

# The Energy Infrastructure Impacts of Virginia's Data Center Boom



Piedmont  
Environmental  
Council

*PEC Annual Meeting - May 30, 2026*

*Julie Bolthouse, Director of Land Use and*

*Michael Barber, Senior Energy Infrastructure Policy Analyst*

# Today's Presentation

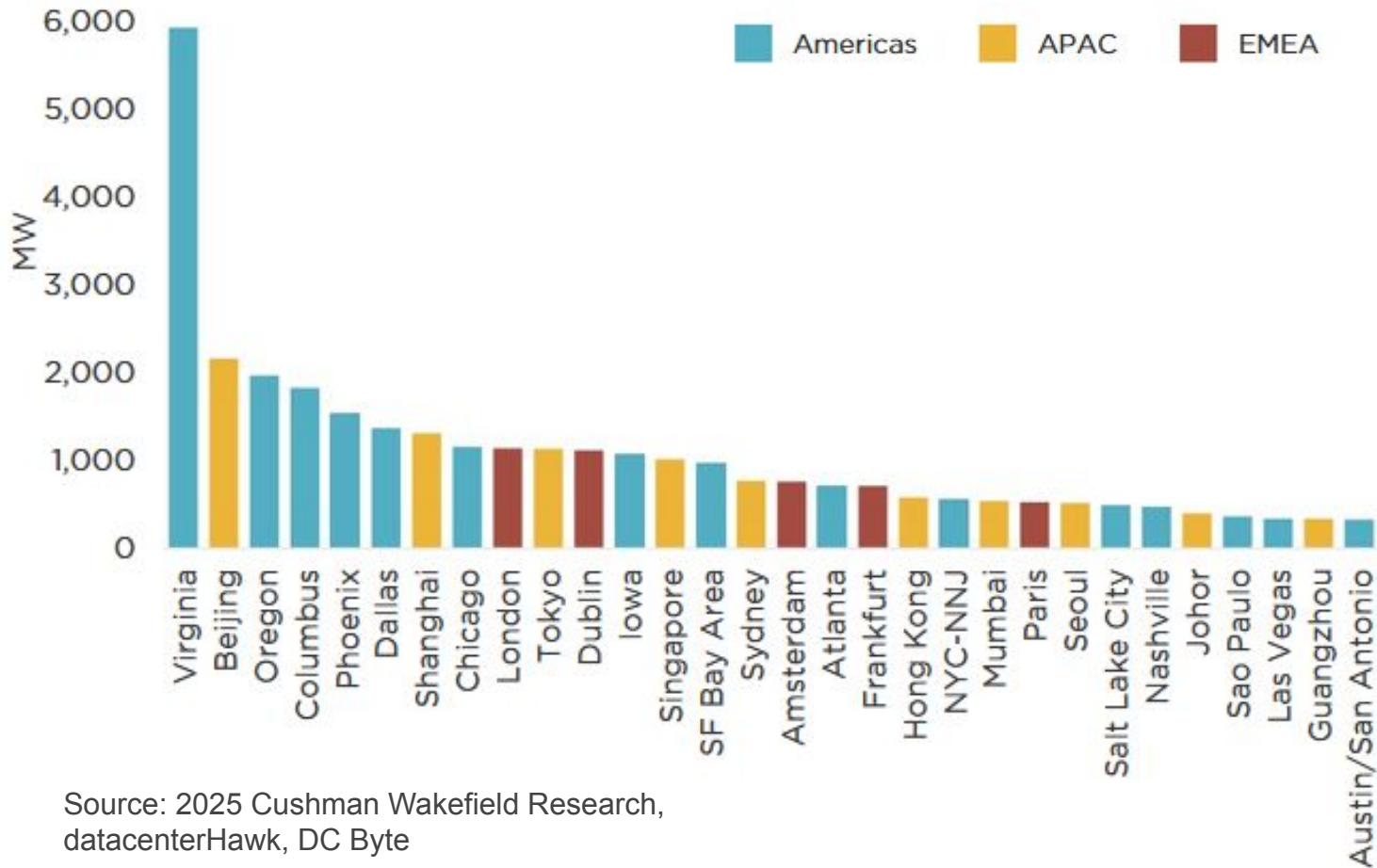
- **Data Center Market in VA**
- **Energy Demand and Grid Build Out to Meet It**
- **Air Quality Implications**
- **Data Center Campaign**



# Top Markets by Operational IT Load



CUSHMAN & WAKEFIELD

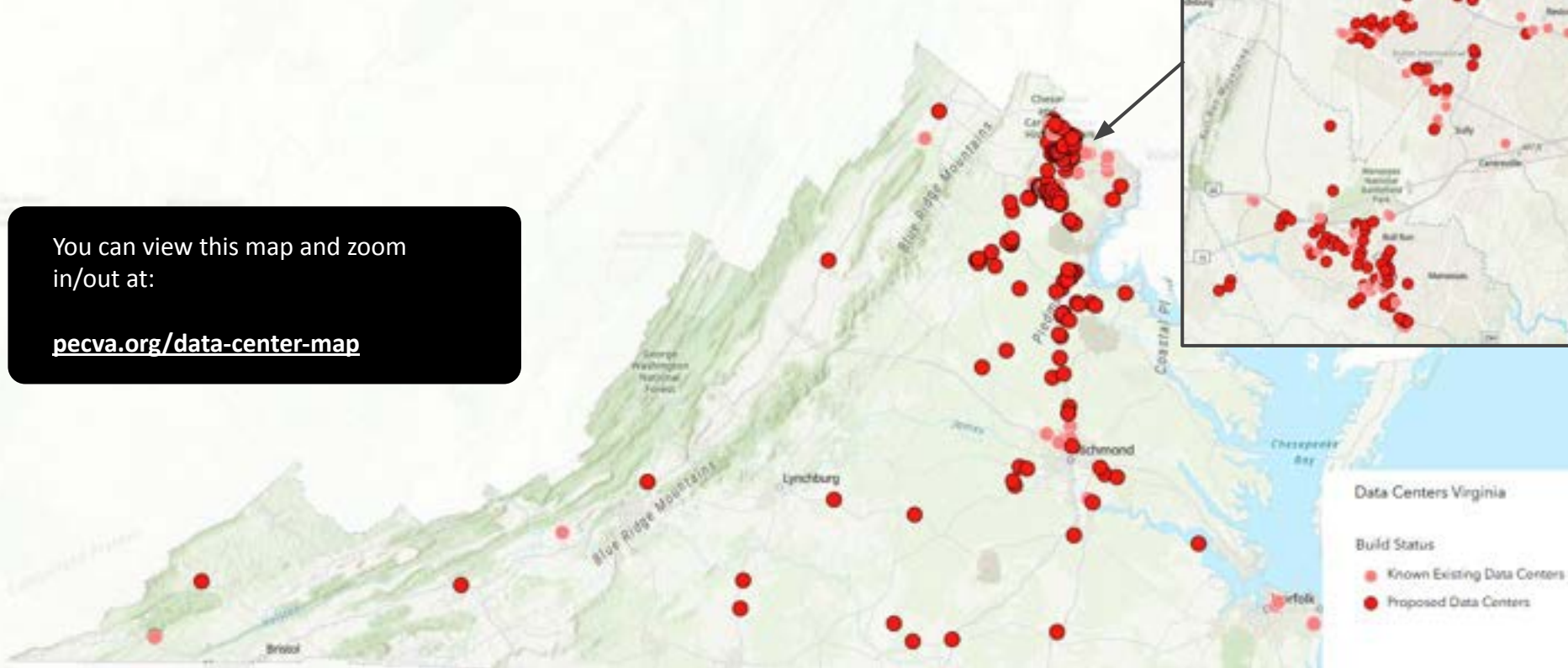


Source: 2025 Cushman Wakefield Research, datacenterHawk, DC Byte

# Data Center Projects In Virginia

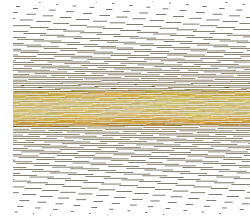
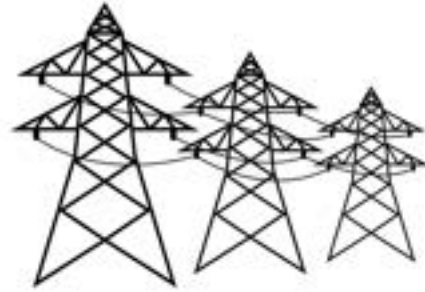


## Existing and Proposed Data Centers - A Web Map



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

# Localities approval process...

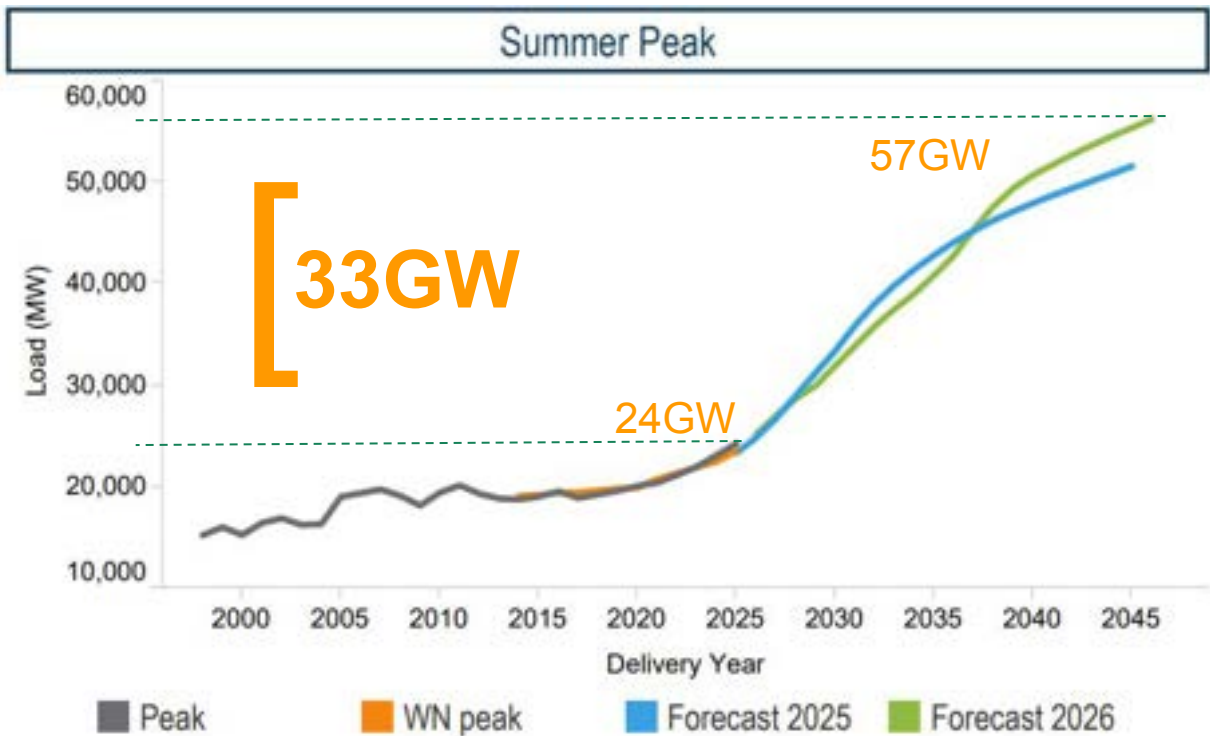


**Currently about 70 million square feet existing  
or being constructed in the state**

**There's another 285 million square feet  
approved or in the pipeline**

# Skyrocketing Load Demand

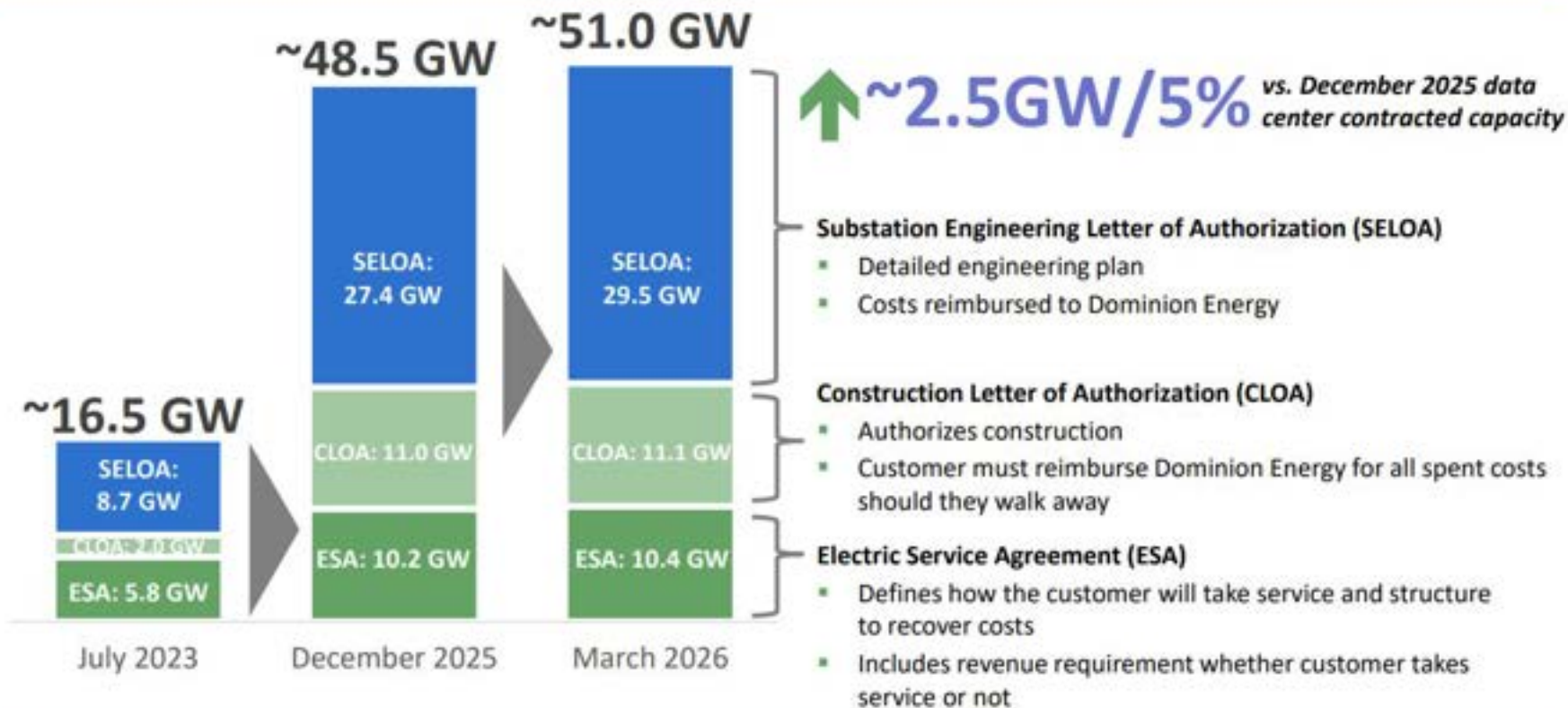
## Dominion Energy's 20 Year Forecast



**Green** = 2026 projection  
**Blue** = 2025 projection

# Dominion Energy Virginia

## Data center contracted capacity (updated)



# Skyrocketing Load Demand

**Dominion Energy has received  
70GWs in Delivery Point requests**

**That's hundreds of substations, thousands of  
miles of transmission lines, and dozens of  
new power plants**

**Who pays and who bears the risk?**

# Utility Ratepayers (You and Me) are Subsidizing Data Center Power Demand

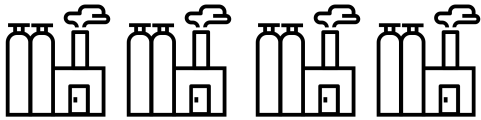
- **Discounted rates**, private negotiations, and stronger leverage and influence as largest customer class
- **Flawed rate structure** that places about 50% of these transmission costs and 40% of generation costs on the residential
- **Higher capacity costs and fuel prices** due to high demand that are born by all users
- **Huge risk** borne other customers if industry contracts or data centers don't consume as much energy as expected



# What Does The Infrastructure Needed to Support This Demand Look Like?

*A Brief Tour of What's In Store For Virginia...*

# Dominion Gas Plant Capacity



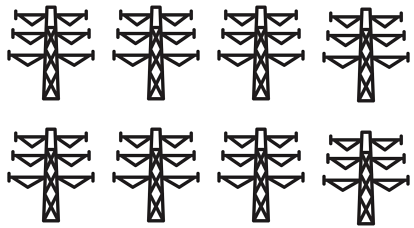
8.3 Gigawatts

# Dominion Solar Capacity



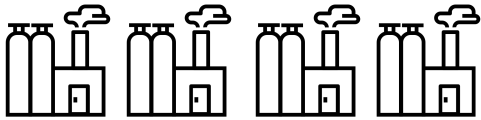
1.2 Gigawatts

# Dominion Transmission Assets



\$14.4 Billion

# Dominion Gas Plant Capacity



8.3 Gigawatts

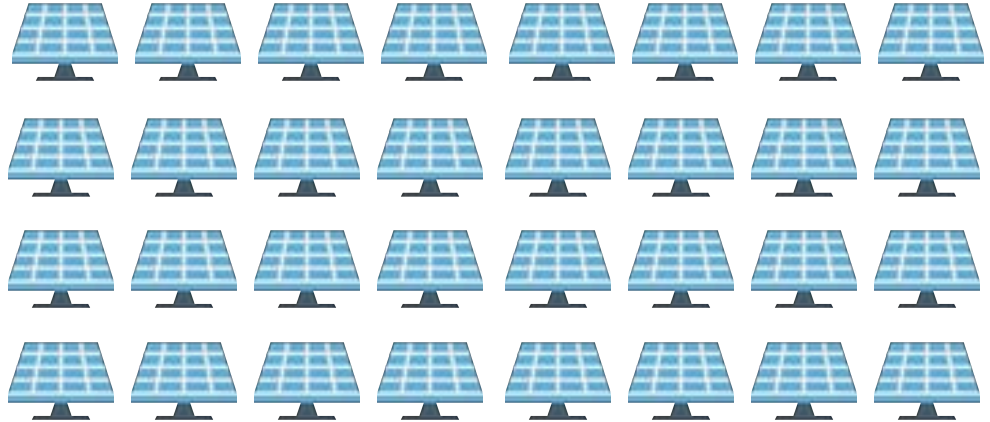
# Dominion Solar Capacity



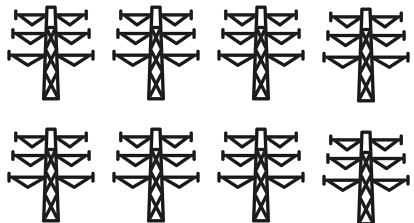
1.2 Gigawatts

...by 2045

+ 17.5 Gigawatts

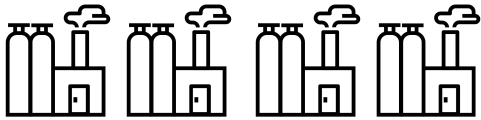


# Dominion Transmission Assets



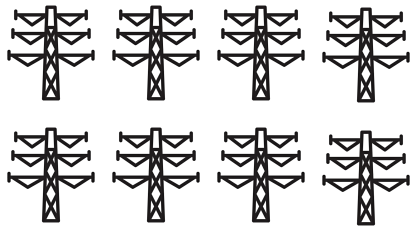
\$14.4 Billion

# Dominion Gas Plant Capacity



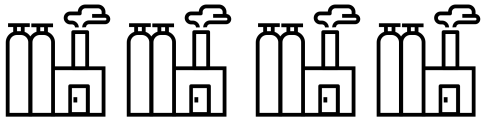
8.3 Gigawatts

# Dominion Transmission Assets



\$14.4 Billion

# Dominion Gas Plant Capacity

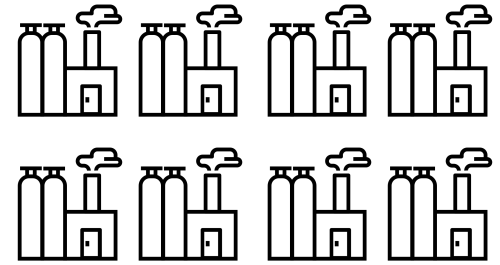


8.3 Gigawatts

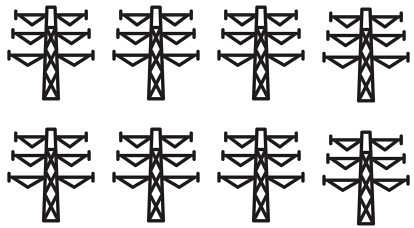
+ 8.5 Gigawatts



2045

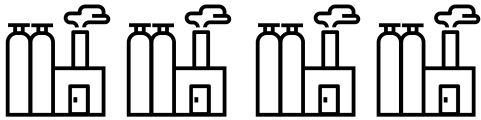


# Dominion Transmission Assets



\$14.4 Billion

# Dominion Gas Plant Capacity

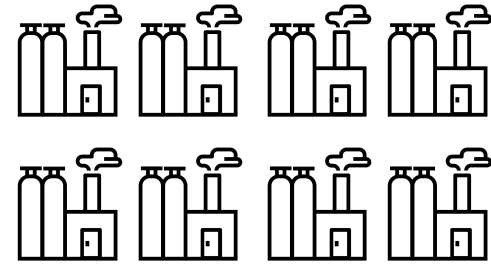


8.3 Gigawatts

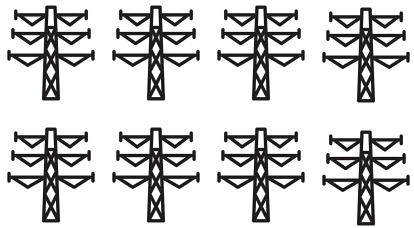
+ 8.5 Gigawatts



2045



# Dominion Transmission Assets

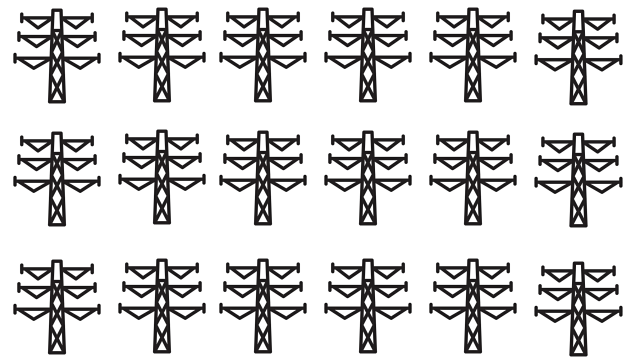


\$14.4 Billion

+ \$14.9 Billion



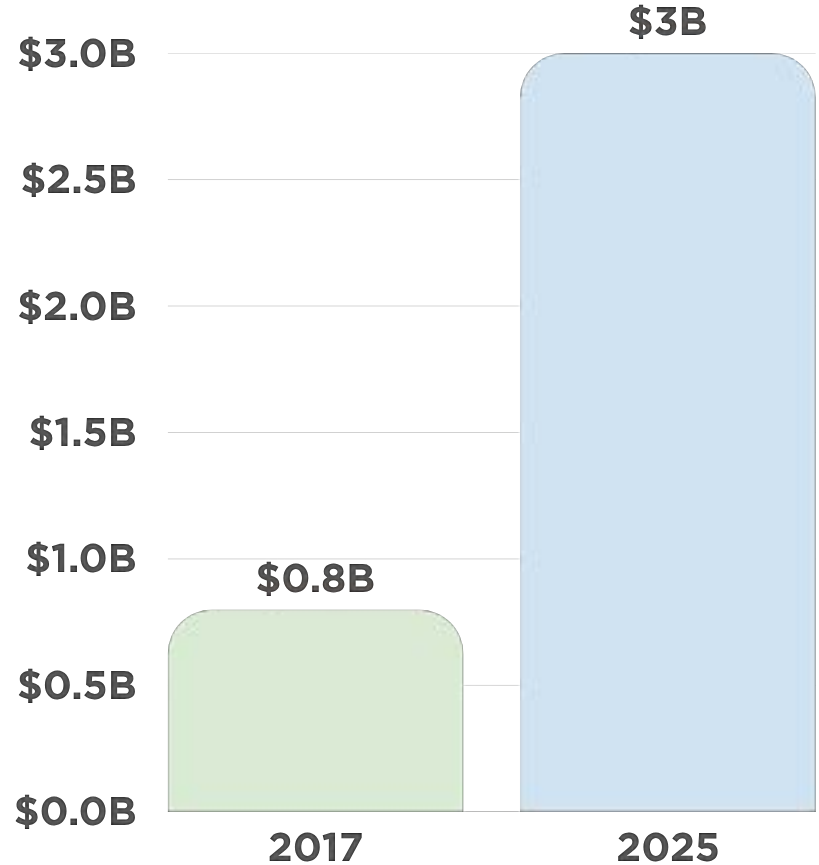
2030



# Dominion Energy

*Annual Transmission  
Spending*

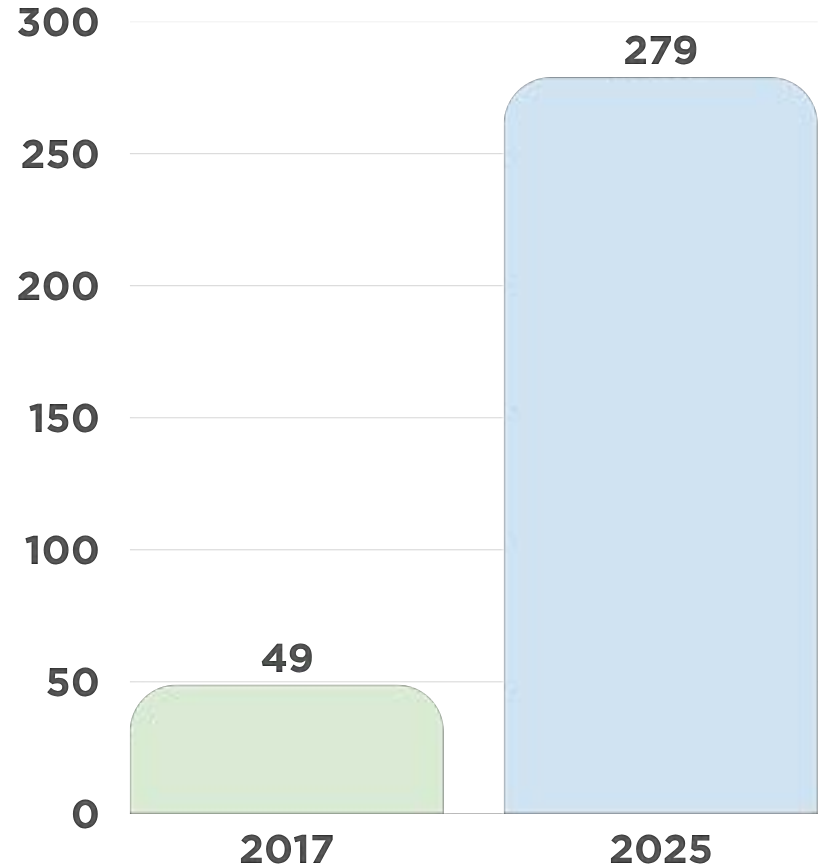
**+ 300% in 8 Years**



# Dominion Energy

*Transmission Projects  
(Active + Planned)*

**+ 400% in 8 Years**



# Regional Transmission Projects

*PJM Regional Transmission Expansion Plan, Annual Baseline Costs*

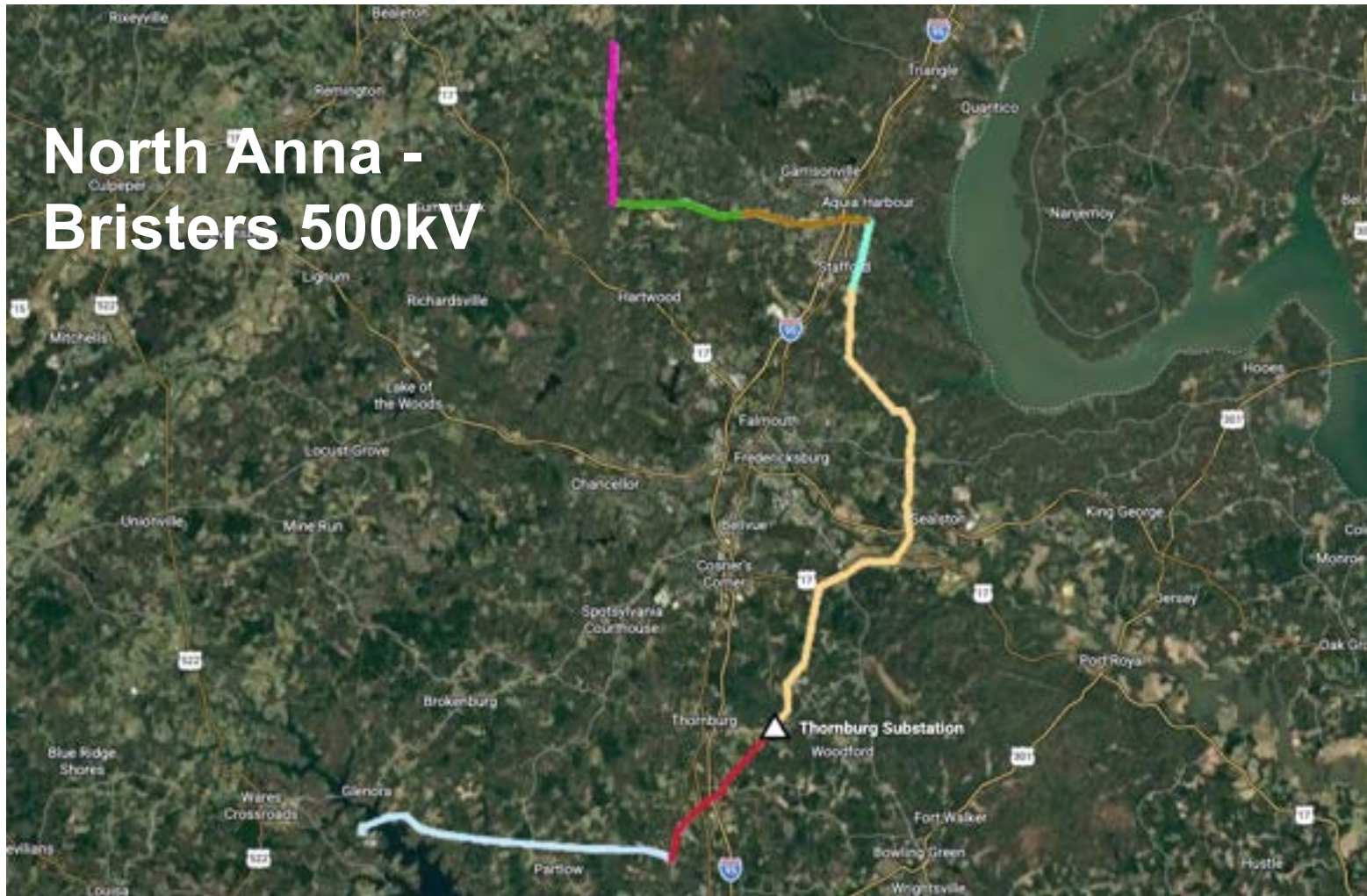
**+ 1,200%** in 4 Years



# Morrisville-Wishing Star 500/230kV



# North Anna - Bristers 500kV



# Charlottesville-Gordonsville 230kV Upgrade





# Joshua Falls - Yeat

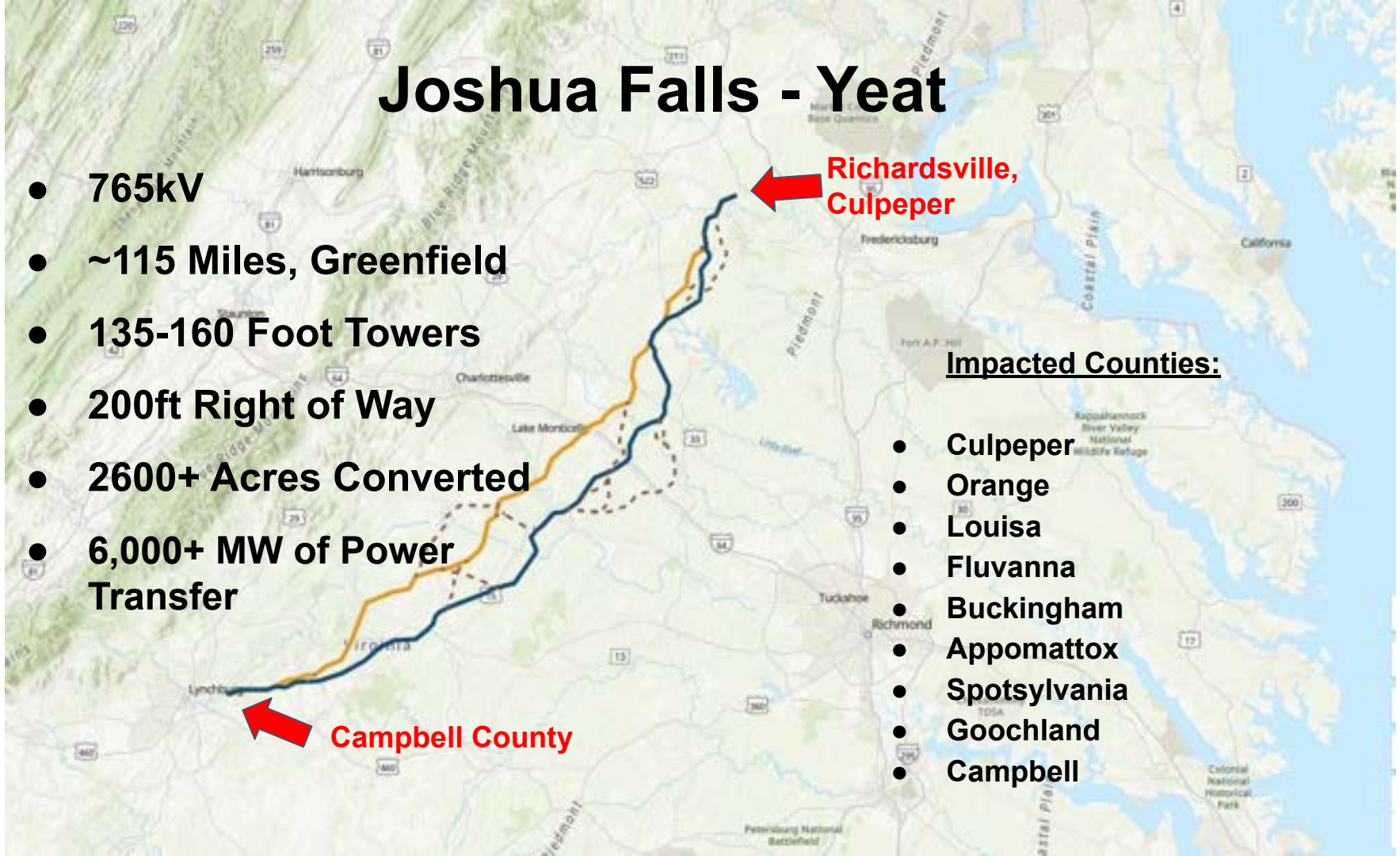
- 765kV
- ~115 Miles, Greenfield
- 135-160 Foot Towers
- 200ft Right of Way
- 2600+ Acres Converted
- 6,000+ MW of Power Transfer

**Richardsville,  
Culpeper**

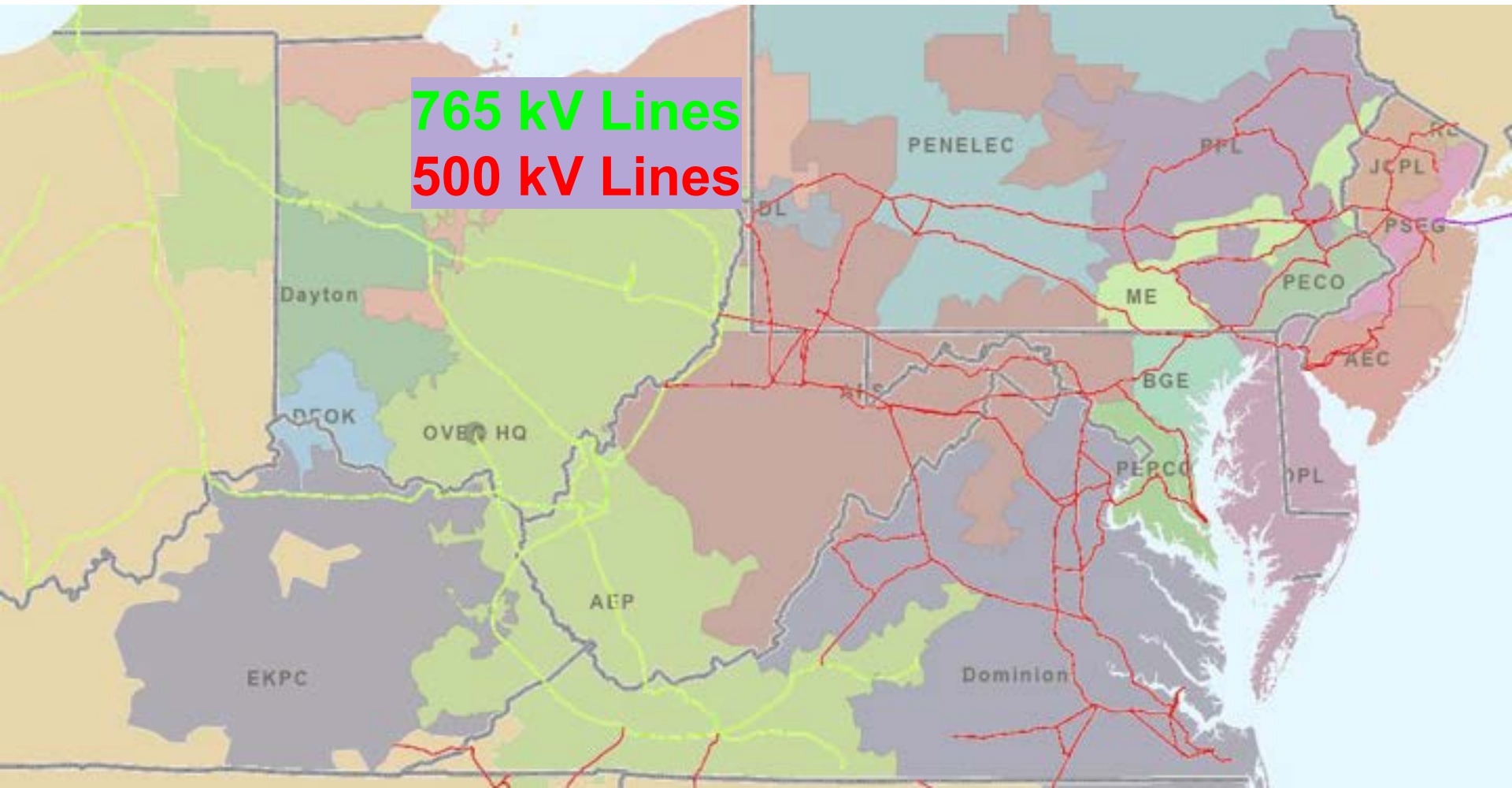
**Campbell County**

## Impacted Counties:

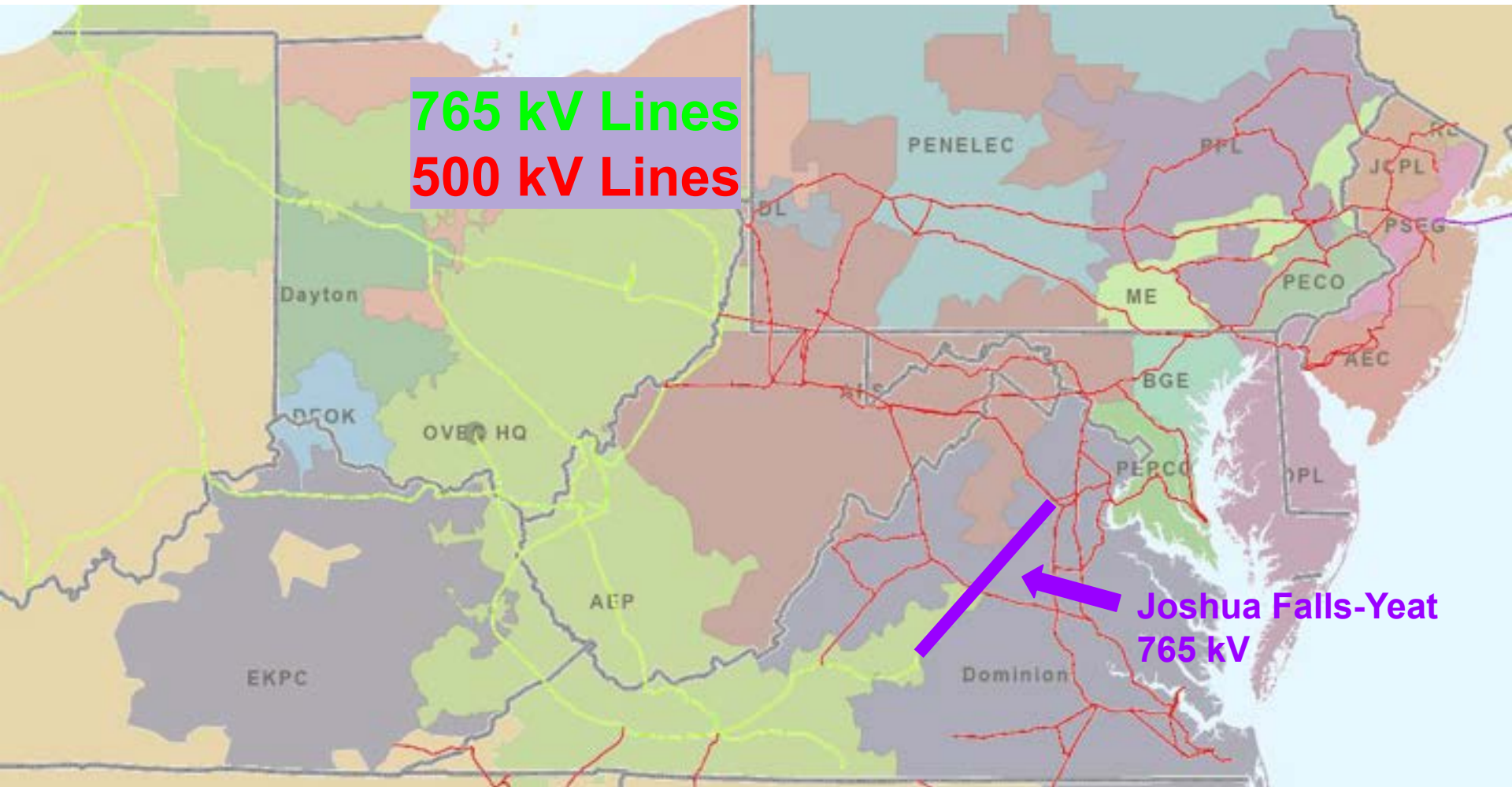
- Culpeper
- Orange
- Louisa
- Fluvanna
- Buckingham
- Appomattox
- Spotsylvania
- Goochland
- Campbell



**765 kV Lines**  
**500 kV Lines**



**765 kV Lines**  
**500 kV Lines**



**Joshua Falls-Yeat  
765 kV**

## Net Generation From Renewables + Nuclear

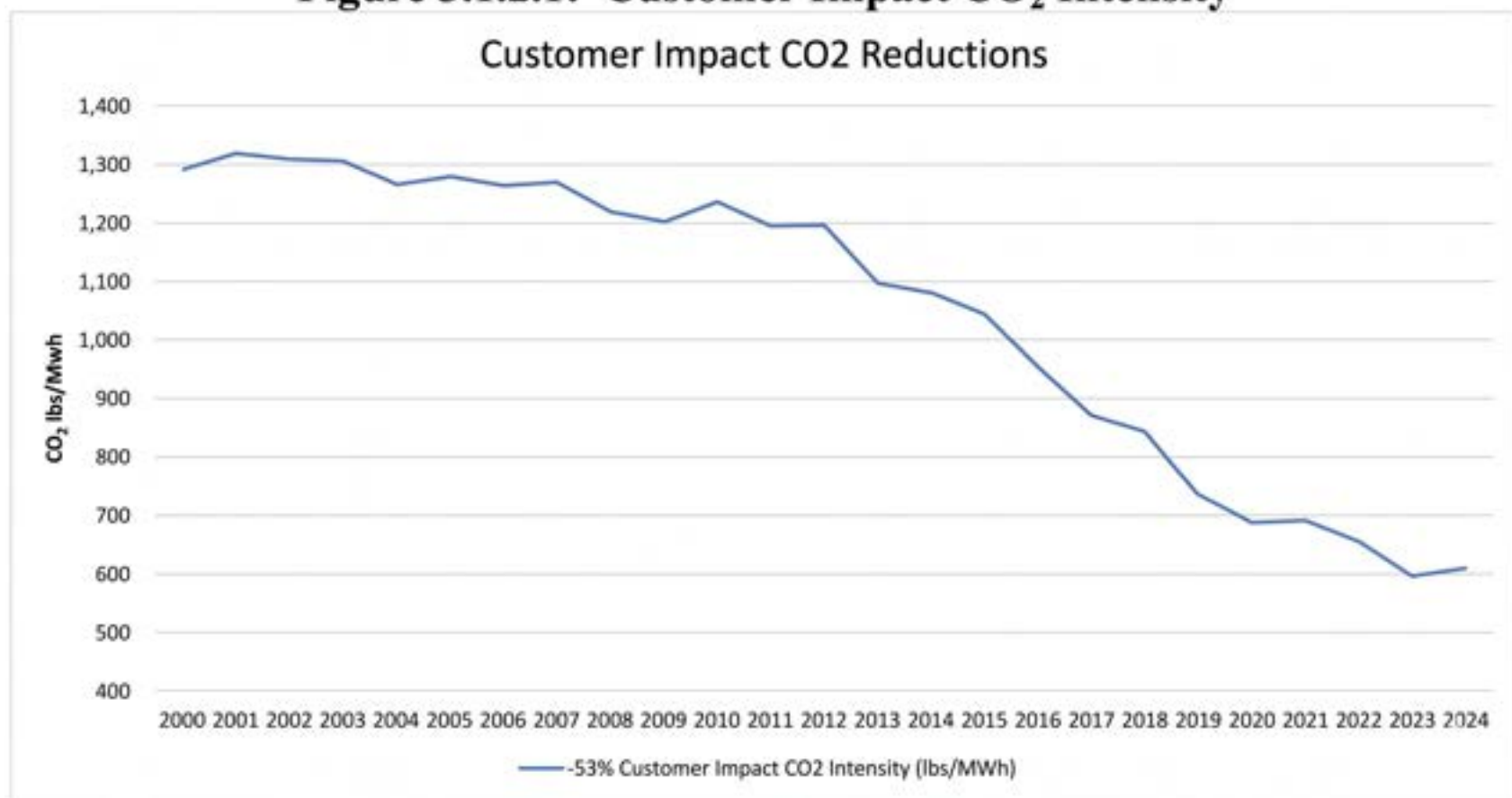
Electric Power Sector Utility  
Scale Generators\*

<b>Virginia</b>	<b>39.15%</b>
<b>West Virginia</b>	<b>6.29%</b>
<b>Ohio</b>	<b>17.85%</b>
<b>Kentucky</b>	<b>6.75%</b>
<b>Indiana</b>	<b>15.09%</b>

\*Does not include Commercial or Industrial Sector generation. Renewables include generation from solar, wind, biomass, landfill, geothermal and conventional hydropower.

*Sources: EIA Utility Scale Facilities Net Generation*

### Figure 3.1.2.1: Customer Impact CO<sub>2</sub> Intensity



# ***Assessing the Impacts***



Source: Google Street View

# Joshua Falls-Yeat, 765kV Transmission Line

*Looking South Across Zoar Road, Locust Grove*



# Applying Advanced Visualizations to Show Impact



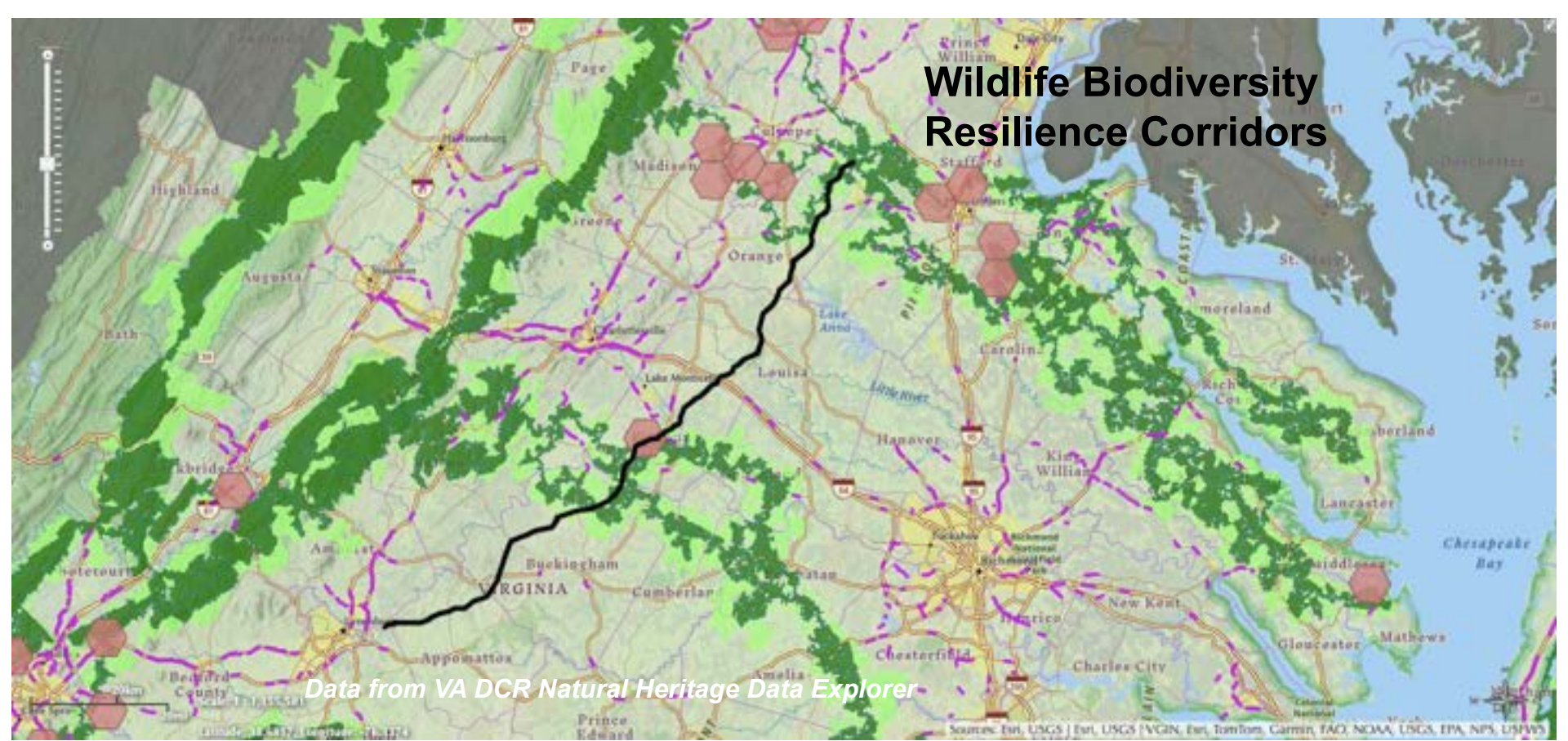


# Wetlands and Streams



*Data: USFWS National Wetlands Inventory*

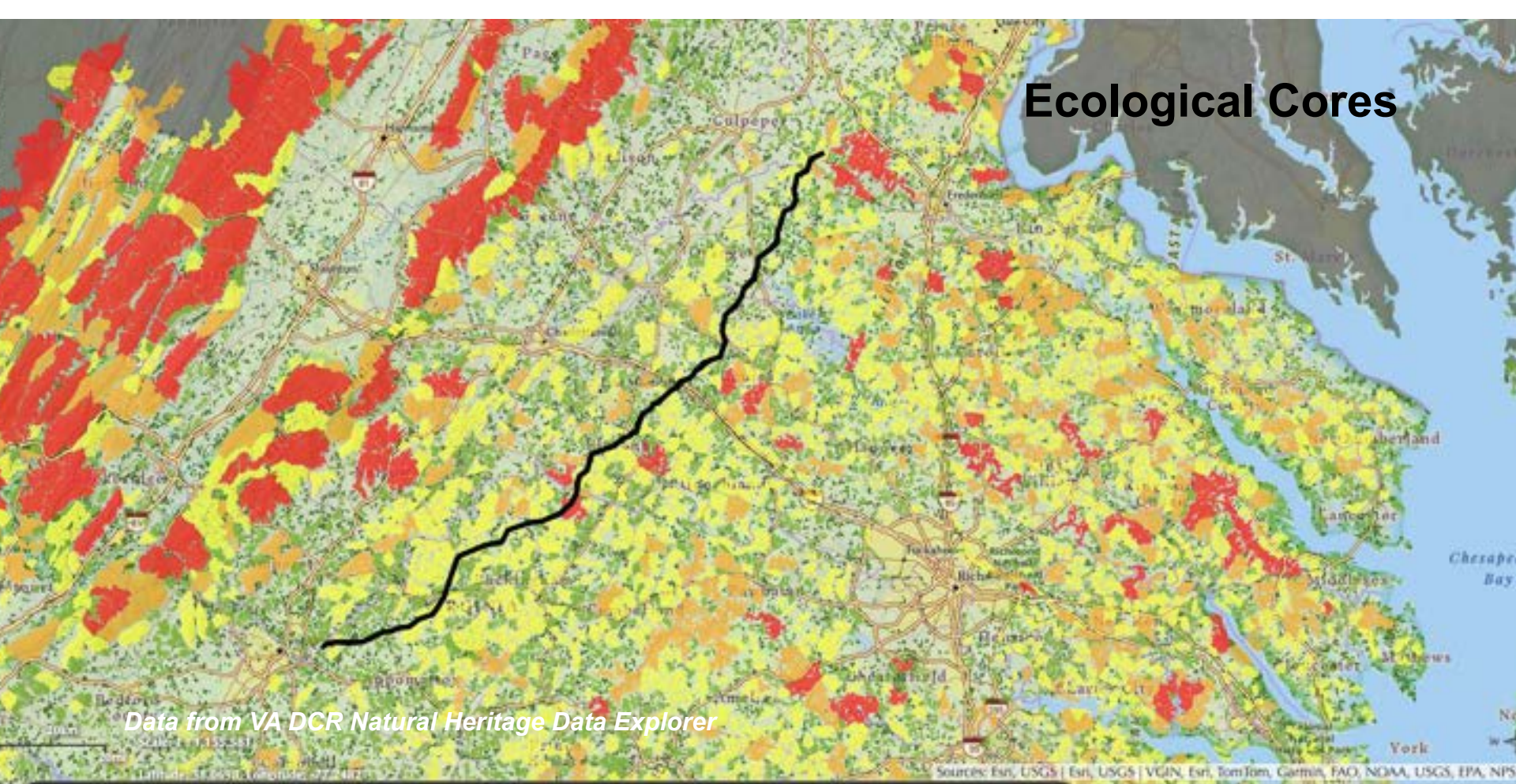
# Wildlife Biodiversity Resilience Corridors



Data from VA DCR Natural Heritage Data Explorer

Sources: Esri, USGS | Esri, USGS | VGIN, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS

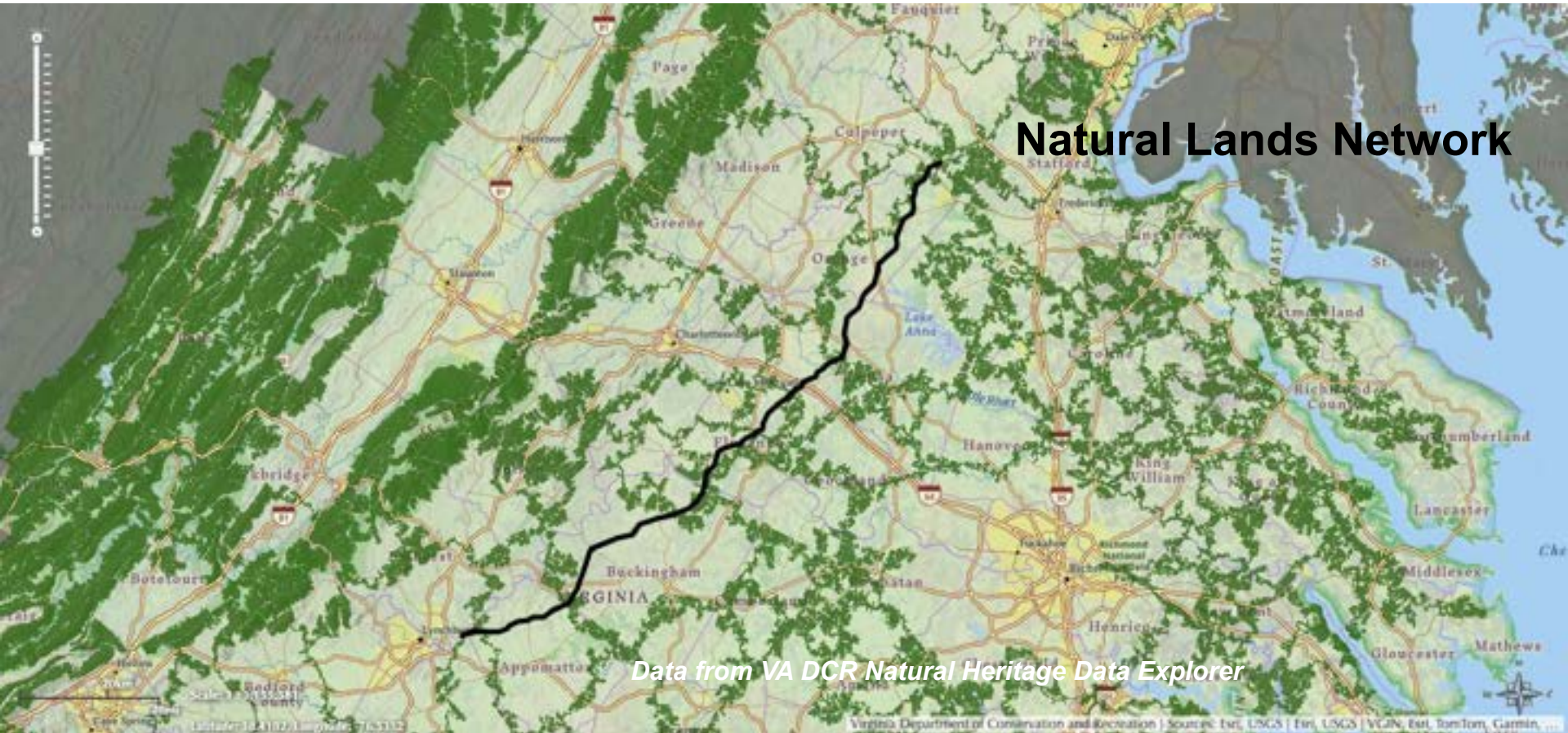
# Ecological Cores



Data from VA DCR Natural Heritage Data Explorer

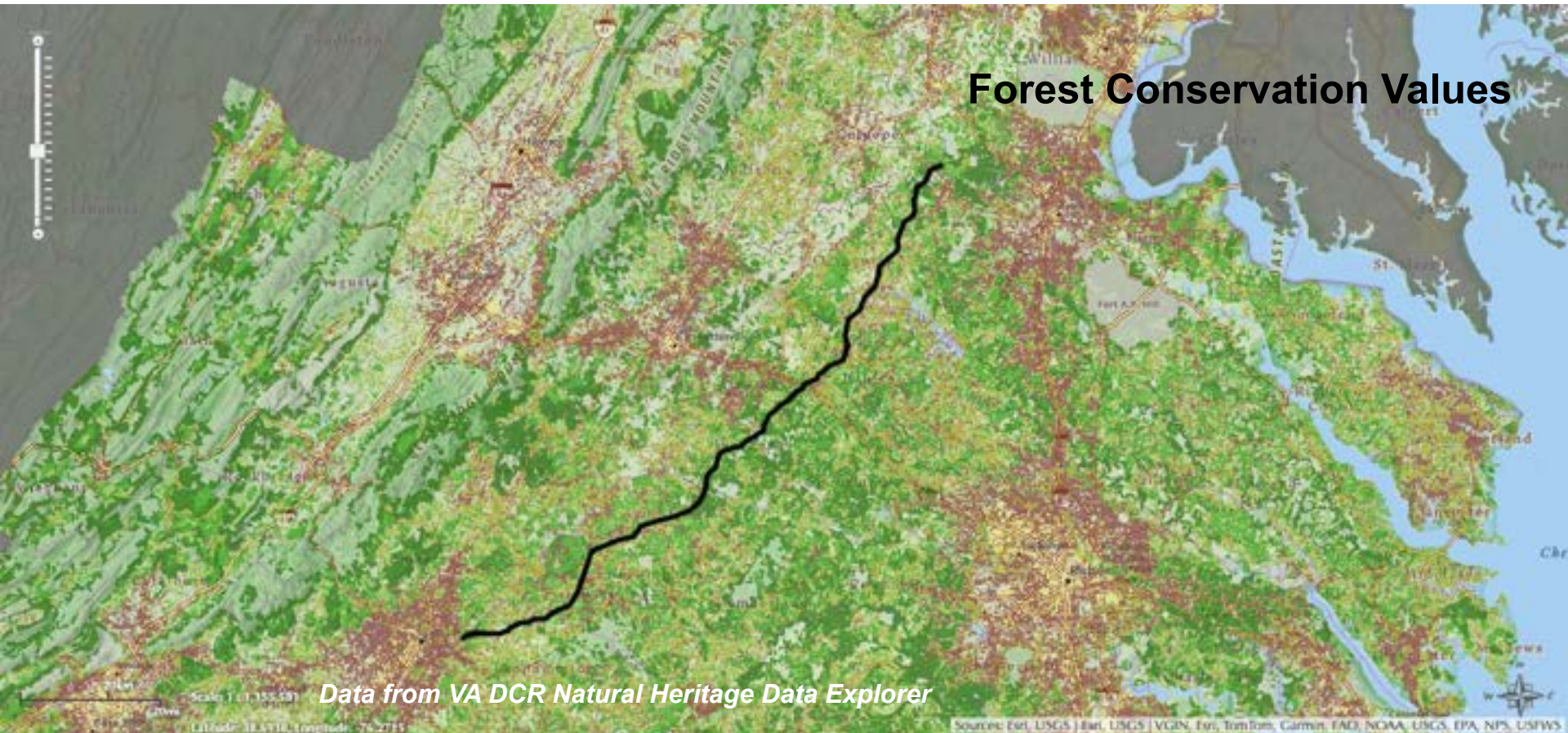
Sources: Esri, USGS | Esri, USGS | VGIN, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS

# Natural Lands Network



*Data from VA DCR Natural Heritage Data Explorer*

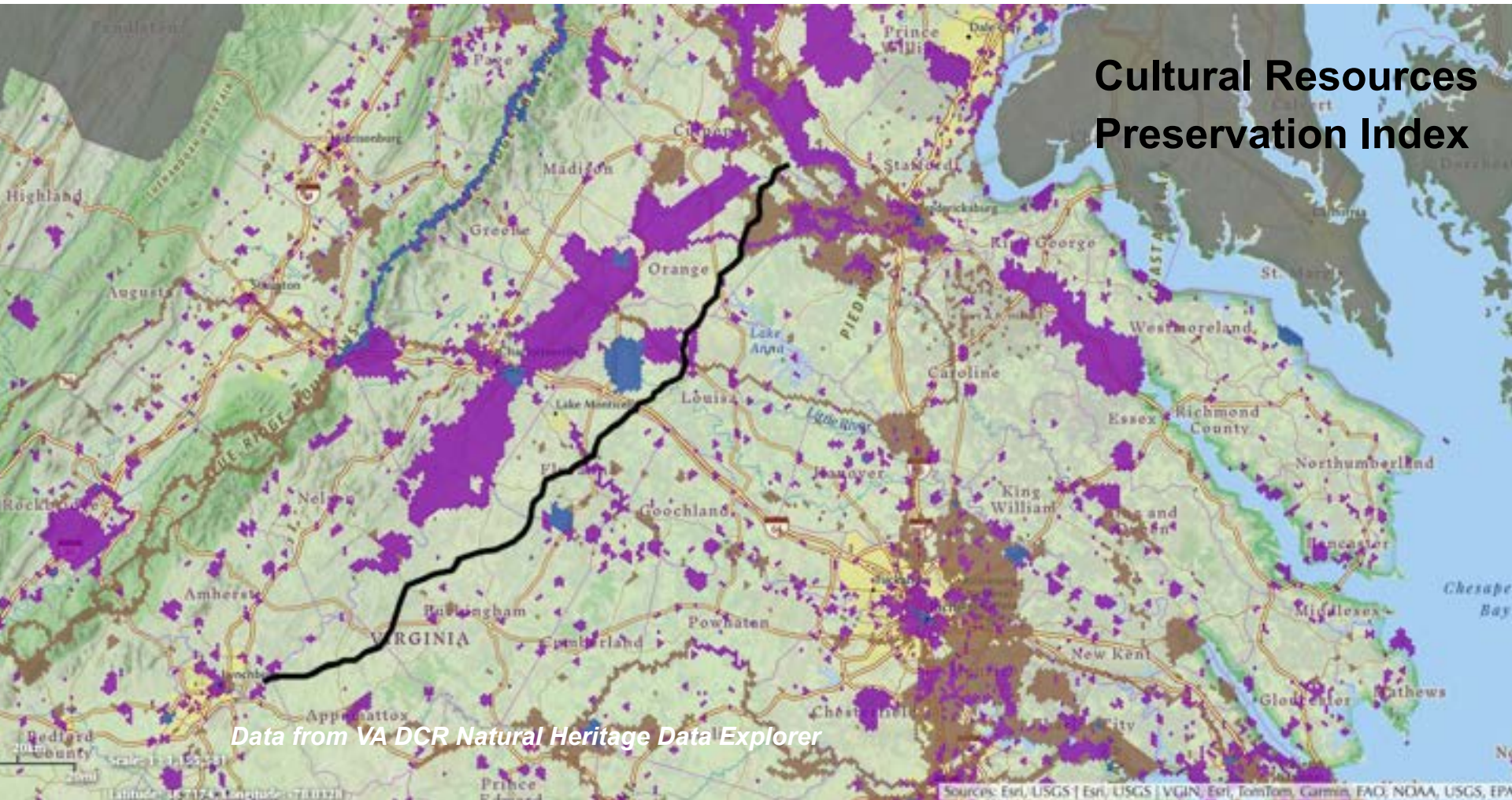
# Forest Conservation Values



*Data from VA DCR Natural Heritage Data Explorer*

Source: Esri, USGS | Esri, USGS | VGIN, Esri, TomTom, Garmin, FAD, NOAA, USGS, EPA, NPS, USFWS

# Cultural Resources Preservation Index



Data from VA DCR Natural Heritage Data Explorer

# Development Pressures

Dominion is pitching this project as a “***new interstate of power***” with the potential for substations and connectivity to other transmission lines in the future:

- New Generation?
- New Energy-Intensive Development?



*Photo By Hugh Kenny, PEC*

# Gas & Power Transmission Expansion



Data Centers Virginia

- Existing
- Proposed

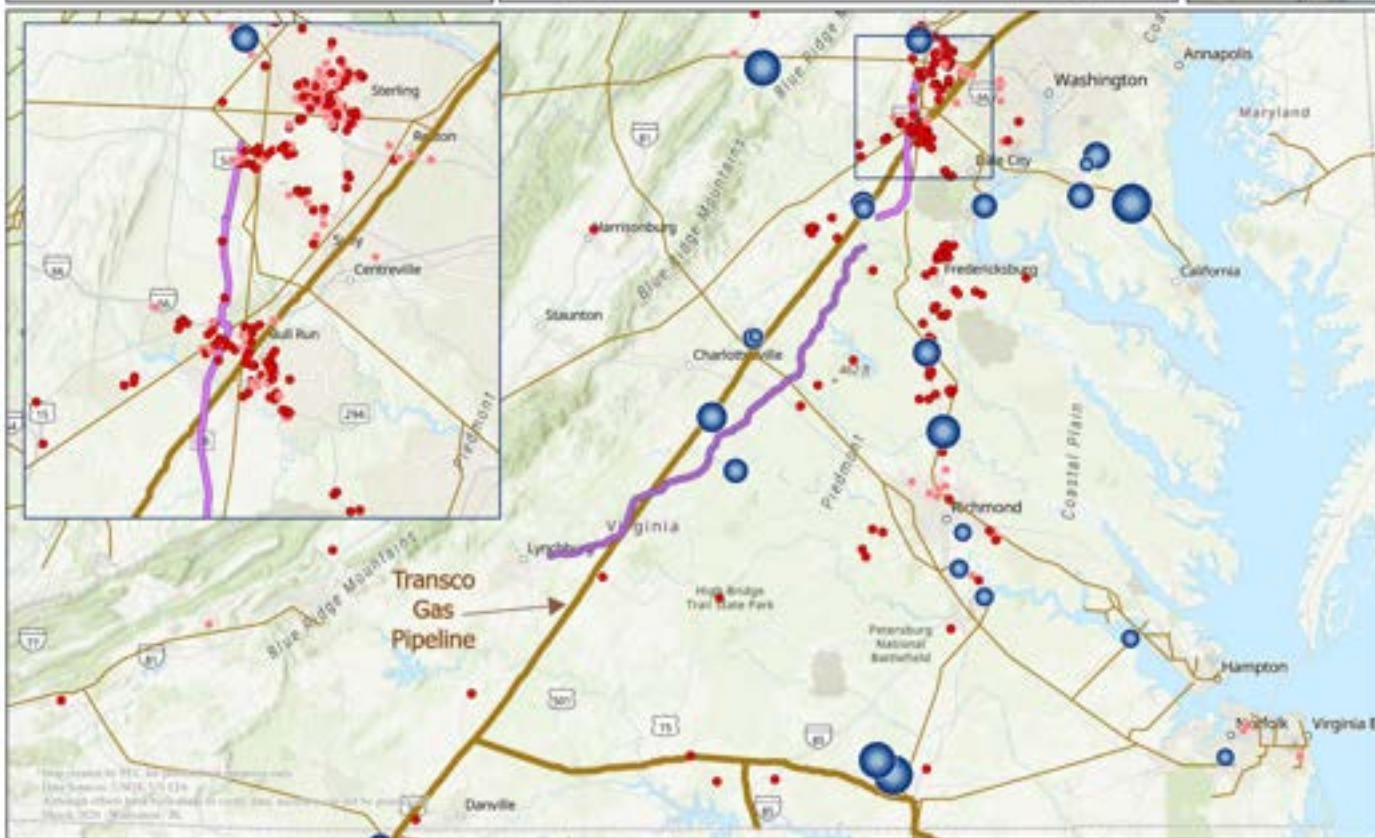
Natural Gas PowerPlants  
(Above 200 MW)\*

- Existing
- Festracked Expansion
- Festracked New

Morrisville to WishingStar Transmission Line

- Joshua Falls to Yeat Transmission Line
- Natural Gas Pipeline

\* Size of circles is directly proportional to Maximum Output (MW) of each gas plant shown



Map created by PEC, Inc. for AECOM  
 Date Issued: 5/2015, 5/15/16  
 Although efforts were made to ensure the accuracy of the information shown on this map, the user should not rely on the information shown on this map for any purpose.  
 March 2015, Washington, DC

# Gas & Power Transmission Expansion



Data Centers Virginia

- Existing
- Proposed

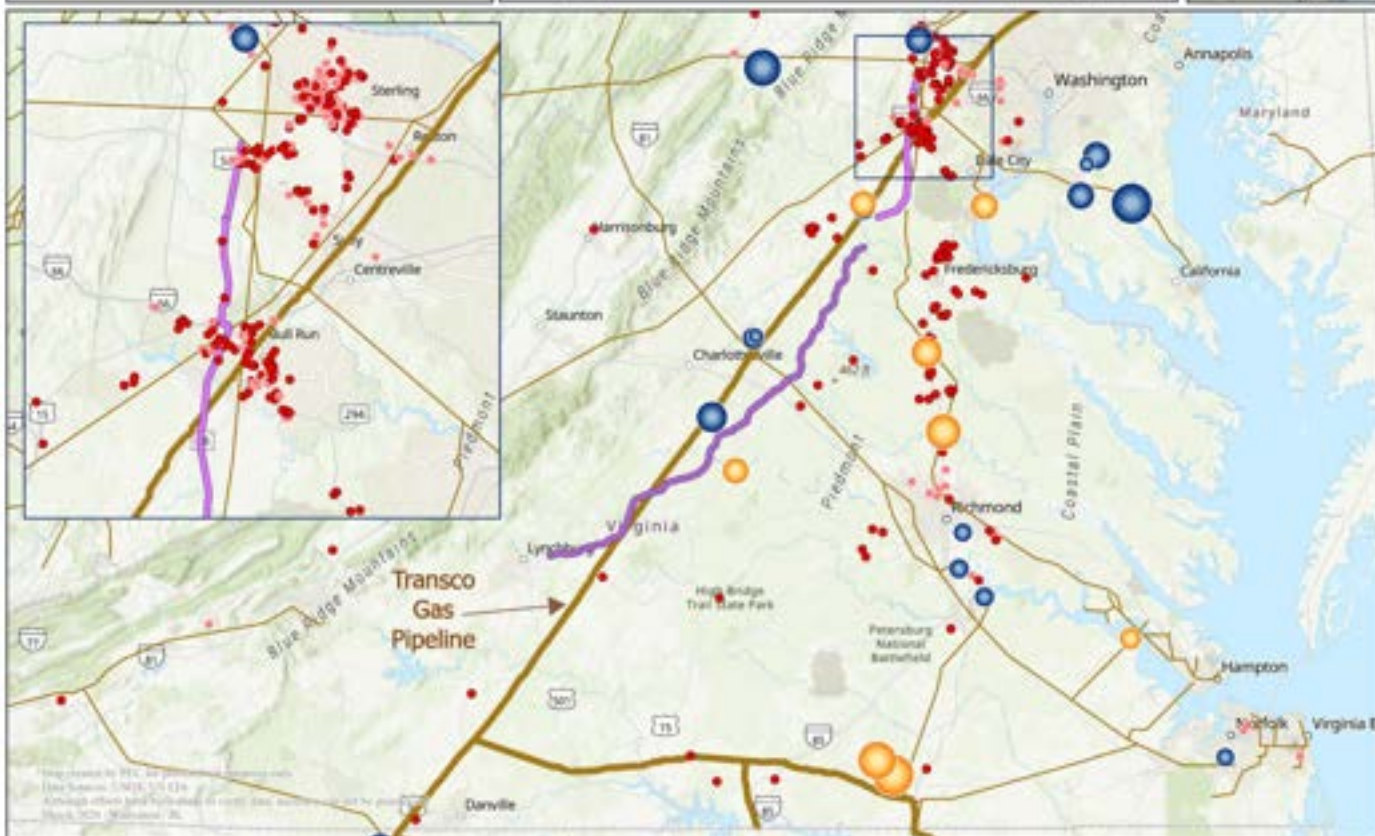
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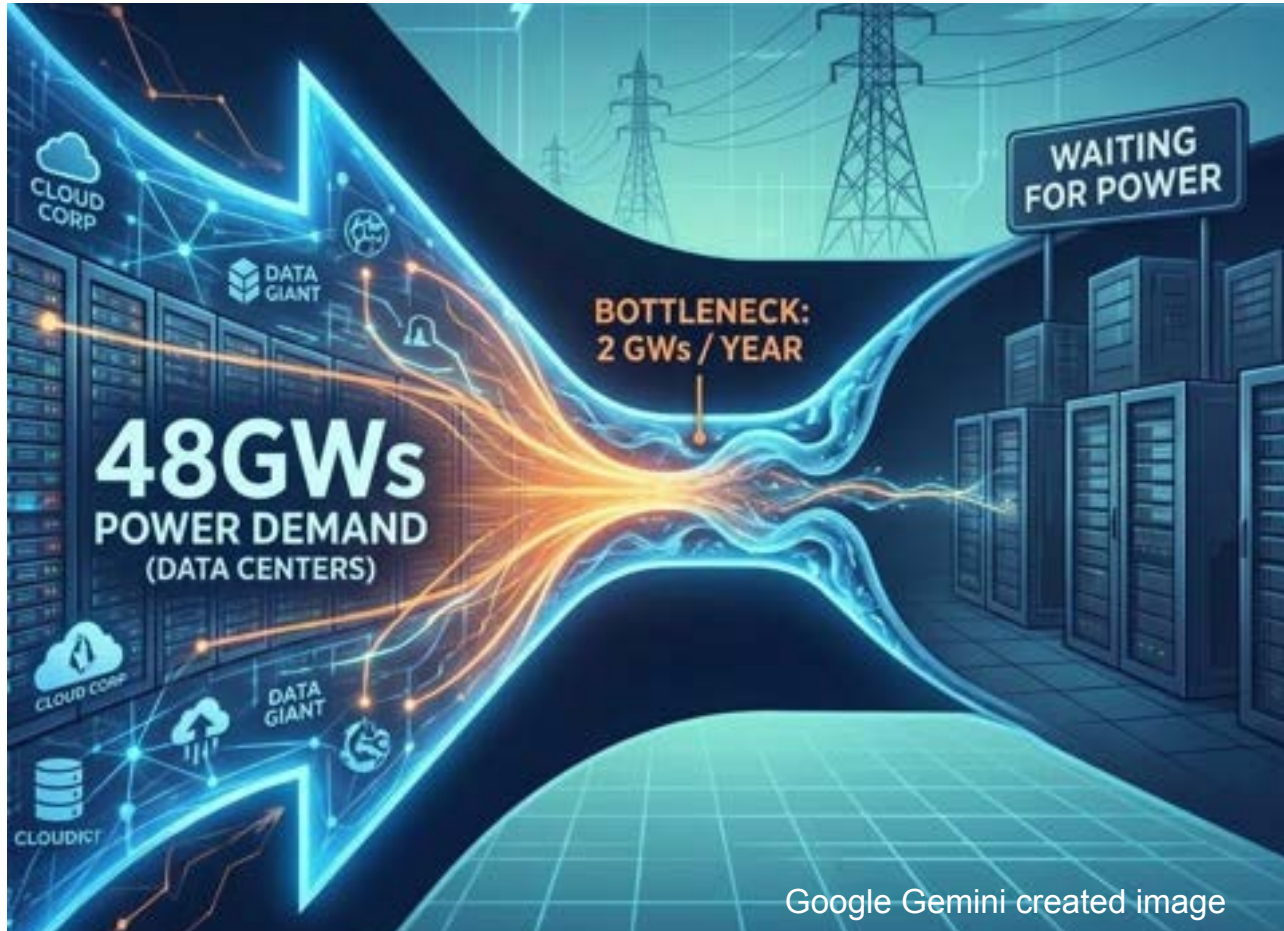
# **Air Quality Implications**

# Air Quality - New Power Plant Proposals



Steam rises out from Tenaska gas plant in Fluvanna County VA. Video by Hugh Kenny/PEC.

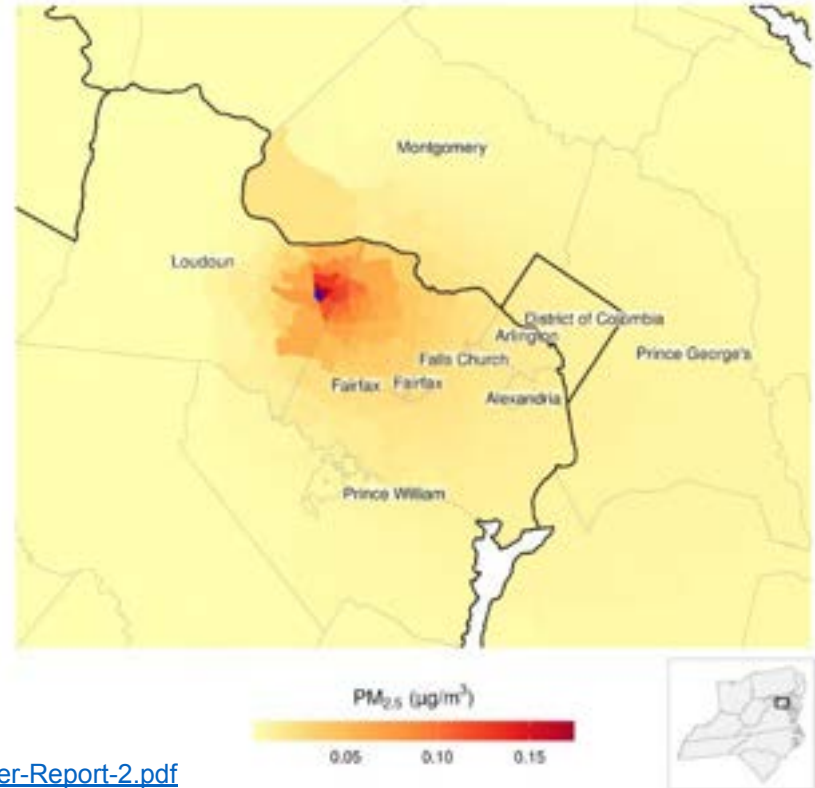
# Visualizing Demand vs. Energization



# Air Quality - Move Towards Onsite Gas Power

## *One small data center has big impacts:*

- **8 gas turbines (135 mw capacity)** and 51 backup diesel generators
- **Minor NSR (no public participation or modeling required):**
  - 56.51 tpy PM<sub>2.5</sub>
  - 95.00 tpy NO<sub>x</sub>
- **Potential for up to \$53 –\$99 million per year** in potential health-related damages



# Air Quality - Backup Generators



Photo credit: peo-acwa-flickr-cc



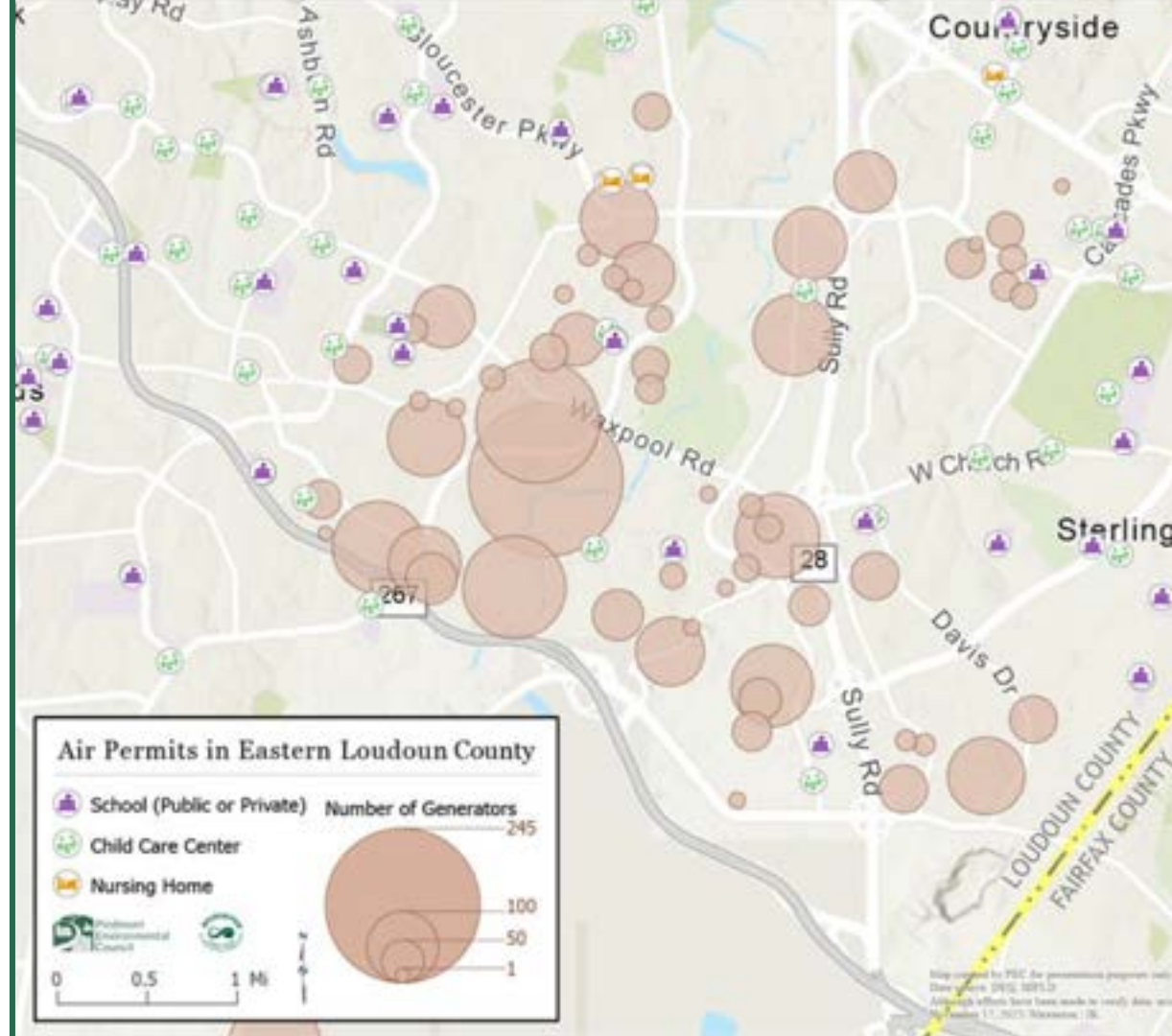
Diesel Generators



## Cumulative Impacts:

Over **13,000** Tier II generators are permitted at data centers in Virginia

About **2,000** are in this small area between Ashburn and Sterling!



Source: [www.pecva.org/work/energy-work/data-center-s-diesel-generators-and-air-quality-pec-web-map/](http://www.pecva.org/work/energy-work/data-center-s-diesel-generators-and-air-quality-pec-web-map/)



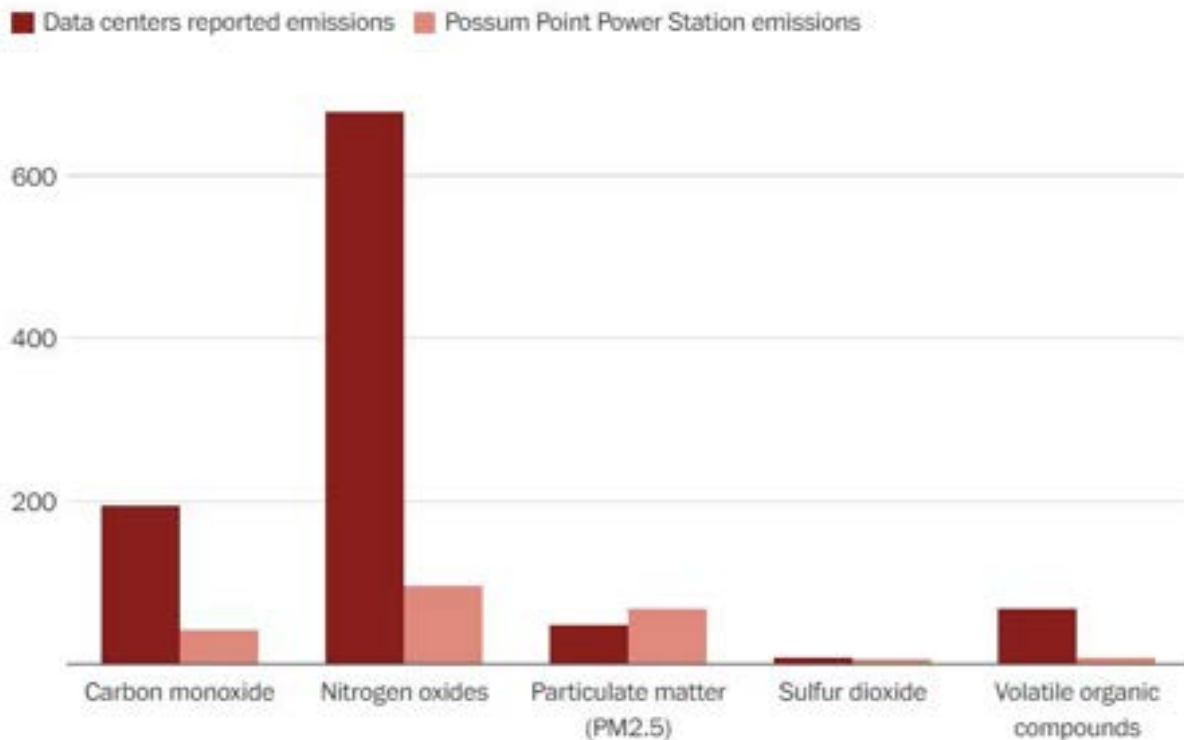
FEB. 12, 2026

# Northern Virginia data center air pollution rivals power plant emissions, VCU research finds

Diesel-powered backup generators already have significant impact, which could dramatically expand within currently permitted levels.

## Virginia's data centers pollute more than a gas-fired power plant

In 2024, the emissions reported by operators of data centers in Northern Virginia collectively exceeded the emissions from the Possum Point Power Station for most pollutants.



Emissions in short tons per year

Source: VCU, Va. Dept. of Environmental Quality

# Potential Increased Usage To Connect More Faster

CLIMATEWIRE ♦

## Wright uses deep freeze to unleash data center generators

By ARIEL WITTENBERG | 01/29/2026 06:17 AM EST

A Department of Energy emergency order prioritizes grid reliability over air pollution rules, potentially exposing communities to dangerous emissions.



Energy Secretary Chris Wright has downplayed the pollution released by diesel generators, an emergency power source for data centers. Petros Giannakouris/AP

# In summary:

- **Cost, risk, and impacts of massive energy infrastructure falling unfairly on other ratepayers**
- **Meeting energy demand means thousands of miles of transmission and dozens of new power plants**
- **Increased air pollution from:**
  - **new power plants**
  - **onsite power, and**
  - **backup generators**



# 5-Prong Data Center Campaign Strategy



## Local Land Use Decisions

### Focus:

Zoning, planning, air permits and building grassroots opposition



## Media Engagement

### Focus:

Press releases, op-eds, interviews, social media, digital advertising



## Academic Studies

### Focus:

Independent research on energy, climate, air quality, water, and communities



## Reform Legislation

### Focus:

Legislation on oversight, transparency, ratepayer protection, and mitigation.



## SCC Utility Cases

### Focus:

Intervention on rate cases, transmission lines, and infrastructure planning.

# Goals of the Campaign - Local Land Use Decisions

- Energy infrastructure and data center planning
- Strong and clear local zoning ordinances
- Local comment opportunity on air permits
- Organized, engaged, and informed local community



## Local Land Use Decisions

### Focus:

Zoning,  
planning, air  
permits and  
building  
grassroots  
opposition

# Goals of the Campaign - Media Engagement

- Raise profile of the issue
- Increase public knowledge about environmental and community impacts
- Encourage public engagement in policy decisions



## Media Engagement

### Focus:

Press releases,  
op-eds,  
interviews,  
social media,  
digital advertising

# Goals of the Campaign - Academic Studies

- Increase transparency and knowledge base on impacts of hyperscale data centers
- Improve public knowledge about environmental and community impacts
- Encourage expert testimony and engagement in agency and legislative decisions



## Academic Studies

### **Focus:**

Independent research on energy, climate, air quality, water, and communities

# Goals of the Campaign - Reform Legislation

- State oversight of regional impacts
- Increased transparency around energy, water, and emissions
- Industry pays for energy costs caused by them and fair taxes
- Incentivize sustainability measures and mitigate impacts at state and local level



## Reform Legislation

### **Focus:**

Legislation on oversight, transparency, ratepayer protection, and mitigation.

# Goals of the Campaign - SCC Utility Cases

- Establish strong cost allocation structures
- Establish strong policies and mitigation practices
- Require transparent and fair infrastructure planning and load forecasting



## SCC Utility Cases

**Focus:**  
Intervention on rate cases, transmission lines, and infrastructure planning.

# What can you do?

- Help share data and concerns about cumulative impacts and costs
- Speak and advocate on local data center planning
- Meet with your state representatives and advocate for state level reform
- Demand ratepayer protections, transparency, and fair policies

WE NEED YOU!





Piedmont  
Environmental  
Council

# Thank you!

*PEC Annual Meeting - May 30, 2026  
Julie Bolthouse, Director of Land Use and  
Michael Barber, Senior Energy Infrastructure Policy Analyst*