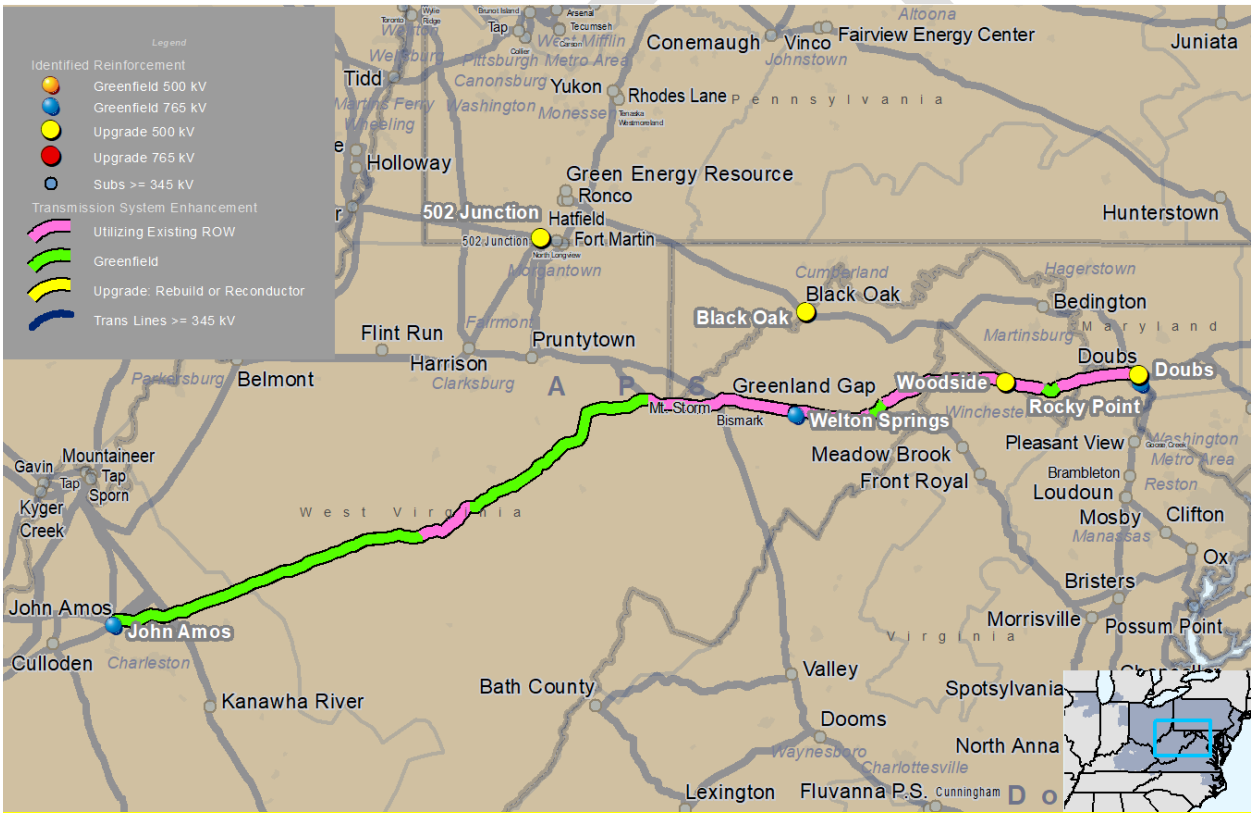
Regional Cluster Proposals

Proposal 708 – TRAIL (FirstEnergy)

First Energy Proposal No. 708 (**Map 2**), described as the 261-mile Amos-Welton Springs-Rocky Point 765 kV line, incorporates construction of multiple transmission lines and substation expansions to provide a robust, expandable transmission solution to address the 2024 Open Window 1 violations. This Proposal 708 is one of the major components of the joint PJM Proposal No. 262 (Portfolio 1A) submitted by Transource. This proposal has a total of nine components, including three substation upgrade components, two greenfield substation components, three greenfield transmission line components and one transmission line upgrade component.

Map 2. Proposal 708



*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.*

Project Overview

First Energy Proposal 708 includes the following components:

- Component 1: Amos Substation Upgrade
- Component 2: Amos-Welton Springs 765 kV Line
- Component 3: Welton Springs Switchyard
- Component 4: Welton Springs-Rocky Point 765 kV Line
- Component 5: Rocky Point Substation
- Component 6: Point of Rocks 500 kV Line Cut-Ins
- Component 7: Black Oak Substation
- Component 8: Loop The 502 Jct-Woodside 500 kV Line into Black Oak Substation
- Component 9: Doubs No. 1 500/230 kV Transformer Terminal Upgrades

Constructability Review

Right-of-Way/Land Usage Risk Analysis

Amos-Welton Springs

Approximate 175-mile 765 kV line will be constructed in West Virginia from the existing Amos substation in eastern Putnam County to the proposed Welton Springs substation in northwestern Hardy County. The transmission line corridor is proposed to cross twelve counties: Putnam, Kanawha, Roane, Calhoun, Braxton, Lewis, Upshur, Barbour, Tucker, Preston, Grant and Hardy. It is assumed that the 765 kV line will parallel existing ROW for approximately 42 miles and require new ROW for approximately 133 miles.

This component would cross approximately seven railroads with Conrail Railroad, Winchester and Western Railroad, South Branch Valley Railroad, CSXT, Norfolk Southern Railway Company, Baltimore and Ohio Railroad; approximately two interstate pipelines with Dominion Transmission Co. and Columbia Gas Trans Co.; approximately four national parks and one state park; and approximately 12 transmission line crossings with the Potomac Edison Company. A significant portion of the component is parallel to the transmission lines, and approximately 121 roads/highways across six counties in West Virginia, Virginia and Maryland. It is anticipated that the proposal could require permits, consultations, clearances and authorizations from three counties in Virginia, three counties in West Virginia and one county in Maryland. State PSC approval, CPCN and DOT utility permits, and driveway/local road permits may be required.

Welton Springs-Rocky Point

Approximate 86-mile 765 kV line will be constructed from the proposed Welton Springs switchyard in Hardy County, West Virginia to the proposed Rocky Point substation in Frederick County, Maryland. The line will traverse Hardy, Hampshire and Jefferson counties in West Virginia; Frederick, Clarke and Loudoun counties in Virginia; and Frederick County, Maryland. The 765 kV line will parallel existing transmission ROW for most of the line except for deviations to avoid developed areas or other constraints.

The proposed corridor for this line attempts to minimize traversing land specifically managed for conservation value such as the Nathaniel and Short Mountain WMAs, the southernmost boundary of the Harpers Ferry National Historical Park, the Appalachian Trail and the C&O Canal Tow Path. In sensitive areas, the proposed transmission line corridor proposes to parallel existing transmission corridors and will require expansion. Coordination with USDA, USFWS, NPS and numerous state and local agencies will be required.

Welton Springs Substation

The proposing entity will contact the landowners to start discussions and negotiations when appropriate. Approximately 35 to 40 acres of usable land will be needed for the substation footprint. This does not include land needed for site development (grading, stormwater management, etc.), transmission line ROW, access roads, on-site soils management or mitigation.

Rocky Point Substation

The property is owned by the proposing entity, and no additional land acquisition is anticipated.

Overall, the transmission line components parallel existing transmission lines and uses some greenfield construction; therefore, this proposal's ROW risk is considered medium-high.

Environmental Risk Analysis

Amos-Welton Springs Line

The proposed route has the potential to impact environmental resources including FEMA floodplains, streams, and wetlands subject to USACE Section 404 and/or Section 10 permitting, and woodlands with the potential to serve as suitable habitat for federally listed Threatened & Endangered Species. Impacts to these resources will require coordination with the appropriate county floodplain administrator and coordination with state wildlife agencies, USACE and USFWS. The proposed route intersects Karst zones. Geotechnical studies are needed to verify subsurface conditions before digging and/or trenching. Proposed route intersects three conservation easements. Coordination with easement holders – U.S. Forest Service; U.S. Army Corps of Engineers; WV Division of Natural Resources; Amherst Industries, Inc. – will be required.

Welton Springs-Rocky Point Line

The proposed route potentially intersects one historical district: Beverley Boundary Increase. Coordination with the WV SHPO is required to confirm the existence and significance of this feature. The proposed route has the potential to impact environmental resources including FEMA floodplains, streams, and wetlands subject to USACE Section 404 and/or Section 10 permitting, and woodlands with the potential to serve as suitable habitat for federally listed Threatened & Endangered Species. Impacts to these resources will require coordination with

the appropriate county floodplain administrator and coordination with state wildlife agencies, USACE and USFWS. Proposed route intersects critical habitat for green floater. Consultation with USFWS and state wildlife agency is needed to determine if the proposed project will have effects on protected species. The proposed route intersects 32 conservation easements. Coordination with easement holders – Potomac Conservancy; Land Trust of Virginia; VA Outdoors Foundation; Loudoun County, VA; Admin State VA; Potomac Conservancy; Old Dominion Land Conservancy; Clarke Co Conservation Easement; Northern Virginia Conservation Trust; Jefferson County, WV Farmland Protection Board; WV Division of Natural Resources; Cacapon and Lost Rivers Land Trust; Admin State WV; Appalachian Trail Conservancy; Maryland Agricultural Land Preservation Foundation – will be required.

Transmission Line Risk Analysis

Amos-Welton Springs 765 kV Line

The vast majority of the work associated with this proposal is the 175-mile 765 kV line that spans across most of West Virginia. The route provided appears to be almost entirely independent of other ROW through mountainous terrain. The acquisition of this amount of ROW and gaining siting approval may take longer than the entire schedule provided.

The proposal is feasible from design and construction, but may face some major risk due to the scale of the work and the route selected being entirely independent of other alignments in the area. Additionally, the proposal is indicating the use for guyed lattice structures, which would reduce costs and allow for flying in of structures on the terrain. However, this type of design is most often used in flatter terrain. Given the grade of a lot of this route, guy lengths may be exceedingly long or infeasible altogether. This project could potentially face significant opposition that will delay it.

Welton Springs-Rocky Point 765 kV Line

Guyed V-lattice tower construction will likely not work in many locations due to terrain. Building adjacent to existing 500 kV line and 138 kV T-line ROW for some of the circuit may cause issues with long spans and many crossings.

Substation Risk Analysis

Welton Springs Substation

Construct a new switchyard (Welton Springs) with 765 kV bus, two 250 MVAR shunt capacitors and a +/-500 MVAR STATCOM. Connect the 765 kV transmission lines: Amos-Welton Springs 765 kV line and Welton Springs-Point of Rocks 765 kV line.

Rocky Point Substation

Construct a new substation called Rocky Point with a 765 kV and a 500 kV yard. Loop in the Doubs-Goose Creek 500 kV line, the Doubs-Aspen 500 kV line and the Woodside-Goose Creek 500 kV line.

Procurement of EHV equipment could lead to unexpected schedule delays due to extended lead times and additional cost. With EHV equipment being relatively uncommon in the U.S., unexpected delays in procurement, engineering and construction may occur. Additionally, regulation and currency fluctuations for overseas equipment are likely to occur, which will impact costs.

The other substation components of this proposal focus primarily on upgrading substations and substation equipment to achieve higher ratings. These types of upgrades in general are low risk.

Constructability Summary

The proposal is a long set of lines crossing multiple states and has its fair share of tricky areas as any project this ambitious would. The Welton Springs to Rocky Point line segment crosses national parks like the Appalachian Trail, Harpers Ferry and the C&O Canal. PJM anticipates that permitting and land acquisition will be notable risks for this project. A high risk was assessed for constructability.

Outage Review

No significant outage risks were identified as a part of this proposal.

Cost Review

As part of the detailed constructability analysis, PJM and its consultants prepared a high-level conceptual, independent cost estimate for the components of this proposal. This estimate is based on a high-level assessment of probable costs for the current conceptual design and is reflective of recent supplier quotes and previous experience with substation engineering, transmission line engineering and construction. Additionally, where available, incumbent substation upgrade cost estimates were requested and incorporated into the independent cost estimate. The independent cost estimate includes a contingency of 30%, as it is a concept-level estimate. A side-by-side comparison of proposing entity costs and independent cost estimates is contained in **Table 6**.

Table 6. Proposal 708 Cost Review

Component ID	Component Description	Proposal Cost Estimates ($M)	Independent Cost Estimates ($M)
1	Amos Substation Upgrade	30.87	30.87
2	Amos-Welton Springs 765 kV Line	875.00	990.73

3	Welton Springs Switchyard	213.82	264.01
4	Welton Springs-Rocky Point 765 kV Line	430.00	486.87
5	Rocky Point Substation	375.64	458.34
6	Rocky Point 500 kV Line Cut-Ins	0.00	22.55
7	Black Oak Substation	0.00	20.21
8	Loop The 502 Jct-Woodside 500 kV Line into Black Oak Substation	19.23	14.97
9	Doubs No. 1 500/230 kV Transformer Terminal Upgrades	0.43	0.43
	Total	**1,944.99**	**2,288.97**

The total proposal cost estimate is within 11–20% of the independent cost estimate and is considered low-medium risk.

Schedule Review

The proposed in-service date of December 2029 is deemed very aggressive for the proposed scope of the project, considering the significant permitting, engineering and construction, and land acquisition risks associated with the greenfield routing with a total of 261 miles of 765 kV construction. The scheduling risk is assessed as high.

Proposing Entity Experience and Capability Review

FirstEnergy, including its participation in the joint venture, has significant experience with the proposed equipment and the capabilities to construct Proposal 708 as submitted. The proposing entity experience and capability risk is considered low.

Proposal 883 – TRAIL (FirstEnergy)

First Energy Proposal No. 883 (

), described as Amos-Welton Springs 765 kV line, incorporates construction of multiple transmission lines and substation expansions to provide a robust, expandable transmission solution to address the 2024 Open Window 1 violations. This Proposal 883 is one of major components of the joint PJM Proposal No. 759 (Portfolio 1B) submitted by Transource.

First Energy Proposal No. 883 has a total of seven components with one greenfield substation component, three substation upgrade components, two greenfield transmission line components and one transmission line upgrade component.