Lovettsville Community Meeting
No Transmission Towers Here
Sponsored by: Loudoun Transmission Line Alliance: Lovettsville

Purpose

To inform Lovettsville citizens and regional neighbors about the proposed Transmission Line and the fast-moving public policy decisions that will impact the structure and location of the Line in Western Loudoun County. The focus will be on community involvement in opposing the line and advocating for smart alternatives to meeting the region's energy needs.

Agenda

Welcome and Introductions
Mary Terpak, LTLA: Lovettsville

Data Centers, Energy Overload, and the Costs to Loudoun County
Tia Earman, Piedmont Environmental Council

Advocacy, Effective Strategies, and Technical Alternatives
Tom Donahue, Electrical Engineer, county resident volunteering with the, Loudoun Transmission Line Alliance and Scenic Loudoun Legal Defense.

Current Situation: Fast Moving Decisions and Community Action
Susan Manch, President of The Waterford Foundation; LTLA

Comments, Questions & Answers
Facilitated by Mary Terpak

Welcome & Introductions

Mary Terpak, LTLA: Lovettsville

Data Centers, Energy Overload, and the Costs to Loudoun County

Hidden Cost of the Cloud: Data Centers in Virginia

And

Tia Earman, Piedmont Environmental Council

Nextera Transmission Lines

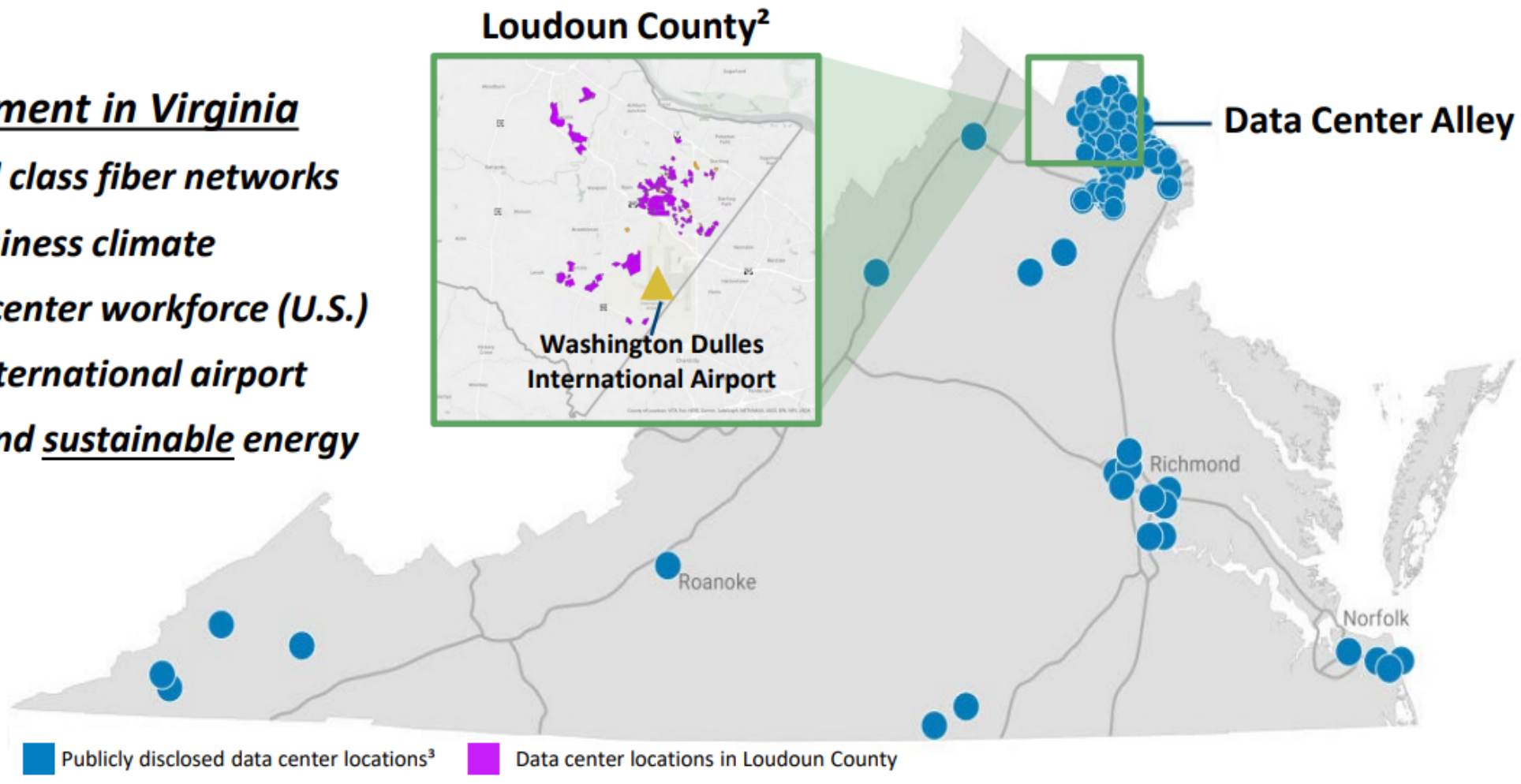
Data Centers and Loudoun County 2024

Dominion Energy Virginia

Northern Virginia boasts the largest data center market in the world[1]

Data center development in Virginia

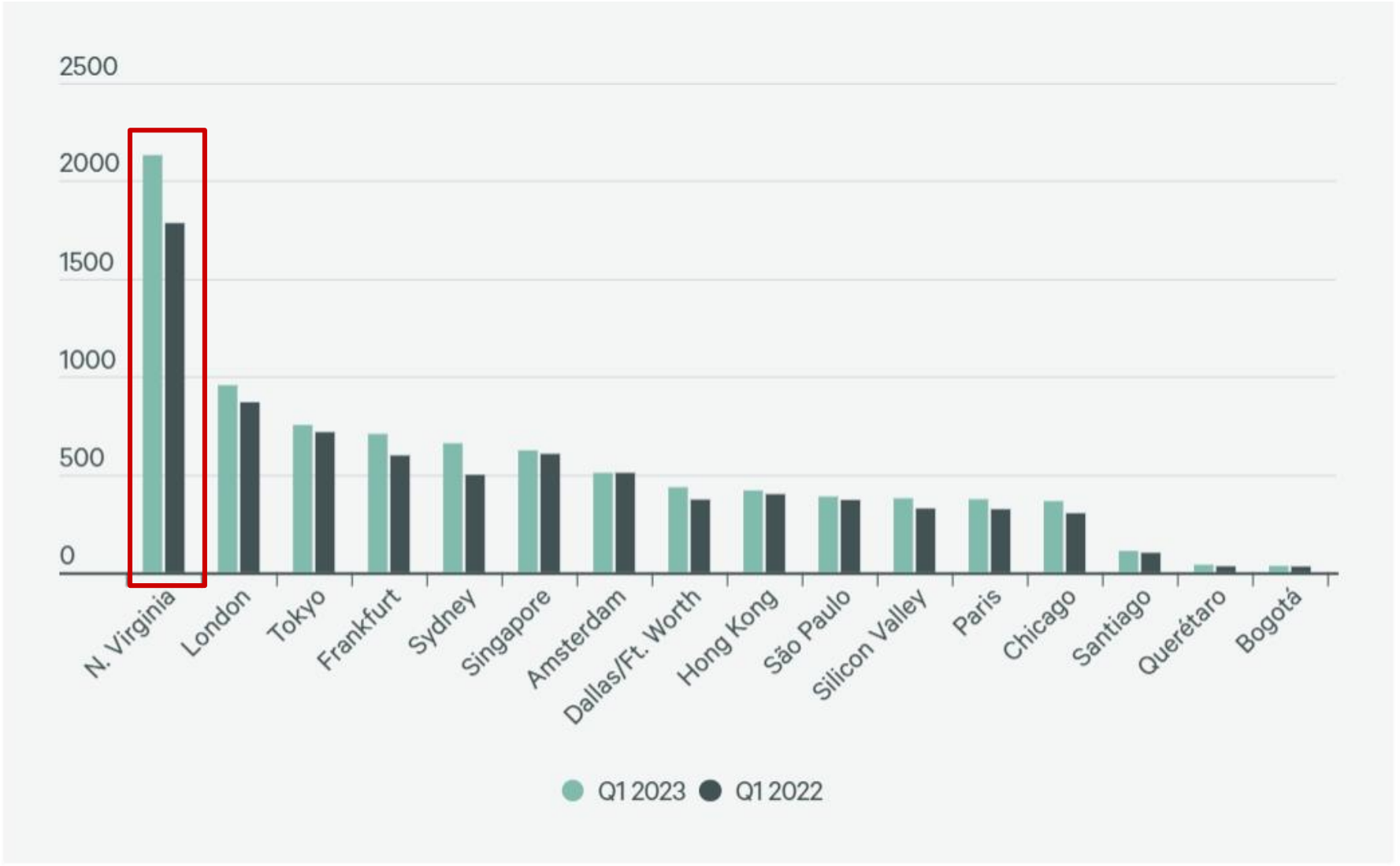
- ✓ *Connectivity to world class fiber networks*
- ✓ *Attractive business climate*
- ✓ *Access to largest data center workforce (U.S.)*
- ✓ *Access to nearby international airport*
- ✓ *Access to affordable and sustainable energy*



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

[1] https://www.vedp.org/industry/data-centers [2] February 2022 Loudoun County Data Center Land Study [3] Data Center locations provided by Data Center Hawk

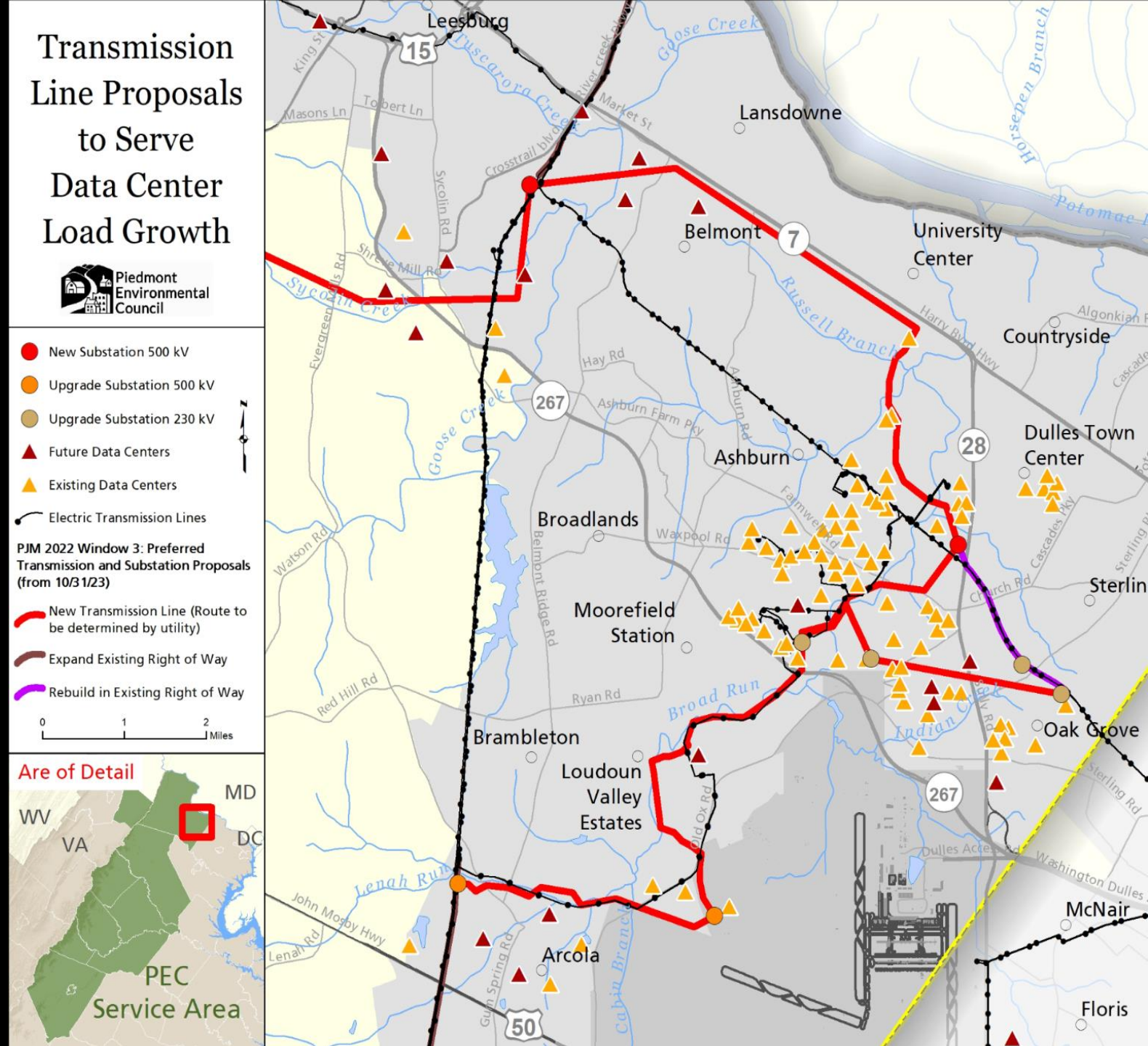
Data Center Inventory (MW)



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.

Data Center Development Has Exploded

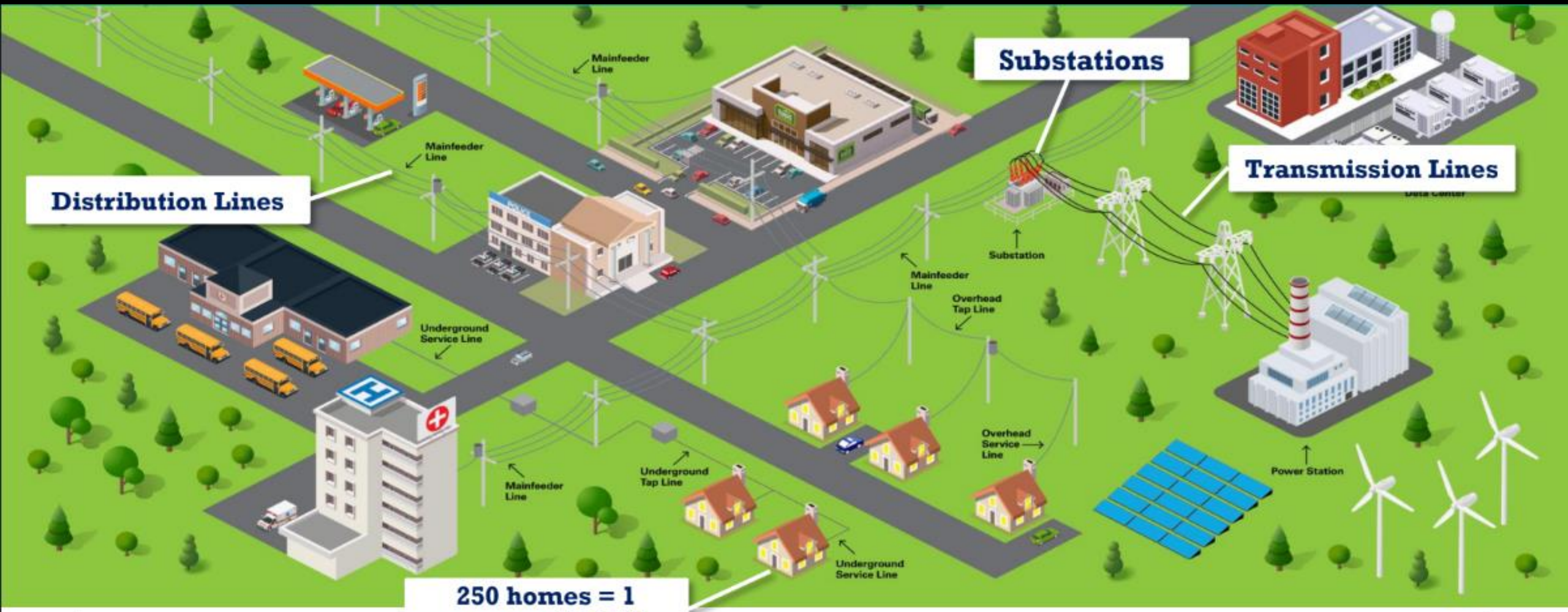
- 30 million sq ft in operation
- 5 million sq ft in development
- How much more? Not yet compiled, but more legislative and by-right proposals coming regularly



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+

The data centers rely on a reliable power grid



Dominion Energy

Let’s put that energy use in context: 1MW = 250 homes

Total Current Load From Data Centers (NoVA)

= 2,800 MW

Total Approved But Unbuilt (VA)

= 11,200 MW

Total Including Applications (VA)

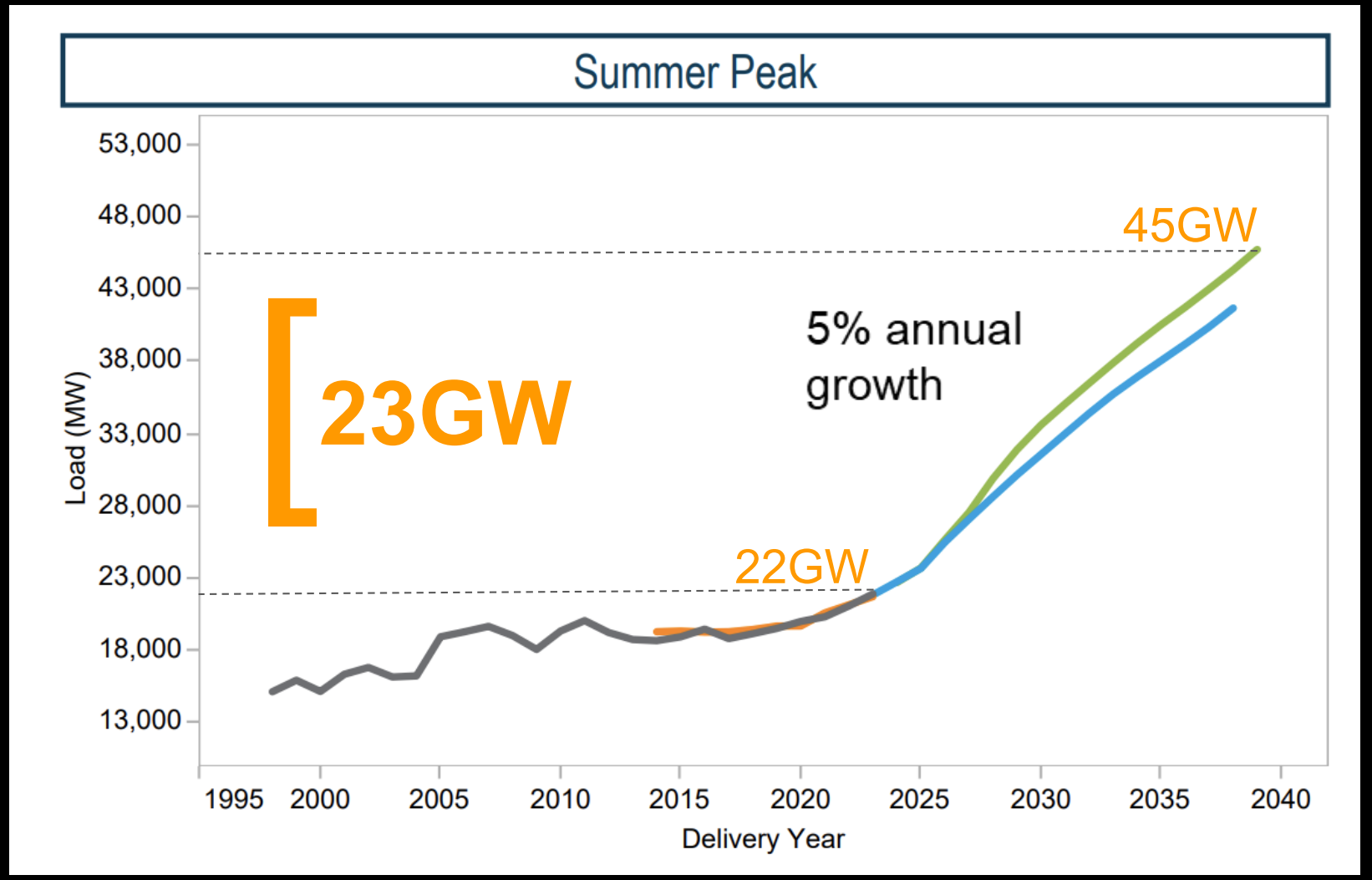
= 58,400 MW

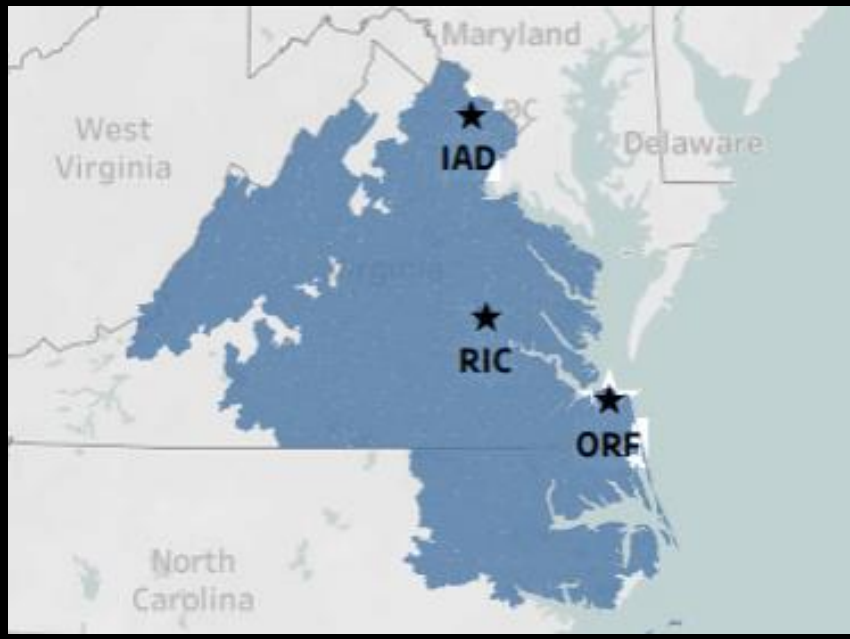
700,000 homes

2.8 million homes

14.6 million homes

Dominion Territory Explosive Growth Trends

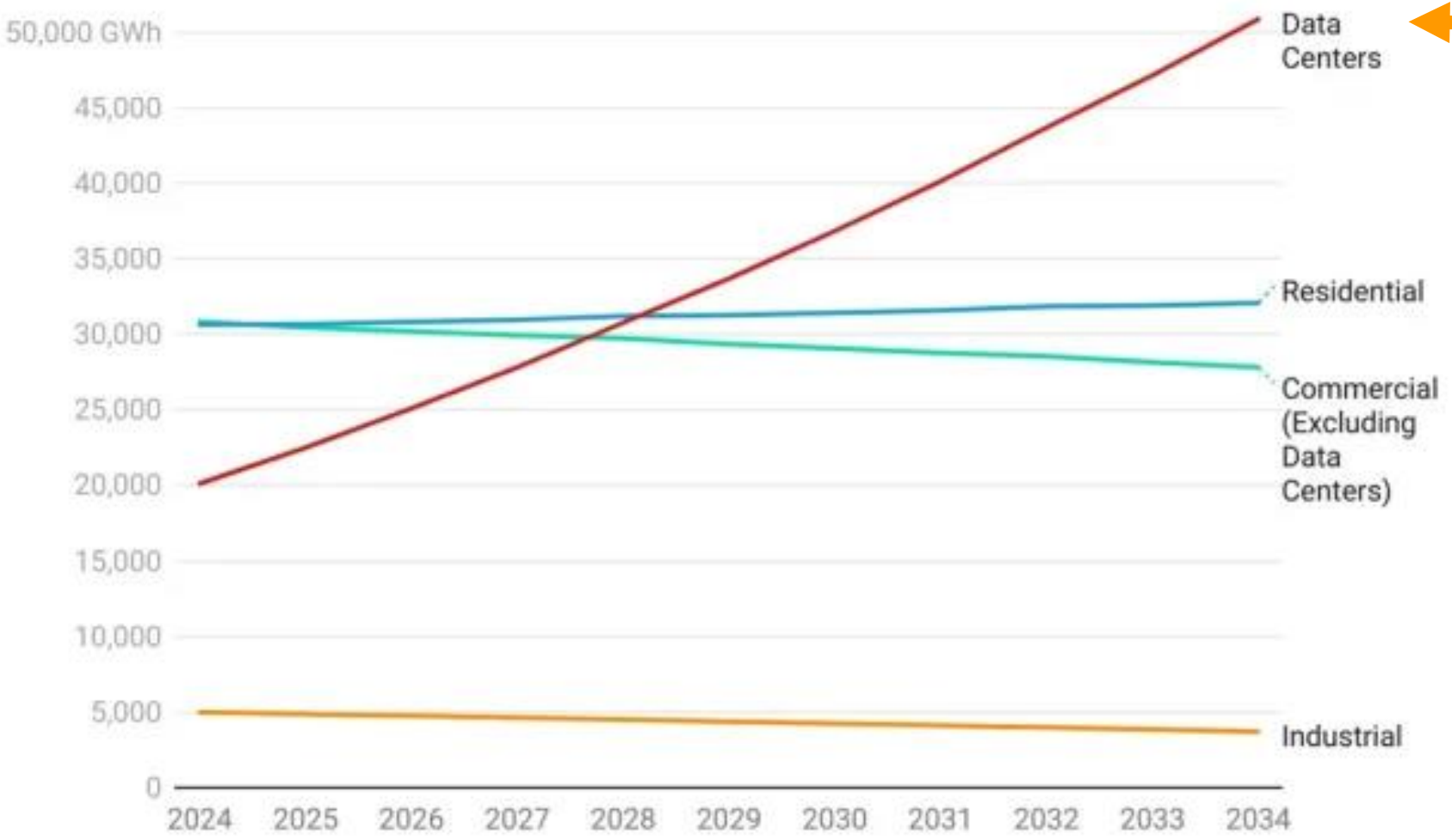




Green = 2024 projection
Blue = 2023 projection

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.

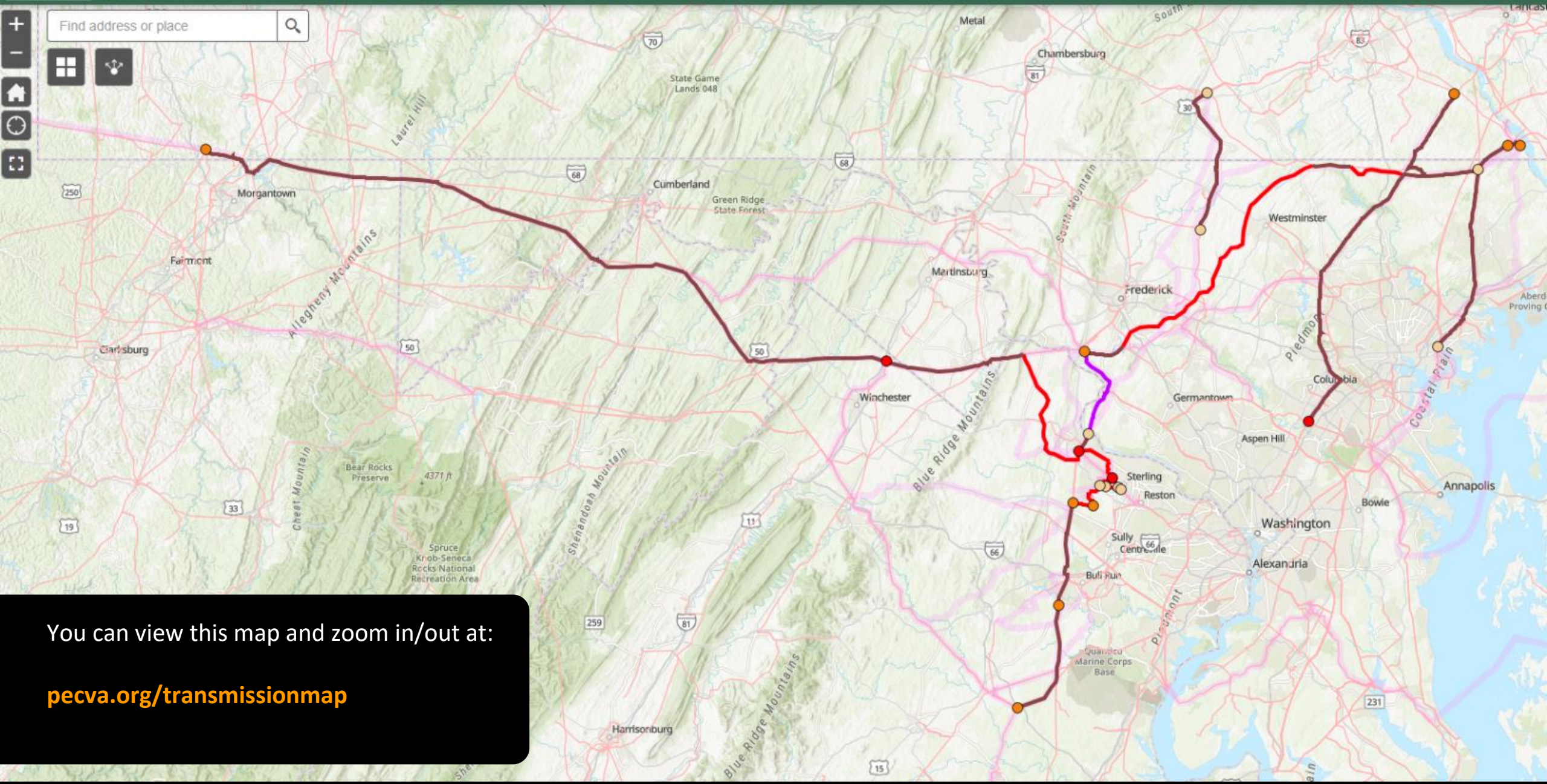


The overall increase in electricity sales is forecasted to be 32% over 10 years. That accounts for increased energy efficiency among other sectors. The forecast does not include projected electricity demand from electric vehicles.

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!

Initial Transmission Line Proposals to Serve Data Center Load Growth



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

pecva.org/transmissionmap

Transmission Line Proposals to Serve Data Center Load Growth

Piedmont Environmental Council

- 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

0 1.5 3 Miles

Are of Detail

Who?

NEXTera ENERGY TRANSMISSION MIDATLANTIC

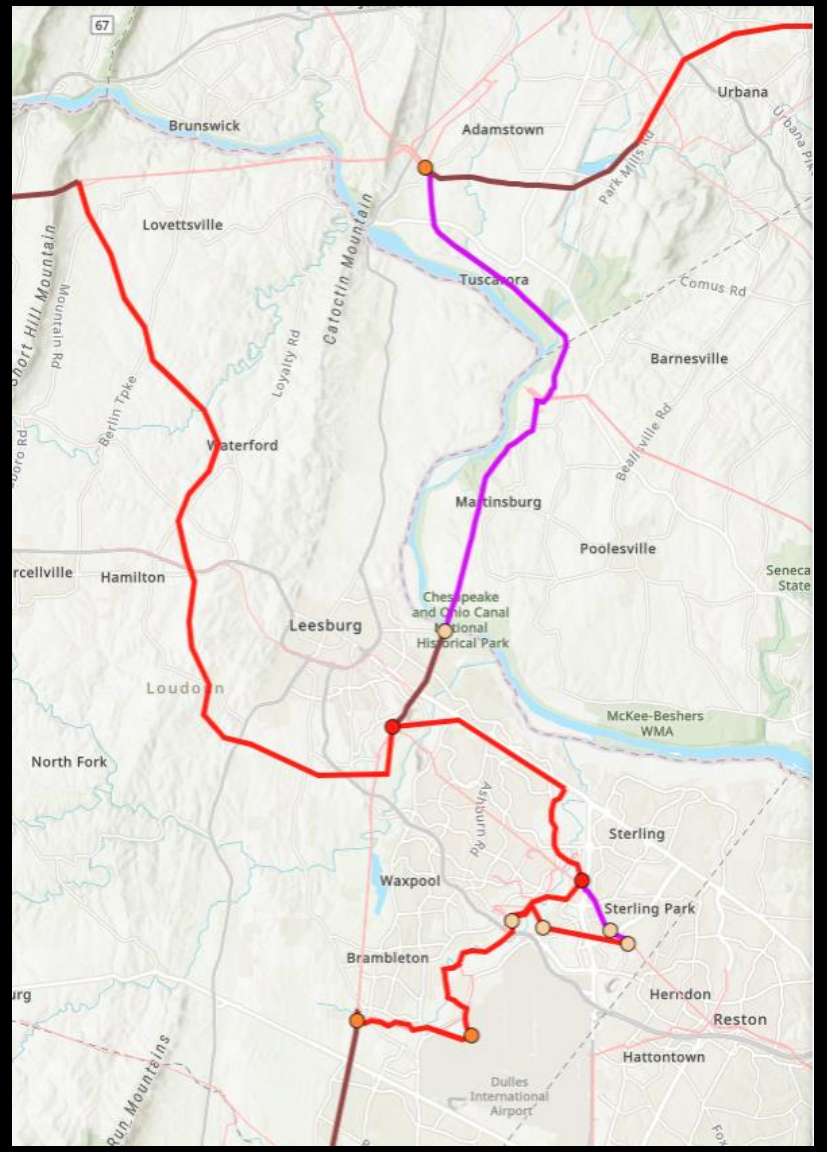
And

Dominion Energy®

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

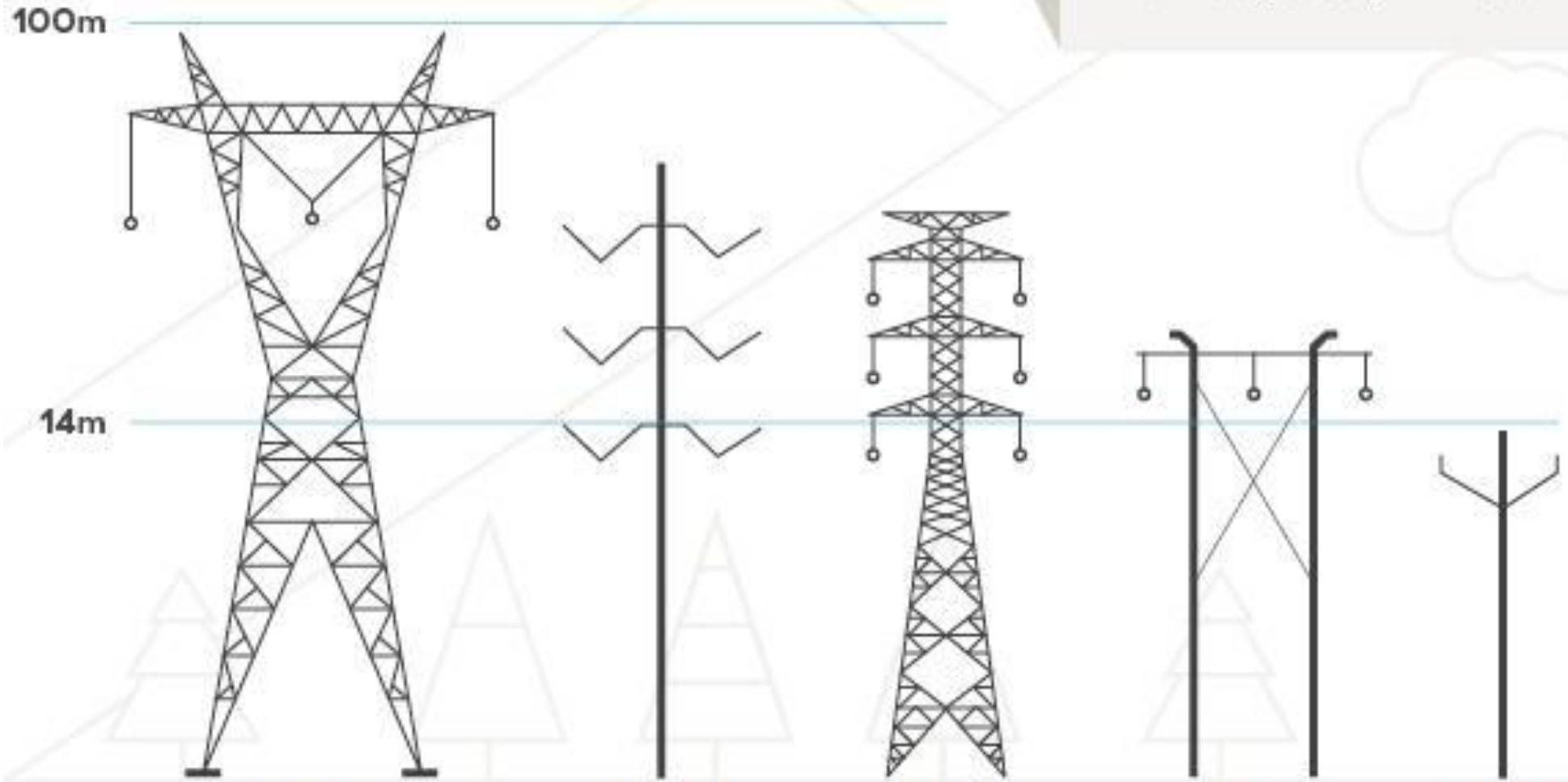

230 kV transmission line

Transmission lines

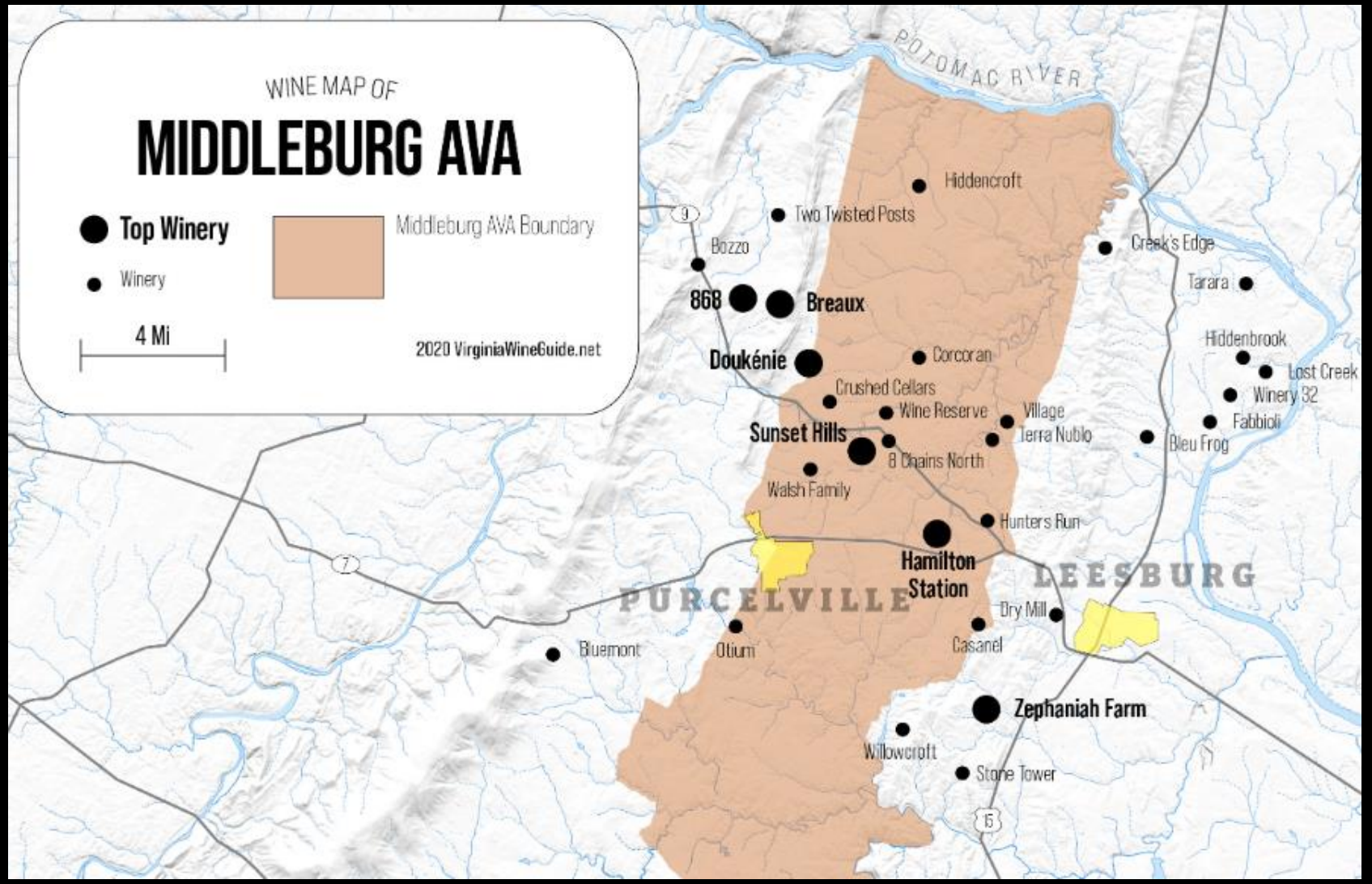
Transmission lines are the big, high voltage power lines that bring electricity from where it's made at our generating stations to substations near communities across B.C.

What's a kV?

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



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

1332 Farms +73 from 2017

Size

176 Farms 1-9 acres

805 Farms 10-49 acres

<u>Leading the State</u>

#1: Equine, cut flowers, Laying Hens, Orchards, Farms growing Grapes, dairy goats, strawberries, blackberries, blueberries

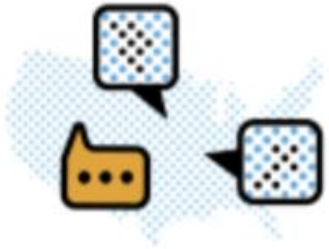
#2: acres under vine, vegetable farms, number of goats, Sheep Farms

Nextera has applied for NIETC designation

The Federal Power Act authorizes the Secretary of Energy to designate any geographic area as a National Interest Electric Transmission Corridor (NIETC) if the Secretary finds that consumers are harmed by a lack of transmission in the area and that the development of new transmission would advance important national interests in that area, such as increased reliability and reduced consumer costs.

4 Phase process which began in February

NIETC Designation Process



	PHASE 1 Information Gathering	PHASE 2 Preliminary List & Comments	PHASE 3 Public Engagement	PHASE 4 NIETC(s) Designated
DOE activities	• Reviews National Transmission Needs Study findings • Begins identifying potential NIETCs	• Publishes preliminary list of potential NIETCs	• Refines geographic boundaries of potential NIETCs and prepares draft report • Conducts community engagement and any required environmental reviews	• Issues final NIETC designation report(s) and any required environmental document(s)
Public activities	• Submits recommendations on where to designate NIETCs and why	• Provides comments, alternatives and recommendations, and additional information	• Participates in DOE-led community engagement activities focused on potential NIETCs	• Focuses on areas of greatest transmission need • Transmission developers in NIETCs access federal financing and siting tools

Modernizing and expanding transmission infrastructure helps **increase reliability, resilience, and access to clean, affordable electricity**

We Are Here

From: https://www.energy.gov/gdo/national-interest-electric-transmission-corridor-designation-process

Who is in charge?

PJM?

Local governments?

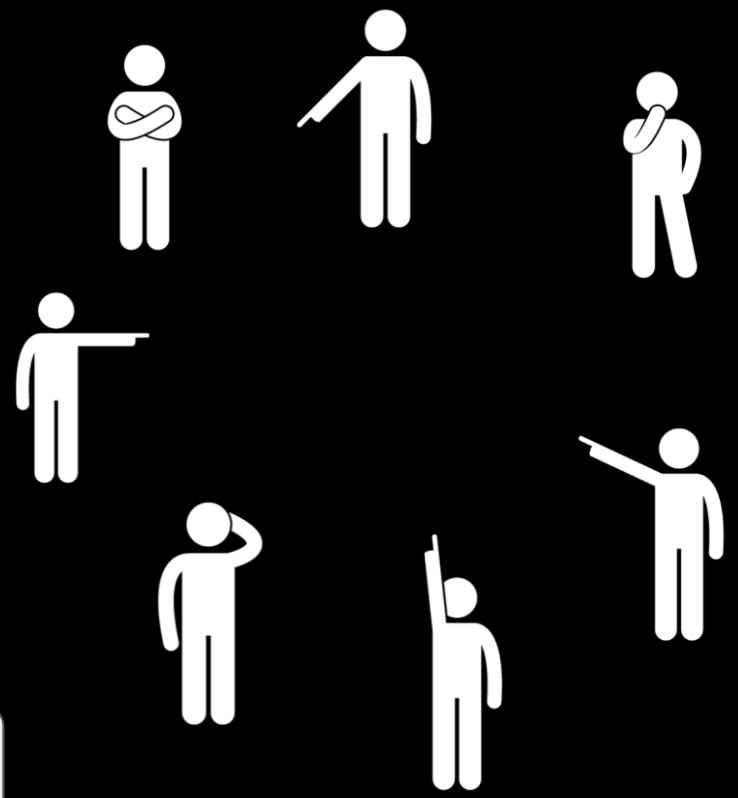
FERC?

Dominion?

Virginia State Corporation Commission?

General Assembly?

DEQ?



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

- **Financially support the local efforts and the broader campaign needed!**

Advocacy, Effective Strategies, and Technical Alternatives

Tom Donahue, Electrical Engineer, county resident volunteering with the, Loudoun Transmission Line Alliance and Scenic Loudoun Legal Defense.

Understanding the Path Ahead

- PJM's Imperative
- The Journey to the SCC
  - How does NIETC fit into this?
- Historical Case Studies To Inform Strategy
- Strategies
  - Just say no (fight the need, harm, and solution)
  - Local power generation
  - Different kinds of transmission lines (HVDC, underground AC)
  - Align with existing infrastructure (power, transportation)
  - Upgrade existing transmission lines (conductors)

I don't know the right answer.
My goal is to inform.
We must learn from history.

PJM View of the Need

(Only point in process where regional scope considered)

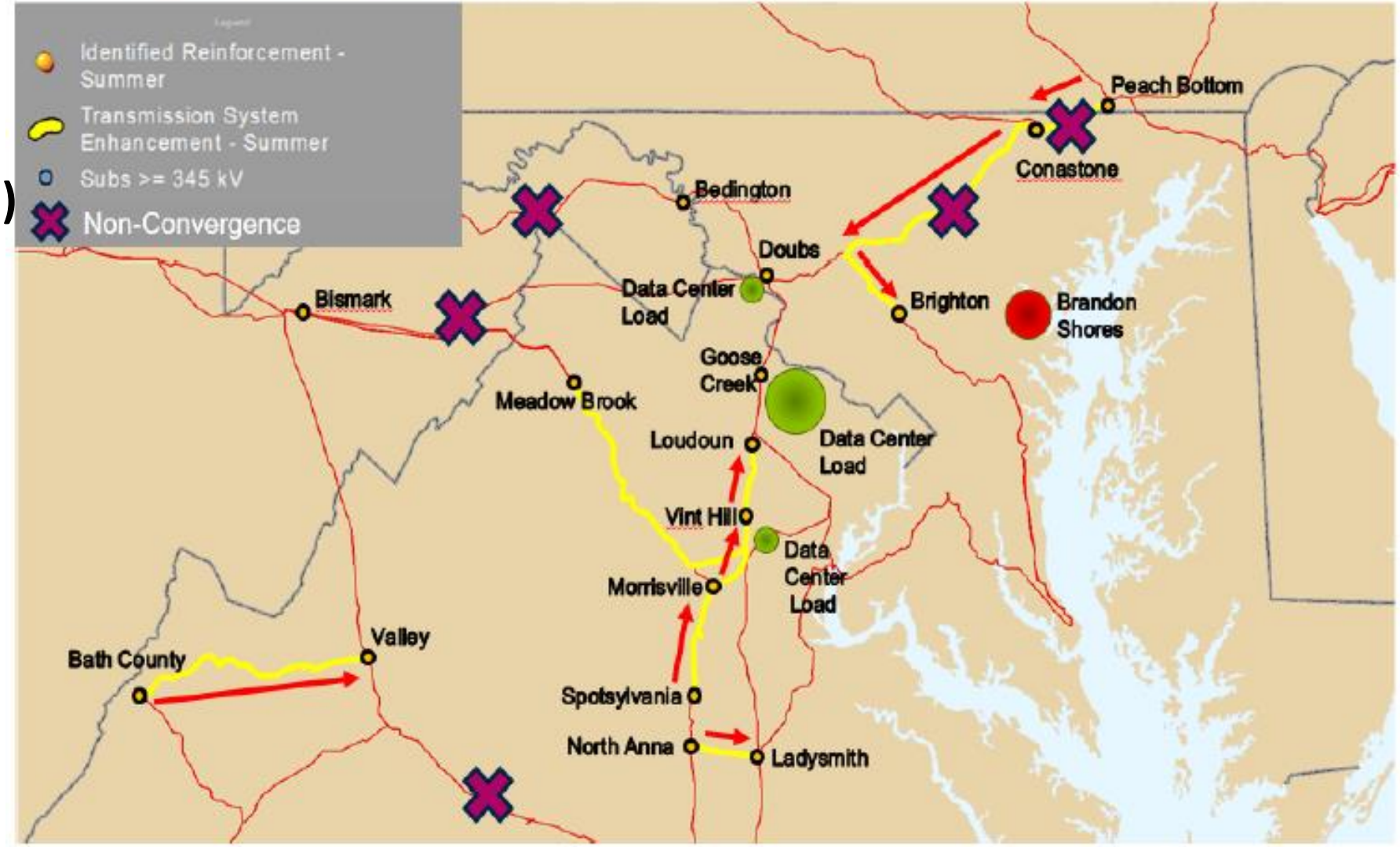
Projected load increasing faster than expected
~7,500 MW
(probably under-estimated)

And likewise for losing old power plants
(40,000 MW at risk)

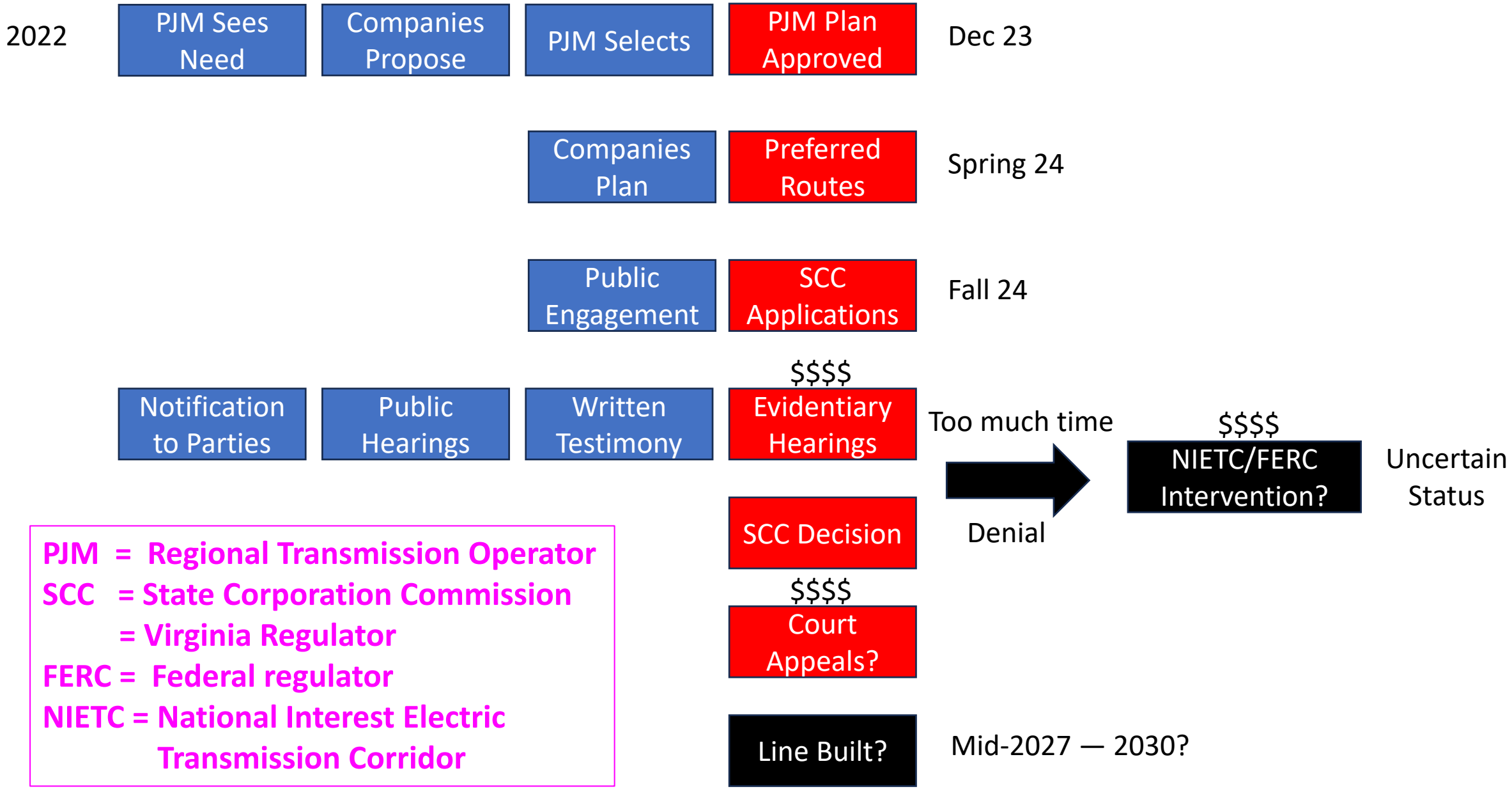
Transmission choke points

MW=1 million watts
kV = 1,000 volts
AC = alternating current
DC = direct (constant) current

Map 1. 2022 RTEP Window 3 Map of Regional/Local Needs

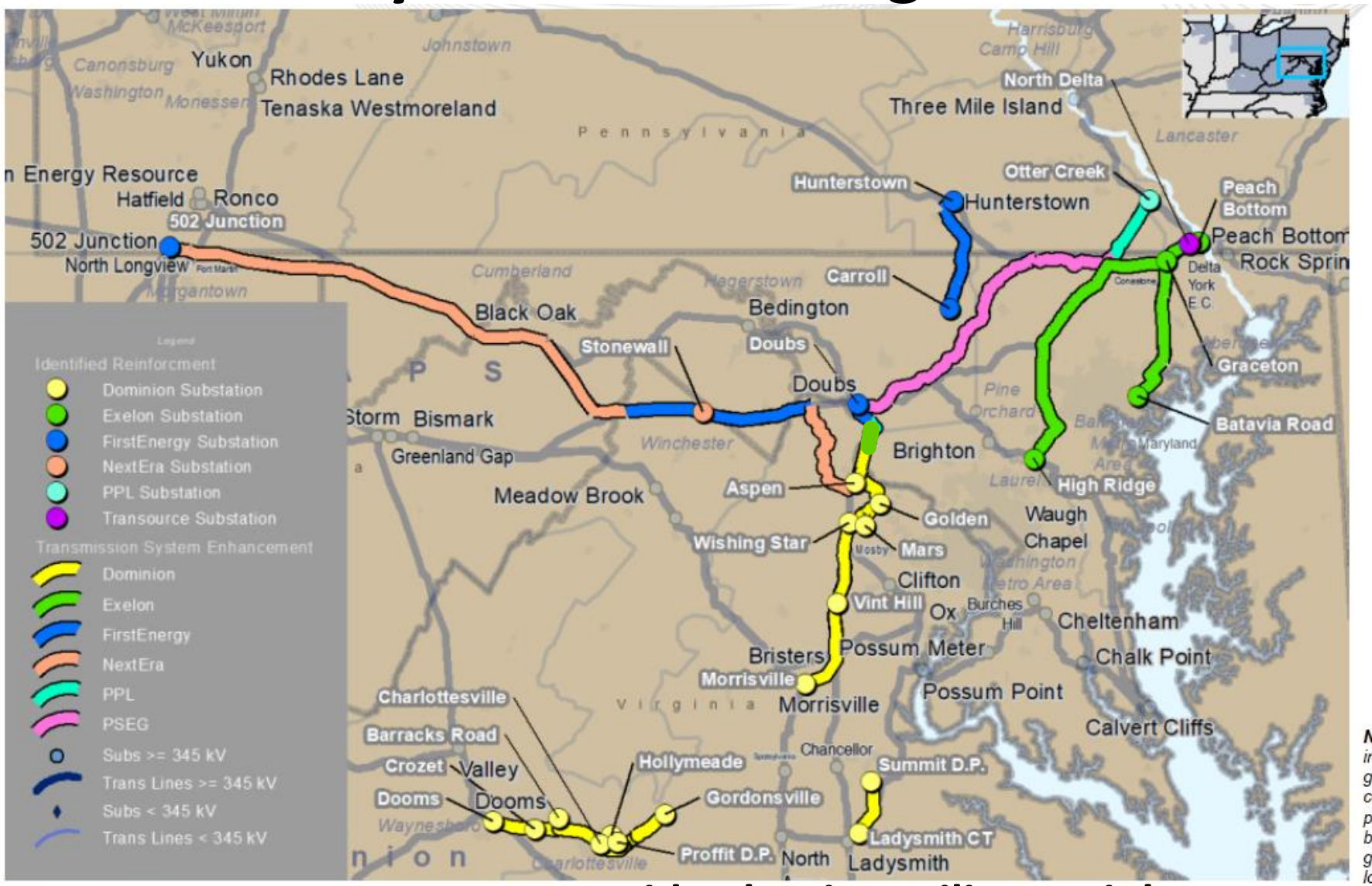


Transmission Line Process



PJM = Regional Transmission Operator
SCC = State Corporation Commission
= Virginia Regulator
FERC = Federal regulator
NIETC = National Interest Electric Transmission Corridor

MARL = 4th Try To Fix Recurring Flow Problem



Multi-Headed Hydra
Multiple companies
Multiple states
Multiple regulators

PJM will be back for more after this

NOTE: *This map is only intended to illustrate the general electrical connectivity of the projects, and should not be relied upon for exact geographical substation locations or line routes.*

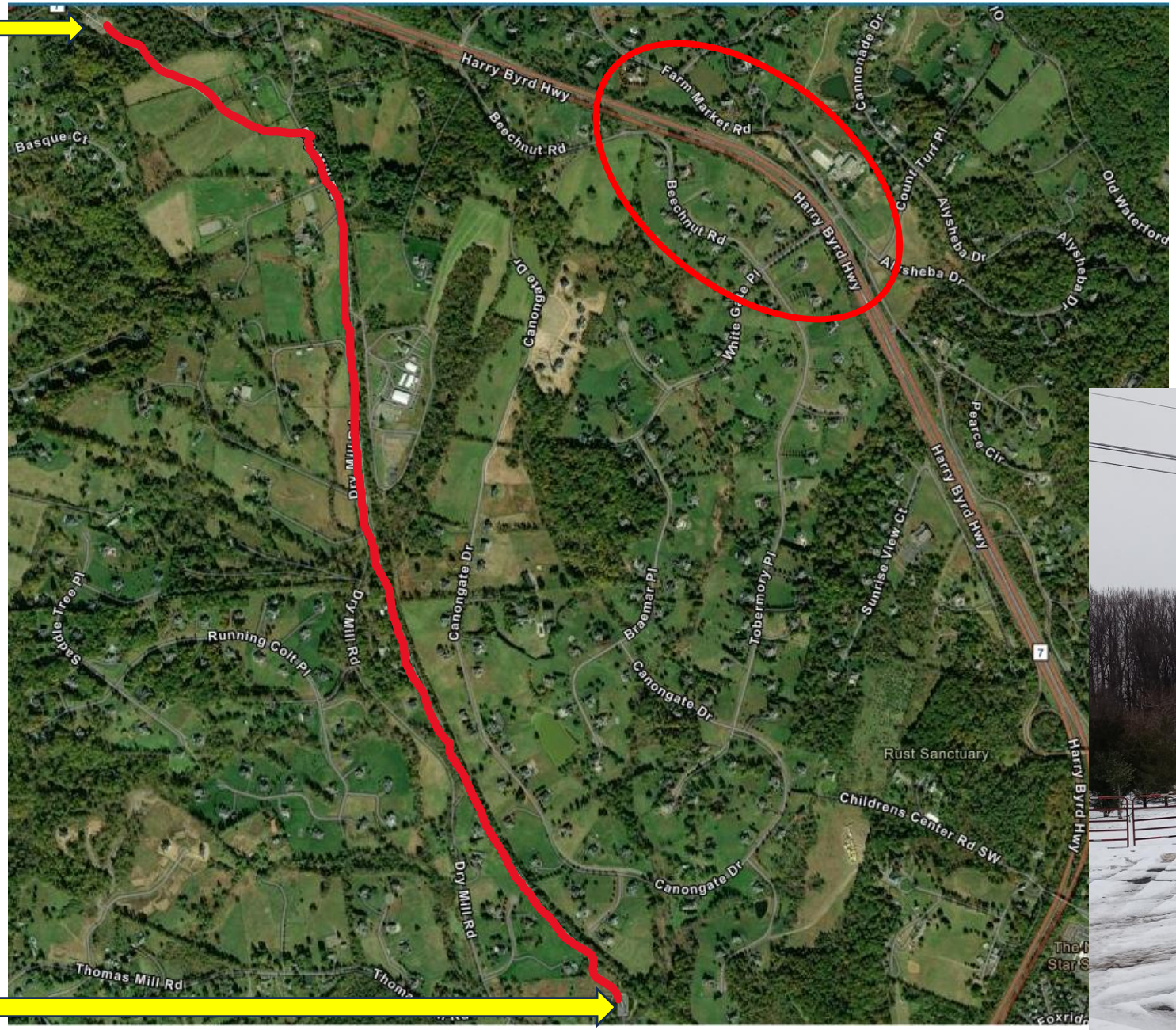
MARL = Mid-Atlantic Resiliency Link or
an unconsolidated sedimentary rock or soil consisting of clay and lime

Case 1: Leesburg Bypass 230 kV (2004-2010)

- Discussion began in 2004 and application in April 2005 because of new housing
- Early feedback pushed Dominion to **avoid W&OD existing right of way**
- Dominion added 4 miles to route by going to Mt. Gilead and through Digges Valley
  - Area now in conservation easements and partly in Goose Creek Historic District
- **Virginia Supreme Court in 1981 ruled utility most show an existing right of way cannot be used**
  - **But Court also said existing right of way could be judged as causing more harm**
- SCC in Feb 2008 decided to use **highway** plus 1.8 miles of **W&OD trail above ground**
  - **Emergency legislation** several weeks later required **underground** pilot
- W&OD trail reopened in November 2010

Underground Line Mandated by Law To Reduce Harm to W&OD

Transition station



Transition station

1.8 miles underground portion of 230 kV line around Leesburg parallel to Dry Mill Rd

Overall line ~12 miles vs. ~16 miles to go through Digges Valley

Avoiding vulnerable houses in Shenstone and along Dry Mill and 4H Fair Grounds

Case Study 2: The TrAIL (2006-2011)

Pennsylvania

Maryland

West Virginia

Virginia

DC

502 Junction

Ft. Martin

Black Oak

Harrison

Pruntytown

TrAIL

Mt Storm

138 kV substations

Stonewall

Millville

Doubs

Brighton

Goose Creek

LC Data

Brambleton

Loudoun /Mosby

Ox

PWC Data

Bristers

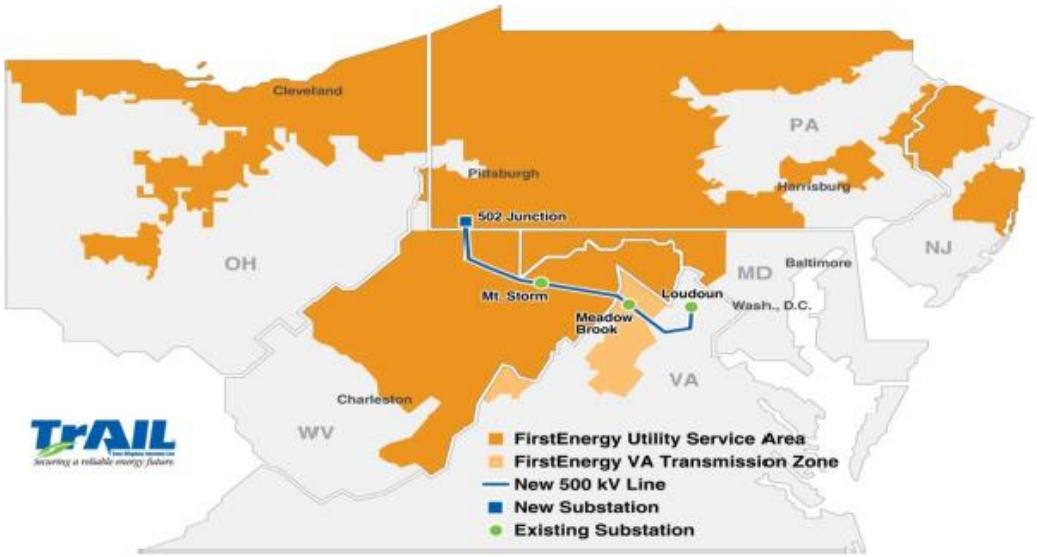
Morrisville

Meadow Brook

TrAIL

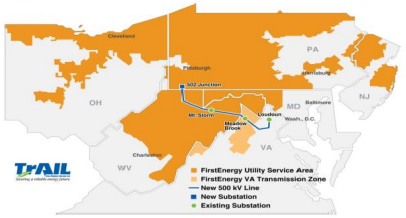
North Anna

Lady Smith



Existing 500 kV ROW
Added to 500 kV ROW
New 500 kV ROW
230 kV ROW Dual Circuit
230 kV ROW Single Circuit
138 kV ROW
500 kV Substation
138 or 230 kV Substation
Added 500 kV Substation

TrAIL Approved Just Ahead of Recession



- Need caused by housing growth and weakness in Mt. Storm–Doubs line
  - SCC approved in October 2008
- Pennsylvania Commission rejected arguments that better to improve Mt. Storm-Doubs and that TrAIL was moving dirty coal power to the east.
- Va. SCC ruled anticipated reliability violations on Mt. Storm–Doubs line must be fixed.
  - A clear reliability need has been shown and the proposed transmission line is an ACCEPTABLE option under Virginia statutes to meet that need.
  - Even if proposed generating plants could realistically be available, transmission line overloads would still be present on the Mt. Storm–Doubs line.
- Virginia Supreme Court in 2009 upheld SCC ruling on appeal:
  - Commission may consider data that may be biased by a federal regulatory process that seeks different goals. (Federal process favored more transmission to fix reliability concerns vs. more generation or conservation).
  - Even if alternative solutions were feasible, a state regulatory agency lacks the authority to require that action be taken on an INTERSTATE scale.

Case Study 3: PATH 765 kV Line (2007-2012)

States in 2009 denied applications because final termination point in question.
Frederick Co. MD zoning ruling blocked final substation in 2010.
Citing shifting economic forecasts and public policy related to renewable energy,
PJM suspended in 2011, withdrew in 2012.

765 kV line
~ 2x
power of
500 kV line

290 miles,
$1.8 billion
estimate

Final
settlement
with PJM
in Dec 2023

Case Study 4: Direct Solution (2013-2015)

Dominion Rebuild and Capacity Upgrade of Mt. Storm to Doubs

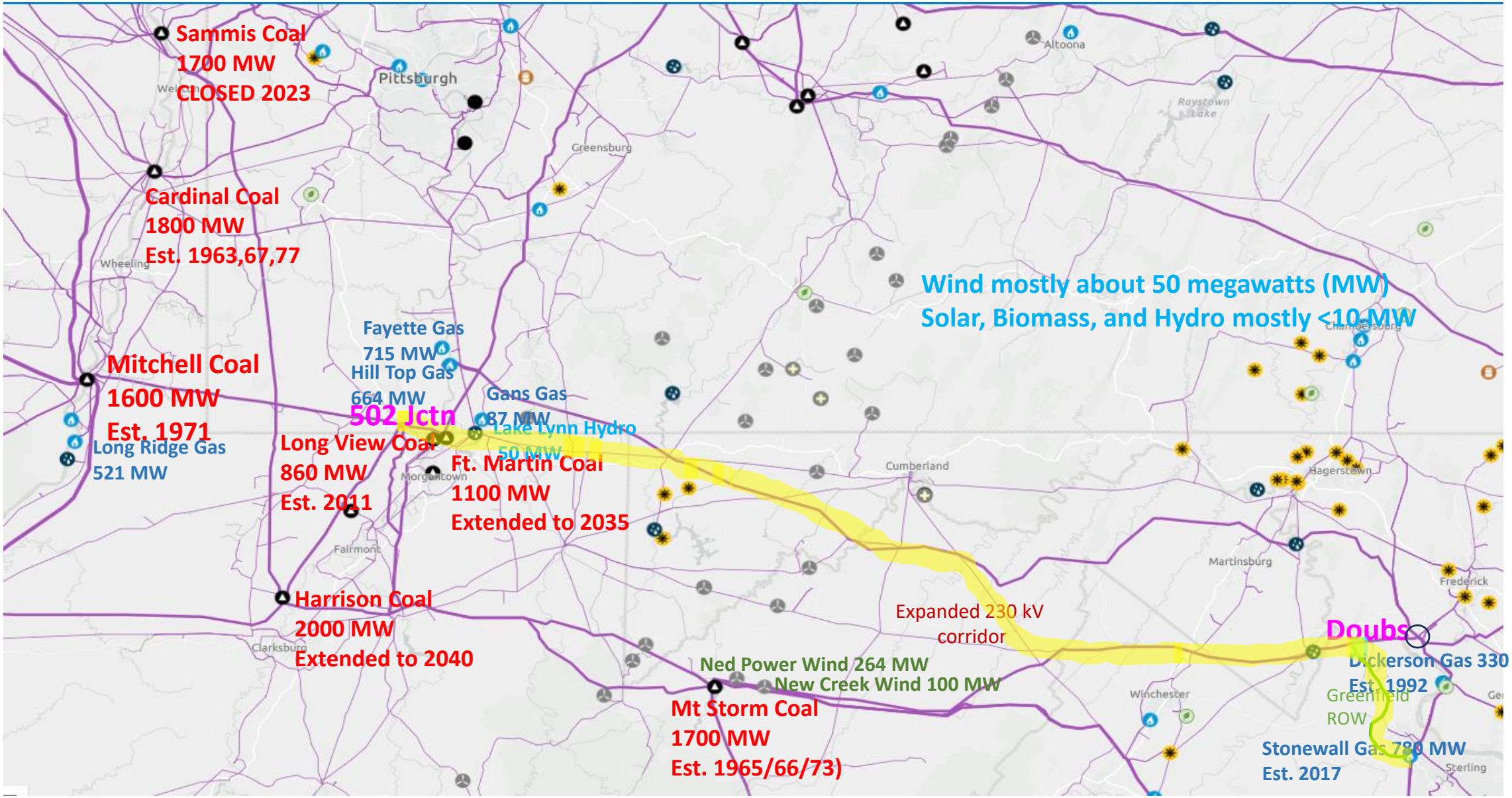
96.4 miles

Strategy 1: Just Say No! (Virginia Code § 56-46.1)

- **Fight the NEED**
  - SCC must verify load/flow modeling and contingency analysis
  - Can reliability issues be resolved by other means?
    - Possible to improve existing lines?
    - Local power generation **imminent**?
  - Data center or general economic outlook diminishing (tech bubble)?
- **Fight the HARM** (also used to fight specific routing)**:**
  - Need **strong specific data** to support a case for harm broad enough to stop the line
  - By law, line must **reasonably** minimize to greatest extent **practicable** harm to**:**
    - Scenic assets and historic resources (helps to be registered)
      - Conservation easements?
    - Economic harm (to agri-tourism and other local businesses, property values)
    - Public safety (electromagnetic fields; pesticides; gas lines)
    - Environmental impact (water, species, habitat, tree cover, etc.)
- **Fight the Solution** (substations, availability of power, coal issues)

What Happens When Aging Coal-Fired Power Sources Retire By 2040?

Role of April 2024 Federal Environmental Regulations for Coal Plants?

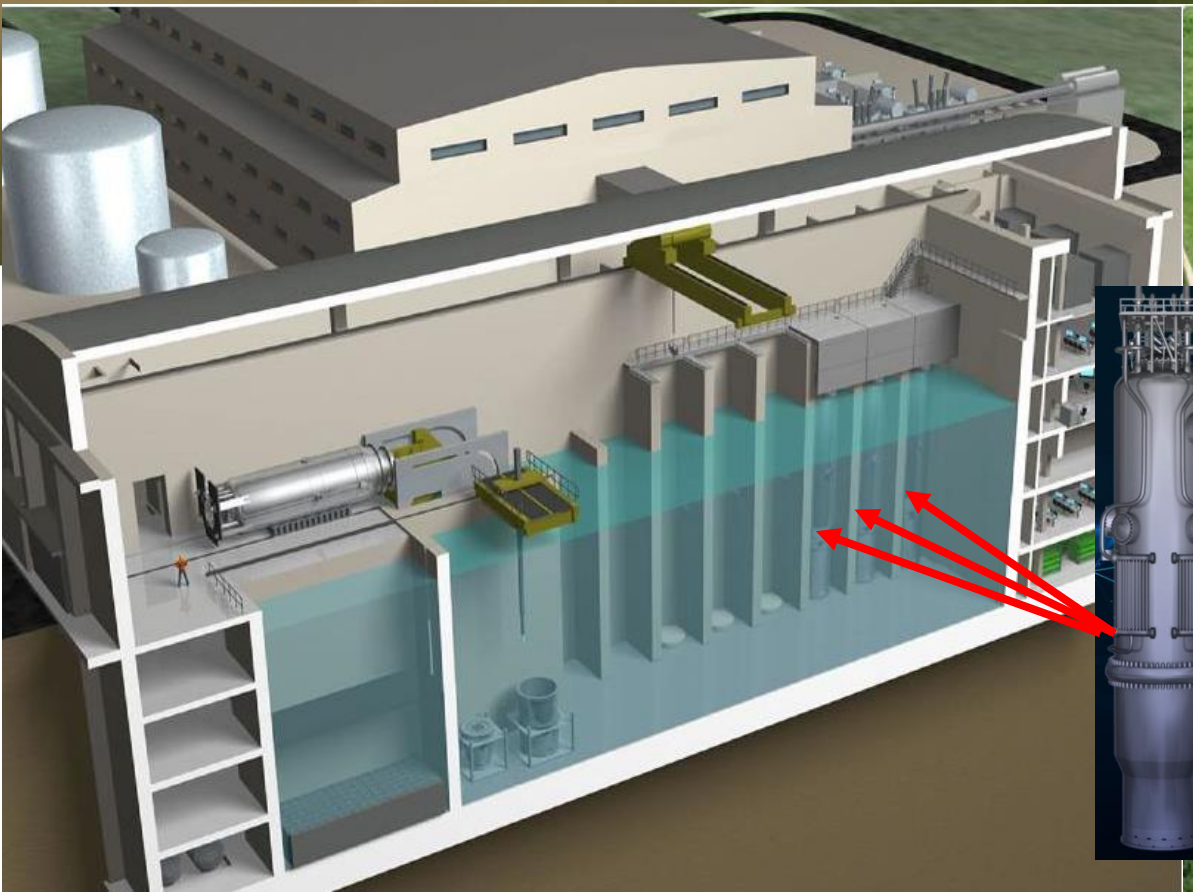


Strategy 2: Build new local generation?

Panda (2017) – Dickerson (2020) = not enough

Kemmerer Wyoming Likely To Be First US SMR Plant (1 SMR) Around 2030

- Small Modular Reactors (SMRs) are just one part of a power plant.
- SMR reactors are “small.”
- Power plants are not.
- Waste stored on site.
- 1 SMR only ~ 300 MW
- Transmission & Substation?



Strategy 3: High Voltage Direct Current (HVDC) and Underground

Railroad right of way makes easier, cheaper

Approved by Iowa
but still need Illinois and PJM

Planning and construction will take another 6 years after that

$2.5 billion
2,100 megawatts
350 miles

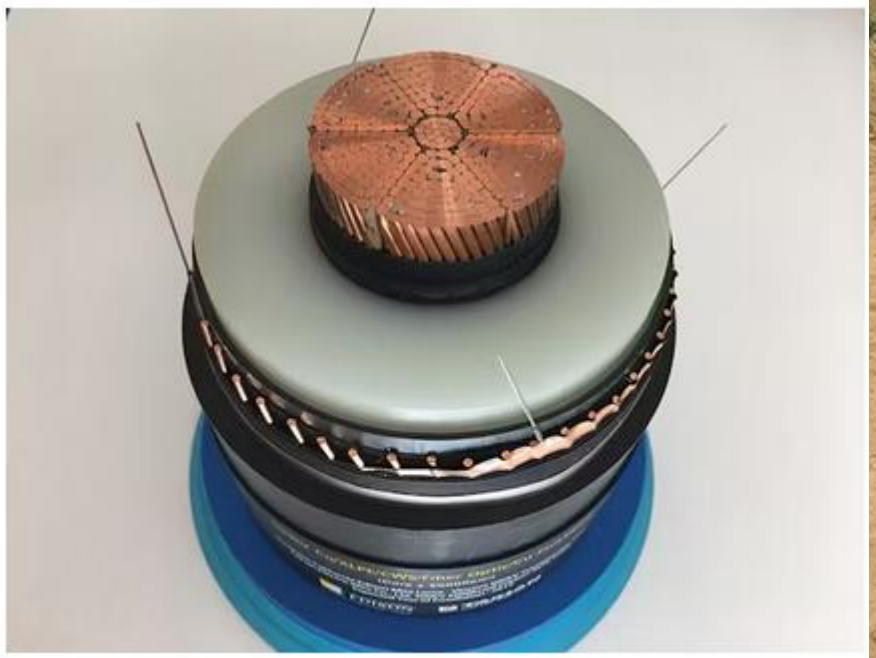
HVDC generally built by private equity rather than usual utilities, often with long planning and construction timelines.

Underground 500 kV AC Tehachapi Line Near Los Angeles 2013-2016

Similar impact as gas line

3.7 miles
$226 million
(2013 estimate)

4,500 MW
double circuit



A 5000-kcmil segmental copper XLPE cable with laminate copper sheath and embedded optical fiber.

18 cables each size of a thigh to reduce heat generation.

Need to account for heat expansion.

Splice vaults buried ~every 1,000 ft

The original splice vault design was a 32-ft-long base unit. But using a modular tunnel-sectiondesign offered flexibility for custom lengths, such as these 64-ft-long vaults.

Strategy 4: Aligned With Existing Infrastructure

Power Line Rights of Way (§ 56-46.1C)

- Woodside to Doubs to Aspen (next slide)
- 502 Junction to Doubs via Martinsburg (PJM chose NextEra over this)
- Existing distribution lines (not just along roads)

Mostly Along Highways (VDOT has a say)

- Route 7? To Where? Same issues as before on Leesburg Bypass?
- Route 15?
- Route 9?
- Berlin Turnpike?
- Further west?
- Smaller roads?

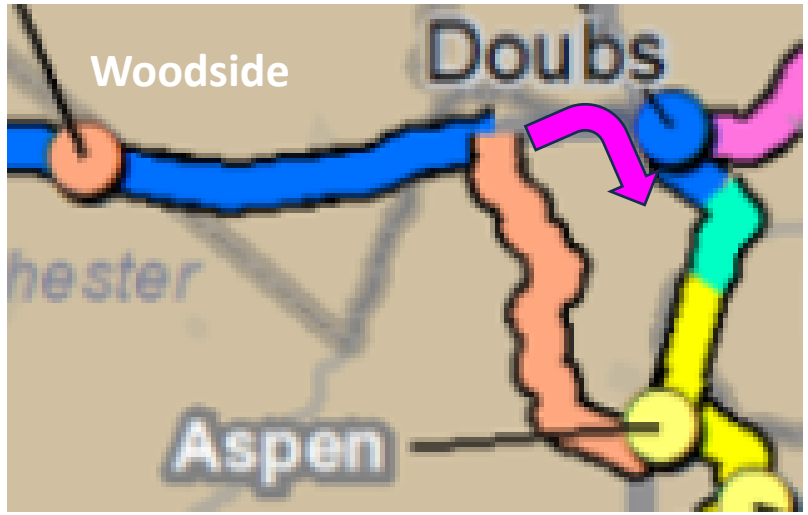
Railroads (CSX) (might be more useful for HVDC)

- Tunnels, bridges, and switchyards must be considered

Rivers (Potomac belongs to Maryland) (might be more useful for HVDC)

- Shoals and falls must be considered
- Line gets buried in river bed

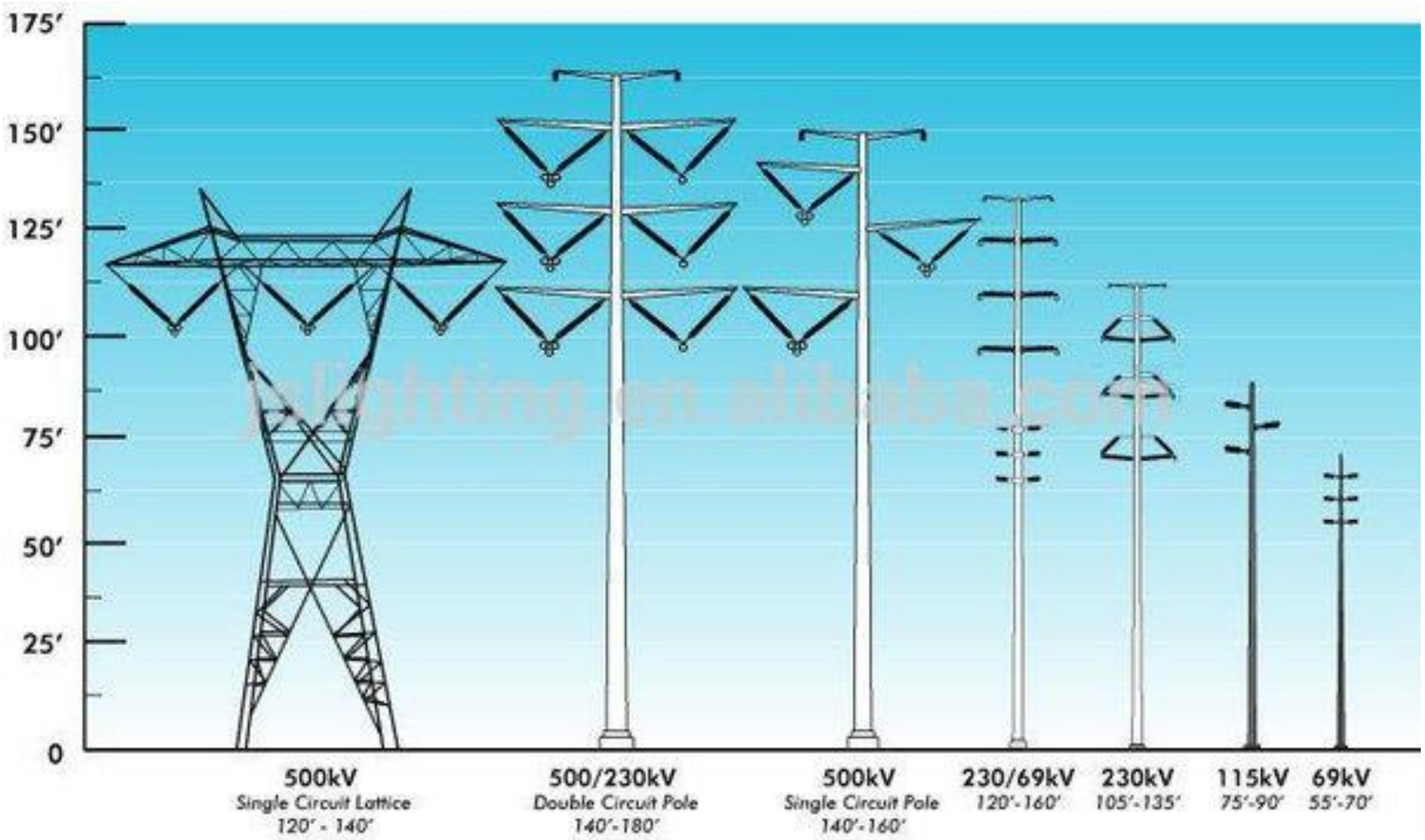
Existing Right of Way to Doubs Considerations



PJM in November 2023 cited this route as a backup plan in the event of too much resistance to western Loudoun route.

Challenges:

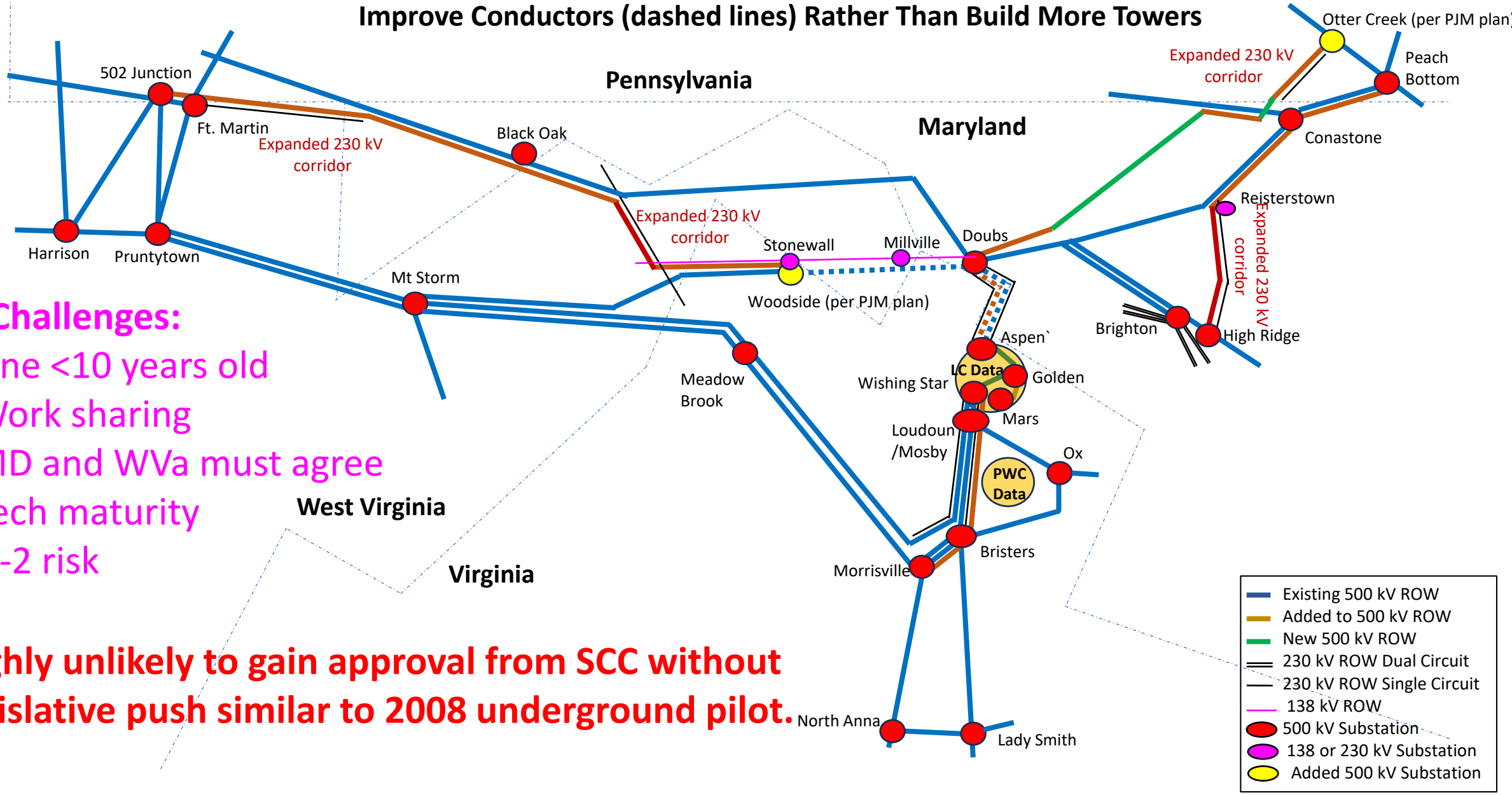
1) Staying within existing ROW
2) Maryland must agree
3) Effect on Northern Loudoun and River Creek
4) Work sharing between companies



South of Leesburg Dominion placing three monopoles in place of two lattice towers.

Strategy 5: Composite Core Conductors to Double Power

Improve Conductors (dashed lines) Rather Than Build More Towers



Big Challenges:

1) Line <10 years old
2) Work sharing
3) MD and WVa must agree
4) Tech maturity
5) N-2 risk

Highly unlikely to gain approval from SCC without legislative push similar to 2008 underground pilot.

Summary

- The SCC will:
  - Evaluate whether the application is an **acceptable** solution to the problem.
  - Seek to **minimize** harm.
  - Seek to use **existing rights of way** unless the new right of way is shown to cause less harm.
  - Not consider **hypothetical futures** that might someday solve the problem.
  - Not be inclined to introduce **cost** or **new technology** unless required by law.
  - Not reengineer the plan beyond its **jurisdiction** of Virginia.
- **Will SCC consider future factors** such as decommissioning coal plants?
- NIETC could be an issue if the SCC process takes **too long** or **denies** the application.
  - Federal process also seeks use of existing rights of way and minimizing harm.

This is HARD. We will need to consider EVERYTHING!
STAY UNITED! Coordinate with other states.
We need help from legislators for leverage with the SCC!!

Current Situation:

Fast Moving Decisions and Community Action

Susan Manch, President of The Waterford Foundation; LTLA

Waterford FOUNDATION, INC.

Loudoun Transmission Line Alliance

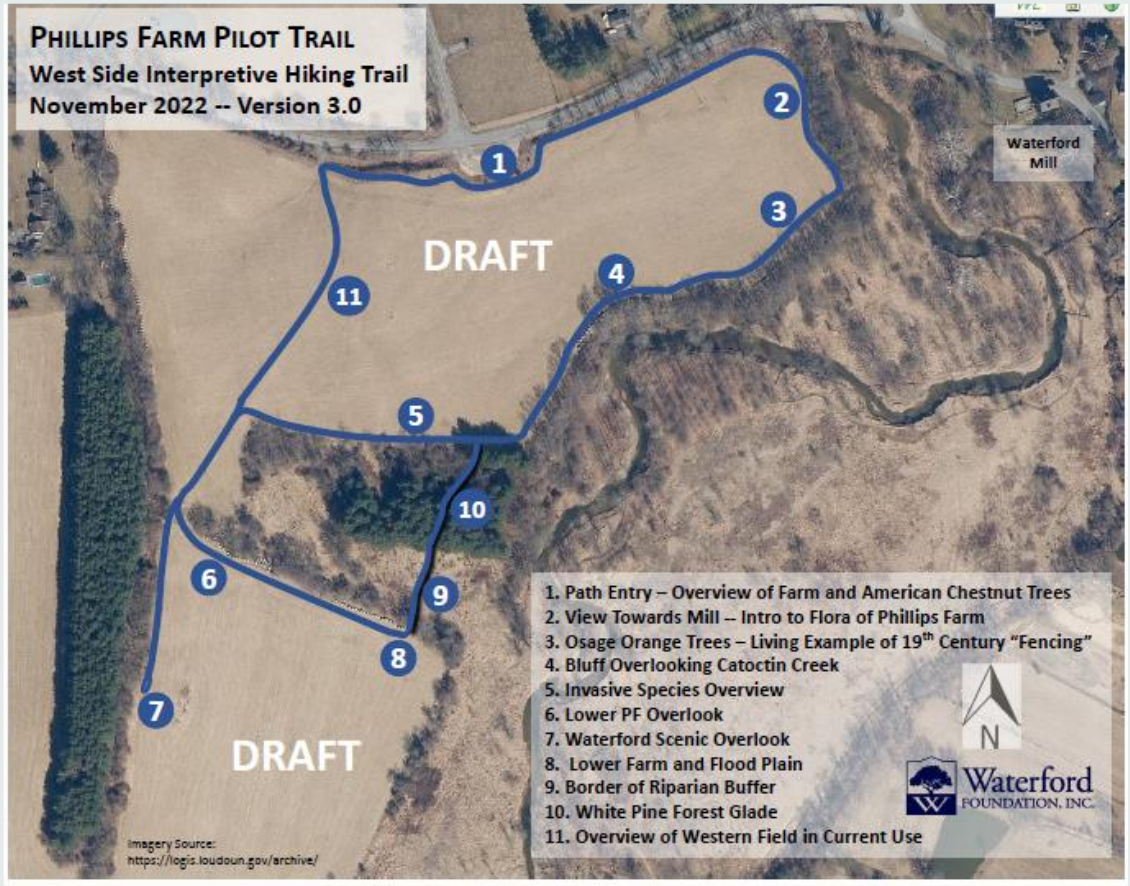
Update and Call to Action

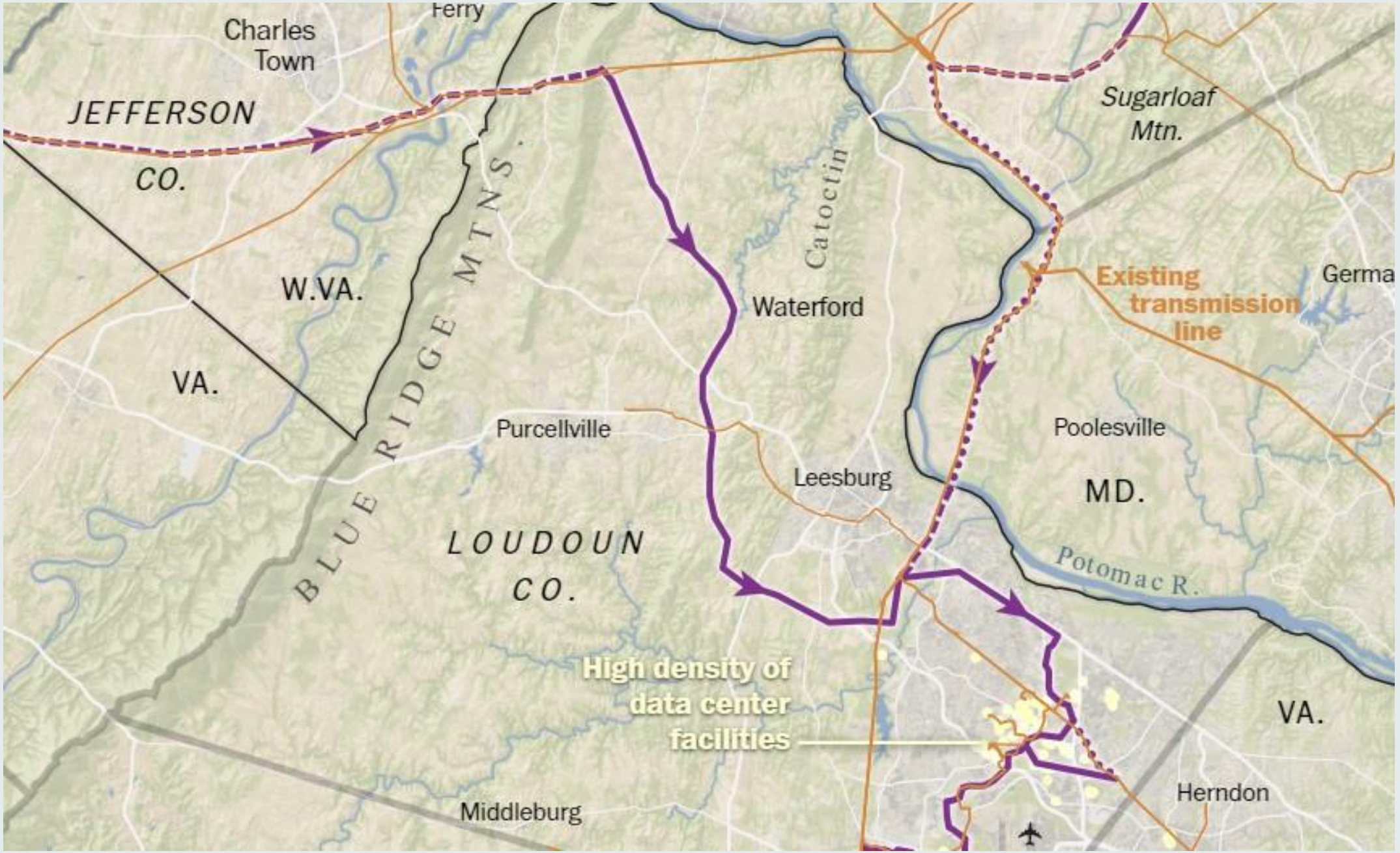
Discussion Points

- From November to Action
- Important Research
- Waterford Leadership Council
- Formation of the LTLA
- The Declaration
- Call to Action and Next Steps

From November to Action

- November 30 PEC meeting
- Revelation!
- Clear community support
- Need for swift action




Ferry
Charles Town
JEFFERSON CO.
W.VA.
VA.
BLUE RIDGE MTNS.
Catoctin
Sugarloaf Mtn.
Existing transmission line
Germa
Waterford
Purcellville
Leesburg
Poolesville
MD.
LOUDOUN CO.
Potomac R.
High density of data center facilities
VA.
Herndon
Middleburg

Important Research

End of the line: environmental justice, energy justice, and opposition to power lines

David J. Hess, Rachel G. McKane & Caroline Pietzryk, Environmental Politics, 19 July 2021

Studied public opposition to power line siting from 2009 – 2019 in North America

- In 18 cases where there was a major route change, the key actors were local governments and a coalition of rural landowners and environmentalists
  - Key issues – property rights, ecological damage, health and safety, and local economy
- In 19 cases where project was cancelled, the same key actors and same key issues

Waterford Leadership Council

Waterford FOUNDATION, INC.

WCA

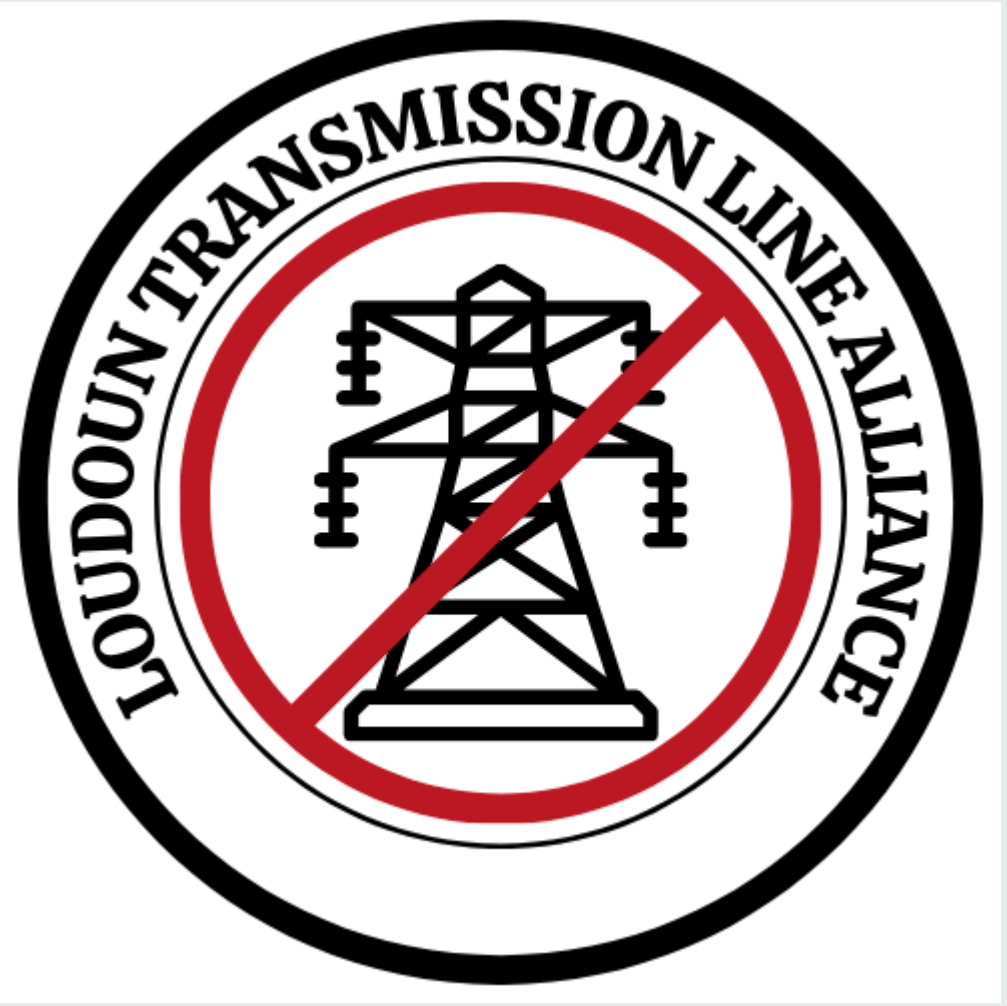
Waterford 2033

300 Years of Preservation & Conservation Through Innovation

- Group formed in 2021 to fill municipal leadership void
  - Waterford Foundation, Waterford Citizens Association, 2033 Futures Committee
- Considered the potential impact to the National Historic Landmark and the village
- Considered potential courses of action
- Determined a need to take the lead in mobilizing opposition
- Planned meeting of key stakeholder groups on February 7

Formation of the LTLA

- Invited over 50 organizations representing communities, businesses, non-profits
- Determined effective opposition profile:
  - Statement of common interest
  - Impact studies
  - Communications strategy
  - Strategy for working with local, state, and US elected officials
  - Steering group to facilitate action



Importance of the Community Groups

Groups like the Lovettsville Community Group are critical to our success:

- To communicate the immediate danger of this project
- To engage grassroots efforts
- To share information – check out waterfordfoundation.org and notransmissiontowershere.org
- To maintain solidarity
- To show the level of community support to NextEra and local, state, and federal elected officials

Developing the Declaration

- Drafted a statement of general concerns
- Received input from many of the LTLA members
- Met to discuss and finalize
- Curated the final statement

The LTLA Declaration

- We strenuously oppose construction of new "greenfield" lines in rural areas of the County. All new transmission lines should be located within existing power corridors – which we understand would be acceptable to PJM.
- As currently configured, the proposed route will cause major collateral damage to existing local businesses, notably in the agricultural and tourism sectors, as well as to residential valuations. Power corridors must be sited to minimize the impact on existing businesses, including those dependent on intact open landscapes.
- Historic and environmental sites, including landscapes, define the distinctive heritage of Loudoun County. In no instance should power corridors transit through or near National Historic Landmarks, historic districts, and other properties under conservation or preservation easements.

LTLA Support

- Declaration
  - 41 Organizations have signed
  - 776 individuals have signed
- Original Petition
  - 1200 individuals signed
- BOS has unanimously passed Resolution agreeing any lines should follow existing pathways

What Lies Ahead?

- We will publish our analysis and impact assessment – for NextEra and the public
- Waiting for NextEra to publish the results of its routing study
  - A public comment period will follow for 30 days
- Waiting for DOE to announce if this project will move on to phase II of the NITEC process
- NextEra will begin holding community meetings – possibly this summer or fall
- NextEra will submit a final proposal to the VA SCC
  - There will be a public comment period, but we will likely need to hire a lawyer to present a brief on our behalf
  - The County Attorney will likely present a brief on behalf of the County
  - The proposal will also be reviewed by DHR and VOF

Call to Action – Visit Waterford Foundation Website

- Sign the Declaration
- Comment to NextEra
- Share your story
- Stay informed – follow social media posts and updates
- Post signs in your yard – available at Foundation offices
- Sign up for emails
- Attend NextEra meetings
- Donate

Waterford FOUNDATION, INC.

Thank You for All You Are Doing

Comments, Questions & Answers

Facilitated by Mary Terpak