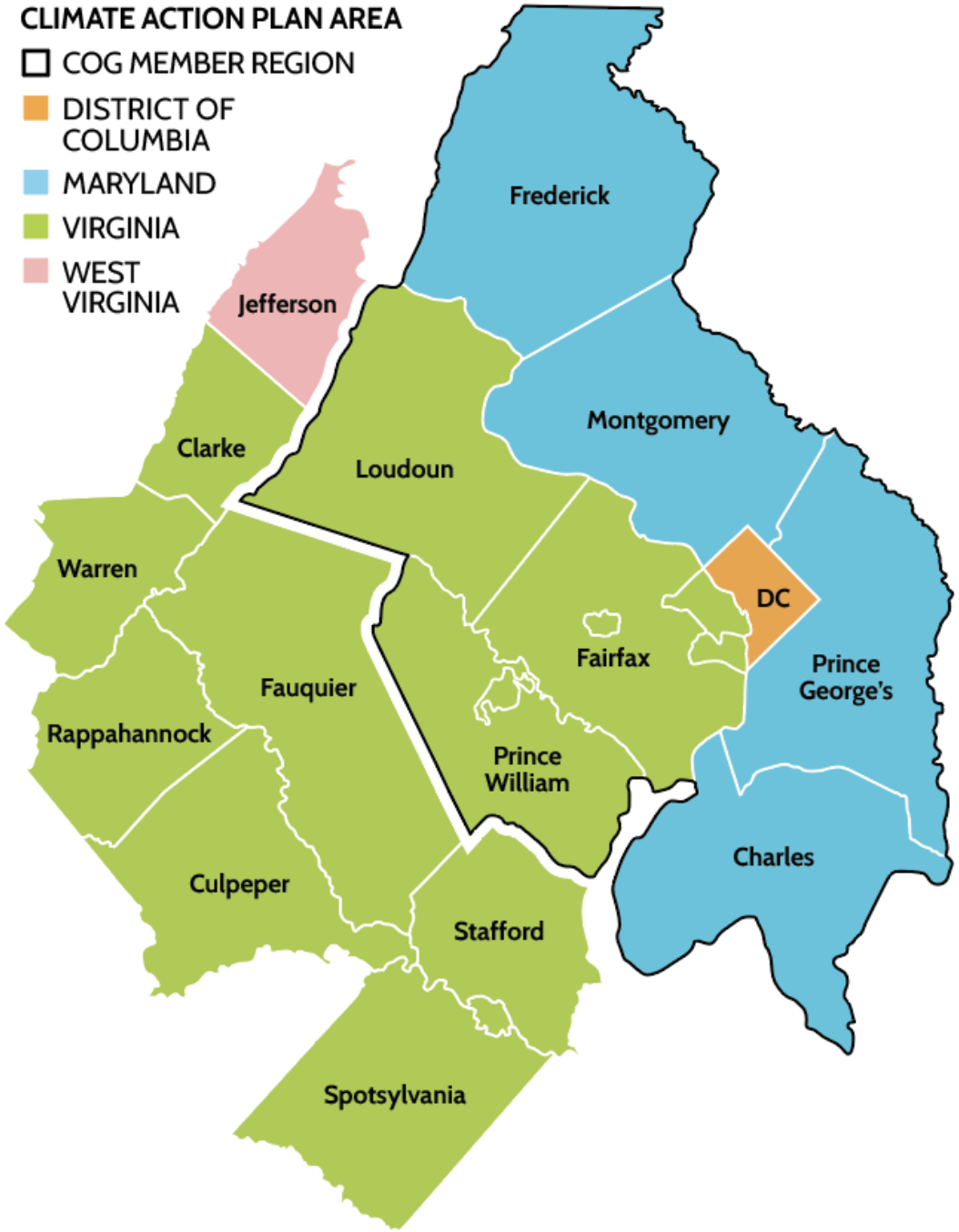
Metropolitan Washington
Council of Governments

Agenda

1. CPRG Program Requirements
2. Data Centers: Regional Impacts
3. Draft Data Center Measure
4. Discussion

CPRG Overview

- The Climate Pollution Reduction Grants (CPRG) program provides grants to States, regions, and local governments to develop and implement plans for reducing greenhouse gas emissions and other harmful air pollution.
- Non-competitive grants to States, District of Columbia, Puerto Rico: $3 million; Metropolitan Statistical Areas (MSAs): $1 million each.
- COG, via DC's allocation, is managing $1 million for MSA climate planning, which includes communities from VA and WV.



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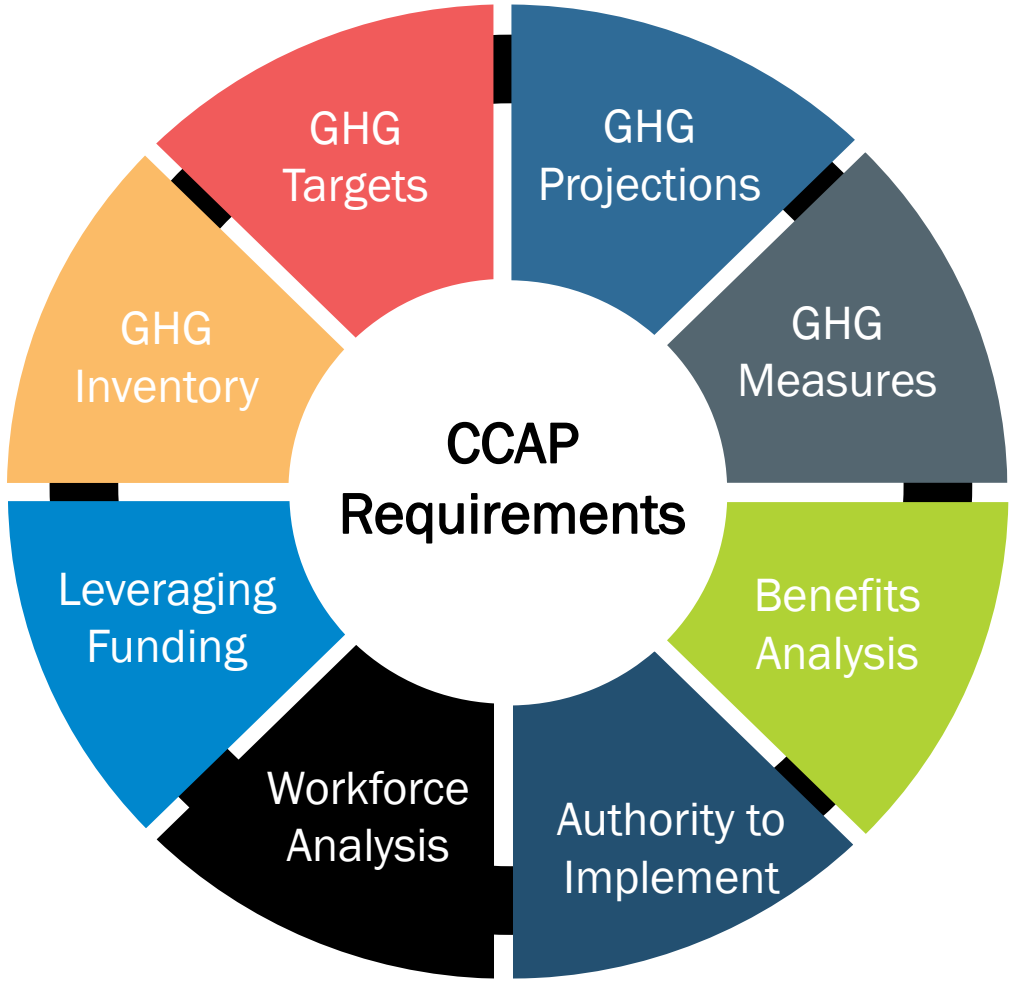
CCAP Requirements

- Due December 1, 2025
- Requires technical, outreach, engagement, and communications workstreams
- COG is focused on aligning with EPA guidance and requirements, but also updating GHG analyses and integrating new planning information for the region



CCAP Measures

Buildings and Clean Energy

- Accelerate the deployment of energy efficiency solutions and decarbonization of residential, institutional, municipal, and commercial buildings
- Accelerate the deployment of clean and renewable energy
- Study, plan for, and deploy district energy and microgrid opportunities
- Clean and efficient data centers (*new measure*)

Transportation

- Provide and promote new and expanded opportunities to reduce VMT through public transportation, non-motorized travel, micromobility, shared travel options, and development
- Accelerate the deployment of low-emission transportation, fuels, and vehicles
- Accelerate the deployment of off-road/non-road electric equipment

Waste

- Reduce GHG emissions from waste and wastewater treatment

Land Use

- Accelerate the expansion of the regional tree canopy and reduce tree canopy loss

Engagement

- Conduct education and public outreach to support measure implementation (*new measure*)

Data Centers in the Region

- The top 3 states for data centers are VA (nearly 500), TX (nearly 300), and CA (nearly 300).
- There are over 300 data centers within a 50-mile radius of Washington, DC, about 200 of which are in Loudoun County.
- Many of the region's data centers are already applying best practices to maximize energy efficiency and manage energy demands.
  - 44 data centers across the MSA are ENERGY STAR certified.
- Data centers consumed nearly 25% of total building electricity use in the MSA, resulting in 10% of the region's GHG emissions.

GHG Inventory and Projections Approach

- As part of the CPRG program, we updated the GHG inventory for the region to break out data center GHG emissions from the broader commercial buildings sector.
- To inform projections of data center growth in the region, MWCOG sent out a survey to all localities in the MSA asking for information on planned and permitted data centers, and expectations for growth. In some cases, CoStar data was used and verified by localities.
- ICF then compiled the collected data center information. Based on estimated energy consumption per square foot, ICF estimated total electricity consumption and associated GHG emissions.
- Draft results were presented to relevant localities in March 2025.

Data Center Survey Results: Square Footage

Existing Data Center Square Footage

Jurisdiction Name	2024
District of Columbia	545,939
Frederick County	547,000
Montgomery County	1,469,501
Prince George's County	42,000
Fairfax County	2,425,706
Loudoun County	43,000,000
Prince William County	10,000,000
City of Manassas	250,000
Culpeper County	517,265
Total	**58,797,411**

Projected Data Center Square Footage

Region	2024	2030	2050
DC	545,939	545,939	545,939
MD	2,058,501	2,178,501	2,178,501
VA	56,192,971	89,568,971	113,168,971
Total	**58,797,411**	**92,293,411**	**115,893,411**

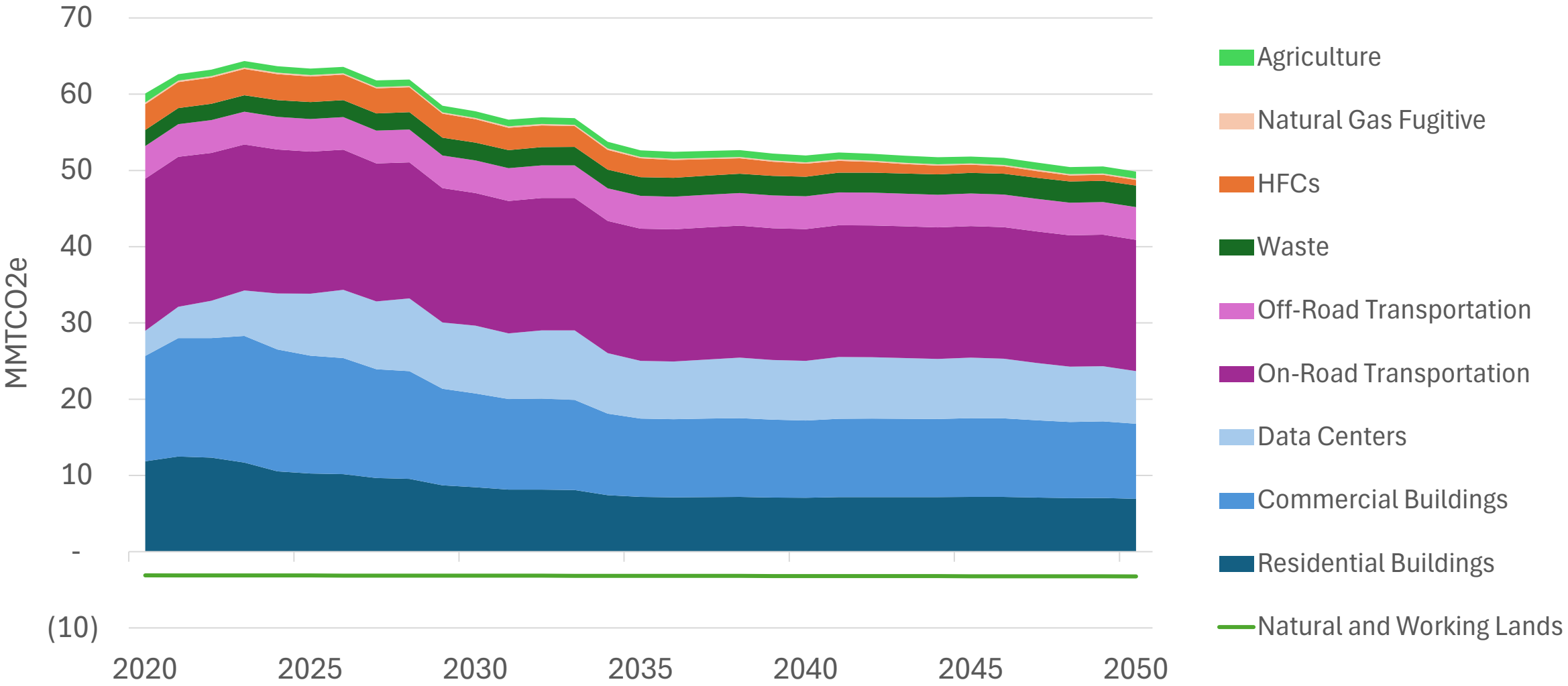
Data Centers: Electricity Demand Estimate

Data centers consumed nearly 25% of total building electricity use in the MSA

Data Center Electricity Consumption (MWh): BAU Projection

Region	2024	2030	2050
DC	243,591	243,591	243,591
MD	918,477	6,237,468	11,493,468
VA	25,072,583	42,592,517	54,980,773
Total	**26,234,651**	**49,073,576**	**66,717,832**

Draft CCAP MSA BAU GHG Projections



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Data Centers CCAP Draft Measure

The goal of this measure is to provide a suite of actions that localities can leverage going forward to maintain the economic advantages data centers provide while addressing concerns regarding how to balance rising electricity consumption with GHG emission reduction goals.

Data center owners and operators, such as Amazon, Microsoft, and Google – who collectively own over half of all hyperscale data centers – will be critical partners for implementing the actions outlined in this measure.

Draft actions incorporate initial input based on small group discussions with localities.

Data Centers CCAP Draft Measure

This measure includes several actions that data centers can take to improve energy efficiency and reduce emissions from onsite backup power. Many of these actions can be encouraged by localities through the permitting process, or reporting or meeting efficiency standards.

The key drivers of data center energy use are servers/IT equipment and cooling systems. The actions below are grouped into five categories:

1) IT Equipment Efficiency
2) Building-level (cooling and power systems efficiency)
3) Onsite Clean Energy
4) Data Tracking and Reporting
5) Engagement and Advocacy

Action Area 1: IT Equipment Efficiency

Servers and IT equipment can drive 40-50% of data center power demand.

- Encouraging data centers to identify savings opportunities through IT equipment upgrades is a relatively straightforward method to help reduce energy demand.
- Reducing the IT power requirements results in a multiplier effect through savings on infrastructure power: every unit of IT power saved reduces infrastructure power to energize and cool the IT equipment.

Key activities include:

- Encourage including ENERGY STAR IT equipment during in procurements
  - Note: will be adding recommended standards in addition to referencing various certification programs
- Encourage the adoption of higher utilization levels in IT hardware when possible.
- Educate customers (e.g., data center operators, facilities, IT departments) on best practices for servers/IT equipment.

Action Area 2: Building-level

Cooling systems often drive 40% of data center energy demand.

- At the building level, data center cooling systems can be either air-cooled or water-cooled.
- Evaporative cooling systems use water evaporation to cool air, and while very energy efficient, consume significant amounts of water.

Key activities include:

- Encourage implementing best practices for cooling & air management, including hot aisle/cold aisle arrangements; free air cooling; and in-row, overhead, or rear door heat exchangers
- Encourage onsite efficiency improvements, including raising the chilled water temperature; assessing chillers for replacement; and installing monitoring systems for real-time management and efficiency assessments

Action Area 3: Onsite Clean Energy and Reliability

- Encourage options to reduce emissions from backup power and increase efficiency
  - Replace diesel generators with natural gas generators
  - Deploy Combined Heat and Powers (CHP) systems
  - CHP plants can also be paired with fuel cells
- Collaborate with utilities to encourage participation in demand response programs
  - Data center load is typically not flexible enough to participate, but they could host grid-scale batteries onsite to provide grid services.
- Conduct feasibility studies for district energy

Action Area 4: Data Tracking and Reporting

- Key metrics: power usage effectiveness (PUE) and water usage effectiveness (WUE)
- Encourage data center operators to implement metering/monitoring systems to track water and energy consumption and benchmark their performance
- Encourage existing data centers to conduct comprehensive energy assessments to identify key areas of energy use
- Encourage data centers to report the amount of renewable energy directly tied into operations, either through on-site installations or off-site power purchase agreements within same service territory.

Action Area 5: Engagement and Advocacy

Implement new policies in localities where applicable:

- Establish policy guidance and use-specific zoning and permitting standards/ordinances for new data centers and utility substations to address concerns related to land use, compatibility, noise, aesthetics, infrastructure and natural and environmental resources.
- Require reporting of PUE where able and set maximum PUE design targets for new data center builds and retrofit/operating targets for existing data centers.

Coordinate to advocate for changes at the state, regional, and federal level:

- Add select data center items to legislative agendas.
- Track state legislative agendas and coordinate regional advocacy to support select bills, especially around data reporting and tracking of energy and water use.
- Intervene as appropriate in utility proceedings related to ratepayer impacts from meeting data center energy demand. Identify opportunities to participate in PJM or FERC stakeholder discussions.
- Support local jurisdictions with data driven decision-making (e.g., including data center estimates in future community-wide GHG inventories).

Appendix

Data Center Overview

What is a data center?

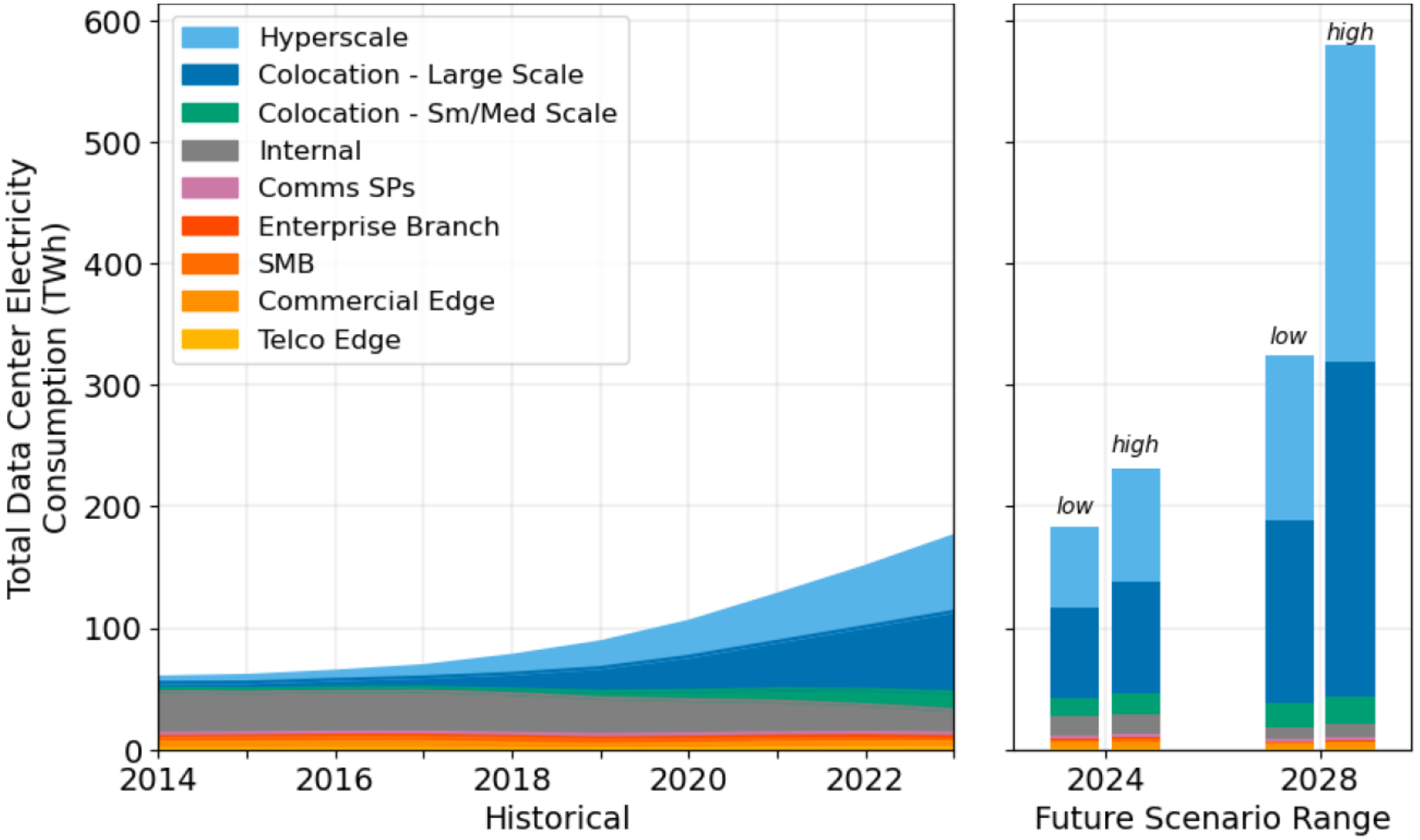
- Buildings containing computer servers and storage and network equipment
- They may route internet traffic, store data, and provide online services such as social media and video streaming
- While they have been around since the invention of the internet, lately data centers have received more attention due to rising energy demands to provide newer services such as artificial intelligence or cryptocurrency mining

Data Center Overview

Why is energy part of the conversation?

- Servers give off a lot of heat, requiring cooling equipment
- While a household or business might only use electricity at certain times of day – and a relatively low amount of it, standalone data centers (e.g., hyperscale facilities) have high and constant utilization.
- 40% of data center energy usage is used for cooling
- 40-50% is consumed by IT equipment/servers
- In 2023, hyperscale and colocation data centers accounted for almost 80% of data server energy use.
    - **Hyperscale** data centers are built by companies that deploy internet services and platforms at massive scale and can exceed 100,000 square feet.
    - Some hyperscale facilities use hundreds of megawatts of electricity – enough to power hundreds of thousands of homes.

U.S. Data Center Electricity Usage and Projections



U.S. Data Center Electricity Use: 2030 Projection