



## Oncor Venus Switch to Sam Switch 345- kV Line - ERCOT Independent Review Project Update

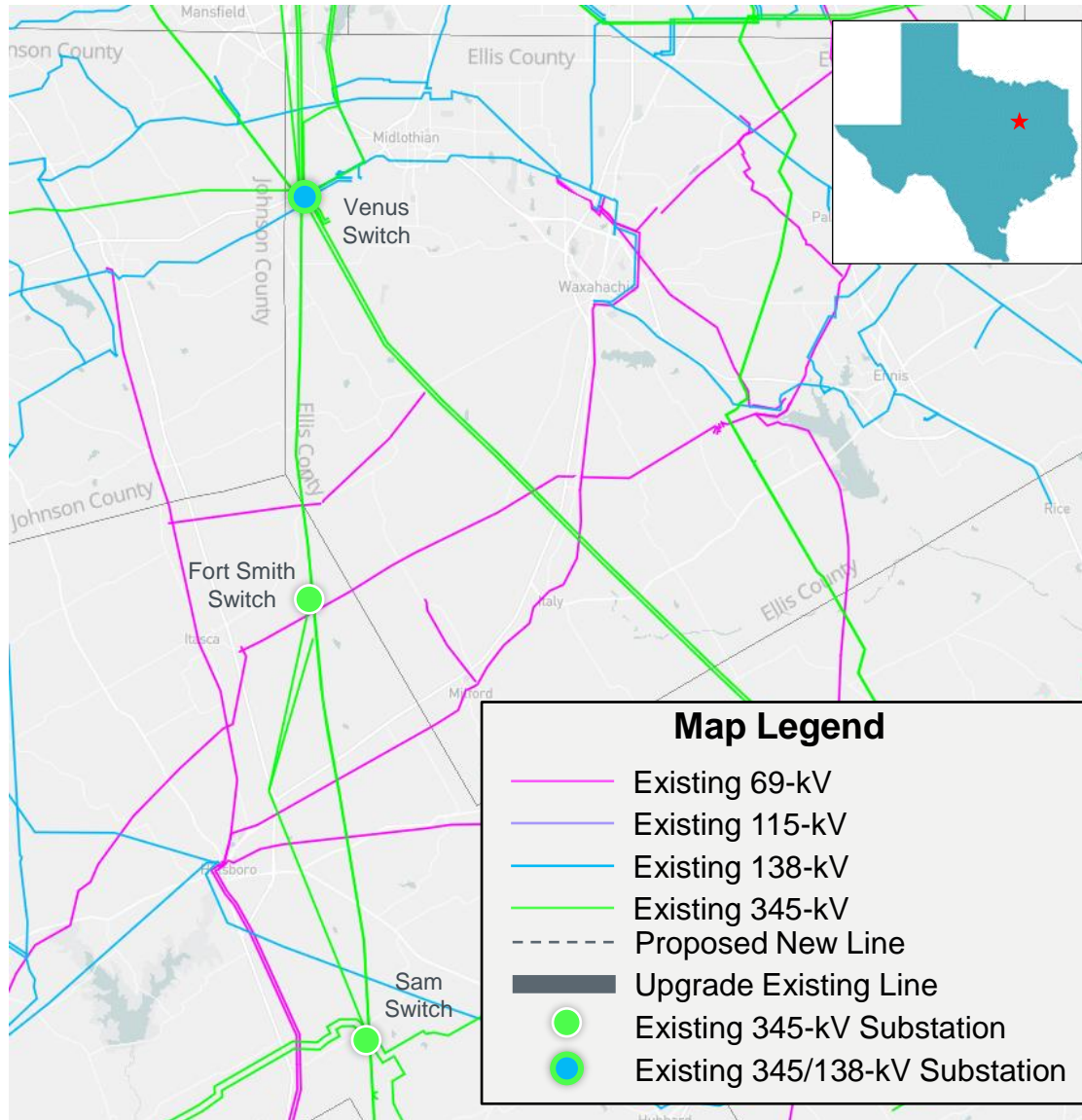
Sarah Gunasekera

RPG Meeting  
September 25, 2024

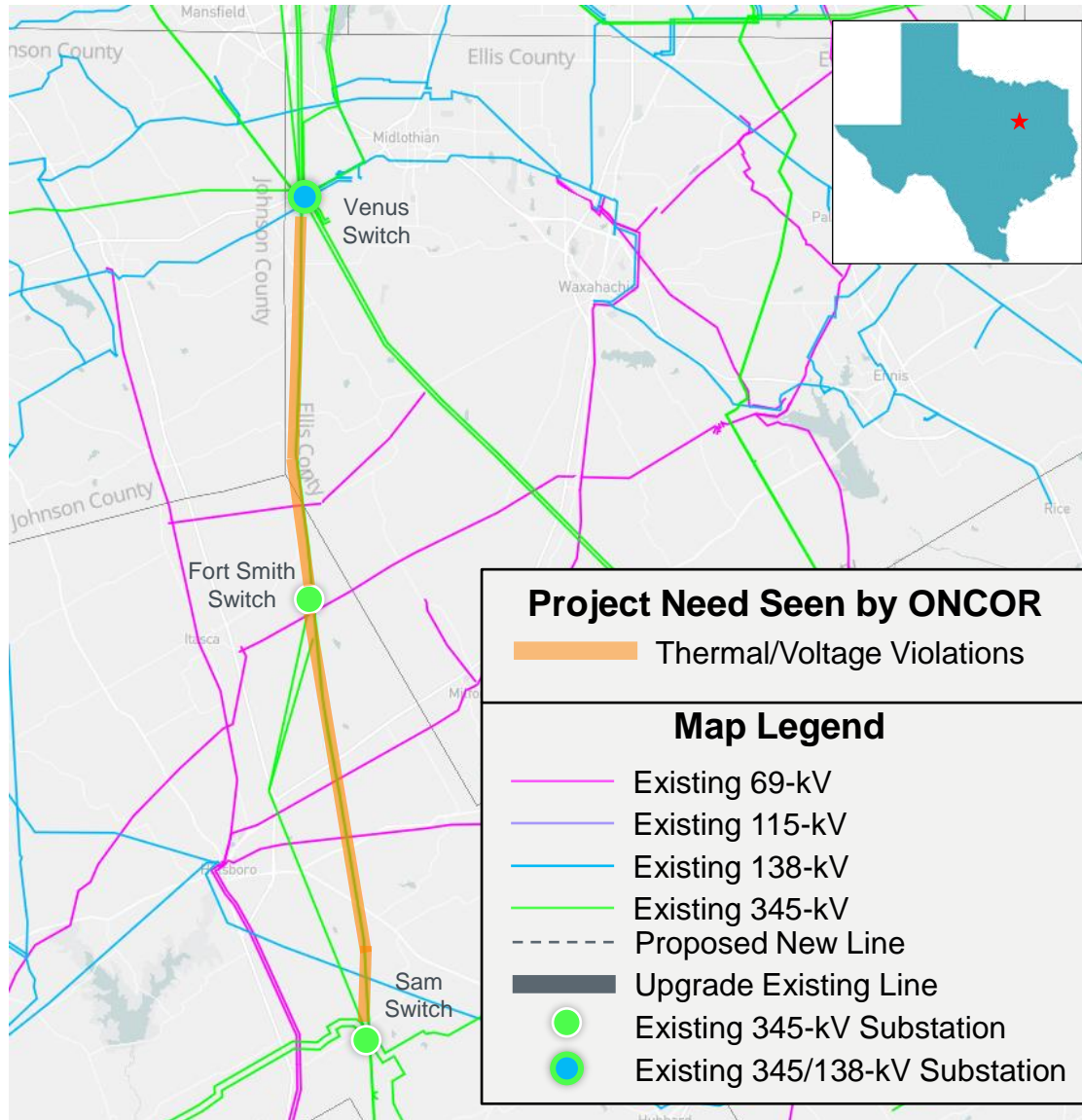
# Introduction

- Oncor submitted the Venus Switch to Sam Switch 345-kV Line Project for Regional Planning Group (RPG) review in June 2024
  - This Tier 1 project is estimated at \$118.9 million and will not require a Convenience and Necessity (CCN)
  - Estimated completion date is May 2026
  - Addresses post-contingency thermal overloads on the Venus Switch – Sam Switch double circuit 345-kV line
- This project is currently under ERCOT Independent Review (EIR)

# Study Area Map



# Study Area Map with Project Need seen by Oncor



# Study Assumptions – Base Case

- Study Area
  - North and North Central Weather Zones, focusing on transmission in Ellis and Hill Counties
  - Monitor surrounding counties that are electrically close to the area
- Steady-State Base Case
  - Final 2023 Regional Transmission Planning (RTP) 2026 summer peak case for North-North Central Weather Zones will be updated to construct the North-North Central (NNC) study base case posted in Market Information System (MIS)
    - Case: 2023RTP\_2026\_SUM\_NNC\_12222023
    - Link: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

# Study Assumptions – Load, Reserve, Transmission, & Generation

- Load in study area
  - ~730MW of confirmed load was added to the study basecase
- Reserve
  - Reserve levels are consistent with the 2023 RTP
- Transmission
  - See Appendix A for a list of transmission projects added
  - See Appendix B for a list of RTP placeholder projects that were removed
- Generation
  - See Appendix C for a list of generation projects added

# Preliminary Results of Reliability Assessment – Base Case

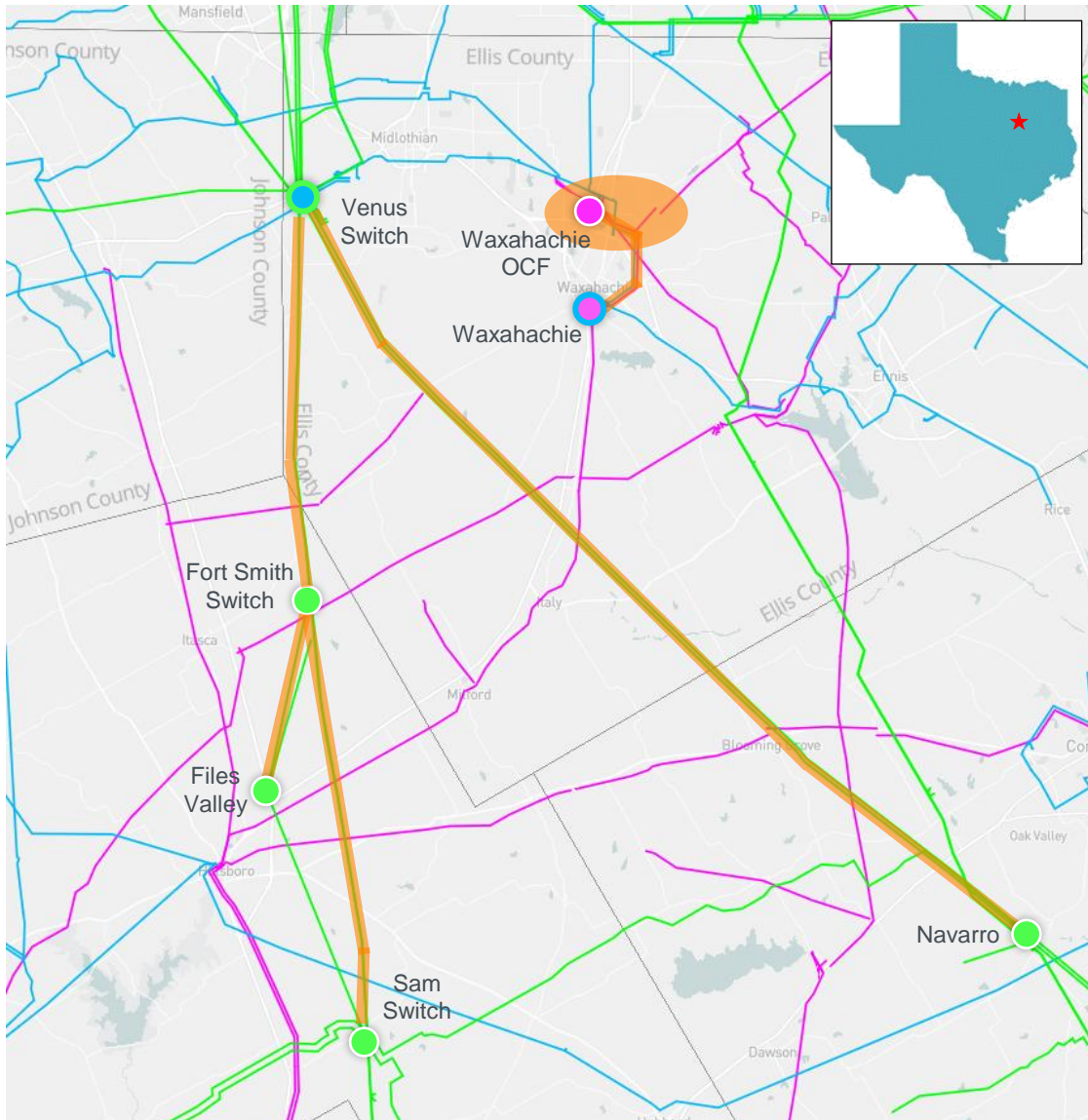
Contingency Category*	Unsolved Power Flow	Voltage Violations	Thermal Overloads
P1	None	3	4
P2, P4, P5	None	None	None
P3 (G-1+N-1)*	None	3**	None
P6.2 (X-1+N-1)*	None	3**	None
P7	None	None	1

\*G-1 Generators tested: Midlothian N1, Compadre S1, Sunvalley S1

\*X-1 Transformers tested: Sherry Switch X1, Everman Switch X1, Lake Creek SES X1

\*\*Violations seen in the basecase under P1 events were also seen under G-1 and X-1 events











# Study Area Map with Project Need seen by ERCOT



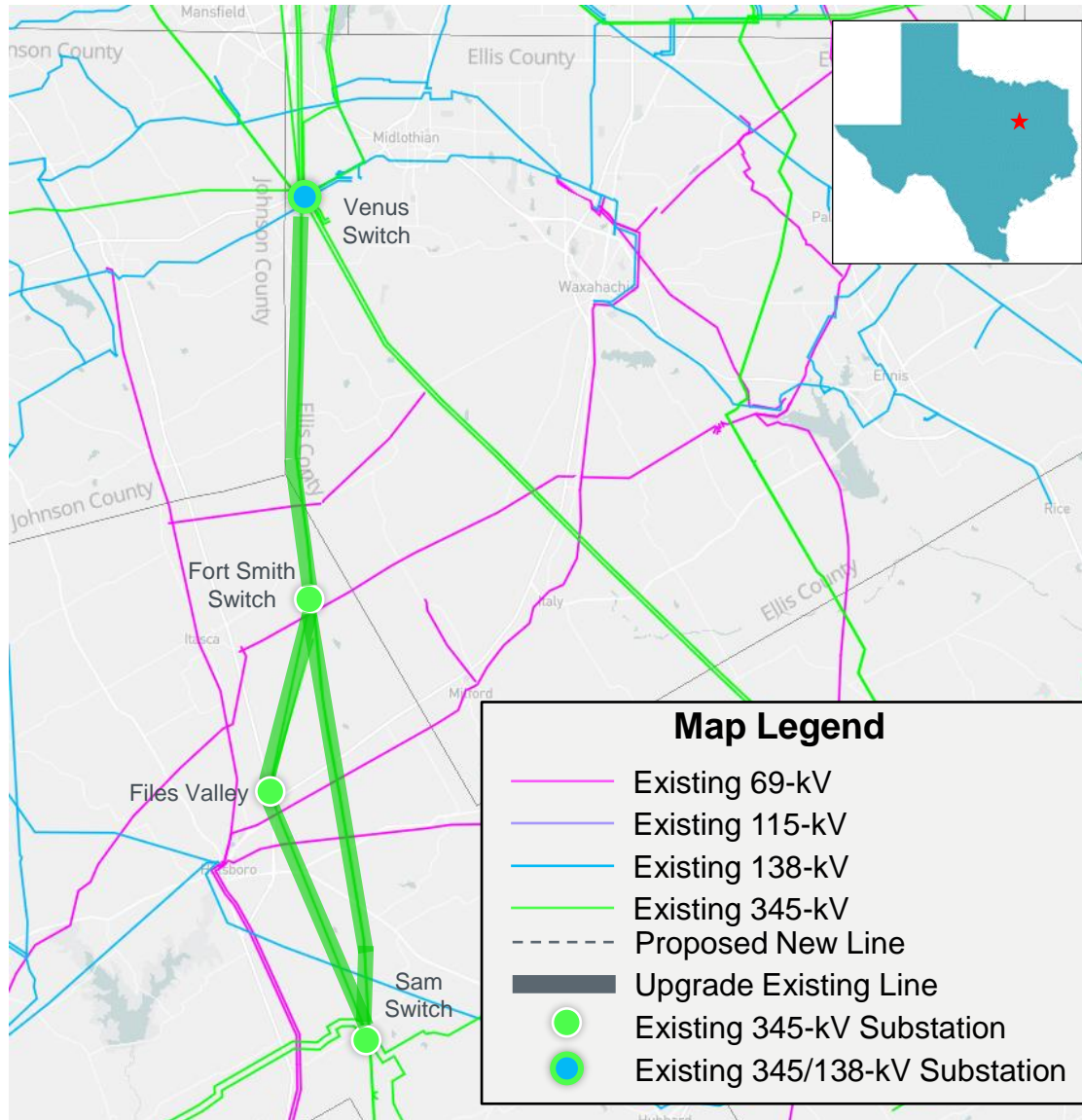
## Project Need Seen by ERCOT

 Thermal/Voltage Violations

## Map Legend

-  Existing 69-kV
-  Existing 115-kV
-  Existing 138-kV
-  Existing 345-kV
-  Proposed New Line
-  Upgrade Existing Line
-  Existing 69-kV Substation
-  Existing 138/69-kV Substation
-  Existing 345-kV Substation
-  Existing 345/138-kV Substation

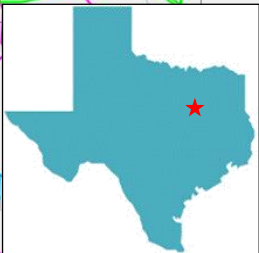
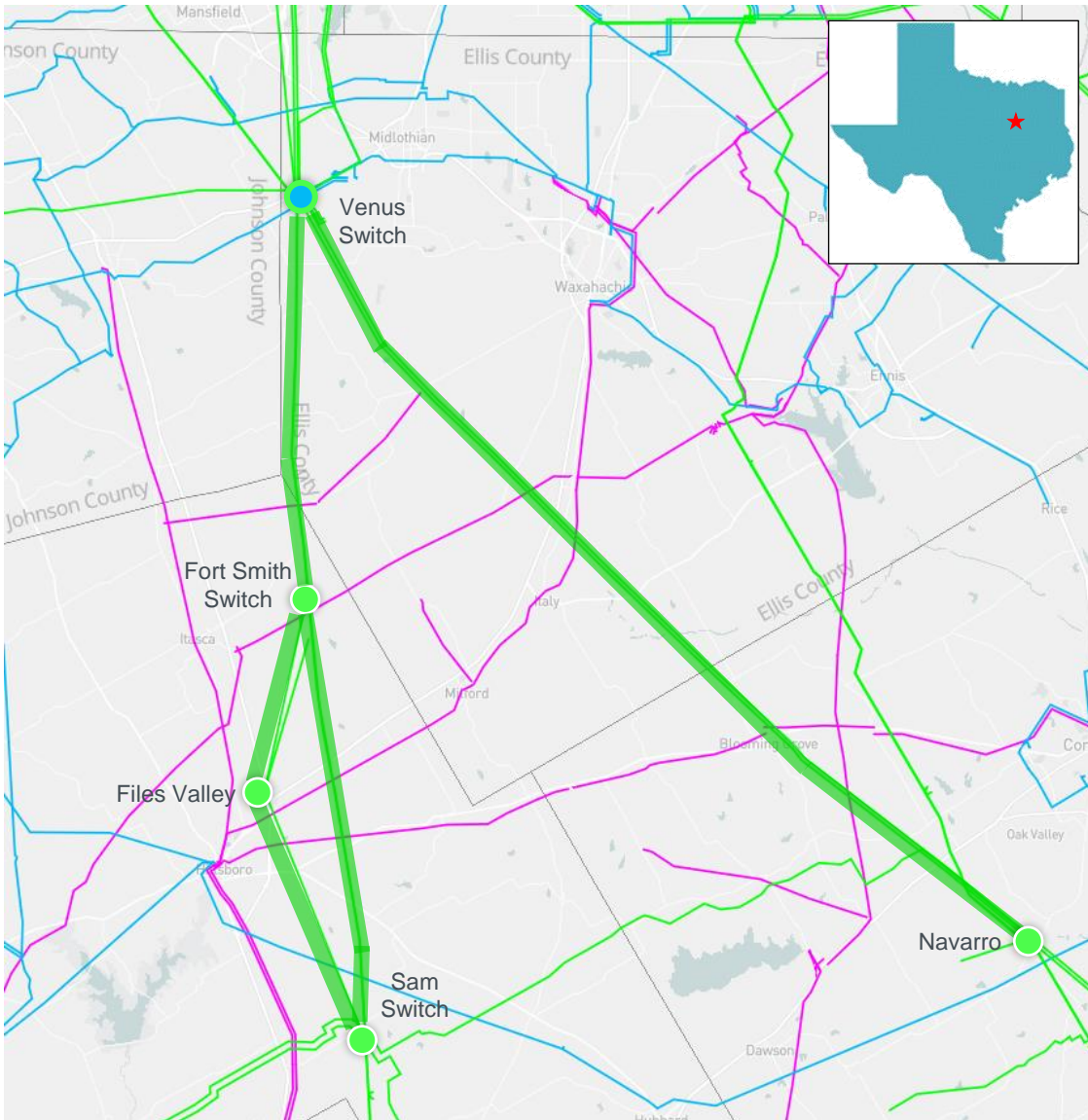
# Option 1 – Oncor Proposed Project



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- Rebuild existing Venus Switch – Fort Smith Switch 345-kV transmission line with normal and emergency ratings of 1912 MVA or greater, approximately 17.80-mile
- Rebuild existing Venus Switch – Sam Switch 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 38.0-mile
- Rebuild existing Fort Smith Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 3.30-mile
- Rebuild existing Sam Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 16.90-mile

# Option 2 – ERCOT Option



### Map Legend

- Existing 69-kV
- Existing 115-kV
- Existing 138-kV
- Existing 345-kV
- Proposed New Line
- Upgrade Existing Line
- Existing 345-kV Substation
- Existing 345/138-kV Substation



## Option 2 – ERCOT Option

- Rebuild existing Venus Switch – Fort Smith Switch 345-kV transmission line with normal and emergency ratings of 1912 MVA or greater, approximately 17.80-mile
- Rebuild existing Venus Switch – Sam Switch 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 38.0-mile
- Rebuild existing Fort Smith Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 3.30-mile
- Rebuild existing Sam Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 16.90-mile
- Rebuild existing Venus Switch – Navarro 345-kV double circuit transmission line with normal and emergency ratings of 1912 MVA or greater, approximately 33.20-mile

# Preliminary Results of Reliability Assessment – Options

	N-1		G-1 + N-1		X-1 + N-1	
	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations
Option 1	None	None	4	3	2**	3**
Option 2	None	None	1	3	None	3**

\*G-1 Generators tested: Midlothian N1, Compadre S1, Sunvalley S1

\*X-1 Transformers tested: Sherry Switch X1, Everman Switch X1, Lake Creek SES X1

\*\*Violations seen under G-1 events were also seen under X-1 events

# Study Procedure

- Project Evaluation
  - Additional project alternatives will be tested to satisfy the NERC and ERCOT reliability requirements
  - ERCOT may also perform the following studies
    - Planned maintenance outage
    - Long-term Load Serving Capability Assessment
- Generation Addition and Load Scaling Sensitivity Analyses
  - Planning Guide Section 3.1.3(4)
- Subsynchronous Resonance (SSR) Assessment
  - Nodal Protocol Section 3.22.1.3(2)
- Congestion Analysis
  - Congestion analysis may be performed based on the recommended transmission upgrades to ensure that the identified transmission upgrades do not result in new congestion within the study area

# Deliverables

- Tentative Timelines
  - Status updates at the future RPG meetings
  - Final Recommendation – Q4 2024

*Thank you!*



Stakeholder comments also welcomed through:

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# Appendix A – Transmission Projects Added

TPIT	Project Name	Tier	Project ISD	TSP	County(s)
60094	Convert Waco East - Elm Mott 69 kV Line to 138 kV	Tier 4	5/15/2024	ONCOR	McLennan
62666	Upgrade and convert McGregor - Waco West Line	Tier 4	12/15/2024	ONCOR	McLennan
66216	Upgrade and convert Waco West - Temple 69 kV Line to 138 kV	Tier 4	6/15/2024	ONCOR	McLennan, Bell
66218A	Hillsboro - Italy 69 kV Line	Tier 4	10/15/2023	ONCOR	Ellis
66218B	Hillsboro - Italy 69 kV Line	Tier 4	12/15/2025	ONCOR	Ellis
71136	Waxahachie-Waxahachie OCF 69 kV Line Rebuild	Tier 4	5/15/2025	ONCOR	Dallas, Ellis
71903	Establish Launch Pad 138 kV Switch	Tier 4	12/15/2025	ONCOR	McLennan
73443	Utilize Melton POI via Navarro 345 kV Switch for Project Lefty	Tier 4	5/15/2024	ONCOR	Navarro
78167	Add 2nd autotransformer at Trumbull	Tier 4	11/15/2025	BEPC	Ellis
78367	Montfort Switch-Shankle Switch 138 kV Line	Tier 3	12/15/2025	ONCOR	Navarro, Ellis
80550	Central Park 138 kV Switch	Tier 4	12/15/2024	ONCOR	McLennan
82304	PMCR for adding Blackjack new station	Tier 4	12/31/2024	TNMP	Bosque
82810	Olympus 138 kV Switch	Tier 4	5/15/2025	ONCOR	Navarro
82826	Sunflower 138 kV Switch	Tier 4	5/15/2025	ONCOR	McLennan

# Appendix A – Transmission Projects Added cont'd

RPG No	Project Name	Tier	Project ISD	TSP	County(s)
24RPG019	Vineyard Switch to Cypress Waters 138-kV Circuit Addition Project	Tier 2	5/1/2026	ONCOR	Dallas, Tarrant
24RPG018	Salado Switch to Hutto Switch 138-kV Line Project	Tier 3	5/1/2027	ONCOR	Bell, Williamson
24RPG001	Temple Area Project	Tier 1	5/1/2026	ONCOR	Bell
23RPG033	Watermill to Seagoville 138 kV Line Project	Tier 3	12/1/2025	ONCOR	Dallas
23RPG020	Hackberry Switch to DFW D East 2 138-kV Double-Circuit Line Section Project	Tier 3	12/1/2025	ONCOR	Dallas
23RPG018	Arlington Reliability Enhancement Project	Tier 2	5/1/2026	ONCOR	Tarrant, Dallas
23RPG006	North Lake 138 kV Switch Rebuild	Tier 4	5/1/2023	ONCOR	Dallas

# Appendix B – Transmission Backed Out

RTP Project ID	Project Name	TSP	County(s)
2023-NC6	Tellico Area Upgrades	ONCOR	Ellis
2023-NC7	Four Brothers Switch -Tradinghouse - Outlaw - Lake Hall Switch - Sam Switch Area Improvements	ONCOR	Mclennan, Ellis
2023-NC13	Hillboro 138-kV Area Upgrades	BEPC	Hill
2023-NC16	Sardis Area 138-kV Line Upgrades	ONCOR	Ellis
2023-NC19	Venus - Fort Smith - Sam Switch Double Circuit 345-kV Line Upgrades and Venus Kemp Ranch 345/138-kV Transformer Addition	ONCOR	Ellis
2023-NC23	Venus - Navarro - Jewett Area 345-kV Line Upgrades	ONCOR	Ellis
2023-NC35	Navarro (3478) - Haney (213) - Hubbard (3515) 138-kV Line Upgrade	ONCOR	Navarro
2023-NC37	Hillboro 138/69-kV Transformer Upgrade	ONCOR	Hill
2023-NC42	Waxahachie Area 69-kV and 138-kV Line Upgrades	ONCOR	Ellis
2023-NC45	Cleburne Switch (2279) to Keene (2294) to Alvarado (2297) to Griffith (1905) to Railport (442) to Venus (1908) 138-kV Line Upgrades	BEPC, ONCOR	Johnson
2023-NC62	Whitney 345/138-kV Transformer Upgrade	BEPC	Hill

# Appendix C – Generation Added

GINR	Project Name	Fuel	Project COD	Capacity (MW)	County
21INR0379	Ash Creek Solar	SOL	01/31/2025	417.74	Hill
23INR0030	Langer Solar	SOL	03/01/2027	249.8	Bosque
23INR0195	Desert Willow BESS	OTH	02/03/2025	154.4	Ellis
23INR0349	Tokio Solar	SOL	08/25/2025	175.72	McLennan
24INR0023	Compadre Solar	SOL	12/25/2024	406.14	Hill
24INR0038	SP Jaguar Solar	SOL	06/01/2026	300	McLennan
24INR0039	SP Jaguar BESS	OTH	06/30/2025	300	McLennan
24INR0138	Midpoint Storage	OTH	08/30/2025	51.26	Hill
24INR0139	Midpoint Solar	SOL	08/30/2025	99.8	Hill
24INR0140	Gaia Storage	OTH	07/31/2025	76.83	Navarro
24INR0141	Gaia Solar	SOL	07/31/2025	152.65	Navarro