

# Energy Infrastructure and Data Centers



Piedmont  
Environmental  
Council

*Webinar - March 4, 2024  
Julie Bolthouse, Director of Land Use*

# Speakers your going to hear from tonight:



**Julie Bolthouse**

Director of Land Use  
PEC



**Tia Earman**

Senior Land Use Field  
Representative for  
Loudoun and Clarke  
PEC



**Michael Myers**

Executive Director  
Loudoun Wildlife  
Conservancy



**Gem Bingol**

Senior Land Use Field  
Representative for  
Loudoun  
PEC

## **PEC's mission:**

**Protect and restore the  
lands and waters of  
the Virginia Piedmont,  
while building  
stronger, more  
sustainable  
communities.**





0 25 50 Miles



OHIO

WEST VIRGINIA

MARYLAND

DELAWARE

KENTUCKY

VIRGINIA

Winchester

DC

Alexandria

Charlottesville

Richmond

Roanoke

Bristol

Danville

Norfolk

Shenandoah River

Rappahannock River

Potomac River

James River

Clinch River

Chesapeake Bay




# Hidden Costs of the Cloud: Data Centers in Virginia



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# Today's Discussion

- Explosive growth of the data center industry
- Transmission Lines and Energy Requirements
- Trends and projections
- What can we individually and collectively do in Loudoun and beyond

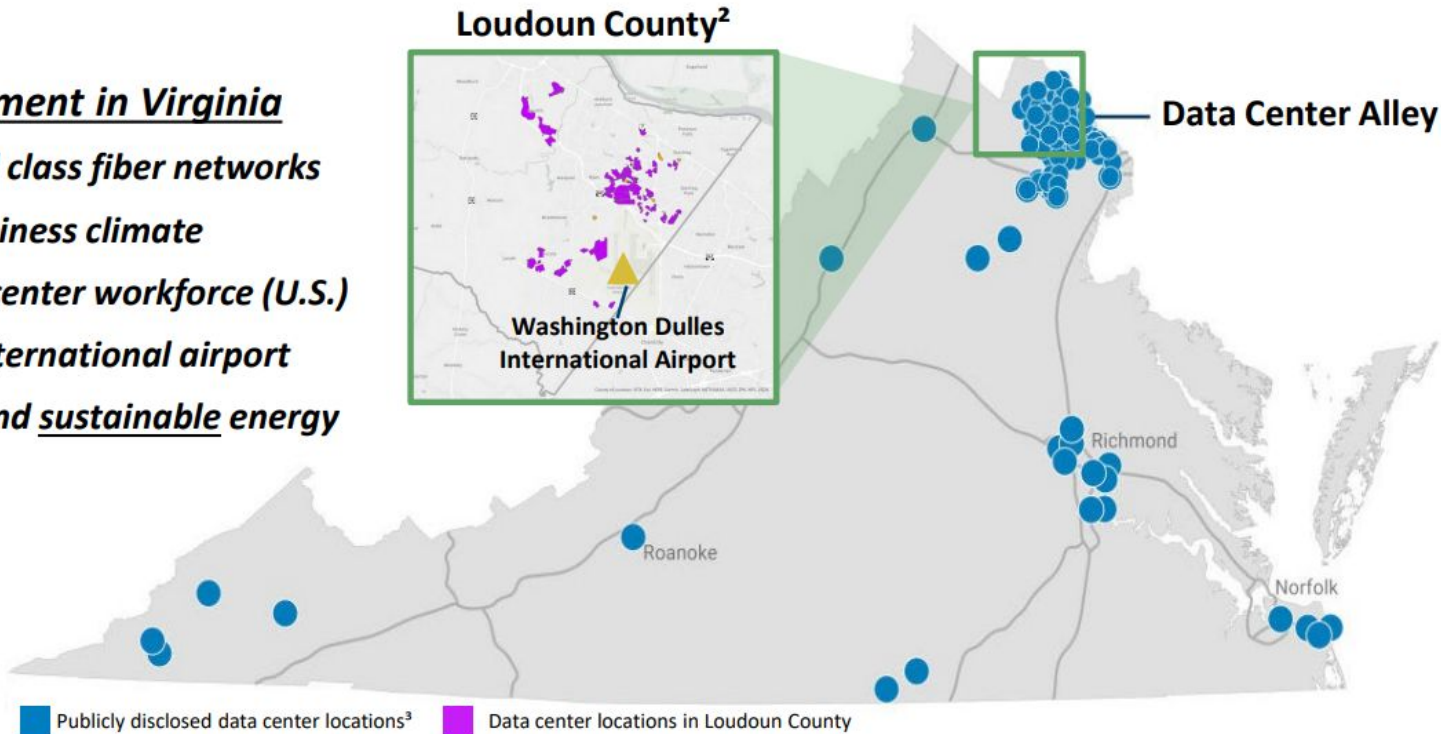


# Dominion Energy Virginia

Northern Virginia boasts the largest data center market in the world<sup>1</sup>

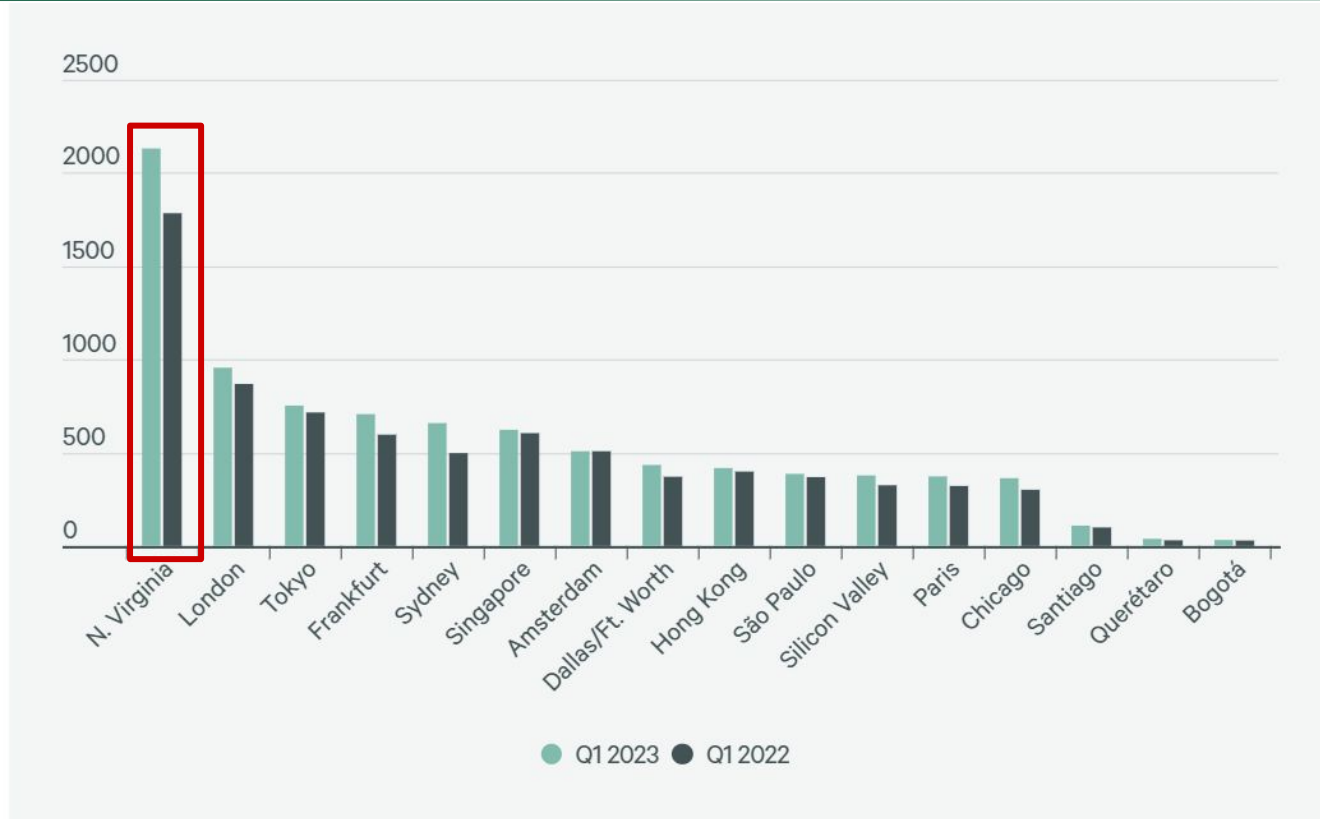
## Data center development in Virginia

- ✓ **Connectivity to world class fiber networks**
  - ✓ **Attractive business climate**
- ✓ **Access to largest data center workforce (U.S.)**
- ✓ **Access to nearby international airport**
- ✓ **Access to affordable and sustainable energy**



***Committed to deliver safe, reliable, affordable and sustainable energy to our customers***

# Data Center Inventory (MW)



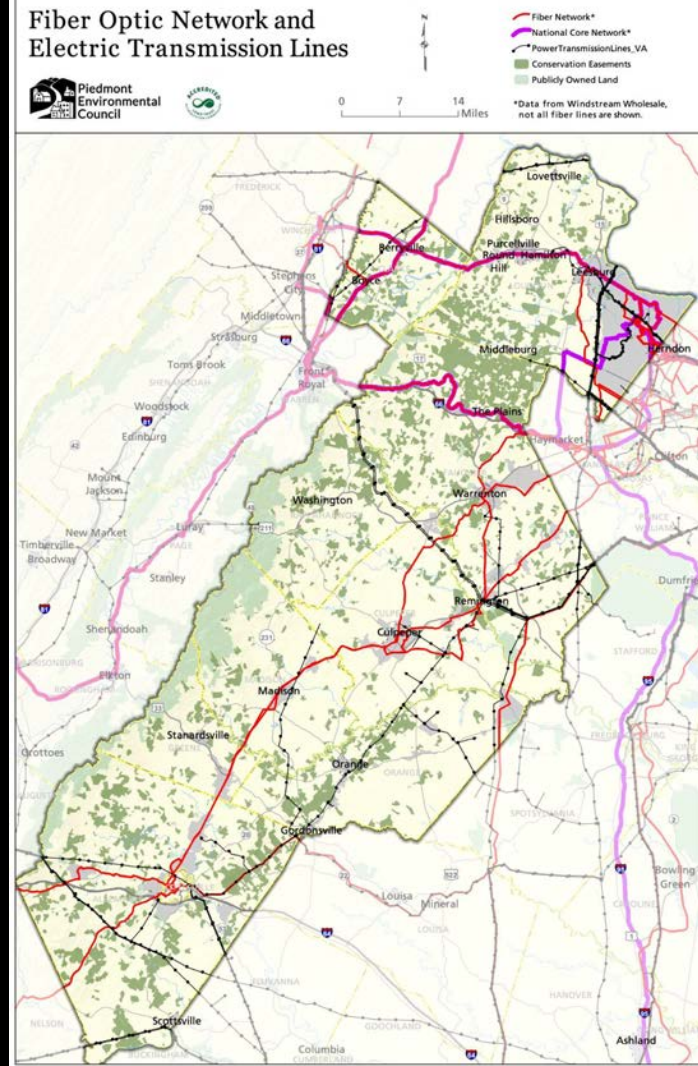
Source: CBRE Research, Q1 2022 & Q1 2023. Figures and data for North American markets include only wholesale colocation facilities. In Europe, Latin America, and Asia-Pacific, total inventory includes both wholesale and retail colocation facilities.



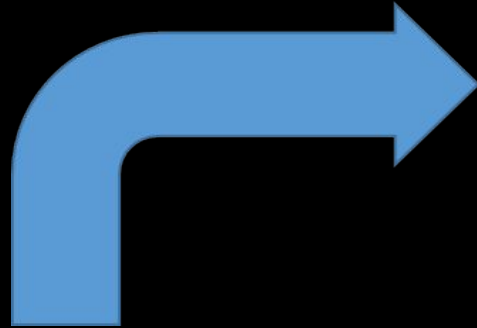
**Why Virginia?**

# Attractive Features of the NoVa Market:

- Robust Fiber Network (MAE-East brought one of the earliest internet exchange points to the eastern seaboard, later Equinix)
- Skilled Personnel
- Safe Location
- Available Land
- Available Water
- Materials/Resources
- Supportive Government Policies
- Tax Incentives (at both the state and local level)
- Power



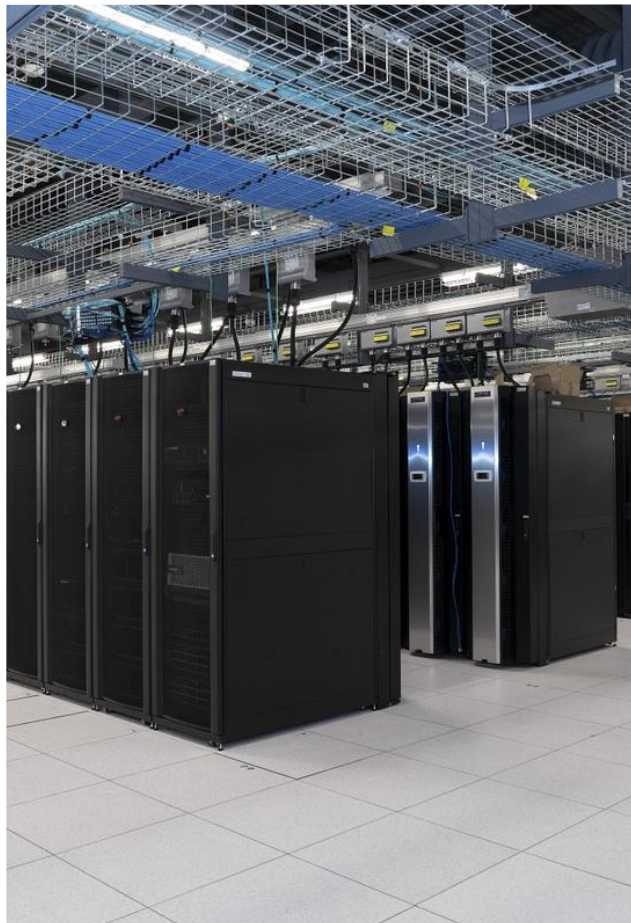
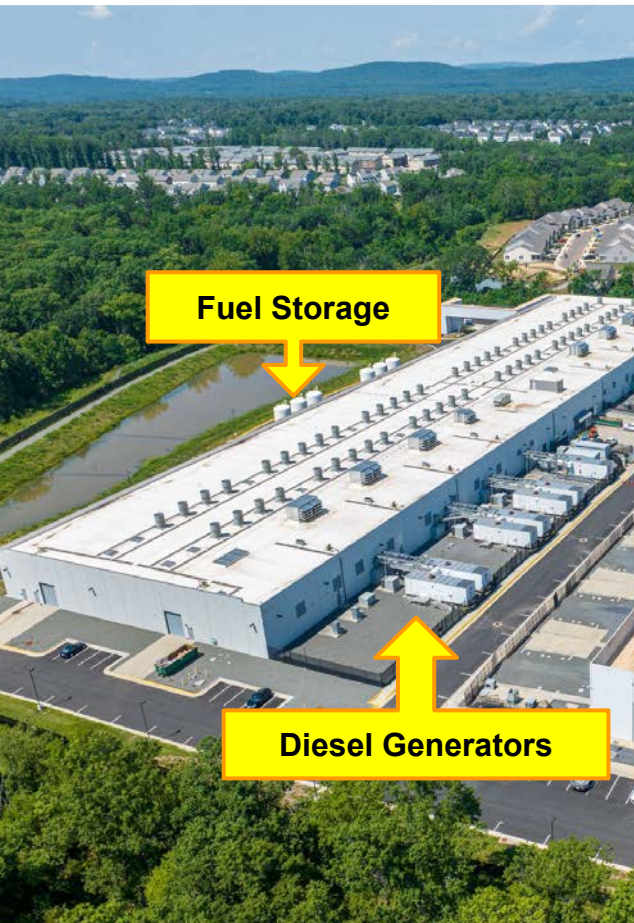
# Data/Energy is a Self Perpetuating **Cycle**...



What's driving **demand**?



# The digital age relies on **data centers**



# And those data centers are **getting much bigger**

- In 2018 large data centers were around 50,000 to 100,000 sqft
- In 2023 large data centers are around 200,000 to 300,000 sqft
- 2018 -> 10-15 MW per building
- In 2023 -> 30-90 MW per building
- Multi building campuses are common using 600MW+



# Prince William Digital Gateway

At least **3 gigawatts (GW)** of energy,  
equivalent to the power used by  
750,000 homes

**37 buildings and 15 substations**

Approved December 12th, 2023

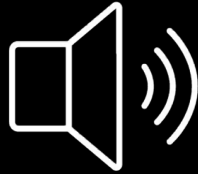




# They create a host of **community-level impacts**



**Parks and Trails**



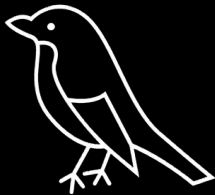
**Noise**



**Water**



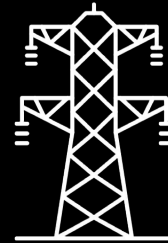
**Air Quality**



**Wildlife Habitat**

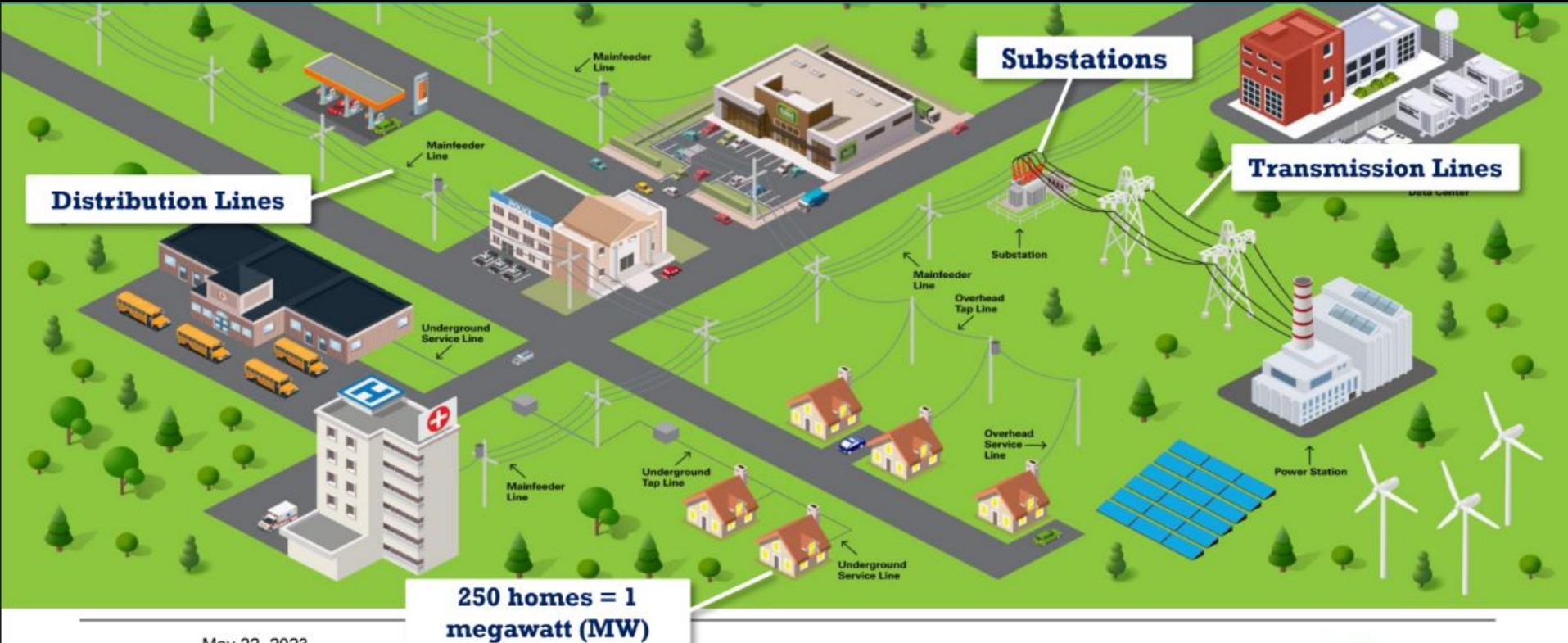


**Design**



**Transmission and  
Substations**

# The data centers rely on a **reliable power grid**



May 22, 2023

\*1000 MW = 1 gigawatt



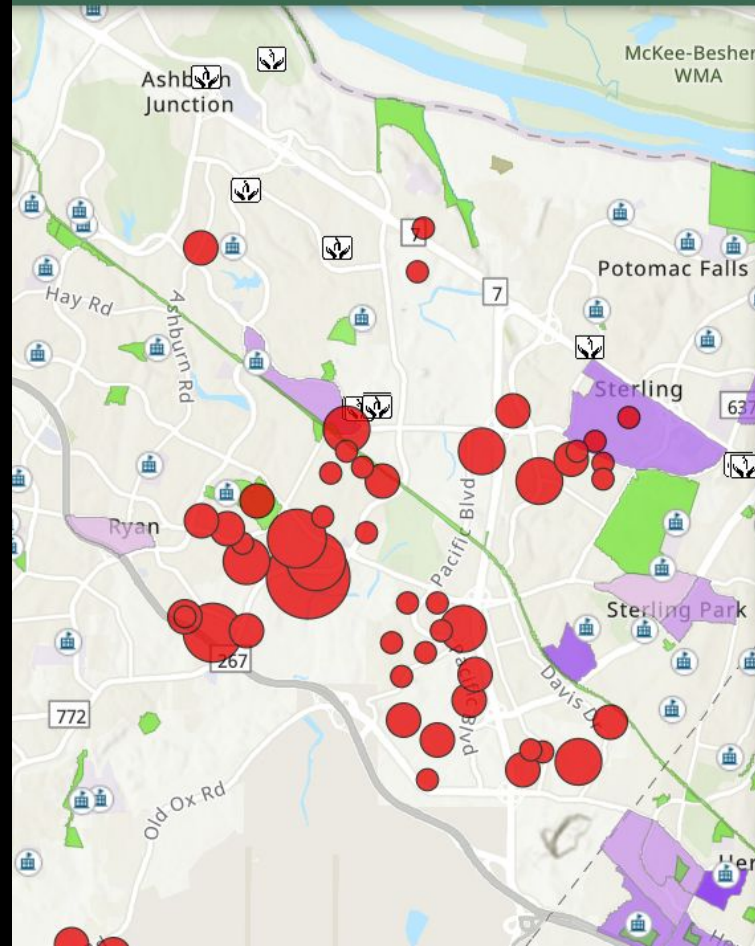
# Back up power is **diesel generators**



# Over 4,000 diesel generators permitted in Loudoun



## Data Center Diesel Generators



### Legend

#### Data Centers Emission

Number of Generators

- > 220 - 260
- > 170 - 220
- > 130 - 170
- > 90 - 130
- > 40 - 90
- 0 - 40

#### Nursing Homes



#### Public School Location



# Data centers consume a **huge amount of electricity**



**A 60 MW data center building is equivalent to 15,000 homes!**

TOP 50 BIGGEST

# DATA CENTER MARKETS

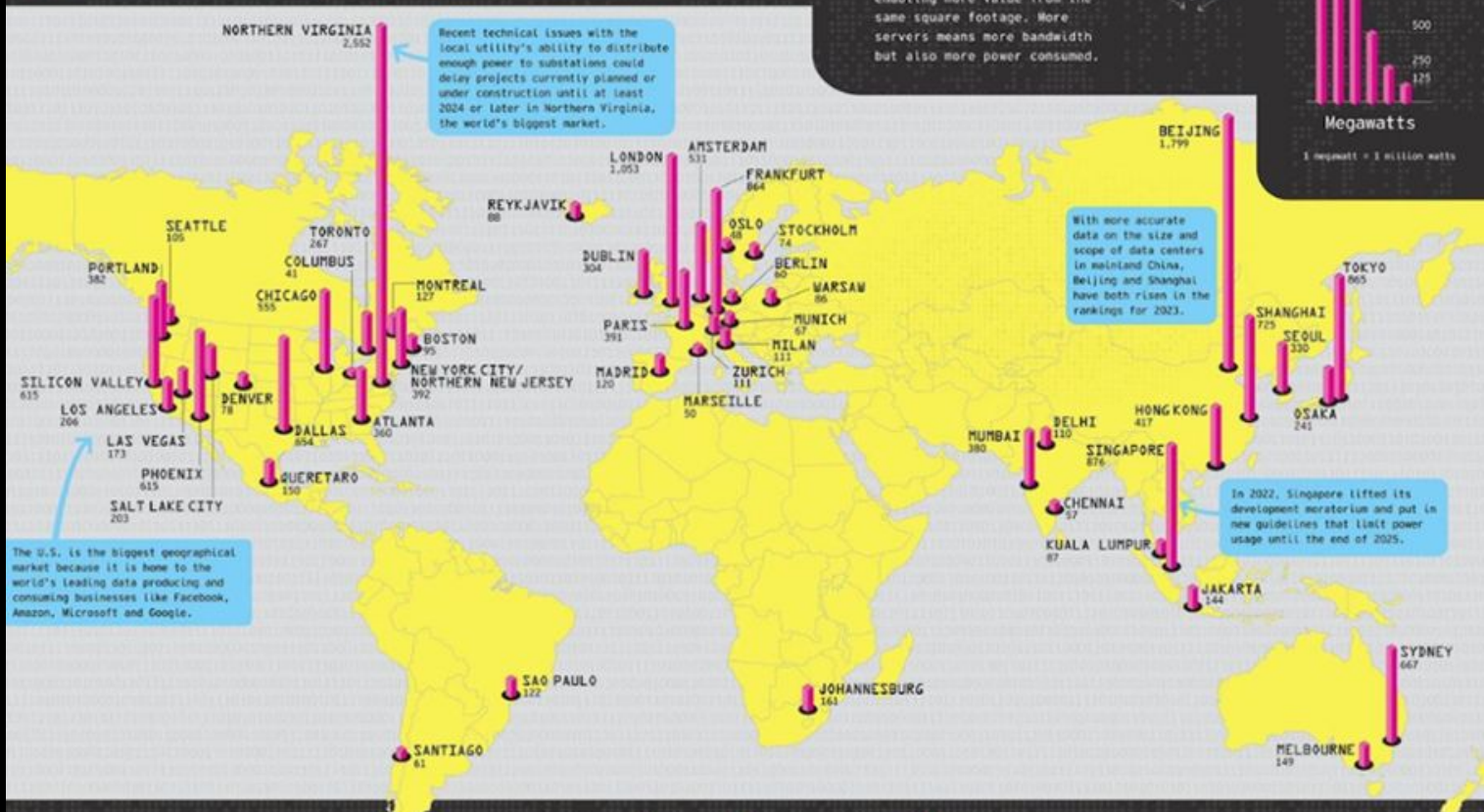
BY ELECTRICITY CONSUMPTION in MEGAWATTS

1,600+ data centers surveyed from 63 markets

Unlike real estate which is measured in square footage, data center size is measured in electricity capacity and consumption. To determine data center size, server density is key because many servers can be stacked vertically into the same footprint, enabling more value from the same square footage. More servers means more bandwidth but also more power consumed.



Megawatts  
1 megawatt = 1 million watts



Recent technical issues with the local utility's ability to distribute enough power to substations could delay projects currently planned or under construction until at least 2024 or later in Northern Virginia, the world's biggest market.

With more accurate data on the size and scope of data centers in mainland China, Beijing and Shanghai have both risen in the rankings for 2023.

In 2022, Singapore lifted its development moratorium and put in new guidelines that limit power usage until the end of 2025.

The U.S. is the biggest geographical market because it is home to the world's leading data producing and consuming businesses like Facebook, Amazon, Microsoft and Google.

SCIENCE & TECHNOLOGY

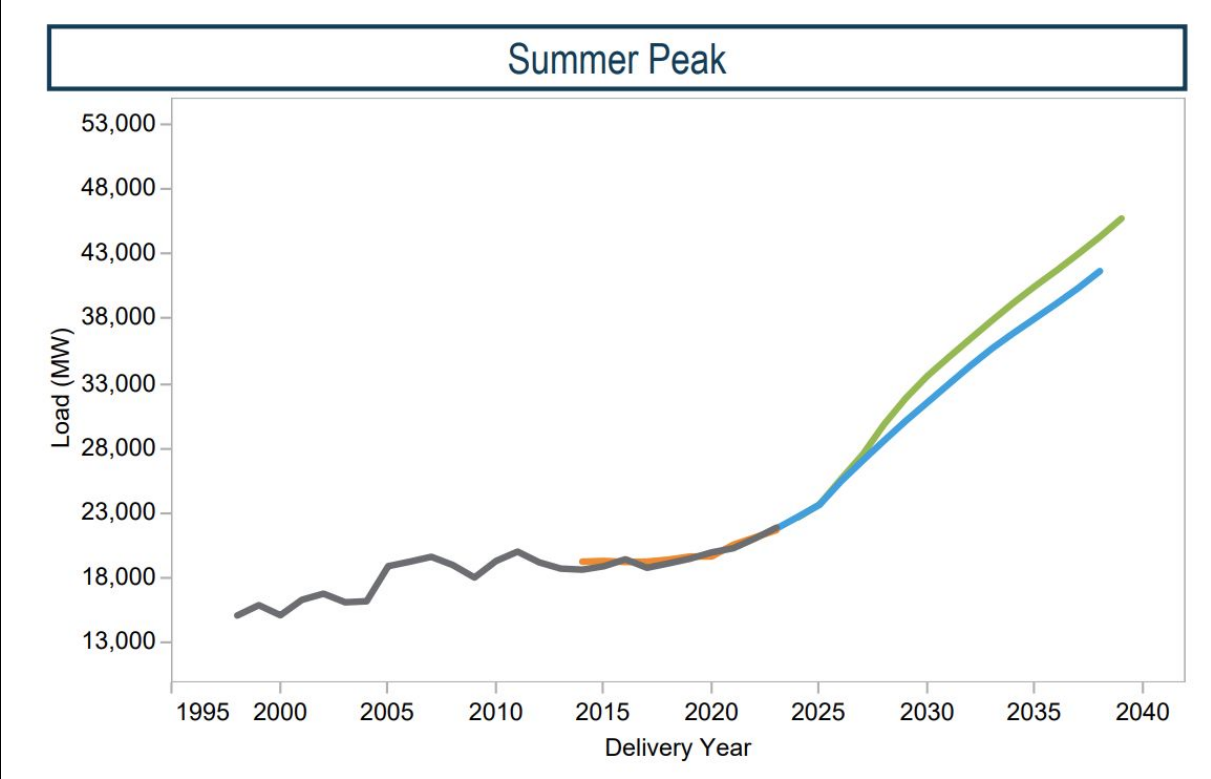
# The hidden costs of AI: Impending energy and resource strain

Deep Jariwala and Benjamin C. Lee on the energy and resource problems AI computing could bring.



In recent years, artificial intelligence (AI) models like ChatGPT have seen notable improvements, with some people concerned about the societal impacts these new technologies may bring including looming concerns related to increasing energy and raw materials demands. (Image: iStock/Alexey Tolmachov)

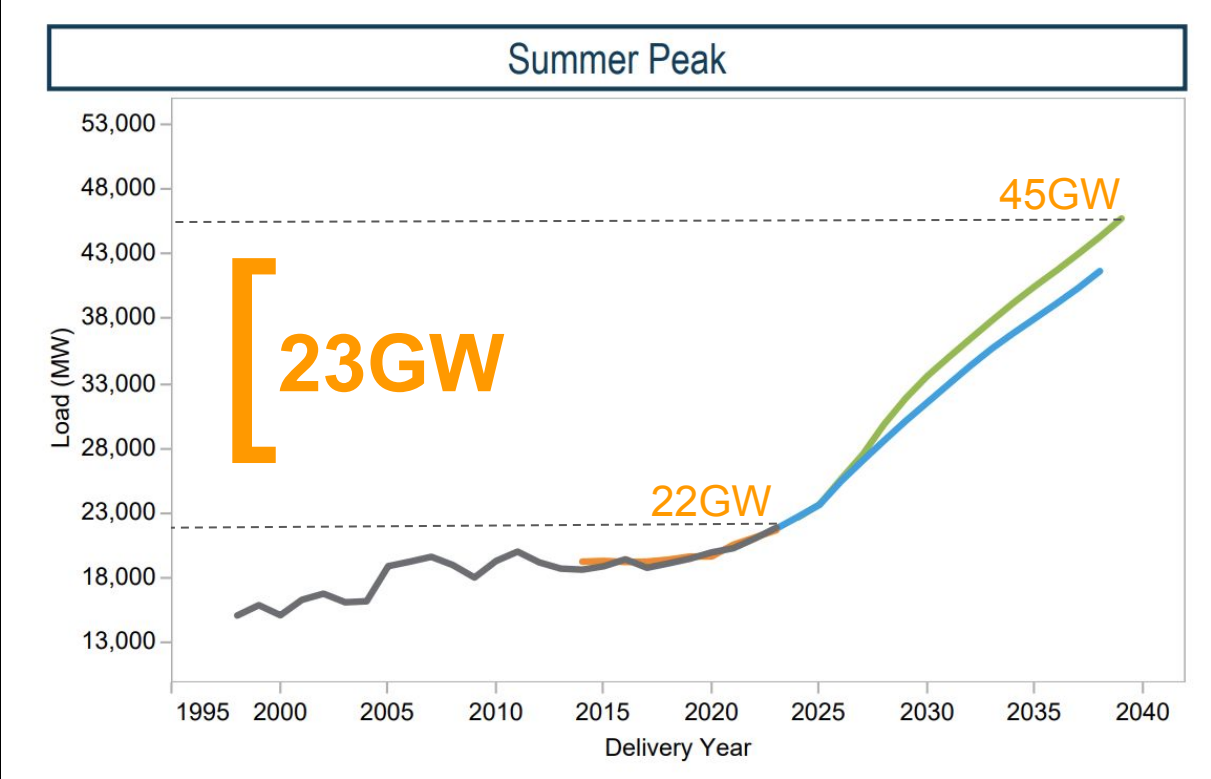
# Dominion Territory Explosive Growth Trends



**Green** = 2024 projection  
**Blue** = 2023 projection



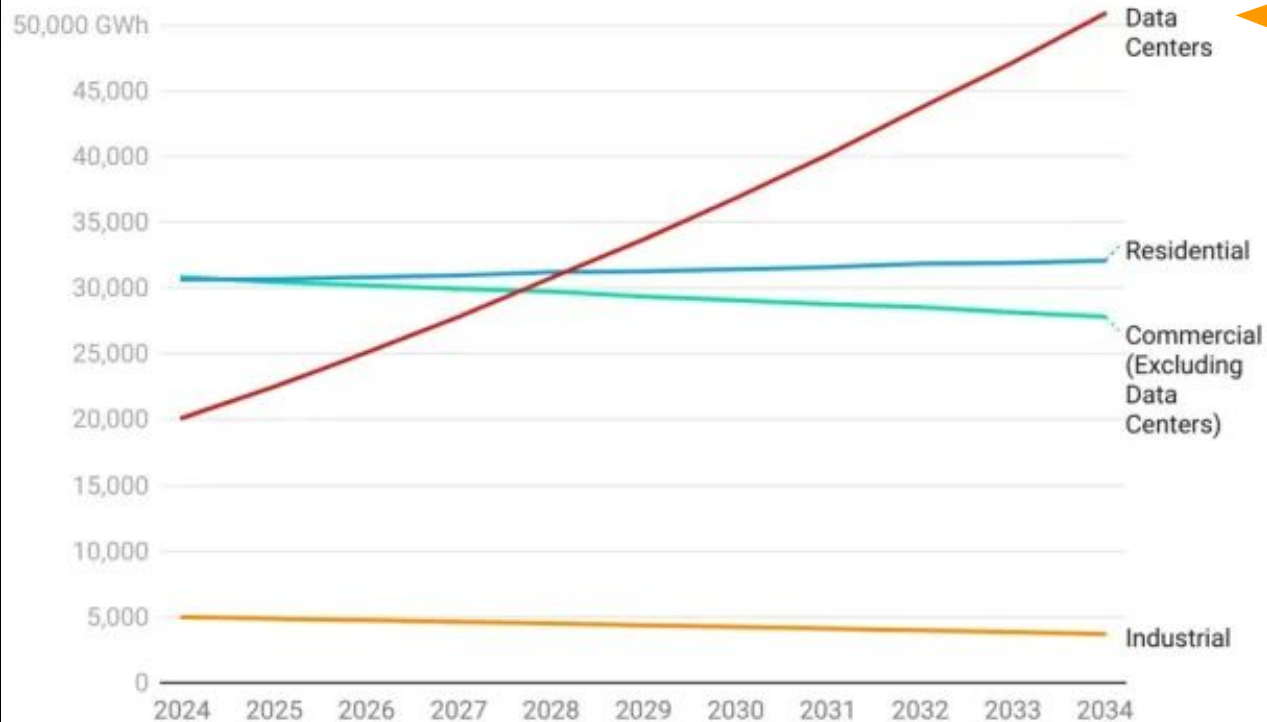
# Dominion Territory Explosive Growth Trends



**Green** = 2024 projection  
**Blue** = 2023 projection

# Forecasted Dominion Energy annual electricity sales

Data center electric sales will increase by 152% in the next decade, while others sectors remain mostly the same.



The overall increase in electricity sales is forecasted to be 32% over 10 years. That accounts for increased energy efficiency among other sectors. The forecast does not include projected electricity demand from electric vehicles.

Chart: Emily Richardson/VCU Capital News Service • Source: The Energy Transition Initiative at the Weldon Cooper Center for Public Service. • Created with Datawrapper

That's a **doubling of Virginia's peak load,**  
solely due to data center development,  
within 15 years!

# What's Dominion's Plan?



ENERGY + ENVIRONMENT

## Dominion projects new gas plants, advanced nuclear will be needed to meet soaring demand

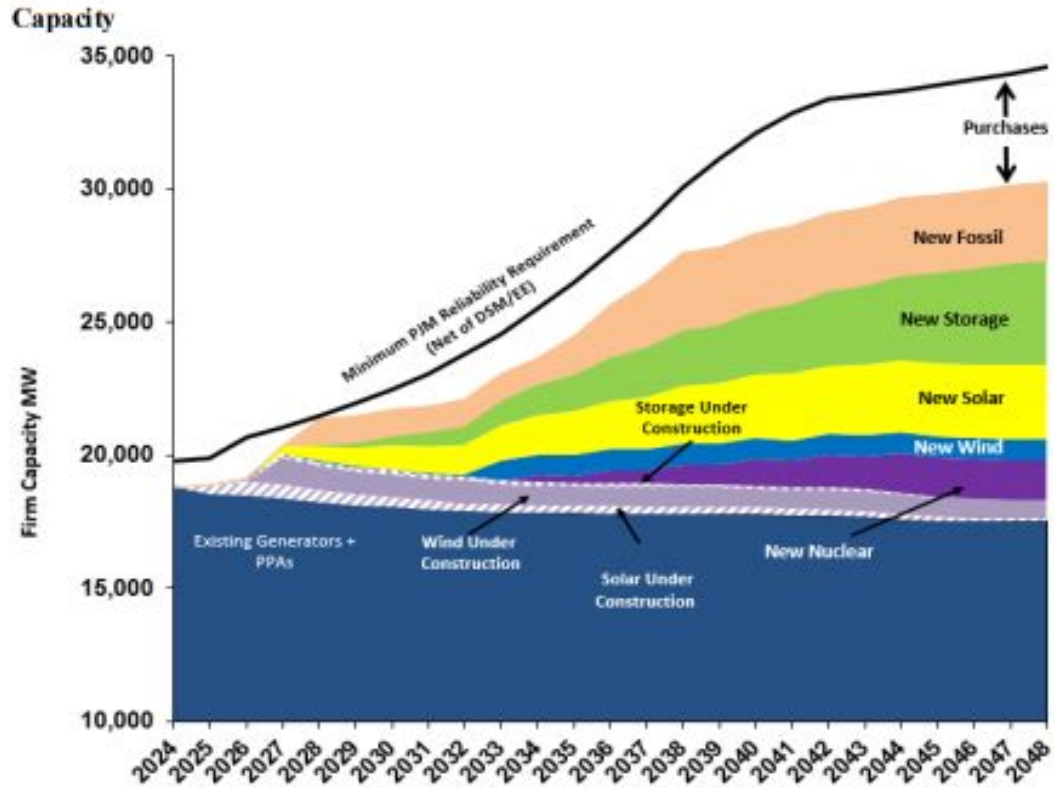
Latest long-range plan shows data centers and electrification are driving rising power needs

BY: CHARLIE PAULLIN - MAY 3, 2023 12:02 AM



# Dominion's plan...

Appendix 2A: Plan B - Summer Capacity, Energy, and RECs



# New 1 GW fracked gas peaking plant planned for Chesterfield...



Courtesy / Dominion Energy



## Dominion's proposed Chesterfield gas plant draws opposition

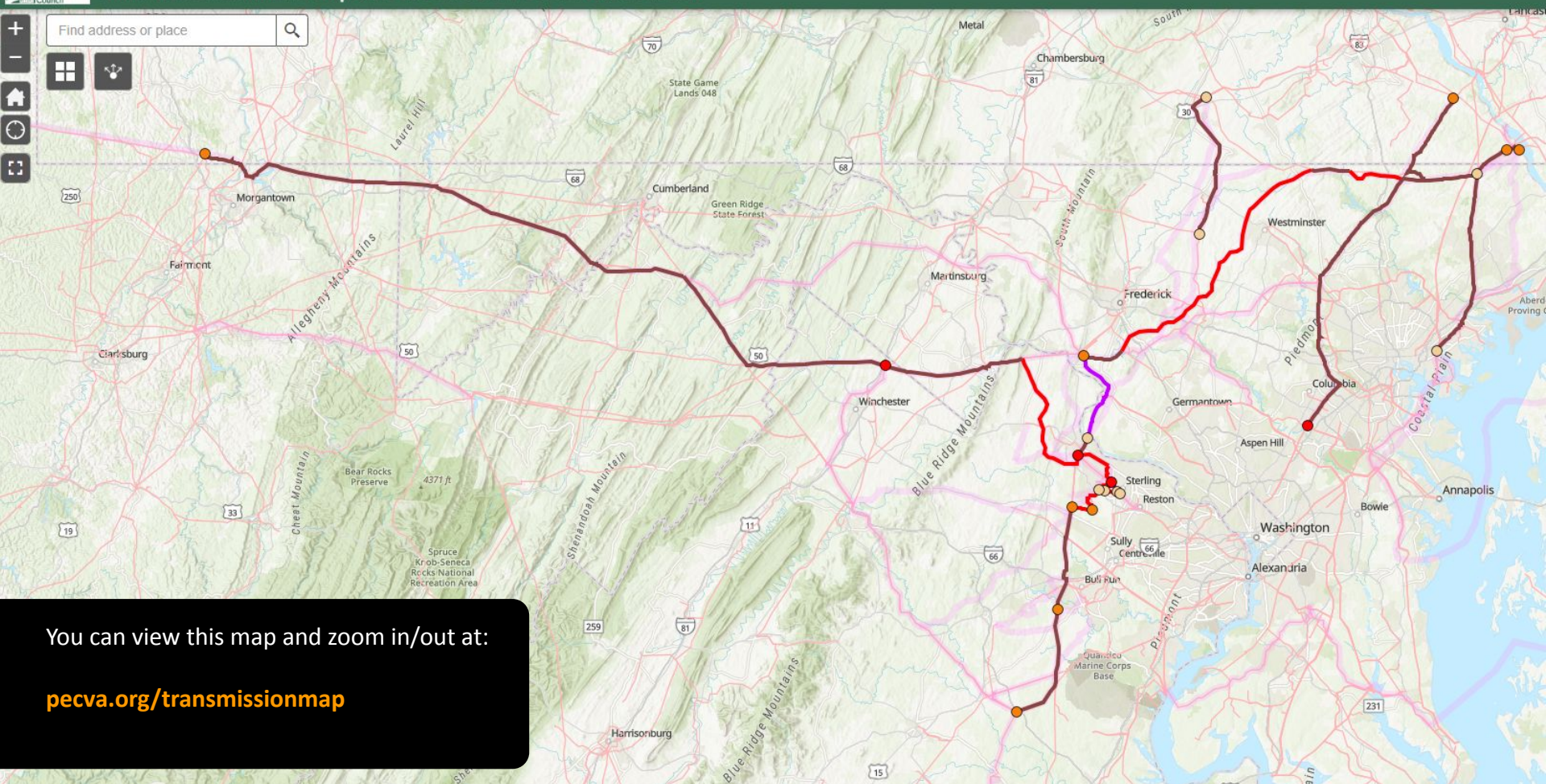
VPM | By Patrick Larsen

Published June 28, 2023 at 5:13 PM EDT



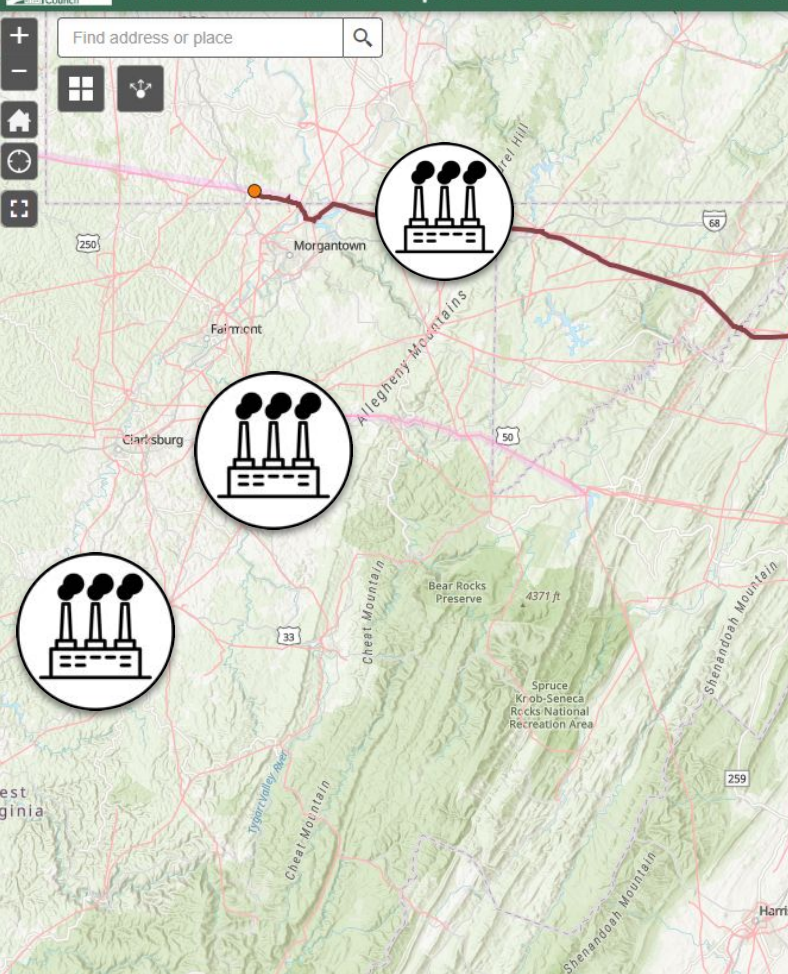
▶ LISTEN • 1:10



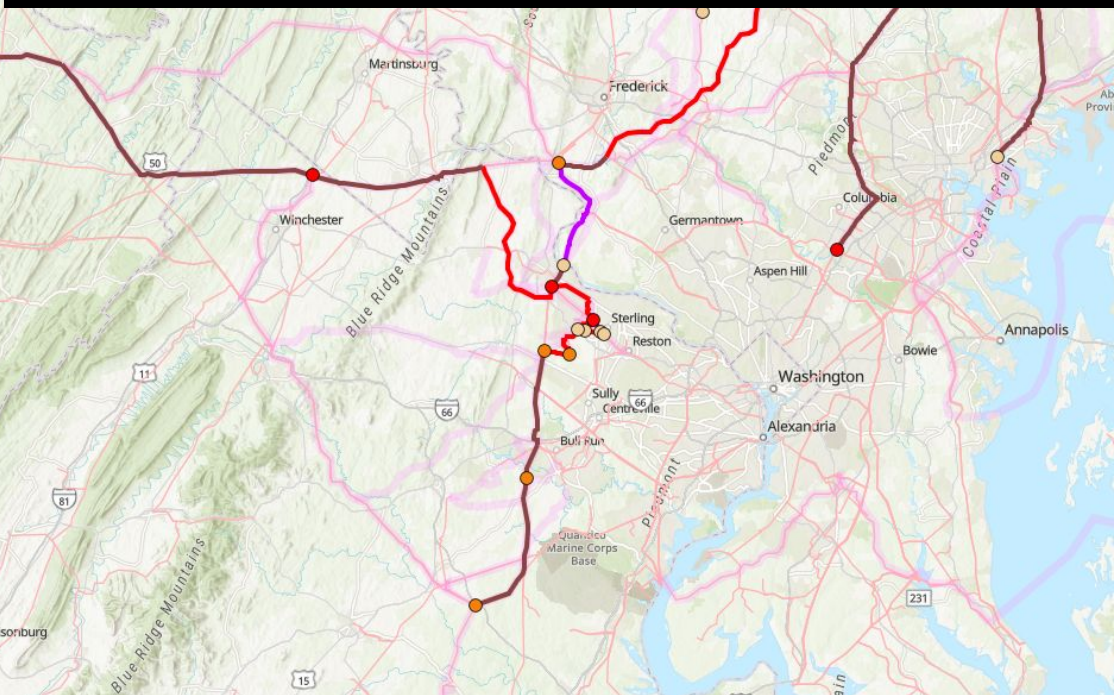


You can view this map and zoom in/out at:

[pecva.org/transmissionmap](https://pecva.org/transmissionmap)

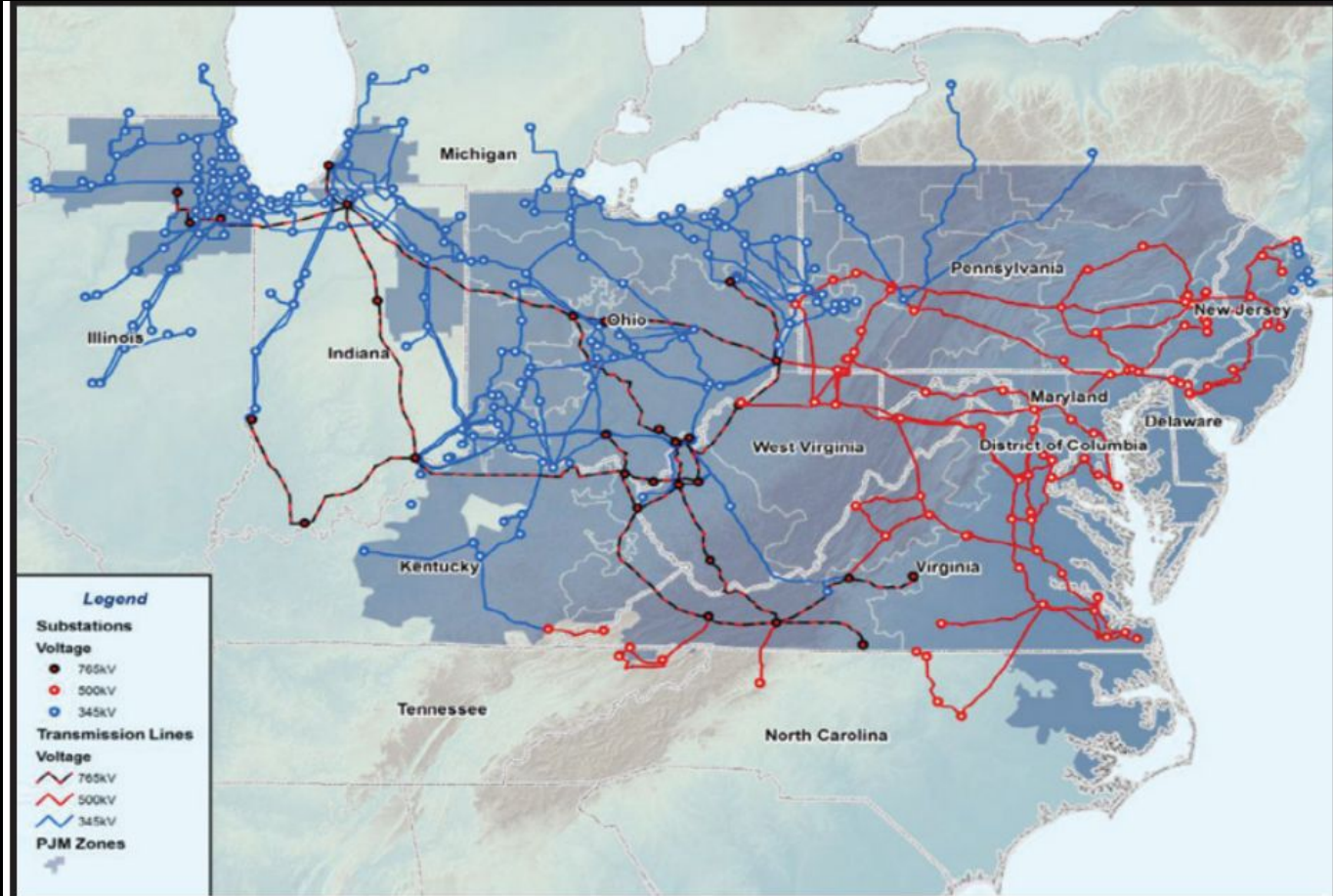


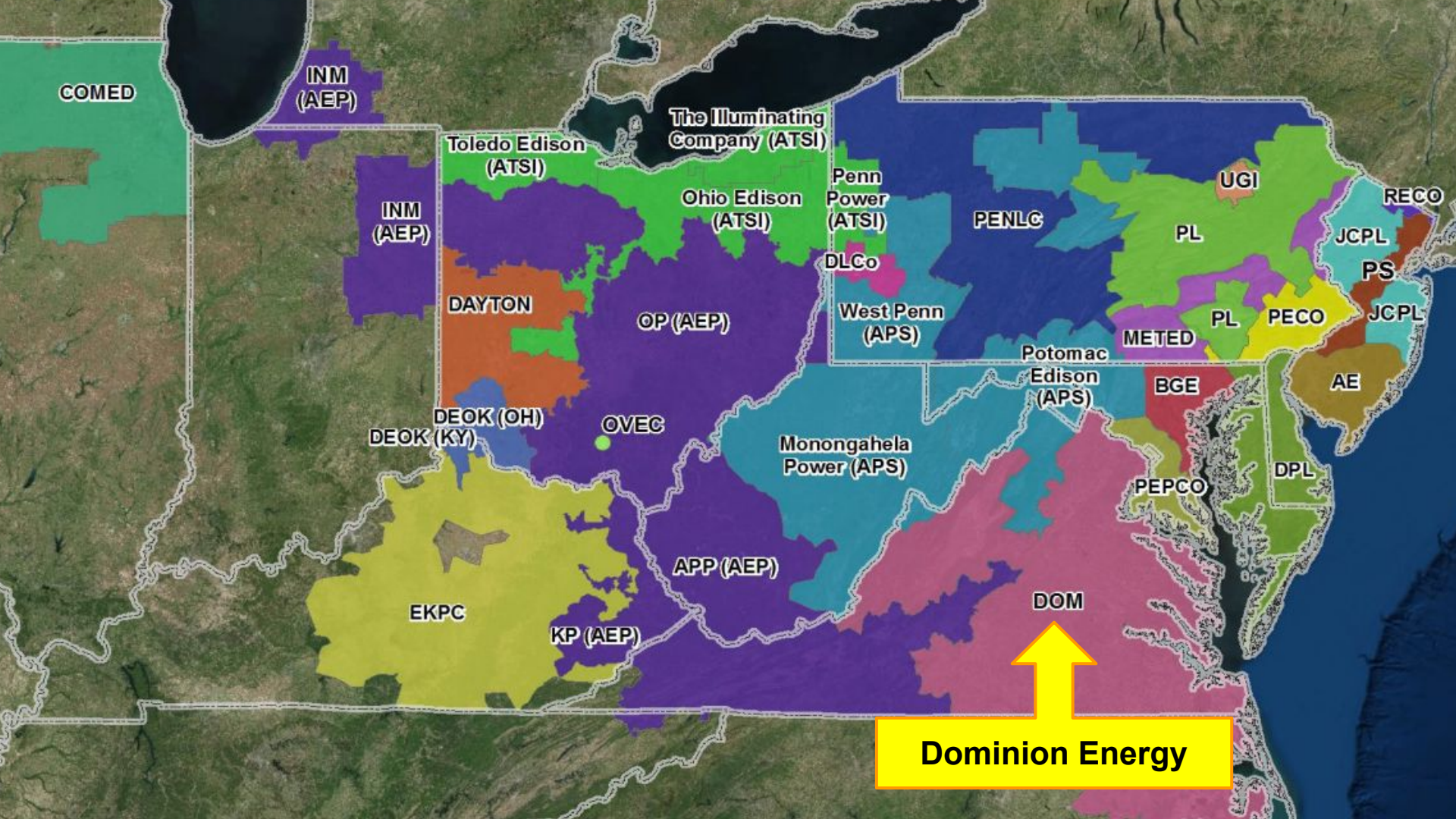
Due to “resource adequacy concerns”, **FirstEnergy abandons their 2030 climate goal.** Fort Martin and Harrison coal fired power plants in W.V. are now forecast to stay online till 2035 and 2040 respectively.





# Regional Transmission Operator - PJM





COMED

INM  
(AEP)

The Illuminating  
Company (ATSI)

Toledo Edison  
(ATSI)

Ohio Edison  
(ATSI)

Penn  
Power  
(ATSI)

PENLGC

UGI

RECO

INM  
(AEP)

Ohio Edison  
(ATSI)

PL

JCPL

PS

DAYTON

OP (AEP)

West Penn  
(APS)

PENLGC

PL

PL

JCPL

PECO

METED

DEOK (OH)  
DEOK (KY)

OVEC

Monongahela  
Power (APS)

Potomac  
Edison  
(APS)

BGE

AE

EKPC

APP (AEP)

DOM

PEPCO

DPL

**Dominion Energy**

# PJM's rationale:



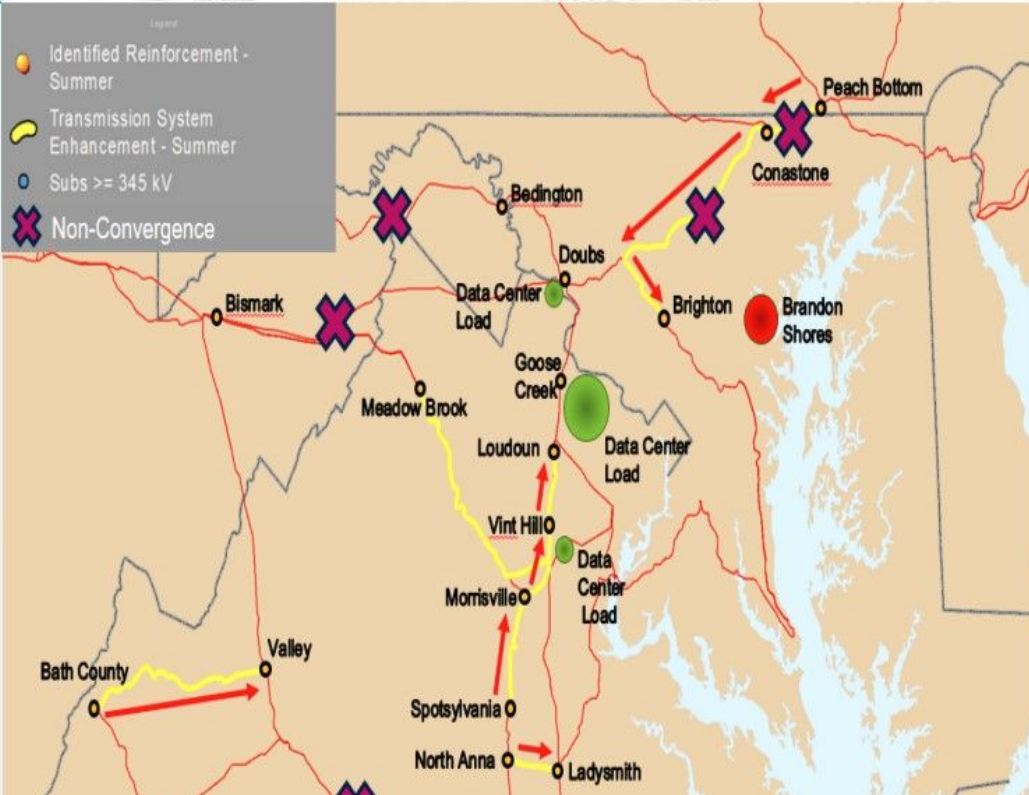
## 2022W3 RTEP- Summary of Drivers/Needs

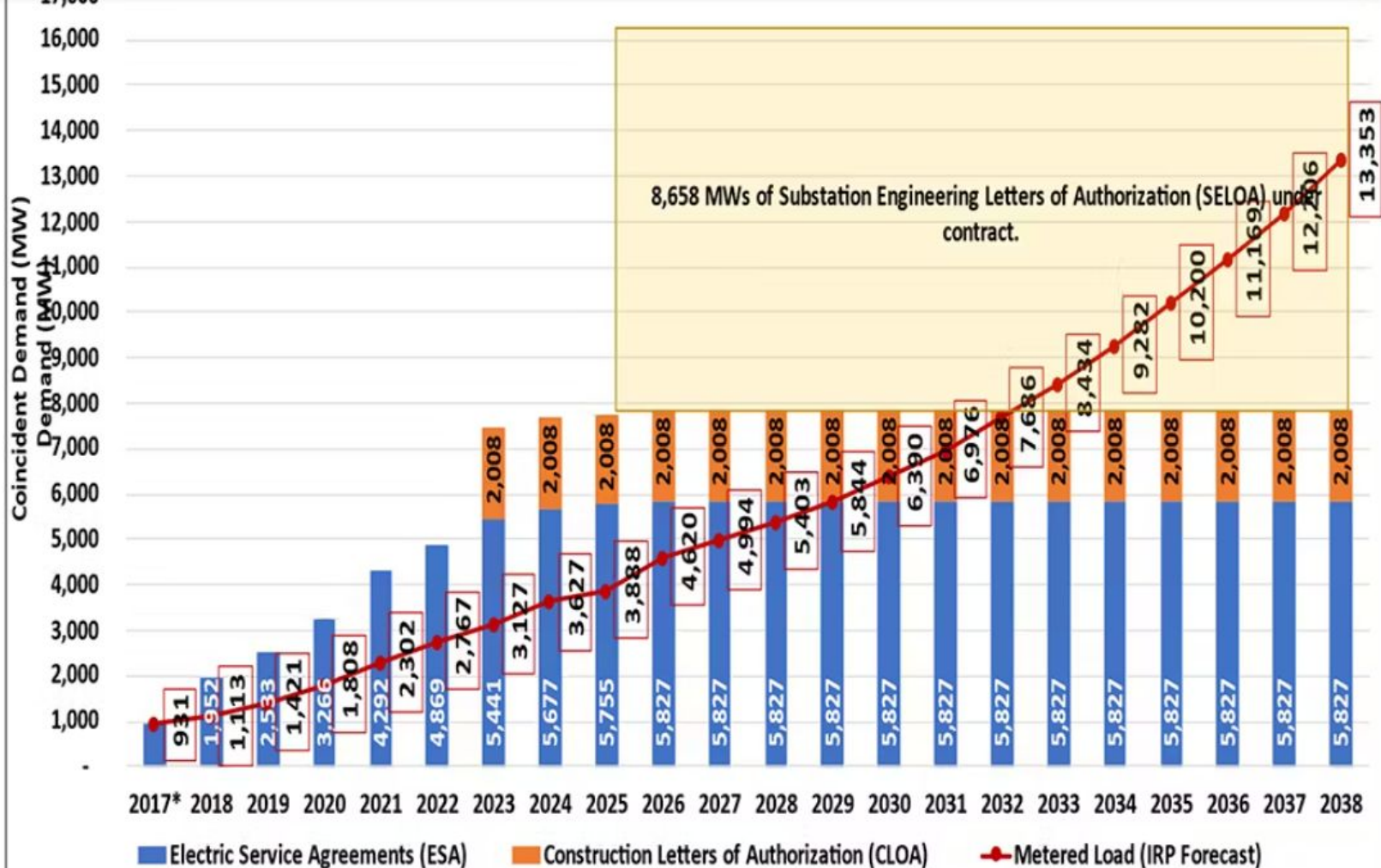
- PJM has had unprecedented data center load growth (up to ~7,500 MW) currently forecasted by 2027- 28 in Dominion (Northern Virginia) and APS (Doubts)
- 11,100 MW of announced deactivations to the west and south of Columbia
- Approximately 100 MW occurring after the 2022

**PJM has had unprecedented data center load growth (up to ~7,500 MW) currently forecasted by 2027-28 in Dominion (Northern Virginia) and APS (Doubts)**

- The ISA
- The to t
- to t

- PJM has implemented a new block dispatch procedure
- The old dispatch procedure maintained historical intraregional transfers, dispatching most of the generators in the Dominion zone at 100%

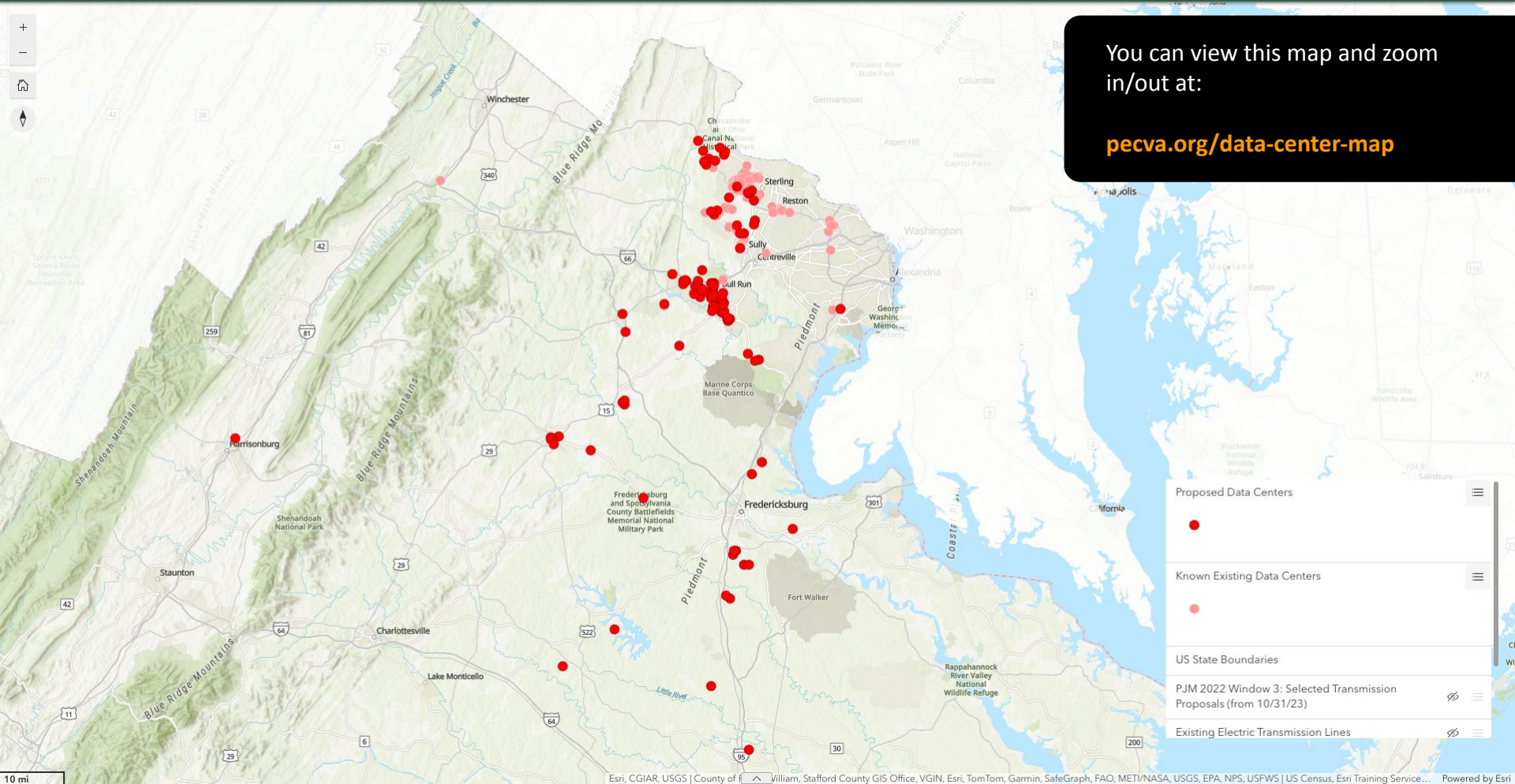




Note: The Company did not review ESAs prior to 2018 and assumed ESAs were equal to actual demand in 2017. Actual ESA totals will be higher than this assumption.

This only addresses  
**immediate demand** in NoVA.

Localities are **continuing to approve**  
data center campuses all over the state  
which will drive up demand further.



You can view this map and zoom in/out at:  
[pecva.org/data-center-map](https://pecva.org/data-center-map)

**Proposed Data Centers**

**Known Existing Data Centers**

US State Boundaries

PJM 2022 Window 3: Selected Transmission Proposals (from 10/31/23)

Existing Electric Transmission Lines

# Approved But Unbuilt + Applications Filed (Virginia)

County	Sq ft	Estimated MW
Caroline	5,716,000	1,715
Culpeper	9,145,000	2,744
Fairfax	5,093,064	1,528
Fauquier	5,441,000	1,632
Hanover	11,000,000	3,300
Harrisonburg City	15,000	5
Henrico	675,000	203
King George	7,250,000	2,175
Loudoun	19,787,417	5,936
Louisa	10,400,000	3,120

County	Sqft	Estimated MW
Mecklenburg	1,100,000	330
Orange	5,000,000	1,500
Prince Edward	1,300,000	390
Prince William	58,215,609	17,465
Scott County	Unknown	
Spotsylvania	11,000,000	3,300
Stafford	6,010,000	1,803
Surry	Unknown	
Virginia Beach	140,000	42

# That's a lot of energy, on top of what is already being used

Total Current Load From  
Data Centers (NoVA)

= 2,800 MW

Total Approved But  
Unbuilt (VA)

= 11,200 MW

Total Including  
Applications (VA)

= 58,400 MW



# Let's put that energy use in context: **1MW = 250 homes**

Total Current Load From  
Data Centers (NoVA)

= 2,800 MW



700,000 homes

Total Approved But  
Unbuilt (VA)

= 11,200 MW



2.8 million homes

Total Including  
Applications (VA)

= 58,400 MW



14.6 million homes

**How much** does Dominion's plan cost?

**Who pays** for all the energy infrastructure to support this industry?

## Executive Summary Table: 2023 Plan Results

	Plan A	Plan B	Plan C	Plan D	Plan E
<b>NPV Total (\$B)</b>	\$109.70	\$127.70	\$127.20	\$140.90	\$138.00
<b>Approximate CO<sub>2</sub> Emissions from Company in 2048 (Metric Tons)</b>	43.8 M	35.9 M	36 M	0 M	0 M
<b>Solar (MW)</b>	10,800 15 yr. 19,800 25 yr.	10,875 15 yr. 19,875 25 yr.	10,800 15 yr. 19,800 25 yr.	10,875 15 yr. 23,955 25 yr.	11,094 15 yr. 24,294 25 yr.
<b>Wind (MW)</b>	3,040 15 yr. 3,220 25 yr.	3,040 15 yr. 3,220 25 yr.	3,040 15 yr. 3,220 25 yr.	3,040 15 yr. 3,220 25 yr.	3,040 15 yr. 3,220 25 yr.
<b>Storage (MW)</b>	1,050 15 yr. 3,960 25 yr.	2,370 15 yr. 5,190 25 yr.	2,220 15 yr. 5,220 25 yr.	2,370 15 yr. 9,780 25 yr.	2,910 15 yr. 10,350 25 yr.
<b>Nuclear (MW)</b>	— 15 yr. — 25 yr.	804 15 yr. 1,608 25 yr.	804 15 yr. 1,608 25 yr.	1,608 15 yr. 4,824 25 yr.	1,072 15 yr. 4,288 25 yr.
<b>Natural Gas-Fired (MW)</b>	5,905 15 yr. 9,300 25 yr.	2,910 15 yr. 2,910 25 yr.	2,910 15 yr. 2,910 25 yr.	970 15 yr. 970 25 yr.	970 15 yr. 970 25 yr.
<b>Retirements (MW)</b>	— 15 yr. — 25 yr.	— 15 yr. — 25 yr.	— 15 yr. — 25 yr.	— 15 yr. 11,399 25 yr.	— 15 yr. 11,399 25 yr.

# This cost will be passed on to ratepayers



### LEGAL NOTICES

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#### NOTICE TO THE PUBLIC OF RENEWABLE PORTFOLIO STANDARD (RPS) FILING BY VIRGINIA ELECTRIC AND POWER COMPANY DB/A DOMINION ENERGY VIRGINIA CASE NO. PUR-2023-00142

- Virginia Electric and Power Company d/b/a Dominion Energy Virginia ("Dominion") has submitted its 2023 Renewable Portfolio Standard ("RPS") filing ("2023 RPS Filing"). The 2023 RPS Filing and public notice portion of the hearing, which will be held on October 26, 2023, at the Dominion Energy Virginia headquarters, will discuss a typical residential customer bill being 1,000 kilowatt hours per month by 2035.
- A Hearing Examiner appointed by the Commission will hold a telephone hearing in this case on November 30, 2023, at 9:00 a.m. for the receipt of public witness testimony.
- An evidentiary hearing will also be held on January 10, 2024, at 9:00 a.m., or at the discretion of the Board located at the New Building, 1300 East Main Street, Richmond, Virginia 23219, to receive the testimony and evidence of Dominion, any respondents, and Commission staff.
- Further information about this case is available on the SOC website at: [soc.electricpowerpages.com/submit.htm](http://soc.electricpowerpages.com/submit.htm)

During its 2023 Session, the Virginia General Assembly enacted Chapters 900 (HB 1526) and 914 (SB 861) of the 2023 Virginia Acts of Assembly. These legislative Acts of Assembly, known as the Virginia Clean Economy Act ("VCEA"), became effective on July 1, 2023. The VCEA, inter alia, establishes a mandatory renewable energy portfolio standard ("RPS") program ("RPS Program") for Virginia Electric and Power Company ("Dominion" or "Company") in § 56-565.5 of the Code of Virginia ("Code"). Subdivision (c) of Code § 56-565.5 requires Dominion to submit annually to the State Corporation Commission ("Commission") plans and petitions for approval of new solar and onshore wind generation capacity ("RPS Filing"). The Commission must determine whether the RPS Filing is reasonable and prudent, given due consideration to the following factors: (i) the RPS and carbon dioxide reduction requirements in Code § 56-565.5, (ii) the generation of new renewable generation and energy storage resources within the Commonwealth, and associated economic development, and (iii) savings anticipated to be achieved by the RPS.

On October 3, 2023, Dominion submitted its annual RPS Filing to the Commission ("2023 RPS Filing" or "Petition"). The 2023 RPS Filing requests the Commission:

- Approve the Company's annual plan for the development of new solar, onshore wind, and energy storage resources ("RPS Development Plan") in connection with the mandatory RPS Program pursuant to Code § 56-565.5; and
- Grant certification of public convenience and necessity ("CPCNM") and approval to construct (i) solar and onshore wind utility-scale projects totaling approximately 320 megawatts ("MW") of solar capacity to Code § 56-562.0; (ii) approval to recover through the Rider CE rate adjustment clause the costs of (iv) the utility-scale solar projects, totaling approximately 334 MW, and related interconnection facilities, related interconnection facilities ("CE-4 Projects"), and (v) one distributed solar project, totaling approximately 3 MW, and related interconnection facilities ("CE-4 Distributed Solar Project"), pursuant to Code § 56-508.1 A, B; (iii) approve an update to Rider CE for recovery of costs associated with the previously approved CE-1, CE-2, and CE-3 projects, the CE-2 and CE-3 distributed solar project, and related interconnection facilities;
- Make a prudence determination for the Company to enter into 13 power purchase agreements ("PPAs") for solar resources, totaling approximately 435 MW, collectively, "CE-4 PPAs" pursuant to Code § 56-565.1 A; (iv) approve recovery through Rider CE of the costs of the CE-4 PPAs pursuant to Code § 56-508.1 A, B; and (v) approve the Company's request to consolidate Rider CE and Rider PPA pursuant to Code § 56-565.1 A, T, resulting in: (a) the recovery of costs associated with the CE-1, CE-2, and CE-3 PPA through Rider CE, and (b) the new Rider PPA as of April 30, 2024.

**RPS Development Plan**  
Dominion states that its RPS Development Plan reports on the Company's progress toward meeting the solar, onshore wind, and energy storage development targets outlined in the VCEA and presents the Company's development plan for solar, onshore wind, and energy storage facilities through 2035. The Company's RPS Development Plan calls for additional investment in solar, onshore wind, and energy storage through 2035.

The Company also provides a consolidated bill analysis calculating the projected monthly bill through 2035 for residential, small general service, and large general service customers for each alternative rate presented in the Company's 2023 Integrated Resource Plan for Alternative Plan B. For example, the Company projects the monthly bill of a Virginia residential customer using 1,000 kilowatt hours ("kWh") per month to be \$243.20 by 2035, an increase of \$127.02 over the \$116.18 rate in 2020. On or before January 3, 2024, any person wishing to offer testimony to the Commission should file a written statement with the Commission at 1300 East Main Street, Richmond, Virginia 23219, or by telephone number that you wish the Commission to call during the hearing to receive your testimony. This information may be provided to the Commission in three ways: (i) by filing a bill of materials with the Commission;

Further, the Company also presents its 2023 RPS Program Compliance Report in the Petition, certifying compliance with the RPS Program for compliance year 2022.

**CE-4 Projects**  
Dominion seeks CPCNM and approval to construct or acquire and operate four utility scale projects totaling approximately 320 MW of solar. In addition to these four projects, Dominion intends to acquire and operate one additional CE-4 Project, a one MW utility facility ("Proposed") however, the Company asserts that, consistent with the Commission's prior determination that projects of the MW or less do not require a CPCNM, and Rule 19 of the Commission's Filing Requirements in Support of Applications for Authority to Construct and Operate an Electric Generating Facility, Proposed does not require a CPCNM.

The names, size, location, interconnection and projected commercial operation date ("COO") for each of the CE-4 Projects is provided below:

Project	Size (MW)	Locality	Interconnection	COO
Station	37	Frederick County	Transmission	2028
East Ridge	95	Phillypotts County	Transmission	2028
Bookers Hill	127	Richmond County	Transmission	2024
Melrose	58	Richmond County	Transmission	2026
Proposed	5	Harrods County	Distribution	2024

The Company asserts that the CE-4 Projects are needed to comply with the VCEA and to serve customers' capacity and energy needs. According to the Company, the total estimated costs for the CE-4 Projects are approximately \$52.8 million, excluding financing costs, or approximately \$2,502 per kilowatt ("kW") at the total 334 MW (nominal) rating.

**Rider CE**  
In this proceeding, Dominion makes four requests related to Rider CE. First, the Company seeks to recover the costs of the recovery of costs associated with the CE-1, CE-2, and CE-3 projects, the CE-2 and CE-3 distributed solar projects, and related interconnection facilities, which have previously been approved by the Commission.

Second, Dominion requests recovery through Rider CE of the costs of the CE-4 Projects and CE-4 Distributed Solar Project, as well as the related interconnection facilities. The CE-4 Projects and CE-4 Distributed Solar Project are approximately 337 MW of capacity of one distributed solar project totaling approximately 3 MW and related interconnection facilities.

The Company asserts that the CE-4 Distributed Solar Project is needed to comply with the VCEA and to serve customers' capacity and energy needs. According to the Company, the total estimated costs for the CE-4 Distributed Solar Project are approximately \$10.3 million, excluding financing costs, or approximately \$3,642 per kW at the total 3 MW (nominal) rating.

Third, the Company seeks to consolidate Rider CE and Rider PPA. Rider PPA was approved by the Commission pursuant to Code § 56-565.1 A for the recovery of costs associated with the CE-1, CE-2, and CE-3 PPA. The Company asserts that the consolidation of Rider CE and Rider PPA is in the interest of judicial economy because the Commission already considers the prudence of PPA in the annual RPS Filing proceedings, and the consolidation would allow the Commission to consider associated cost recovery issues in one proceeding. Also, a consolidation would result in the recovery of costs associated with the previously approved CE-1, CE-2, and CE-3 PPA through Rider CE. Consolidation would also result in the end of Rider PPA as of April 30, 2024.

Fourth, the Company seeks to recover the costs of the CE-4 PPA through Rider CE. Dominion seeks the Commission to approve revised Rider CE for the rate year beginning May 1, 2024, and ending April 30, 2025 ("Rate Year"). The Company is requesting a solar revenue requirement of \$138,578,496 in Rider CE for the Rate Year. If the proposed total revenue requirement for the Rate Year is approved, the impact on customer bills would depend on the customer's rate schedule and usage. According to Dominion, implementation of its revised Rider CE on May 1, 2024, would increase the monthly bill of a residential customer using 1,000 kWh per month by approximately \$1.54 when compared to the consistent total residential rates in the current Rider CE and Rider PPA.

**CE-4 PPA**  
In its 2023 RPS Filing, Dominion also seeks a prudence determination for the CE-4 PPA. The CE-4 PPA consists of: (i) eight PPAs for utility-scale solar generating facilities totaling approximately 420 MW and (ii) the PPA for distributed solar generating facilities totaling approximately 3 MW. Dominion asserts that the CE-4 PPA is needed to comply with the VCEA and to serve customers' capacity and energy needs. As noted above, the Company seeks approval to recover the costs of the CE-4 PPA through Rider CE. In addition to the costs of the CE-1, CE-2 and CE-3 PPA previously approved by the Commission.

Interested parties are encouraged to review Dominion's Petition and supporting documents in full for details about these and other proposals.

**TAKE NOTICE** that the Commission may appoint reviewers among customer classes and/or design rates in a manner differing from that shown in the Petition and supporting documents and thus may adopt rates that differ from those appearing in the Company's Petition and supporting documents.

The Commission entered an Order for Notice and Hearing in this proceeding that, among other things, scheduled public hearings on Dominion's Petition. A hearing for the recovery of testimony from public witnesses on the Company's Petition shall be conducted telephonically at 10 a.m. on January 10, 2024, or on before January 3, 2024, any person wishing to offer testimony to a public witness shall provide to the Commission (a) your name, and (b) the telephone number that you wish the Commission to call during the hearing to receive your testimony. This information may be provided to the Commission in three ways: (i) by filing a bill of materials with the Commission;

“For Alternative Plan B... the Company projects the monthly bill of a Virginia residential customer using 1,000 kilowatt hours (“kWh”) per month to be \$243.20 by 2035, an increase of \$127.02 over the May 1, 2020 level...”

- Dominion legal notice Oct. 25, 2023

“For Alternative Plan B... the Company projects the monthly bill of a Virginia residential customer using 1,000 kilowatt hours (“kWh”) per month to be \$243.20 by 2035, **an increase of \$127.02** over the May 1, 2020 level...”

- Dominion legal notice Oct. 25, 2023

That’s a 100% increase by 2035!

LEGAL NOTICES

ADVERTISEMENT

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NOTICE TO THE PUBLIC OF RENEWABLE PORTFOLIO STANDARD (RPS) FILING BY VIRGINIA ELECTRIC AND POWER COMPANY D/B/A DOMINION ENERGY VIRGINIA CASE NO. PUR-2023-00142

Virginia Electric and Power Company (the Dominion Energy Virginia (“Dominion”) has submitted a 2023 Renewable Portfolio Standard (“RPS”) filing (“2023 RPS Filing”) to the 2023 RPS Filings subcommittee (“RPS Development Plan”) for approval or denial. The RPS Development Plan will be approved or denied on or before the date set forth in the RPS Development Plan. The RPS Development Plan will be approved or denied on or before the date set forth in the RPS Development Plan. The RPS Development Plan will be approved or denied on or before the date set forth in the RPS Development Plan.

During its 2023 Session, the Virginia General Assembly enacted Chapters 900 (HB 1526) and 910A (SB 65) of the 2023 Virginia Acts of Assembly. These legislative Acts of Assembly, known as the Virginia Clean Economy Act (“VCEA”), became effective on July 1, 2023. The VCEA, inter alia, establishes a mandatory renewable energy portfolio standard (“RPS”) program (“RPS Program”) for Virginia Electric and Power Company (“Dominion”) or “Company”) in § 56-565.5 of the Code of Virginia (“Code”). Subsection (b) of Code § 56-565.5 requires Dominion to submit annually to the State Commission on “Commission”) plans and petitions for approval of new solar and energy wind generation capacity (“RPS Filing”). The Commission shall determine whether the RPS Filing is reasonable and prudent, given due consideration to the following factors: (i) the RPS and carbon dioxide reduction requirements in Code § 56-565.5; (ii) the generation of new renewable generation and energy storage resources within the Commonwealth; and associated economic development; and (iii) savings projected to be achieved by the RPS.

On October 3, 2023, Dominion submitted its annual RPS Filing to the Commission (“2023 RPS Filing” or “Filing”). The 2023 RPS Filing requests the Commission:

- (i) Approve the Company’s annual plan for the development of new solar, onshore wind, and energy storage resources (“RPS Development Plan”) in connection with the mandatory RPS Program pursuant to Code § 56-565.5;
- (ii) Approve to recover through the Rider CE rate adjustment clause the costs of (a) five utility-scale solar projects, totaling approximately 334 MW, and related interconnection facilities (collectively, “CE-4 Projects”); and (b) one distributed solar project, totaling approximately 3 MW, and related interconnection facilities (“CE-4 Distributed Solar Project”), pursuant to Code § 56-565.1A.5;
- (iii) Approve an update to Rider CE for recovery of costs associated with the previously approved CE-1, CE-2, and CE-3 projects, the CE-2 and CE-3 distributed solar projects, and related interconnection facilities;
- (iv) Make a prudence determination for the Company to enter into 13 power purchase agreements (“PPAs”) for solar resources, totaling approximately 425 MW, (collectively, “CE-4 PPAs”) pursuant to Code § 56-565.1A;
- (v) Approve recovery through Rider CE of the costs of the CE-4 PPAs pursuant to Code § 56-565.1A.5; and
- (vi) Approve the Company’s request to consolidate Rider CE and Rider PPA pursuant to Code § 56-565.1A.7, resulting in: (a) the recovery of costs associated with the CE-1, CE-2, and CE-3 PPA through Rider CE; and (b) the removal of Rider PPA as of April 30, 2024.

**RPS Development Plan**  
Dominion states that its RPS Development Plan reports on the Company’s progress toward meeting the solar, onshore wind, and energy storage development targets outlined in the VCEA and presents the Company’s development plan for solar, onshore wind, and energy storage facilities through 2035. The Company’s RPS Development Plan calls for additional investment in solar, onshore wind, and energy storage through 2035.

The Company also provides a consolidated bill analysis calculating the projected monthly bill through 2035 for residential, small general service, and large general service customers for each alternative plan presented in the Company’s 2023 RPS Development Plan for Alternative Plan B. For example, the Company projects the monthly bill of a Virginia residential customer using 1,000 kilowatt hours (“kWh”) per month to be \$243.20 by 2035, an increase of \$127.02 over the May 1, 2020 level. The Company’s RPS Development Plan also includes the Commission’s Case No. PUR-2023-00134. The Company’s bill projections are not final and all customer rates are subject to regulatory approval.

Further, the Company also presents its 2023 RPS Program Compliance Report in the Petition, certifying compliance with the RPS Program for compliance year 2022.

**CE-4 Projects**  
Dominion seeks CPNs and approval to construct or acquire and operate four utility scale projects totaling approximately 334 MW of solar. In addition to these four projects, Dominion intends to acquire and operate one additional CE-4 Project, a one MW solar facility (“Proposed”) however, the Company asserts that, consistent with the Commission’s prior determination that projects of the MW or less do not require a CPN, and Rule 19 of the Commission’s Filing Requirements in Support of Applications for Authority to Construct and Operate an Electric Generating Facility, Proposed does not require a CPN.

The name, size, location, interconnection and projected commercial operation date (“COO”) for each of the CE-4 Projects is provided below:

Project	Size (MW)	Locality	Interconnection	COO
Station	37	Stafford County	Transmission	2028
East Ridge	95	Prince George County	Transmission	2028
Bookers Hill	127	Richmond County	Transmission	2024
Melrose	98	Stafford County	Transmission	2026
Proposed	5	Henrico County	Distribution	2024

The Company asserts that the CE-4 Projects are needed to comply with the VCEA and to serve customers’ capacity and energy needs. According to the Company, the total estimated costs for the CE-4 Projects are approximately \$55.8 million, excluding financing costs, or approximately \$2.92 per kilowatt (“kW”) at the total 334 MW (nominal) rating.

**Rider CE**  
In this proceeding, Dominion makes four requests related to Rider CE. First, the Company seeks to update Rider CE to the recovery of costs associated with the CE-1, CE-2, and CE-3 projects, and CE-4 distributed solar projects, and related interconnection facilities, which have previously been approved by the Commission.

Second, Dominion requests recovery through Rider CE of the costs of the CE-4 Projects and CE-4 Distributed Solar Project, as well as the related interconnection facilities. The CE-4 Projects and CE-4 Distributed Solar Project are needed to comply with the VCEA and to serve customers’ capacity and energy needs. According to the Company, the total estimated costs for the CE-4 Distributed Solar Project are approximately \$10.3 million, excluding financing costs, or approximately \$3,642 per kW at the total 3 MW (nominal) rating.

Third, the Company seeks to consolidate Rider CE and Rider PPA. Rider PPA was approved by the Commission pursuant to Code § 56-565.1A.5 for the recovery of costs associated with the CE-1, CE-2, and CE-3 PPAs. The Company asserts that the consolidation of Rider CE and Rider PPA is in the interest of judicial economy because the Commission already considers the prudence of PPAs in the annual RPS Filing proceedings, and the consolidation would allow the Commission to consider associated cost recovery mechanisms. Such a consolidation would result in the recovery of costs associated with the previously approved CE-1, CE-2, and CE-3 PPAs through Rider CE. Consolidation would also result in the end of Rider PPA as of April 30, 2024.

Fourth, the Company seeks to recover the costs of the CE-4 PPAs through Rider CE. Dominion seeks the Commission to approve revised Rider CE for the rate year beginning May 1, 2024, and ending April 30, 2025 (“Rate Year”). The Company is requesting a solar resource requirement of \$138,578,496 in Rider CE for the Rate Year. If the proposed total resource requirement for the Rate Year is approved, the impact on customer bills would depend on the customer’s bill schedule and usage. According to Dominion, implementation of the revised Rider CE on May 1, 2024, would increase the monthly bill of a residential customer using 1,000 kWh per month by approximately \$1.54 when compared to the consistent total residential rates in the current Rider CE and Rider PPA.

**CE-4 PPAs**  
In its 2023 RPS Filing, Dominion also seeks a prudence determination for the CE-4 PPAs. The CE-4 PPAs consist of: (i) eight PPAs for utility-scale solar generating facilities totaling approximately 425 MW and (ii) the PPA for distributed solar generating facilities totaling approximately 3 MW. Dominion asserts that the CE-4 PPAs are needed to comply with the VCEA and to serve customers’ capacity and energy needs. As noted above, the Company seeks approval to recover the costs of the CE-4 PPAs through Rider CE. In addition to the costs of the CE-1, CE-2 and CE-3 PPAs previously approved by the Commission.

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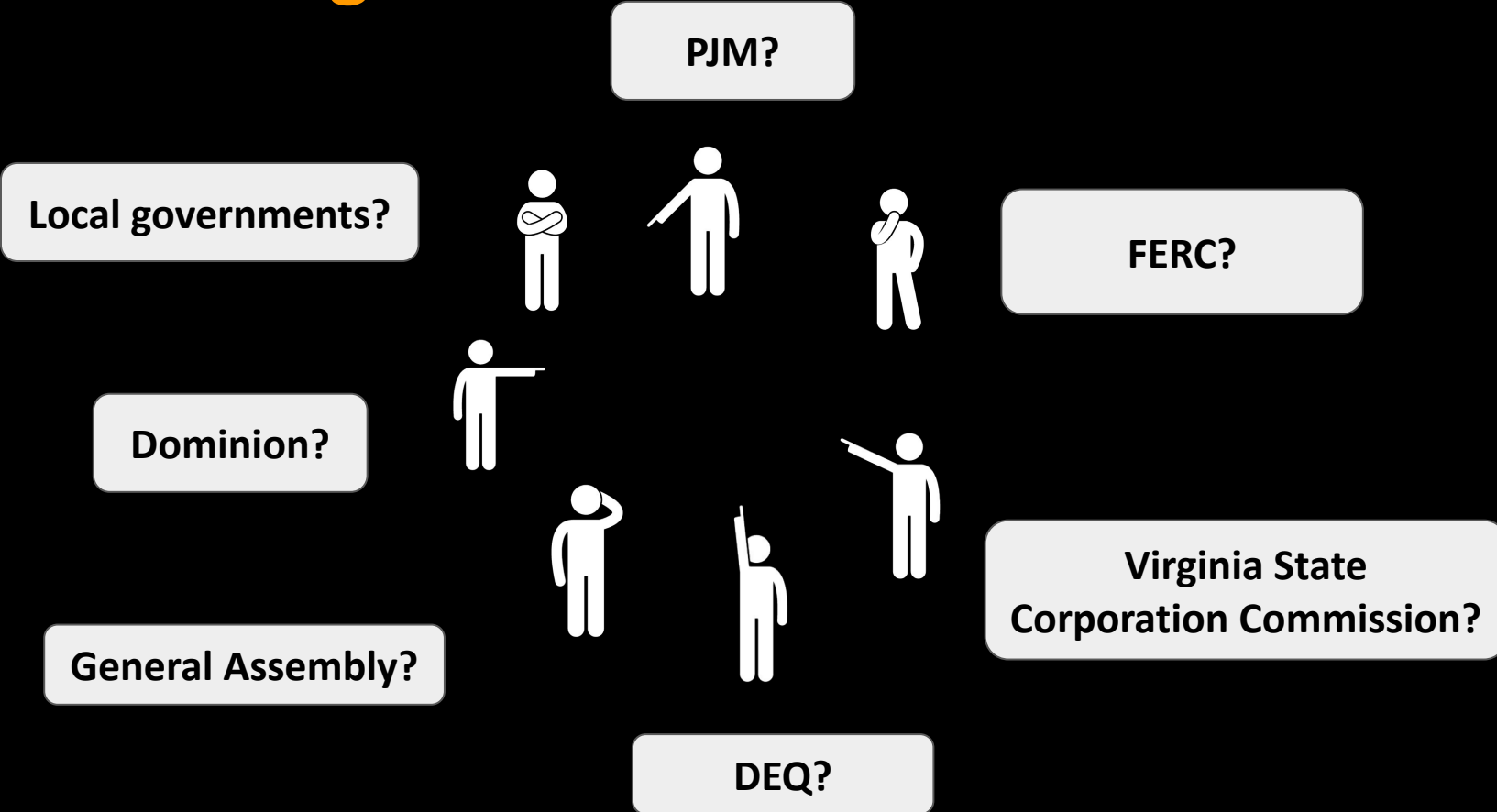
**HEARING NOTICE** The Commission may approve revisions among customer classes and/or design rates in a manner differing from that shown in the Petition and supporting documents and may adopt rates that differ from those appearing in the Company’s Petition and supporting documents.

The Commission entered an Order for Notice and Hearing in this proceeding that, among other things, scheduled public hearings on Dominion’s Petition. A hearing for the review of testimony from public witnesses on the Company’s Petition shall be conducted telephonically at 11 a.m. on January 15, 2024, or before January 15, 2024, any person wishing to offer testimony as a public witness shall provide to the Commission (a) their name, and (b) the telephone number to which the Commission is to call during the hearing to receive your testimony. This information may be provided to the Commission in three ways: (i) by filing said form on the Commission’s

**What's happening in Virginia is **unprecedented.****

**We don't have all the answers, but we know what's happening is important and we know it **matters immensely to the future of Virginia.****

# Who is in charge?





# Who is in charge?

## Local governments?

We need the revenue! Regional impacts are the state's problem!

## Electric Utility?

We have an obligation to serve any customer that requests power.

## General Assembly?

Approving land uses is the purview of localities, not the state.

## PJM?

We just operate a competitive market and ensure reliability!

## FERC?

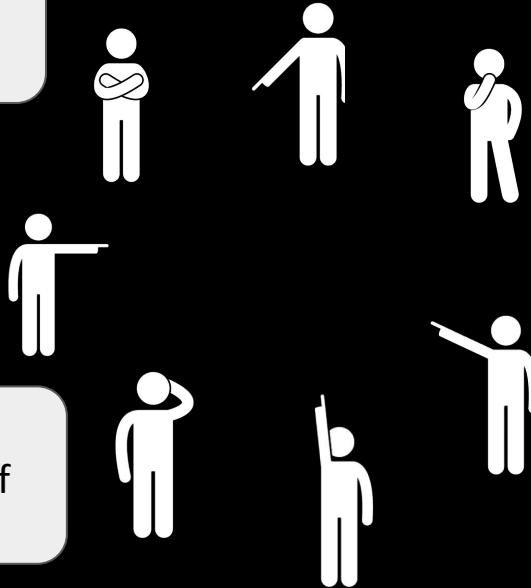
This is Virginia's issue, we just regulate interstate transmission.

## Virginia State Corporation Commission?

We regulate the utilities within the guidance set forth in the Virginia Code.

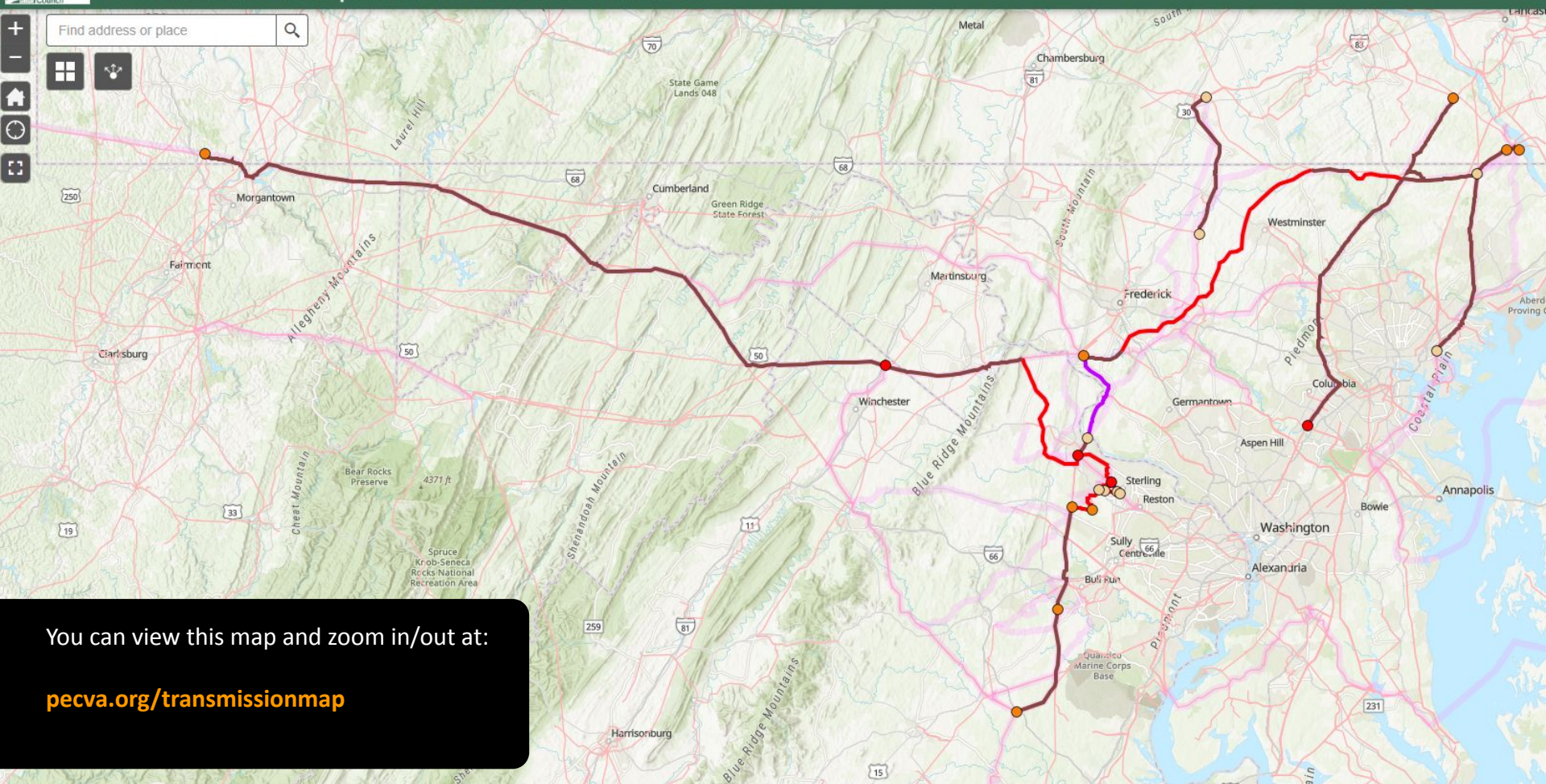
## DEQ?

We evaluate permits individually and have no framework for evaluating cumulative impacts.



**Virginia cannot continue** down this path.

What's happening in Loudoun?



You can view this map and zoom in/out at:

[pecva.org/transmissionmap](https://pecva.org/transmissionmap)

# Who?



And

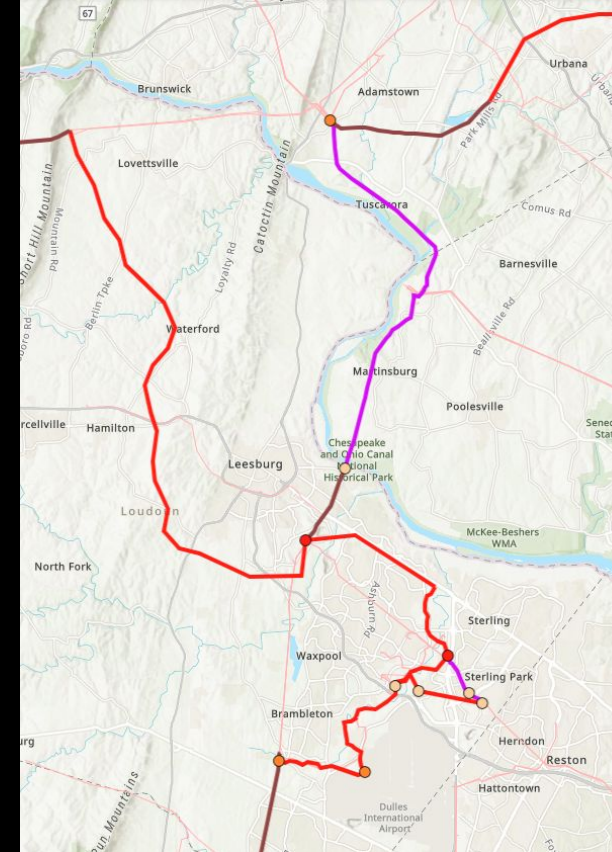


# What?



- Single 500 kV overhead in west
- A 500/230 kV overhead in the east
- Likely 115-165 foot wide right of way
- Likely 100-200 feet in height

# Where?





500 kV transmission line



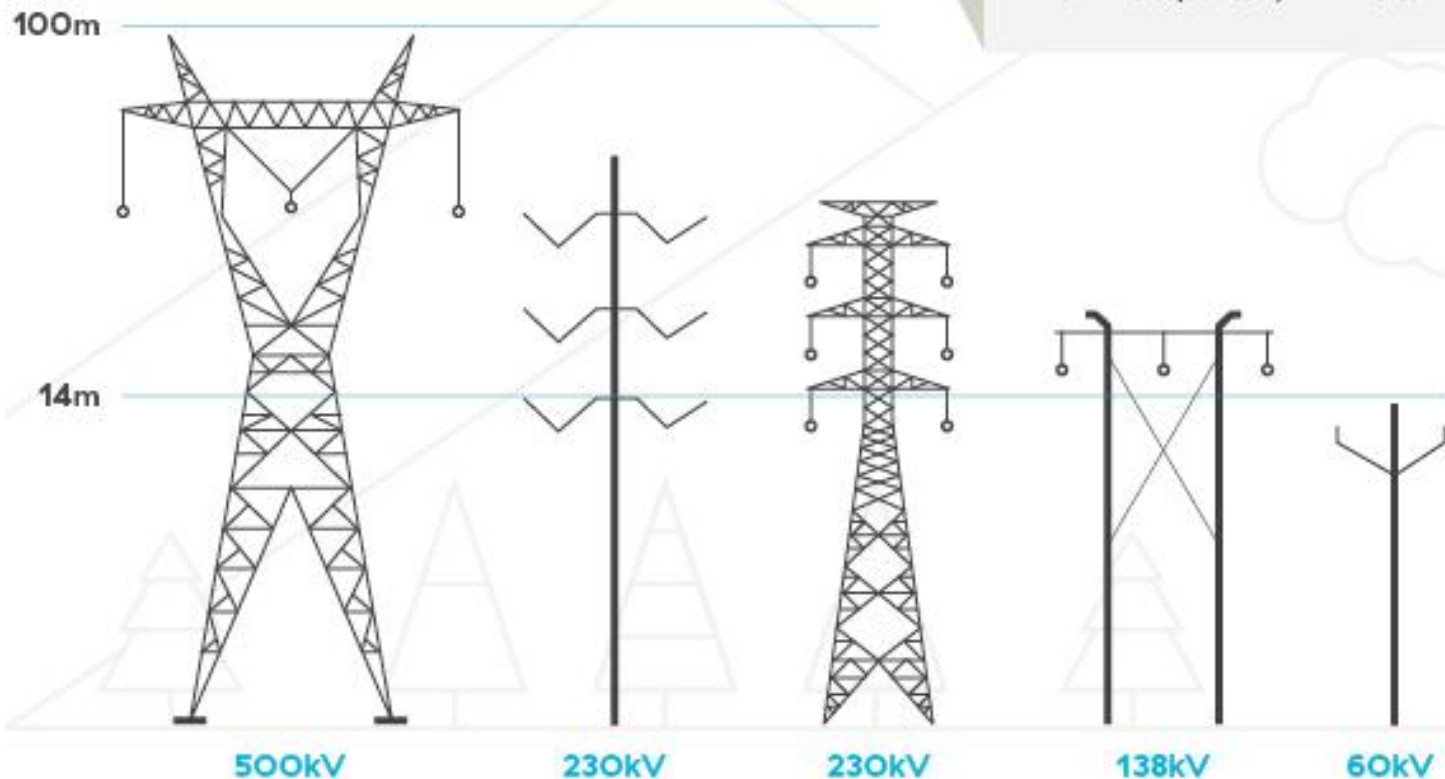
230 kV transmission line

## Transmission lines

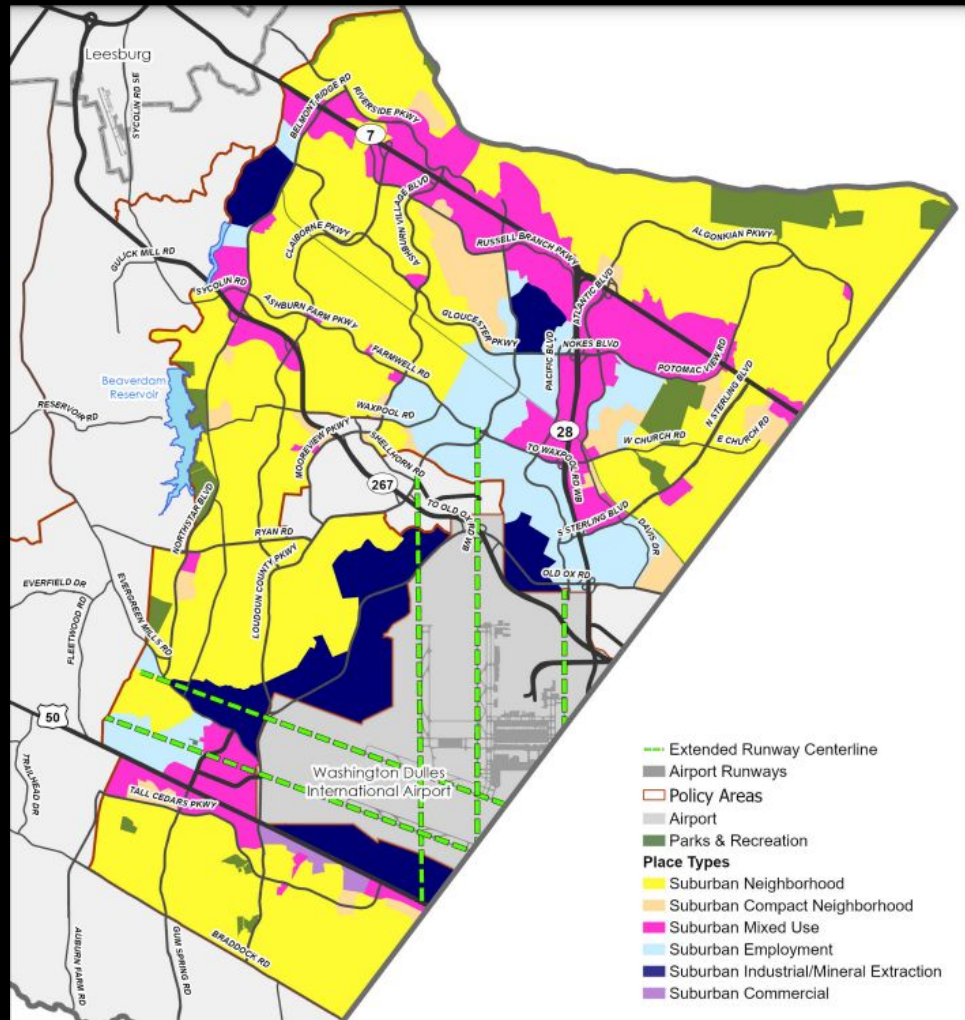
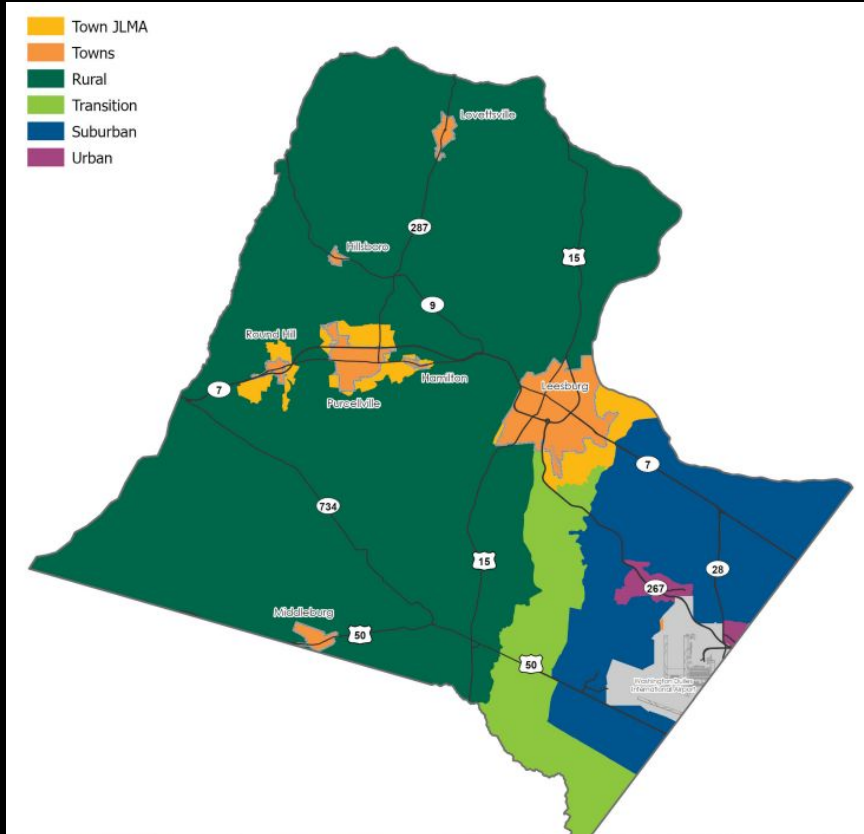
Transmission lines are the big, high voltage power lines that bring electricity from where it's made at our generating stations to substations near communities across B.C.

### What's a kV?

kV stands for kilovolt, which is a unit of potential energy. One kV is equal to 1,000 volts.



# This doesn't meet Loudoun's vision in the east or the west...





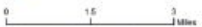
# Transmission Line Proposals to Serve Data Center Load Growth



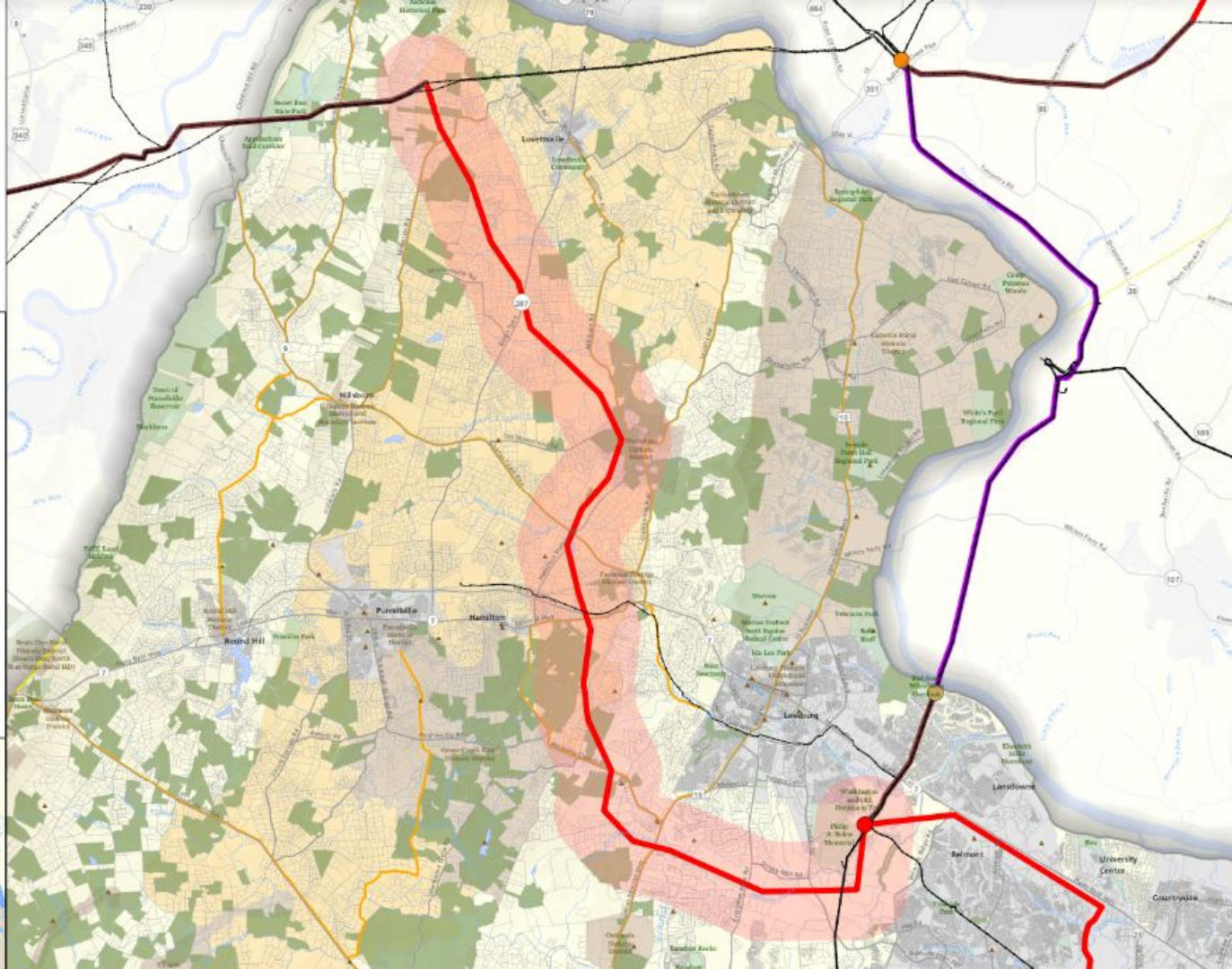
- Property Lines
- Publicly Owned
- Conservation
- Historic Districts
- Middleburg Viticultural Area
- Electric Transmission Lines
- Virginia Scenic Roads
- 1 mile buffer Proposed

PJM 2022 Window 3: Preferred Transmission and Substation Proposals

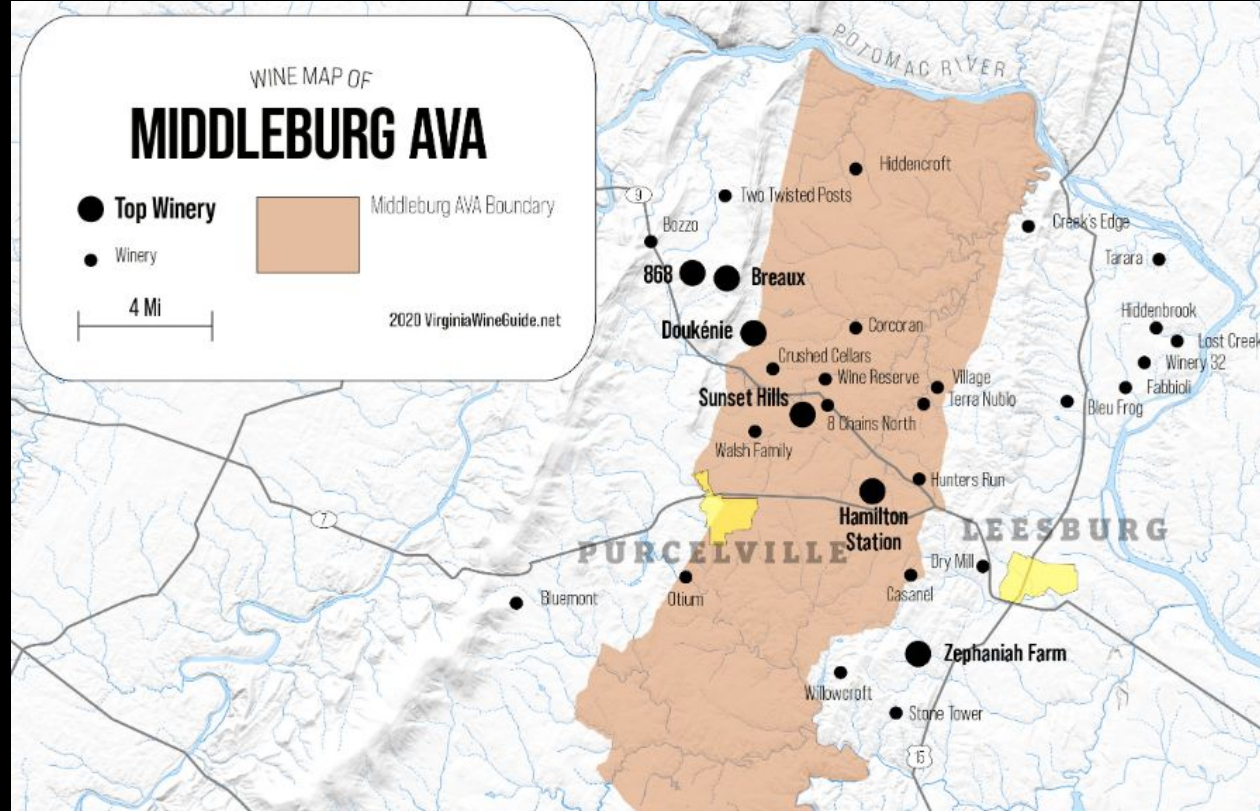
- New Transmission Line (Route to)
- Expand Existing Right of Way
- Rebuild in Existing Right of Way
- New Substation 500 kV
- Upgrade Substation 500 kV
- Upgrade Substation 230 kV



## Are of Detail



# Agriculture and tourism are incredibly important parts of Loudoun's **local economy**

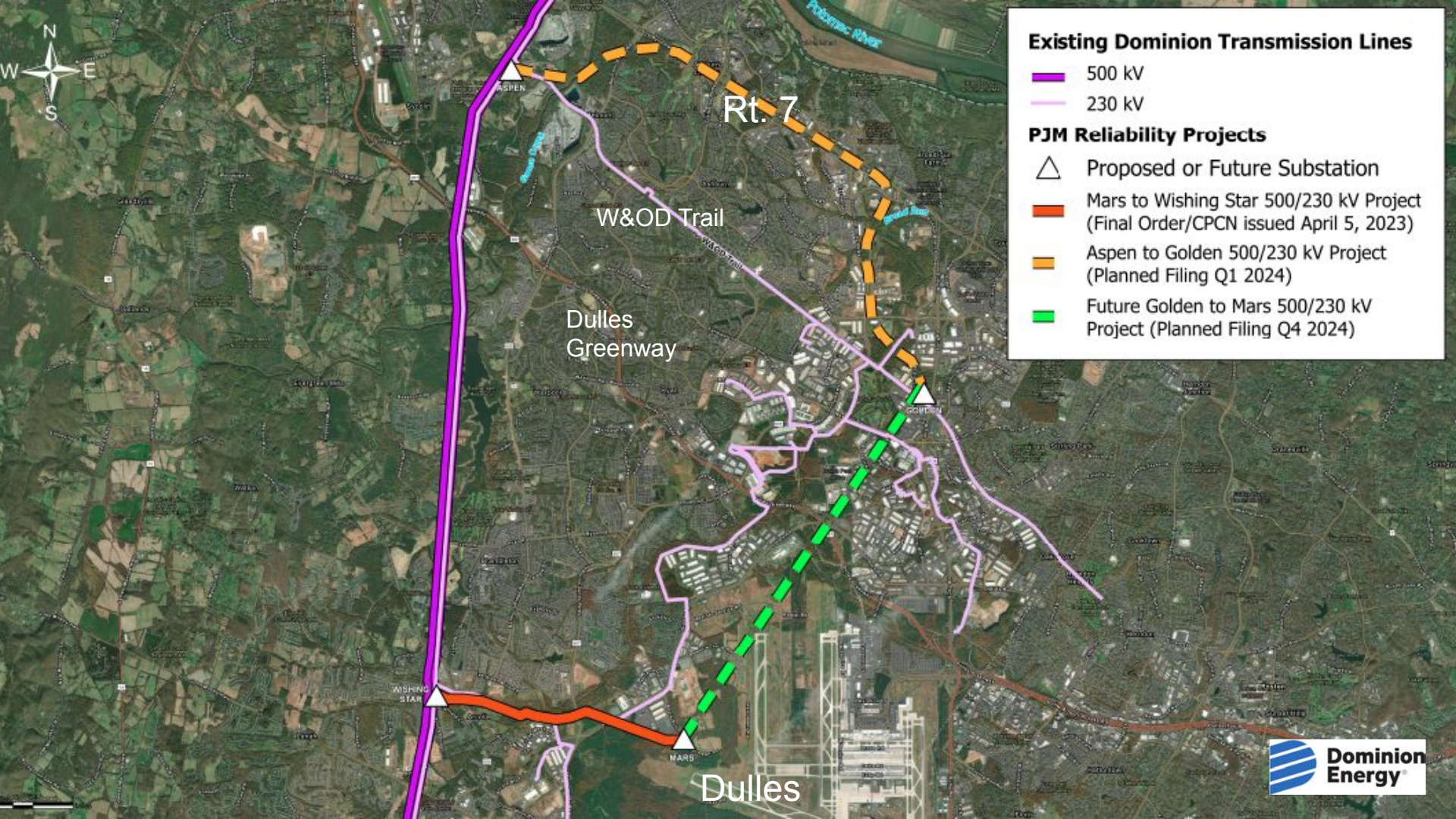


# Loudoun County 1st in Virginia for Visitor Revenue

- **\$3 Billion Annual Tourist Spending**
- **65% of visitors surveyed ranked wineries as their #1 destination**
- **Citing the “beautiful landscapes, open spaces, and scenery”**

## 2022 Census of Agriculture Data

<b>Number of Farms</b>	<b>+73</b>
<b>Acres in Farming</b>	<b>-11,722</b>
<b>#1 in Virginia</b>	<b>#2 Virginia</b>
<b>Honey Production Cut Flower Sales Equine Farms # of Horses</b>	<b>Alpacas/Llamas Goat Farms Christmas trees Grape Production</b>
<b>Young Farmers Veteran owned/run Asian owned/run</b>	<b>Women owned Operations</b>



**Existing Dominion Transmission Lines**

- 500 kV
- 230 kV

**PJM Reliability Projects**

- Proposed or Future Substation
- Mars to Wishing Star 500/230 kV Project (Final Order/CPCN issued April 5, 2023)
- Aspen to Golden 500/230 kV Project (Planned Filing Q1 2024)
- Future Golden to Mars 500/230 kV Project (Planned Filing Q4 2024)



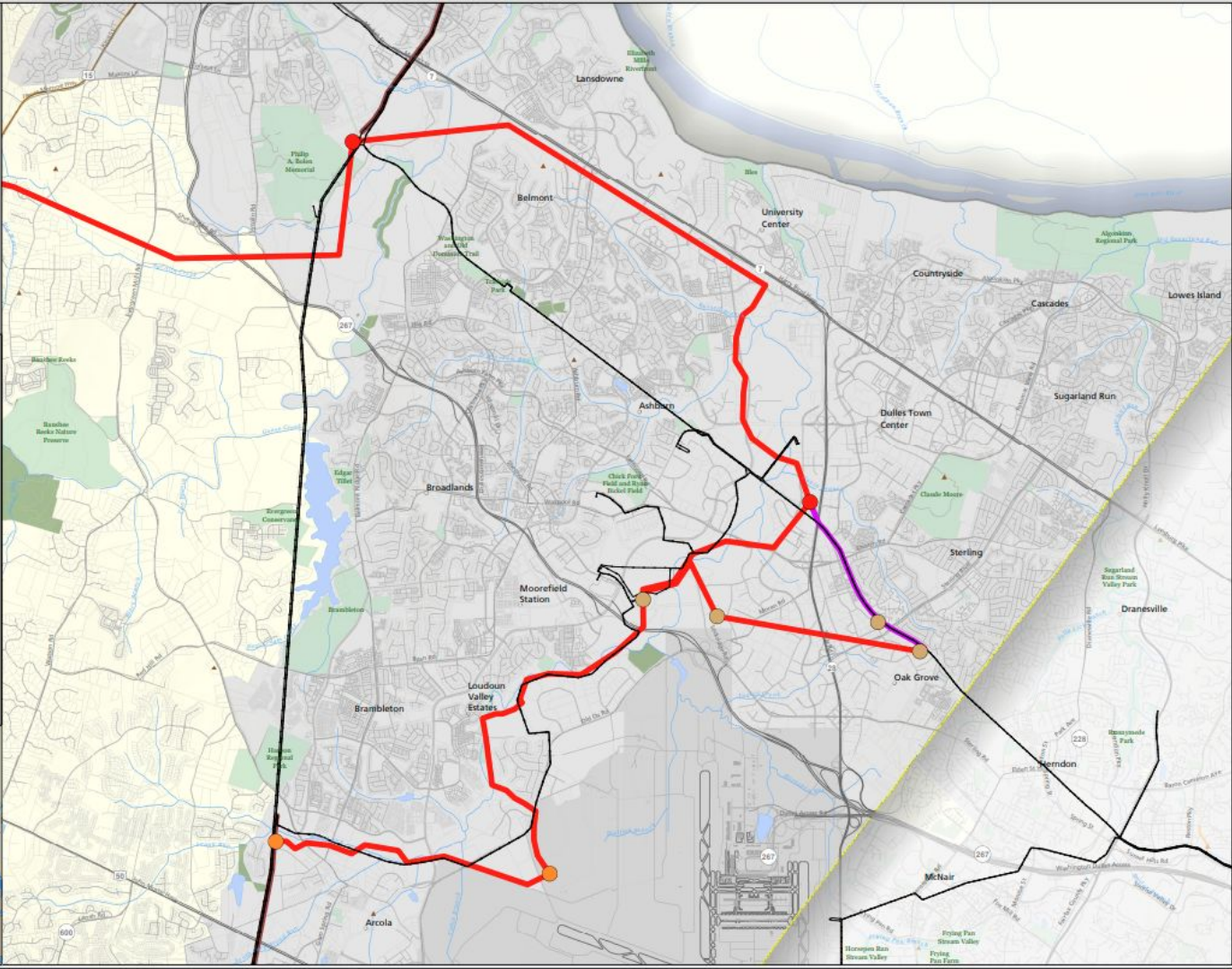
# Transmission Line Proposals to Serve Data Center Load Growth



- Electric Transmission Lines
- Property Lines
- Publicly Owned Land
- Conservation Easements

PJM 2022 Window 3: Preferred Transmission and Substation Proposals (from 10/31/23)

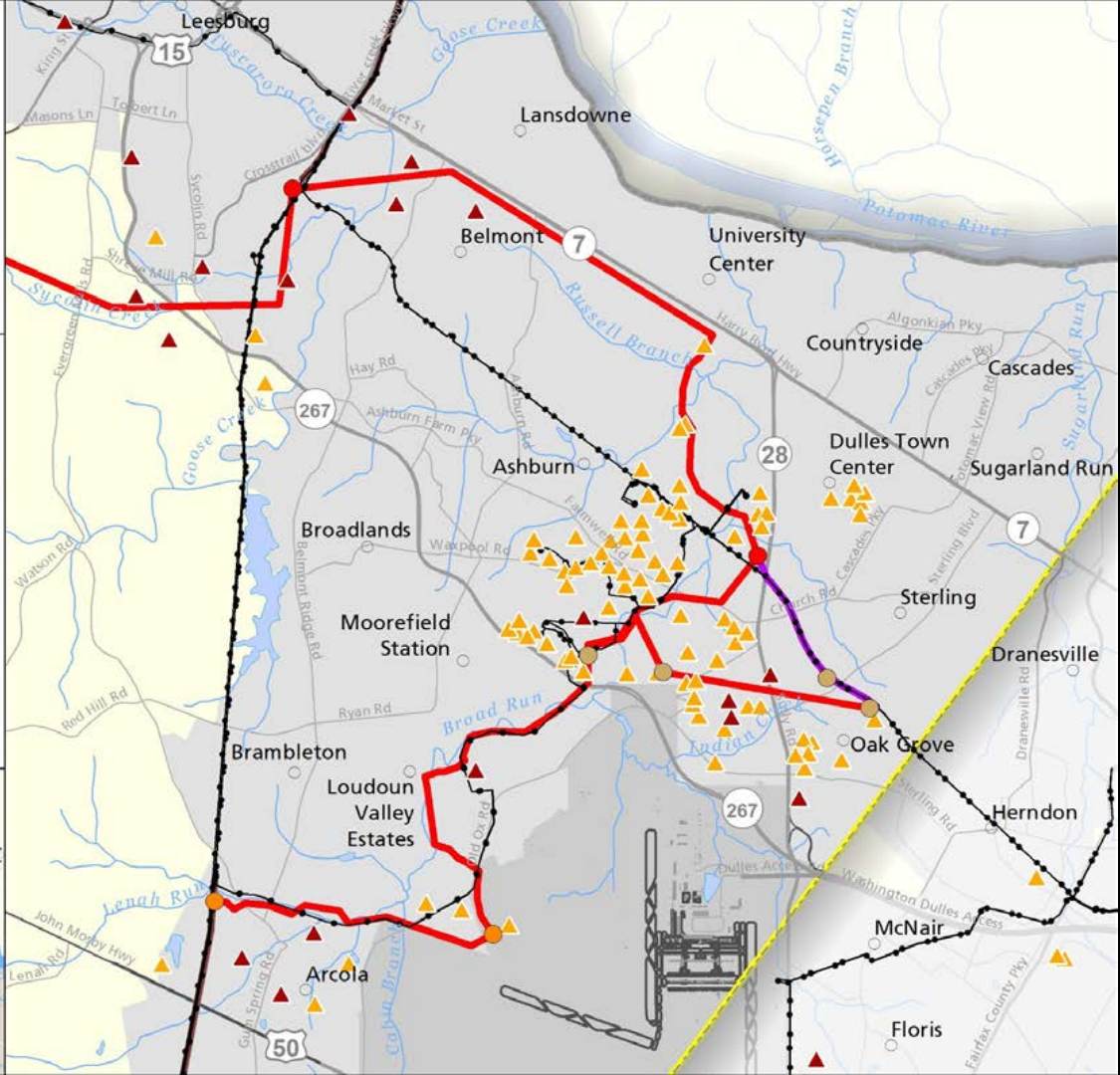
- New Transmission Line (Route to be determined by utility)
- Expand Existing Right of Way
- Rebuild in Existing Right of Way
- New Substation 500 kV
- Upgrade Substation 500 kV
- Upgrade Substation 230 kV



# Transmission Line Proposals to Serve Data Center Load Growth



- New Substation 500 kV
  - Upgrade Substation 500 kV
  - Upgrade Substation 230 kV
  - ▲ Future Data Centers
  - ▲ Existing Data Centers
  - Electric Transmission Lines
- PJM 2022 Window 3: Preferred Transmission and Substation Proposals (from 10/21/23)
- New Transmission Line (Route to be determined by utility)
  - Expand Existing Right of Way
  - Rebuild in Existing Right of Way
- 0 1 2 Miles

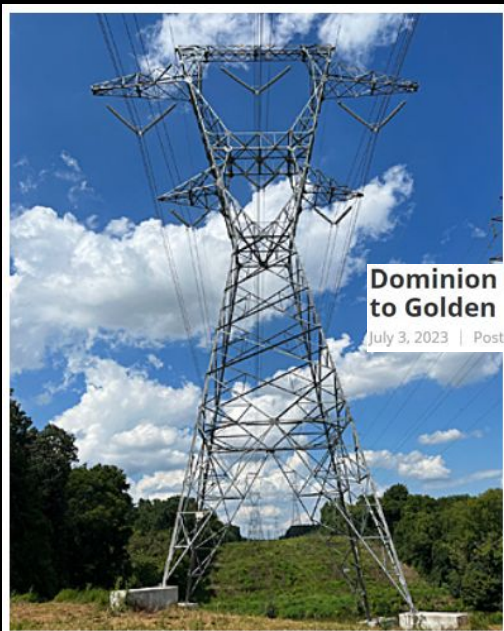


# Another Beautiful Bird Walk at Sweet Run State Park

July 24, 2023 | Posted by [Sheila Ferguson](#) | [Field Trips, Wildlife News](#)

## Dominion Energy Project: Wishing Star to Mars

July 1, 2023 | Posted by [Sheila Ferguson](#) | [Action Alerts/Advocacy](#)



500 kV transmission lines and towers similar to those proposed



## Dominion Energy Projects: Twin Creeks to Apollo and Aspen to Golden

July 3, 2023 | Posted by [Sheila Ferguson](#) | [Action Alerts/Advocacy, Wildlife](#)

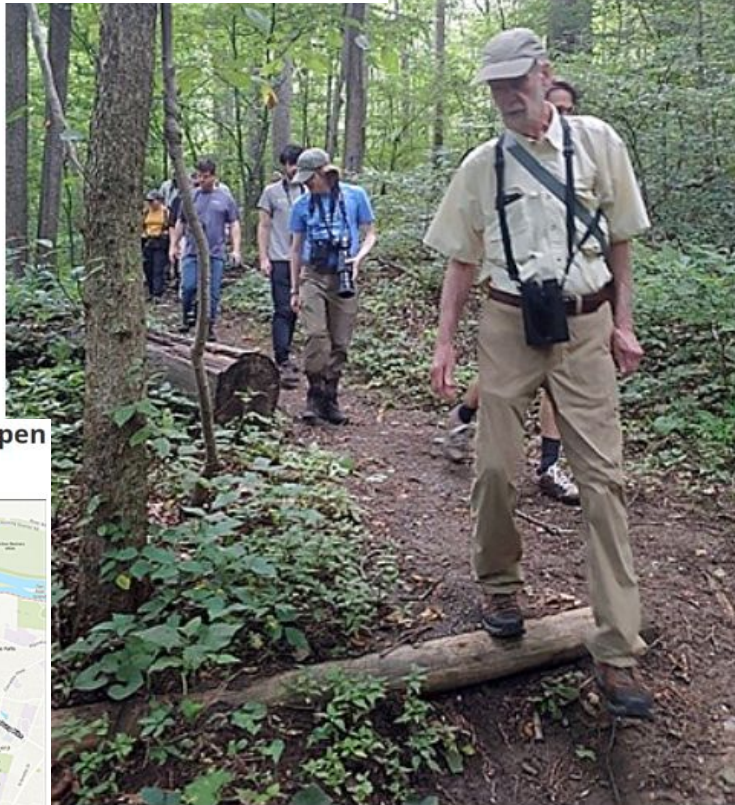
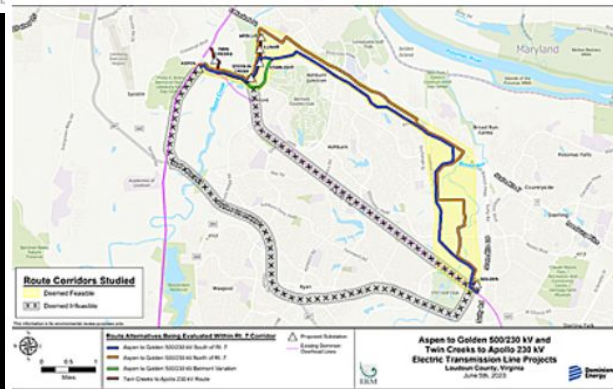


Photo by Scott Harris

# Importance of **Planning**



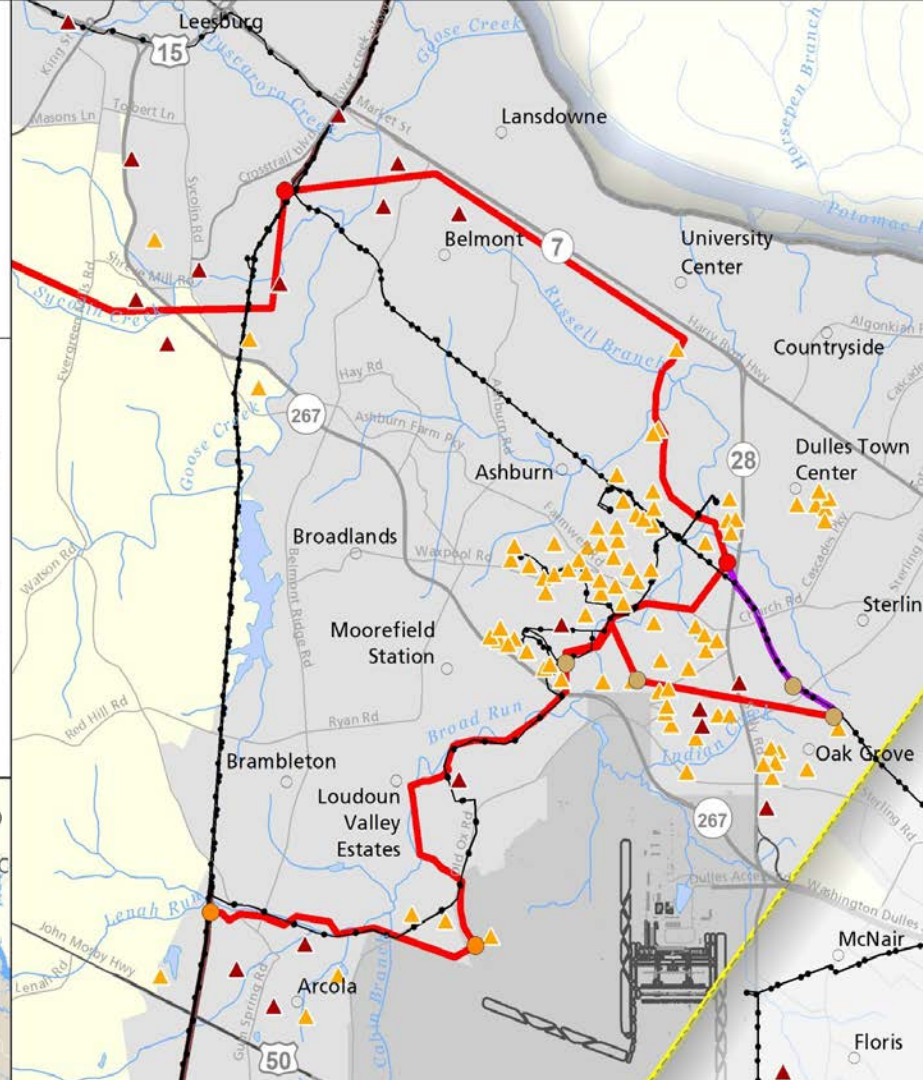
Ashburn, Va



# Data Center Development Has Exploded

- 30 million sq ft in operation
- 5 million sq ft in development
- How much more? Not yet compiled, but more legislative and by-right proposals coming regularly

## Transmission Line Proposals to Serve Data Center Load Growth

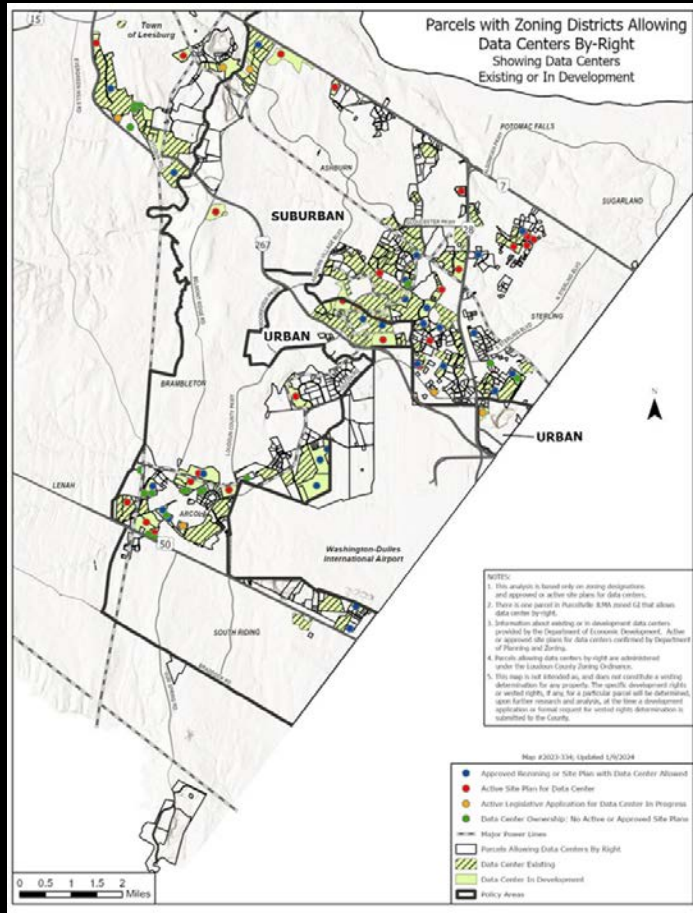
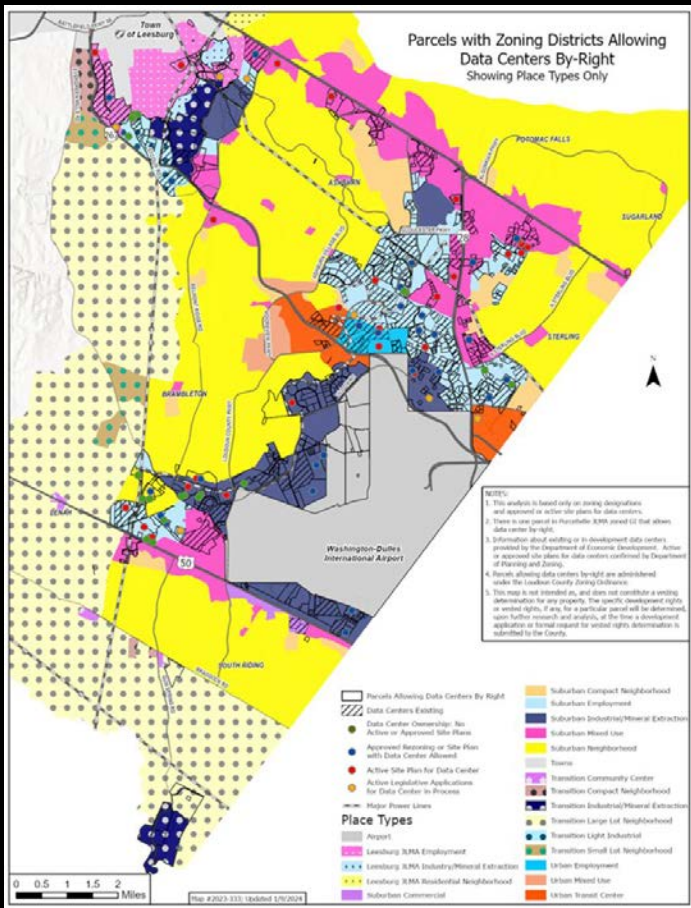


**What Can Loudoun Do to **Manage**?**

# Change Policies and Standards with Adoption by 2025

← Change Map and Location Policies

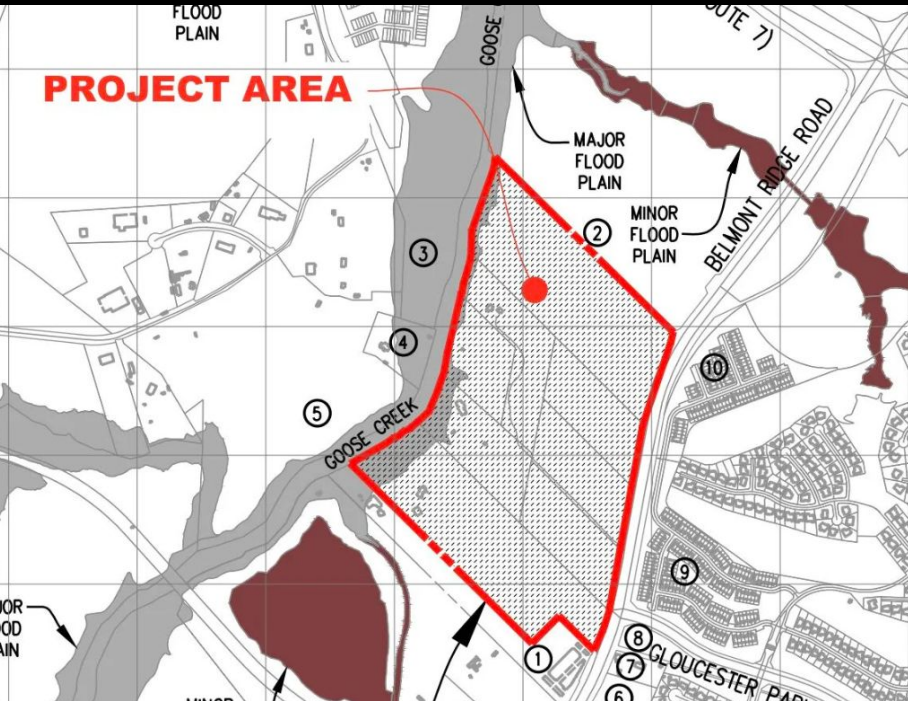
Change By-right Zoning to Special Exception →



Maps: Loudoun County Planning & Zoning

In the **Meantime...**

# Data Center Apps Keep Coming: It's **Time to Pause** Approvals



Map submitted with application

Belmont Innovation Campus  
600 MW demand



Panda/Stonewall Power Plant  
Max output 778 MW

## In Addition...

- Limit additional fiscal dependency to avoid future risk
- Eliminate “available incentives including an exemption from the 6 percent sales and use tax for servers, generators, chillers and server-related equipment.” (source: county website)
- Act on the Board Member Initiative to eliminate the Fast Track option



## In Addition...

- Adopt out of the box solutions and demand more from data centers to:
  - Reduce ground-level impacts on community
  - Increase sustainability standards
  - Require space for substations onsite & higher design standards adjacent to residential
- Ask for help from the General Assembly
- Develop partnerships to tackle problems



# In summary:

- Explosive growth of data centers requires massive amounts of energy and energy infrastructure
- Burden of air, water, grid, and community impacts is falling on communities
- Threatening Virginia's clean energy future, the environment and our communities
- Costs of infrastructure are borne unfairly by existing ratepayers





# What needs to happen?

- **Better planning and monitoring**  
regional/state plan that guides development and monitors impacts
- **Greater transparency**  
clear information made available about energy demands, water use, cost of infrastructure on a project and cumulative basis, etc.
- **Full impacts understood**  
policies that require local government to consider the regional impacts of proposed data centers
- **Improved standards and innovation**  
better standards for sustainable construction, sustainable power, innovative solutions in the energy and data center sectors, and onsite energy efficiency
- **Industry paying their fair share**  
data center industry pays for the energy infrastructure they need, relieving the rate payers of this financial obligation
- **Mitigation**  
more robust mitigation paid for by developers to offset impacts to communities and environment



So what are we doing  
at the **state level**?

# Spreading the word and pushing for reform



# Lobbying at State Level



# Advocating for state legislative changes...

[vcnva.org/our-common-agenda/](http://vcnva.org/our-common-agenda/)

## OUR COMMON AGENDA

2023 ENVIRONMENTAL BRIEFING BOOK

a publication of Virginia Conservation Network

### MITIGATING DATA CENTER DEVELOPMENT'S IMPACTS

#### LAND USE REFORM

##### EXECUTIVE SUMMARY

Virginia is home to the largest concentration of data centers in the world, widely cited as hosting 70% of global internet traffic.<sup>1</sup> This massive industry is continuing to grow very fast, requiring huge amounts of energy, land, and water to operate, resulting in widespread community impacts. Yet, the Commonwealth does not currently have any regulatory oversight of data center development and localities continue to approve more facilities without considering the cumulative impacts. This explosive growth of data centers threatens to derail state efforts to meet climate goals, improve air and water quality, advance land conservation, and protect national and state parks.

##### CHALLENGE

Data center development in Virginia has been accelerating for years with the hub in Northern Virginia known as the largest in the world. Recently that demand has exploded throughout the state, with buildings larger than big box stores and as tall as 90 feet on sprawling campuses. Developments are now being proposed in environmentally sensitive areas next to our national, state, and local parks,<sup>2</sup> in close proximity to our rivers and streams,<sup>3</sup> and in rural areas requiring costly new electrical infrastructure.<sup>4</sup> Others are adjacent to residential neighborhoods, schools, medical facilities, and nursing homes.

##### THE GIGANTIC FOOTPRINT OF THE DATA CENTER INDUSTRY THREATENS REGIONAL POWER, LAND CONSERVATION, AND AIR & WATER QUALITY

The footprint of this industry is gigantic and threatens regional power supply, water quality, land conservation, and air quality beyond individual localities reviewing the application. A single data center building now uses between 60-90MW of power at peak demand which is more than 15,000 households<sup>5</sup>. Data centers now make up 21% of Dominion Energy Virginia's

power load<sup>7</sup> (see SURGING ENERGY DEMAND FROM DATA CENTERS, pg 105). A data center can also consume 3-5 million gallons of water a day for cooling – the equivalent of a small city's overall annual consumption.<sup>8</sup> They consume massive amounts of land as well. Digital Gateway, a proposal in Prince William County, would allow 27 million square feet of data center development which is the equivalent of about 150 Wal-Mart Supercenters. All of this impervious surface results in increased stormwater runoff and pollution.

To ensure uninterrupted 24/7 service, data center facilities have commercial-sized backup power generators and large fuel tanks on site in the case of a grid outage. According to DEQ, data centers in Loudoun County have air permits for more than 4,000 backup diesel generators<sup>9</sup> with a total rated capacity of over 11 gigawatts of power! For context, the North Anna nuclear power facility has a rated capacity of 1.8 gigawatts. If the rapid pace of data center construction continues, further straining power, these backup generators could increasingly be put to use, putting air quality and public health at risk.<sup>10</sup>

##### SOLUTION

Despite Virginia having the highest number of data centers in the world, the state lacks critical information about their impacts on our environment and energy grid. Currently, approvals are made unilaterally by localities, which have a strong tax incentive to approve proposals without considering the broader statewide impacts. A comprehensive study of the impacts on the Commonwealth's electrical grid, environment, historic and recreational resources, environmental justice concerns, and ability to meet climate goals is critically needed to protect our communities especially those residents most vulnerable to utility rate hikes, air pollution, and climate impacts.

The National Academies of Science is an independent academic institution with the

ability to lead this study and provide objective advice to inform policy as they have done on past issues such as gold mining and uranium mining. Using data from utilities, localities, and state agencies, the study would include a buildout analysis of what is in operation, approved, and planned and an evaluation of impacts on the electrical grid and ratepayers, climate goals, water consumption, water quality, air quality, land conservation, recreation, and historic preservation.

The General Assembly must also establish a process for state review, including a grid impact statement submitted to Virginia Energy for all new data center power demand requests and a regional review of impacts from new data center proposals by federal and state agencies and regional utilities. Virginia Energy review would provide oversight to ensure continued grid reliability and prevent excessively high costs falling to the ratepayers. The regional review would provide an opportunity for these entities

One of six Amazon data center buildings that sit in front of community in Loudoun County. The buildings hold a total  
Photo by Hugh Kenney, Piedmont Environmental Council



# What can **you** do?

- **Ask County and Town officials** to pause approvals and adopt stronger policies and standards
- **Reach out to state elected officials** and ask them to support data center reform legislation at state level
- **Stay informed** on both Dominion and Nextera routing processes, county planning and zoning, and state/federal opportunities to act



# What can **you** do?

- **Share information** with friends, family, contacts and neighbors.
  - Share the video
  - Forward our follow-up
  - There is lots of great info at [pecva.org/datacenters](http://pecva.org/datacenters)
- **Financially support** the local efforts and the broader campaign needed!



# A Great Example: **Power Rangers - Step Up Loudoun Project**

BOARD ROOM



## POWER RANGERS

Kavya Kumar, Sahana Kulkarni, and Rhea Bhadange

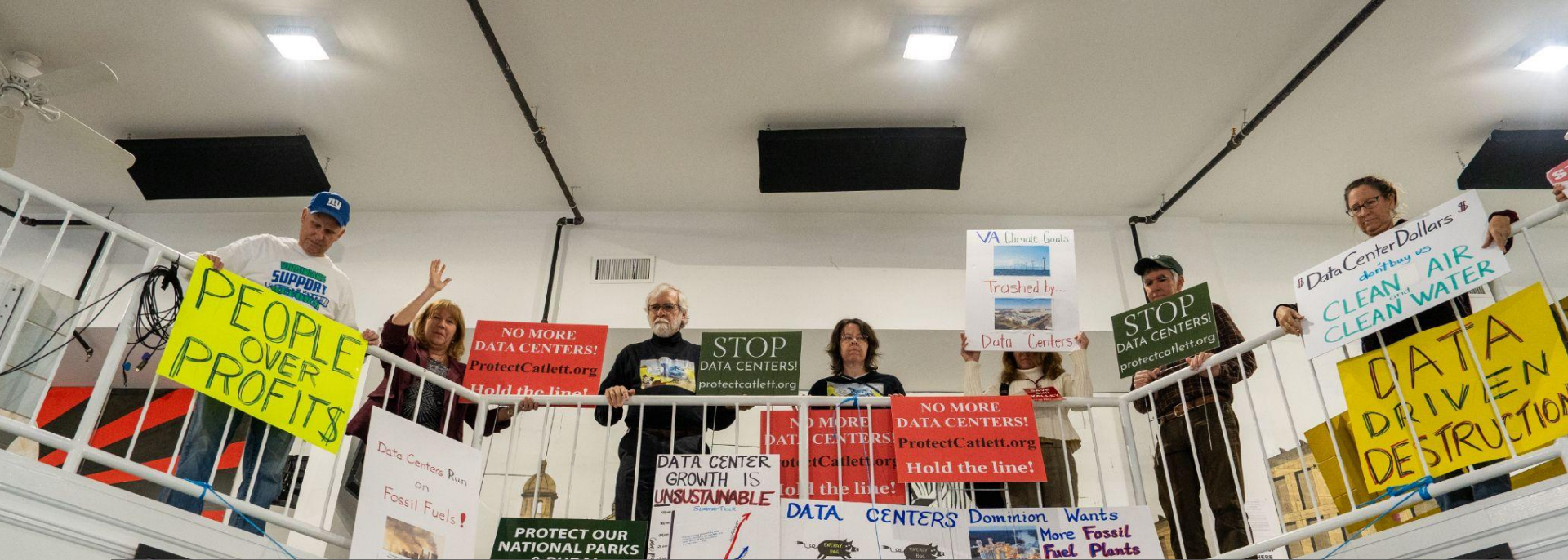
### WHY THIS ISSUE

There are nearly **200** data centers in Northern Virginia, and this number is only increasing. The environmental effects of the data centers on Loudoun County are detrimental.

- Greenhouse gas emissions
- Consuming large amounts of water
- Using massive amounts of energy and electricity to stay operational



**Questions?**



***“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has” -Margaret Mead***