Electric Transmission and Distribution System
Electric Transmission System at a Glance

- Operates in Virginia, North Carolina and West Virginia
- 6,600 miles of transmission lines
  - 500 kV – 1,299 miles
  - 230 kV – 2,871 miles
  - 138 kV – 63 miles
  - 115 kV – 2,293 miles
  - 69 kV – 78 miles
- More than 800 substations
- More than 45,000 transmission structures

Electric Transmission is responsible for delivering electricity to Electric Distribution and large industrial customers.
Dominion Energy has the highest projected peak load growth rate in PJM based on:

- Residential/Commercial
- Government/Military
- Data Centers

**PJM peer average = 0.4%**
A Defining Moment for the Industry

2003 Blackout resulted in:
• Heightened regulations
• Mandatory fines
• Renewed focus on our nation’s energy infrastructure

Note: This is a depiction not an actual satellite image of the 2003 Blackout.
Key Regulatory Bodies

FERC – Exclusive jurisdiction to determine and regulate the reliability of the electric transmission grid

NERC – Regulatory authority to develop and enforce the mandatory reliability standards – criteria, data and methodology to evaluate and ensure the reliability of the bulk power system in North America

PJM – Regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia; Virginia law mandates Dominion Energy’s membership

SCC – Regulates Virginia public utility facilities, retail rates and service including transmission line need and routing; issues certificates of public convenience and necessity (typically electric transmission lines equal to or greater than 138 kV)

Local Governments – Regulate local land use (substations); typically electric transmission lines equal to or less than 138 kV

Cities and Counties
At Dominion Energy, we are committed to identifying and resolving reliability concerns in the areas we serve.
Forces Driving Infrastructure Need

- Economic Growth
- Aging Power Grid Assets
- Addressing Mandatory NERC Criteria Standards
Modeling Required for System Reliability

**Identify**

- Economic Growth
- Aging Power Grid Assets
- Addressing Mandatory NERC Criteria Standards

**Propose**

- Variety of ways to develop solutions:
  - Uprates*
  - Rebuilds
  - New Lines
  - New Equipment

- Does this solution:
  - Meet the need requirement?
  - Resolve all NERC Criteria violations?
  - Provide long-term reliability?
  - Use existing, proven technology?

**Solve**

- Does this solution:
  - Meet the need requirement?
  - Resolve all NERC Criteria violations?
  - Provide long-term reliability?
  - Use existing, proven technology?

**Seek Approval**

- State
- Local
- Other

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*Modifications made to existing structures and hardware which increase the current capability of the line. No change in appearance occurs.
Project Development and Approval

High-level Steps

• **Step 1:** Determine need and potentially impacted communities

• **Step 2:** Review existing conditions – routing and siting

• **Step 3:** Develop conceptual project scope and engineering

• **Step 4:** Public engagement process (pre-SCC) to include open house(s), project website, detailed mailers

• **Step 5:** SCC review of Dominion Energy project scope and feedback from participating parties to the case

• **Step 6:** SCC-approved configuration
The Virginia State Corporation Commission (SCC) has regulatory authority over all energy providers in Virginia and requires certification for all transmission lines out of the ordinary course of doing business or are at or above 138 kilovolts (kV). Among other responsibilities, the SCC validates the need for a proposed line and approves the route and structures. In reviewing a proposed project, the SCC must consider whether potential impacts on scenic assets, historic districts, and the environment have been reasonably minimized.

**Electric Transmission Line SCC Application Review Process**

- **SCC conducts public hearings**
  - Held in selected areas near the project
  - Respondents submit testimony
  - SCC Staff submits report about the project

- **Domestic Energy submits application to SCC**
  - Includes full project details, including need, cost, routing options, potential impacts, etc.
  - SCC posts application for public review
  - Available at sc.c.virginia.gov

- ** tabletop**
  - DEQ issues coordinated comments
  - Summary of recommendations from multiple state resource agencies to minimize impacts and for compliance with legal requirements

- **Discovery begins**
  - Discovery begins
  - SCC Staff starts its review; SCC Staff, Domestic Energy, and respondents may serve discovery

- **Public comment period opens**
  - Submitted online or via mail

- **SCC Staff submits rebuttal testimony**
  - In response to DEQ summary, staff report and respondent testimony

- **Interested parties can join case as respondents**
  - Formal mechanisms to join proceedings

- **Public comment period closes**

- **SCC conducts formal evidentiary hearing**
  - Testimony submitted and subject to cross-examination by SCC Staff, Domestic Energy, and respondents

- **SCC hearing examiner issues report of recommendation**

- **Participants issue responses**
  - SCC Staff, Domestic Energy, and respondents comment to hearing examiner’s report

- **Process could take as little as eight months to complete if uncontested, with more complex proceedings ranging from 12-24 months from start to finish**

- **SCC issues final order**
  - If approved, SCC issues a Certificate of Public Convenience and Necessity (CPCN) authorizing Domestic Energy to construct and operate the facilities
Electric Transmission Line Planning and Public Engagement Process

**LISTEN**
- Identify project need, begin conceptual project planning and design, and initiate public outreach and engagement.
- Local, county, and state officials: Meet with elected officials, county leadership, planning staff, etc.

**LEARN**
- State and federal agencies: Request input on routing considerations and Department of Environmental Quality (DEQ) supplements.
- Historic preservation and natural resource groups and Native American tribes: Request and consider input to minimize impacts to identified sites and residences.
- Finalize project design with available routes and options, share design options with stakeholders and begin required permitting process.

**DOMINION ENERGY**
- Consults with key stakeholders throughout the planning process to gather and incorporate feedback into design plans.

**IMPROVE**
- Community members: Outreach efforts include, but not limited to, mail notifications to property owners, newspaper advertisements, open house meetings, public input meetings, focus groups, and media posts.

**SHARE**
Routing Considerations

Foundational Principles

• Process always begins with review of existing rights of way and facilities
• Review land use of the property owners
• Colocate with other infrastructure, where appropriate
• Adhere to property boundaries if possible
• Minimize impacts to agricultural, human, environmental, cultural and historical concerns
Partnerships to Meet Future Demand
Modern Grid Infrastructure Improvements = Win-Win

Local Economy
- Creates jobs during construction
- Provides long-term tax revenues

Economic Development
- Supports local businesses with more reliable energy
- Provides flexibility for future economic growth

Reliable, Diverse Energy
- Improves service for customers by preventing power outages or speeding response to outages
- Diversifies energy supply by bringing renewables like solar and wind to the electric grid
Key Takeaways

Substantial new load associated with development will require new or modified electric transmission infrastructure.
Key Takeaways

Generally speaking, proposed large loads at a site located near existing electric transmission lines can make the routing and siting process easier.
Colocating electric transmission facilities with other utilities (highways, railroads, etc.) can help mitigate impact on private property, and environmental, historic and scenic resources.
The approval and permitting process is lengthy for new electric transmission infrastructure; communicate early and often with appropriate energy providers to ensure timely completion.
Our company is built on a proud legacy of public service, innovation and community involvement.
Extra Slides if Needed
Core Values

Safety:
Safety is our highest priority – in the workplace and in the community.

Ethics:
Ethical behavior matters, and our reputation depends on it.

Excellence:
We set high performance standards and are committed to continuous improvement in all areas of our business. The odds of long-term success improve when we go beyond “good” and strive for “great.”

Teamwork:
“One Dominion Energy” – We know that strong, sustainable performance depends on how well we support each other in executing our business plan.
Electric Transmission vs. Electric Distribution

Transmission Lines:
Lattice, H-frame and Monopole Structures

Distribution Line:
Overhead Structures
PJM Interconnection

One of the largest centrally dispatched control areas in North America

- PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity
- Neutral, independent party – operates a competitive wholesale electric market and manages the high-voltage electric grid
- PJM’s long-term regional planning process provides a broad, interstate perspective that identifies the most effective and cost-efficient improvements to the grid
- Ensures reliability and economic benefits on a system-wide basis
The Interconnected Grids
Dominion Energy is in the Eastern Interconnection
Transmission System Projects

Maintaining reliability is becoming more complex

• Economic growth – regional and statewide
• Aging power grid assets
• Addressing mandatory NERC criteria standards
• PJM Load Forecast
• Large load additions – such as data centers
• Generation retirements and additions
• Growth of intermittent renewables
Local Zoning, Siting, Approval Steps

- Inform state and local officials
- Details to local officials
- Local public outreach and engagement
- Land use committee
- Planning commission
- Board of supervisors
Routing Considerations

Physical Constraints

• Wetlands and waterway crossings
• Conservation lands such as those owned by the Virginia Outdoor Foundation, National Park Service, Department of Conservation and Recreation, and counties
• Threatened and endangered species
• Cultural and historical resources
• Neighborhoods
• Public gathering spaces such as schools, churches and parks

Additional Factors

• Ability to obtain permitting
• Public opinion
• Political dynamics
• Non-governmental organizations' perspectives
• Native American tribes
• Environmental justice
Structure Selection: Horizontal vs. Vertical

Structure selection has a direct correlation to:

- Structure height
- Width of the right of way
- Existing and future development
- Terrain, geology and environmental impacts