



CPS – Eastside 345/138-kV Switching Station Project ERCOT Independent Review

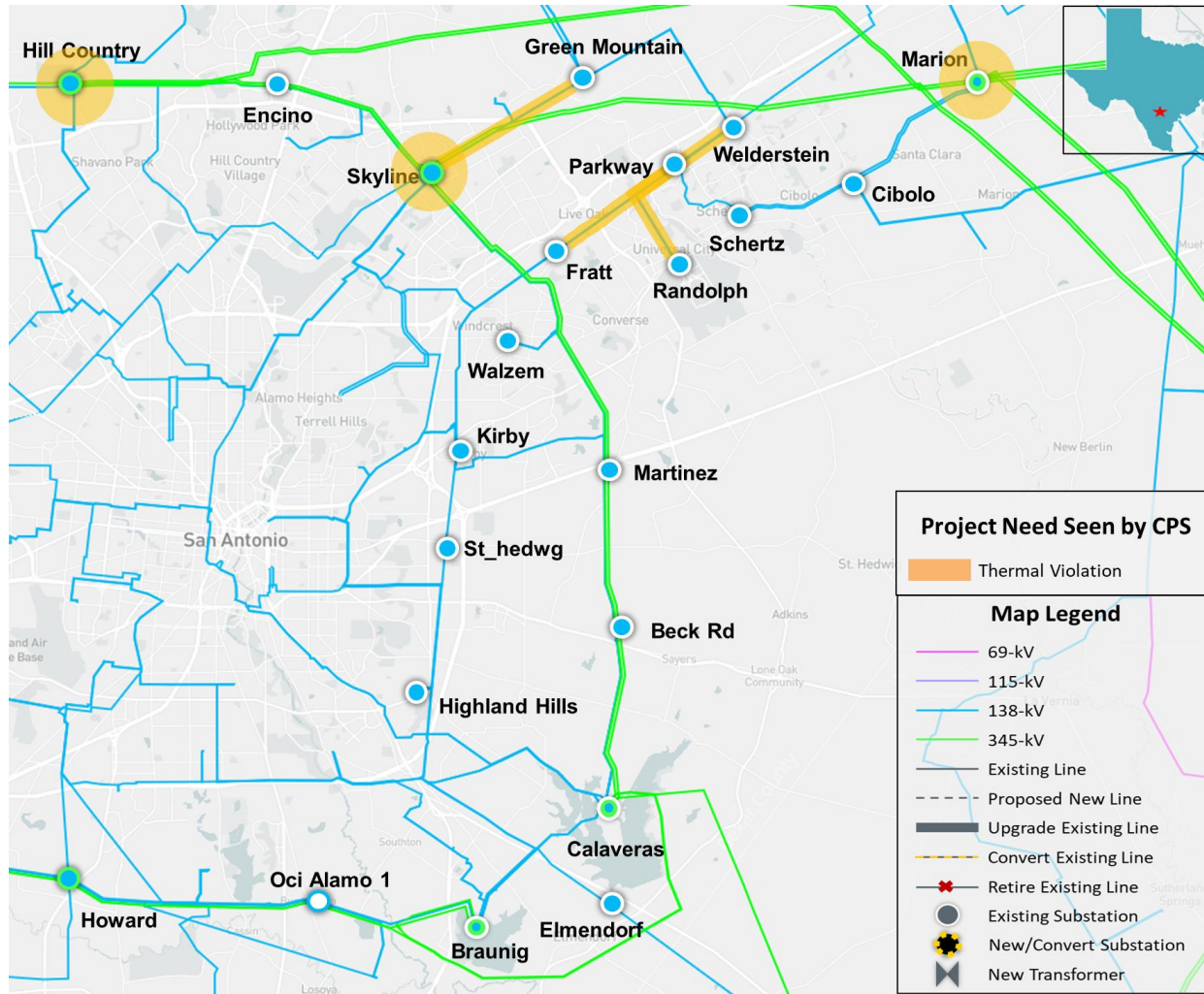
Abishek Penti

RPG Meeting
May 14, 2024

Recap

- CPS Energy (CPS) submitted the Eastside 345/138-kV Switching Station Project for Regional Planning Group (RPG) review in February 2024
 - This Tier 1 project is estimated to cost \$158 million and will require a Certificate of Convenience and Necessity (CCN)
 - Estimated in-service date is June 1, 2028
 - Addresses thermal overloads on 345/138-kV autotransformers and 138-kV transmission lines
- CPS provided an overview and ERCOT provided the study scope at the March 2024 RPG Meeting
 - <https://www.ercot.com/calendar/03182024-RPG-Meeting--Webex>
- This project is currently under ERCOT Independent Review (EIR)

Recap - Study Area Map with Violations seen by CPS



Recap - Study Assumptions – Base Case

- Study Region
 - Southern and South Central Weather Zones, focusing on the transmission elements near the San Antonio Area in Bexar County.
 - Monitor surrounding counties that are electrically close to the area
- Steady-State Base Case
 - Final 2023 Regional Transmission Planning (RTP) 2029 summer peak case for South-South Central (SSC) Weather Zones, posted in Market Information System (MIS), will be updated to construct the summer peak load study base case
 - Case: 2023RTP_2029_SUM_SSC_12222023
 - Link: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

Recap - Study Assumptions – Load, Reserve, Transmission, & Generation

- Load in study area
 - Load levels are consistent with the 2023 RTP
- 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	None	1
P2, P4, P5	None	None	None
P3 (G-1+N-1)*	1	208**	3
P6.2 (X-1+N-1)*	None	210**	9
P7	None	211**	4

*See Appendix D for list of G-1 generators and X-1 transformers tested

**The RTP placeholder project 2023-SC10 - Wiseman 138-kV Substation Addition and CPS Multiple Cap Bank Additions resolves the voltage violations

Project Need as Seen by ERCOT – Base Case

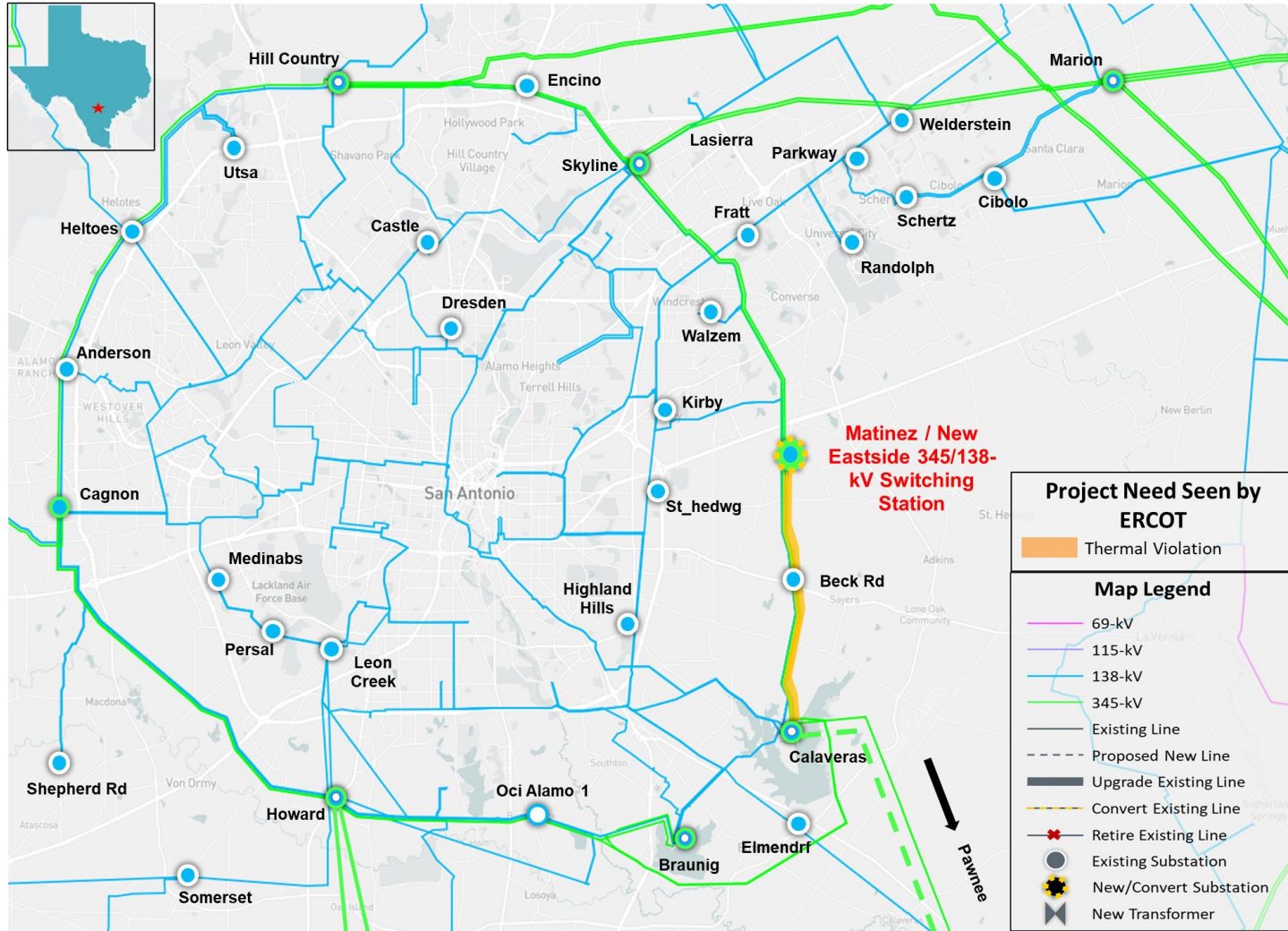


Preliminary Results of Reliability Assessment – Base Case + San Antonio South Reliability II Project + 2023-SC10 RTP Placeholder Project

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

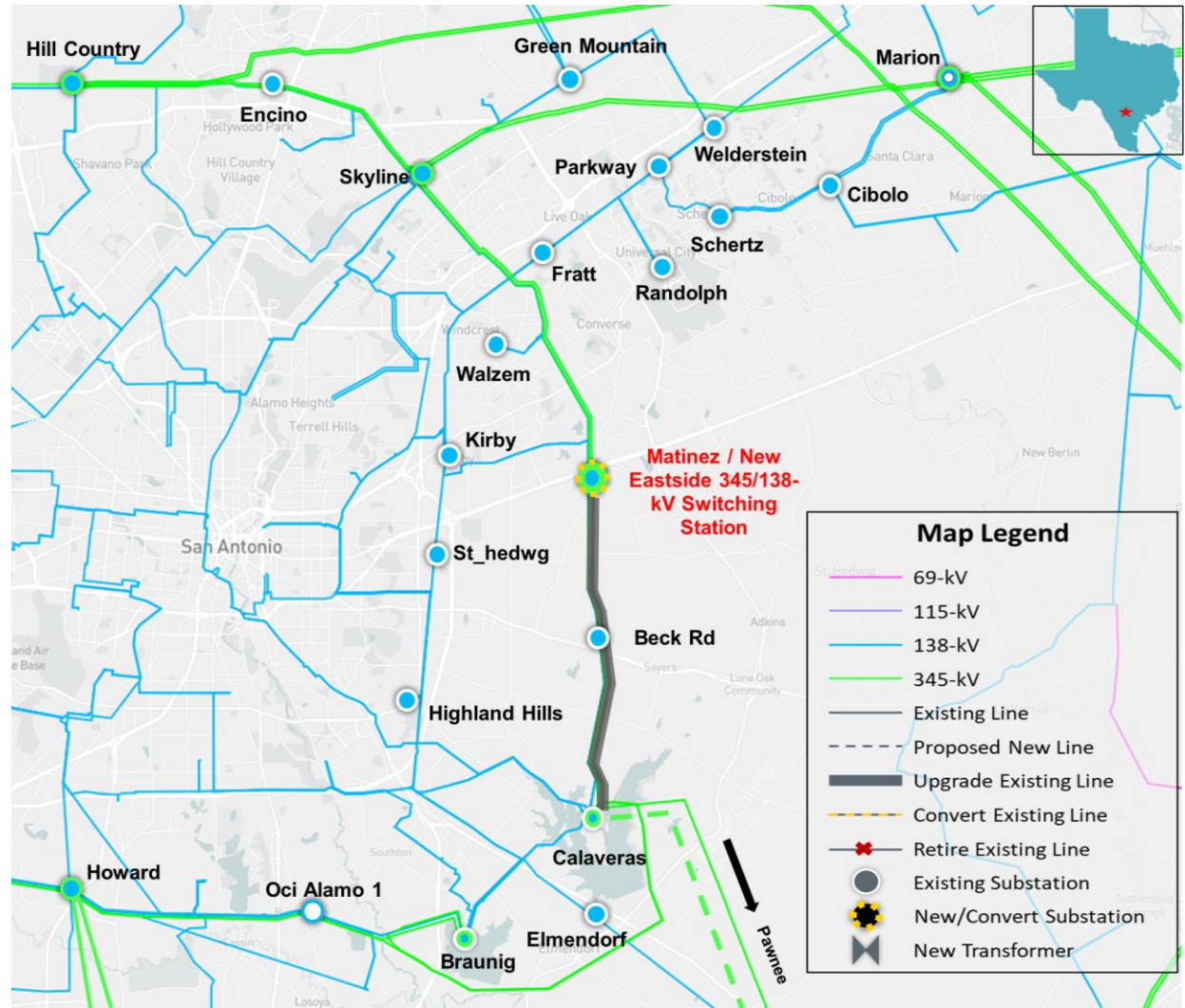
*See Appendix D for list of G-1 generators and X-1 transformers tested

Preliminary Results of Reliability Assessment – Base Case + San Antonio South Reliability II Project + 2023-SC10 RTP Placeholder Project



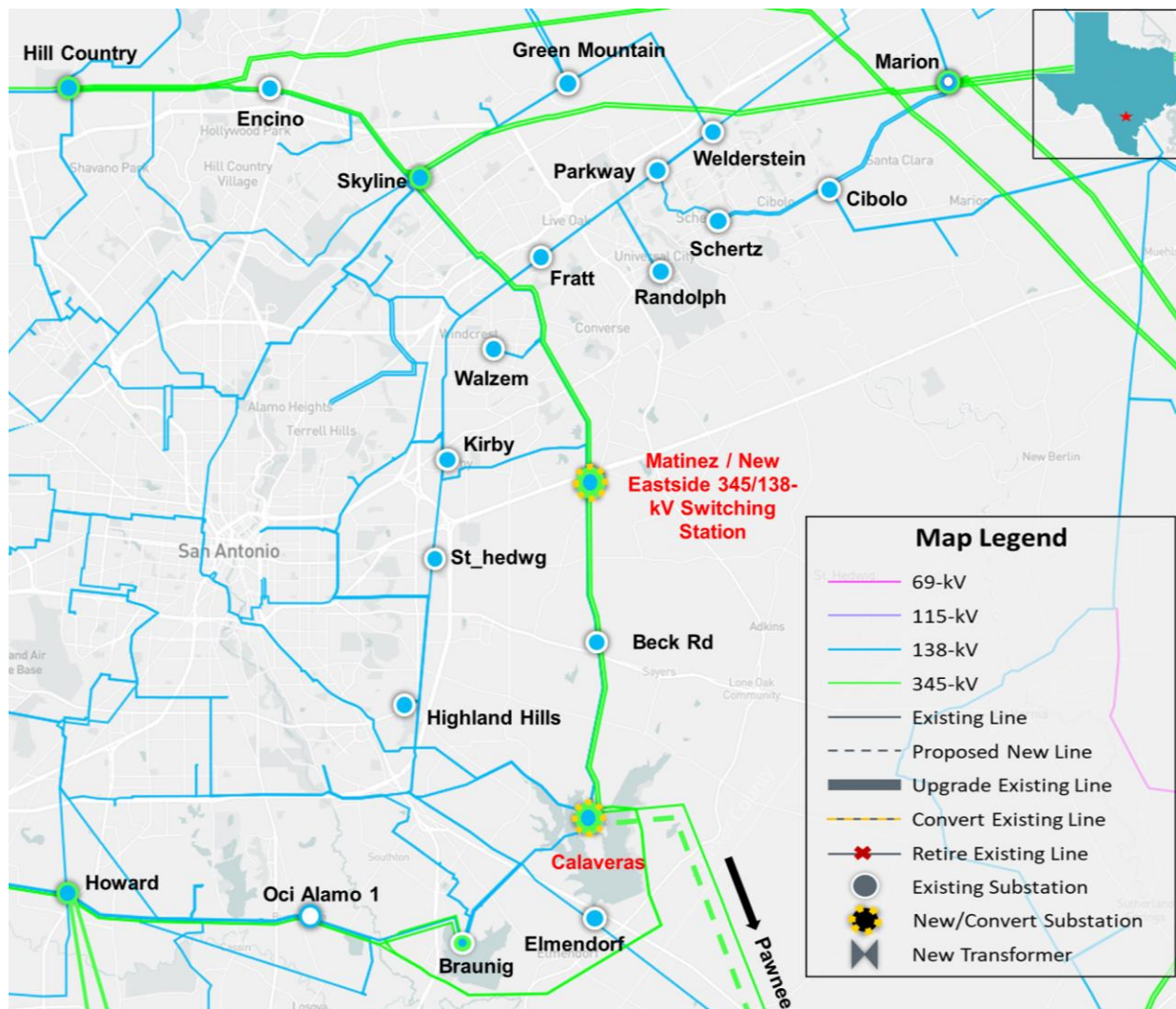
Option 1 – Project Proposed by CPS

- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Rebuild the 345-kV Spruce – new Eastside switching station circuit 1 and circuit 2 in existing easement with a rating of 2347 MVA or greater, approximately 9.8-mile.



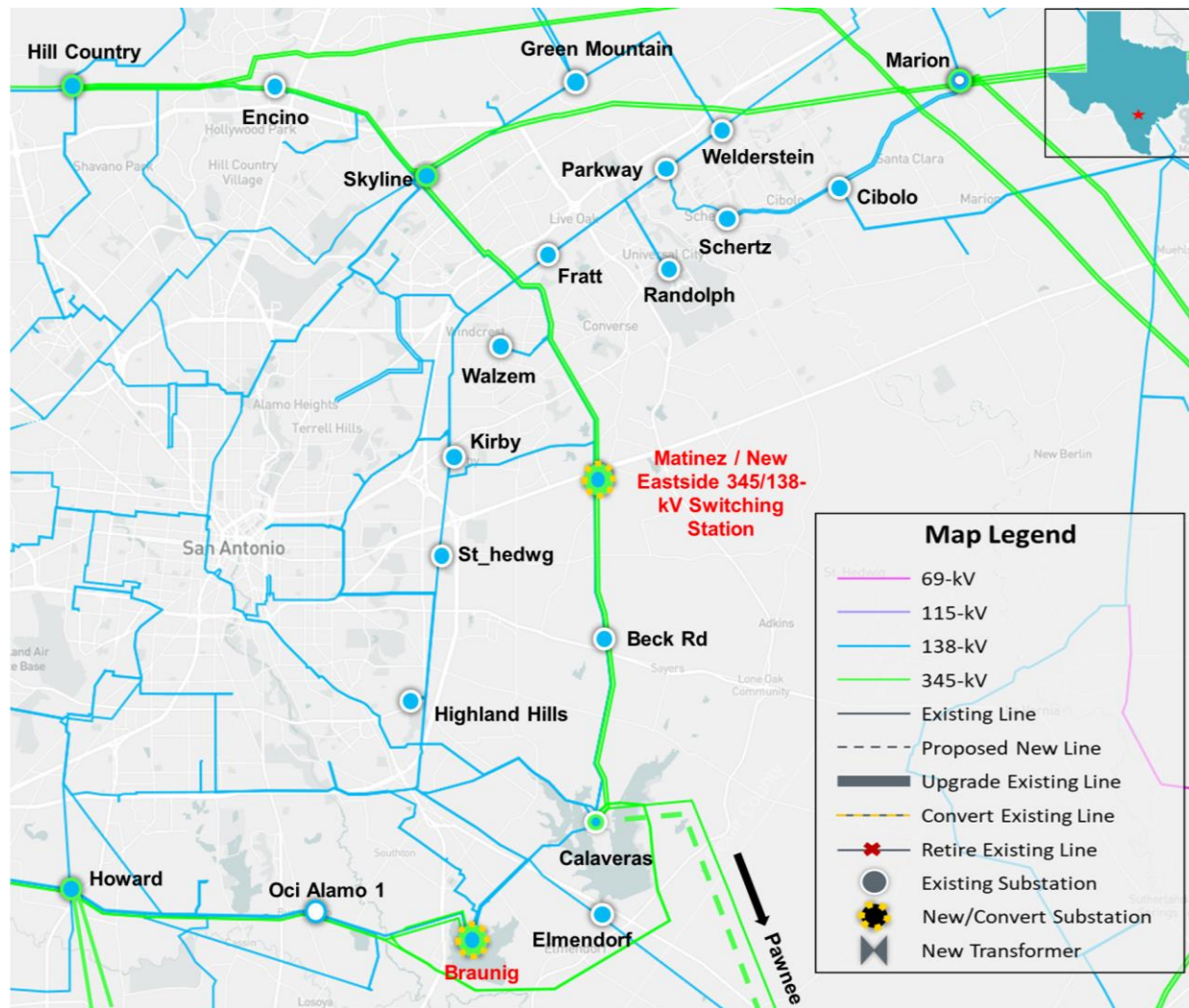
Option 2 – Addition of Auto Transformers at Spruce

- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Spruce 345-kV Substation to Deely 138-kV Substation



Option 3 – Addition of Auto Transformers at Braunig

- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Van Rose 345-kV Substation to Braunig 138-kV Substation



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	None	None	None	None
Option 2	None	None	None	None	None	None
Option 3	None	None	None	None	None	None

- All three options will be further evaluated

Next Steps and Tentative Timeline

- ERCOT will continue to evaluate options and provide status updates at future RPG meetings
 - ERCOT may perform the following studies
 - Planned maintenance outage analysis
 - Long-term load serving capability assessment
 - 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
 - Generation and Load Scaling Sensitivity Analyses
 - Planning Guide Section 3.1.3(4)
 - Subsynchronous Resonance (SSR) Assessment
 - Nodal Protocol Section 3.22.1.3(2)
 - Cost estimates and feasibility assessments will be requested from CPS
- Tentative timeline
 - Final recommendation – Q2 2024

Thank you!



Stakeholder comments also welcomed through:

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Appendix A – Transmission Projects

- List of transmission projects added to study base case

TPIT No	Project Name	Tier	Project ISD	TSP	County
23RPG028	Rio Medina Project	Tier 2	1/1/2027	STEC	Medina
22RPG026	Wimberley Loop project	Tier 2	5/1/2027	PEC	Blanco, Hays
23RPG003	Eagle Ford Large Load Interconnection Project	Tier 3	12/4/2025	GVEC	DeWitt
23RPG004	Lockhart to Luling 69-kV Transmission Line Overhaul Project	Tier 4	6/30/2025	LCRA	Caldwell
23RPG015	Cuero Substation Upgrade Project	Tier 4	5/15/2024	LCRA	DeWitt
72500	Rio Lago - New 138kV Substation	Tier 4	11/30/2024	BEC	Bandera
72268	CPSE_New Ingram Rd Substation	Tier 4	5/1/2025	CPS	Bexar
73098	Castroville Cut-in 138 kV	Tier 2	5/30/2025	ETT TCC	Medina
71873	CPSE_Hill Country Auto# 2 Impedance Upgrade	Tier 3	6/1/2025	CPS	Bexar
73063	Big Foot to Lytle: Convert to 138 kV	Tier 4	9/20/2025	AEP TCC	Medina, Frio

Appendix A – Transmission Projects (cont.)

TPIT No	Project Name	Tier	Project ISD	TSP	County
76242	Lytle: Build new 138 kV terminal	Tier 4	9/20/2025	AEP TCC	Medina
76768	Upgrade Pearson -Pearsall	Tier 4	12/1/2025	STEC	Frio, Medina
67992D	CPSE_345KV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_Upgrade,CPSE_Medina_to_36th_Street_Upgrade	Tier 3	1/31/2026	CPS	Bexar
76790	Upgrade Pearsall Auto	Tier 4	5/1/2027	STEC	Frio
73417	LCRATSC_Schumansville_SheriffsPosse_StormHardening	Tier 4	15/5/2025	LCRA	Guadalupe , Comal
73793	LCRATSC_McCartyLaneEast_Zorn_TL_Storm_Hardening	Tier 4	15/5/2025	LCRA	Hays, Guadalupe

Appendix B – Transmission Projects

- List of transmission projects removed from the study base case

TPIT No	Project Name	TSP	County
2023-SC5	Beck Road 345/138-kV Substation Expansion	CPS	Bexar
2023-SC19	South to Central Texas 345-kV Double-Circuit Line Additions	AEN, AEP, LCRA, ONCOR	San Patricio, Bee, Karnes, Wilson, Guadalupe, Comal, Hays, Travis, Williamson
2023-SC16	Hondo to Hondo Creek Switching Station 138-kV Line Upgrade	CPS, STEC	Medina
2023-SC20	Pearson - Natalia - Devine - Moore - Pearsall 69-kV Line Rebuild	STEC	Frio, Medina
2022-S3	Pearsall 138/69-kV Transformer Upgrade	STEC	Frio
2023-S3	Oaks Sub 138/69-kV Transformer Upgrade	STEC	Atascosa
2023-S4	Poteet Sub to Oaks Sub 69-kV Line Upgrade	STEC	Atascosa
2023-S5	Poteet Sub to Pearsall Switching Station 69-kV Line Upgrade	STEC	Atascosa, Frio
2023-S6	Rossville Substation Cap Bank Addition	STEC	Atascosa

Appendix C – Generation Projects

- List of generation projects added to study base case

GINR	Project Name	Fuel	Project COD	Capacity (MW)	County
22INR0366	LIBRA BESS	OTH	03/30/2024	206.21	Guadalupe
22INR0422	Ferdinand Grid BESS	OTH	05/31/2026	202.65	Bexar
23INR0154	Ebony Energy Storage	OTH	04/30/2024	203.5	Comal
23INR0381	Soportar ESS	OTH	03/15/2025	102.11	Bexar
23INR0483	Rio Nogales CT1 Rotor Replacement	Gas	6/8/2023	3.10	Guadalupe
24INR0427	CPS AvR CT1 Rotor Replacement	GAS	02/15/2024	11.3	Bexar

Appendix D – G-1 Generators and X-1 Transformers

G-1 Generators	X-1 Transformers
Spruce – CALAVER_JKS2	Hill Country – Ckt 1 345/138-kV
	San Miguel – Ckt 1 345/138-kV
	Skyline – Ckt 1 345/138-kV