



## San Miguel to Marion 345-KV Project – ERCOT Independent Review (EIR) Status Update

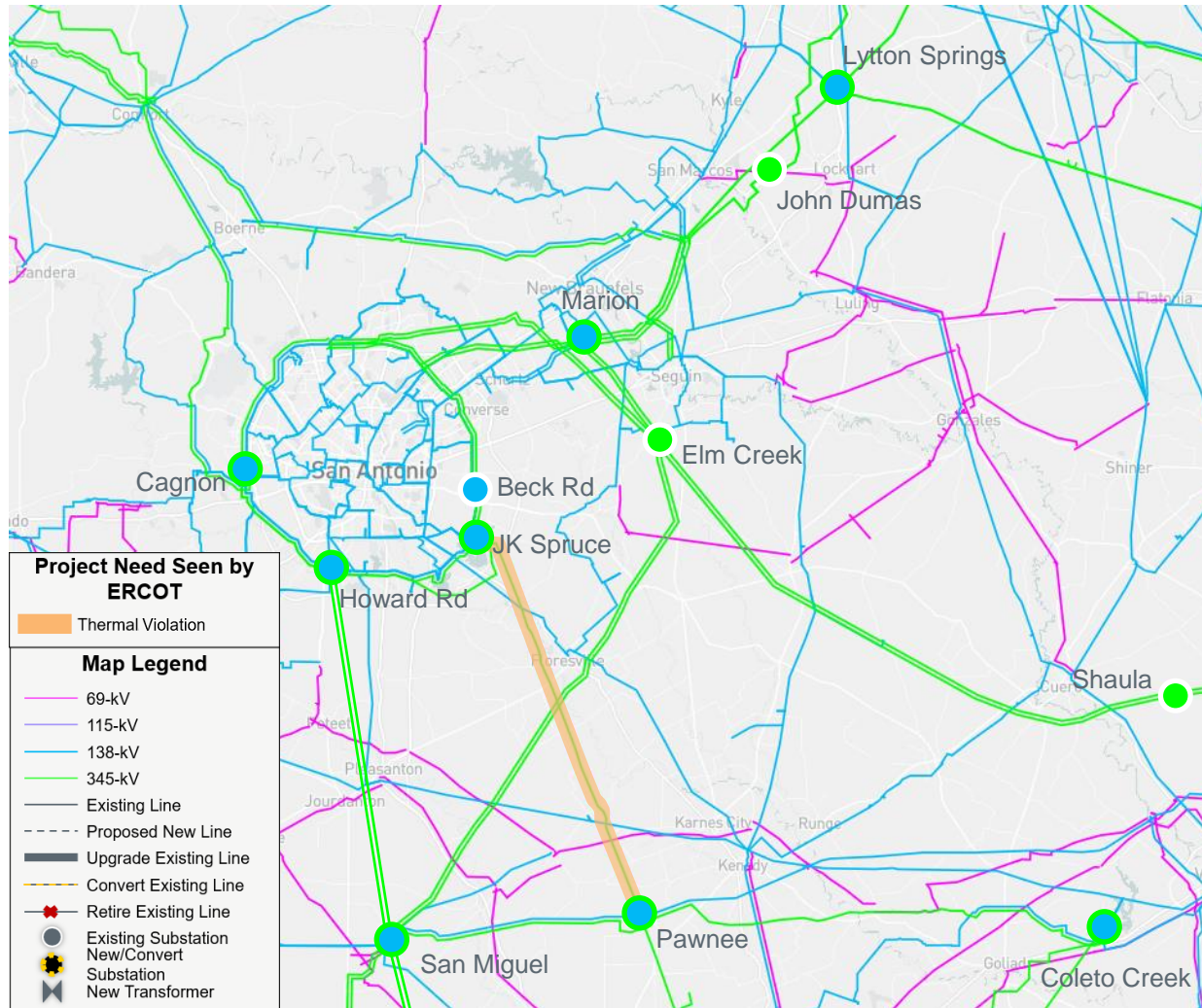
Caleb Holland

RPG Meeting  
March 18, 2024

# Recap

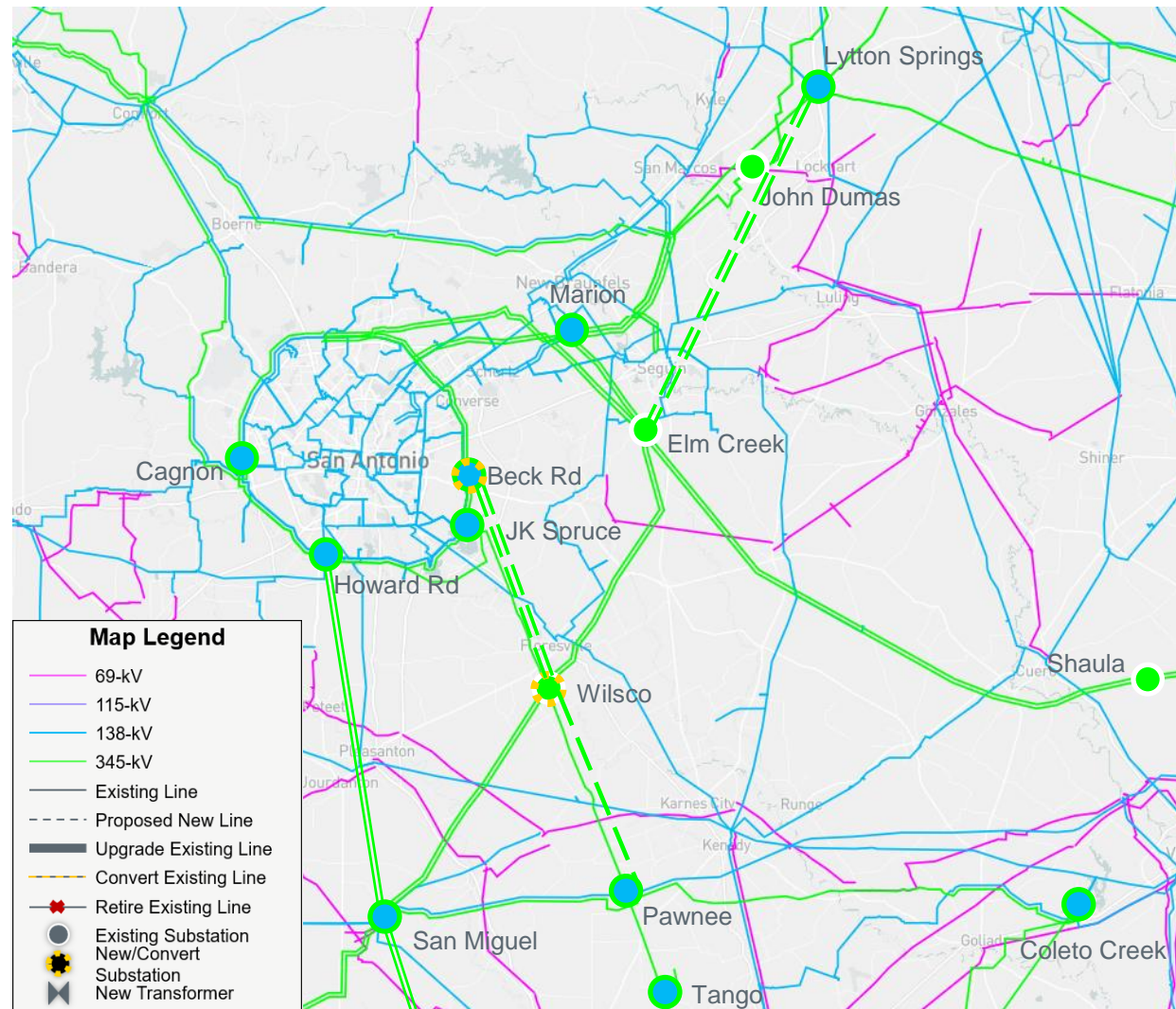
- ERCOT provided the study scope and then status updates at the November 2023 and January and February 2024 RPG Meetings
  - <https://www.ercot.com/calendar/11142023-RPG-Meeting>
  - <https://www.ercot.com/calendar/01172024-RPG-Meeting>
  - <https://www.ercot.com/calendar/02122024-RPG-Meeting>
- This project is currently under ERCOT Independent Review (EIR)

# Recap – Project Need as Seen by ERCOT



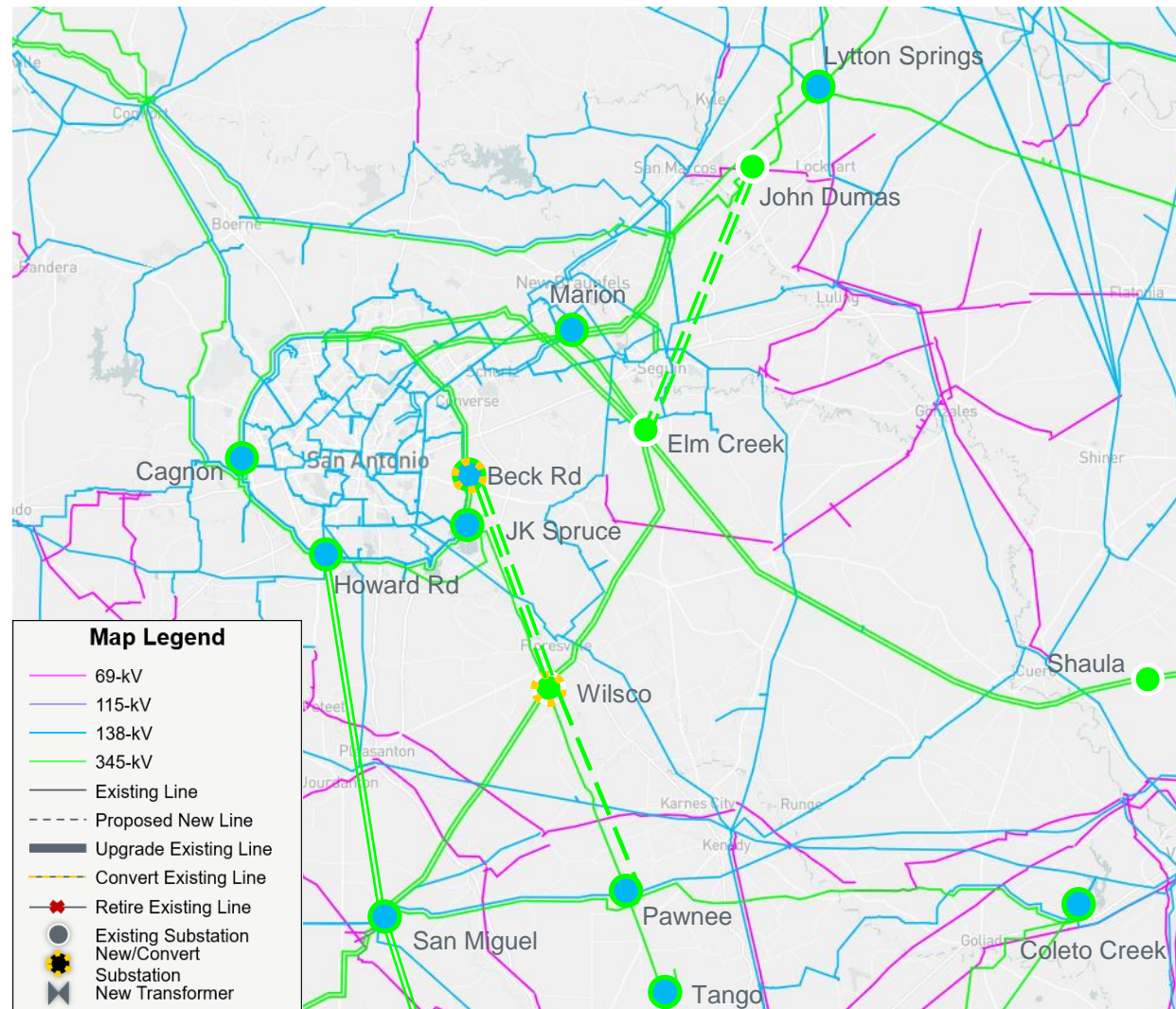
# Recap – Option 7

- Construct a new 345-kV switching station (Wilsco) near the intersection of the San Miguel to Elm Creek 345-kV transmission line and the Spruce to Pawnee 345-kV transmission line
- Construct a new 345/138-kV switching station on the East side of San Antonio near Beck Rd
- Construct a new 345-kV double circuit transmission line from Beck Rd to Wilsco
- Construct a new 345-kV double circuit transmission line from Elm Creek to Lytton Springs
- Add a second 345-kV circuit from Wilsco to Pawnee



# Recap – Option 8

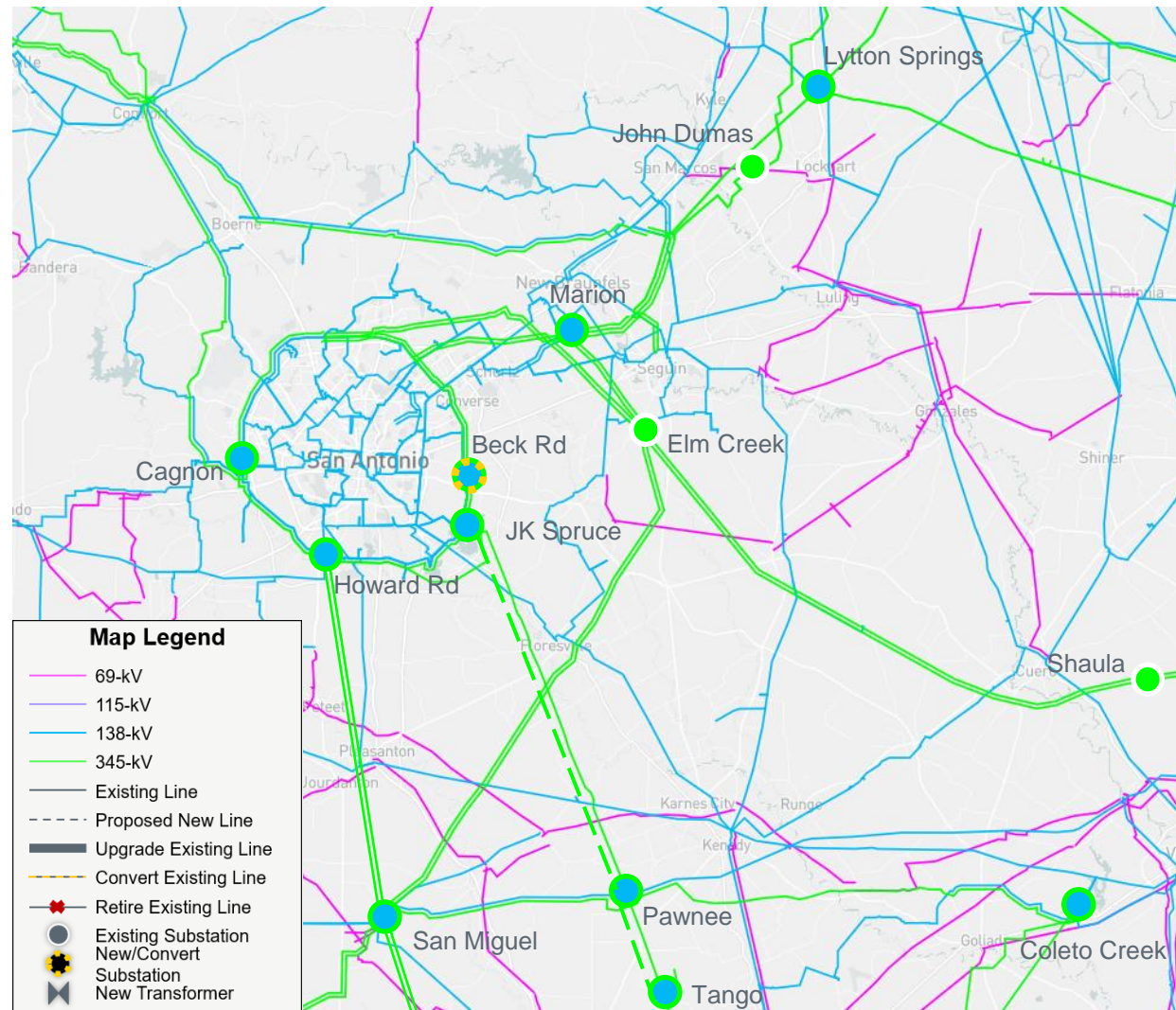
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- Construct a new 345/138-kV switching station on the East side of San Antonio near Beck Rd
- Construct a new 345-kV double circuit transmission line from Beck Rd to Wilsco
- Construct a new 345-kV double circuit transmission line from Elm Creek to John Dumas
- Add a second 345-kV circuit from Wilsco to Pawnee





# Option 14 – Revised

- Construct a new 345/138-kV switching station on the East side of San Antonio near Beck Rd
- Rebuild the 345-kV single circuit from JK Spruce to Pawnee into a 345-kV double circuit transmission line
- Rebuild the 345-kV single circuit from Pawnee to Tango into a 345-kV double circuit transmission line



# Recap – Long Term Load Serving Capability Assessment

- Scenario 1
  - Adjusted load up in substations in the Study Area (San Antonio area)
  - Adjusted conforming load down outside of the Southern and South Central weather zones to balance power
- Scenario 2
  - Adjusted load up in substations in the Study Area (San Antonio area)
  - Adjusted wind generation up in the Southern and Coast weather zones
- Based on N-1 contingency

|          | Incremental Load Serving Capability (MW) |            |
|----------|--|------------|
| Option   | Scenario 1                               | Scenario 2 |
| Basecase | 151                                      | 159        |
| 7        | 593                                      | 670        |
| 8        | 570                                      | 670        |
| 10       | 663                                      | 884        |
| 14       | 582                                      | 1080       |



# Maintenance Outage Scenario Analysis

- ERCOT conducted planned maintenance outage analysis on all short-listed options to compare relative performance of the options
  - Load levels in the South and South Central Weather zones were scaled down based on the historical non-summer peak data, in order to mimic the non-summer peak load condition
  - Based on the review of system topology of the area, ERCOT tested N-2 contingency combinations, and then tested all applicable contingency violations with system adjustments (N-1-1)
- No thermal or voltage constraints were observed in the N-1-1 analysis

| Option    | Thermal Violation | Voltage Violation |
|-----------|-------------------|-------------------|
| Option 7  | None              | None              |
| Option 8  | None              | None              |
| Option 10 | None              | None              |
| Option 14 | None              | None              |

# Comparison of Short-listed Options

|  | Option 7 | Option 8 | Option 10    | Option 14        |
|--|----------|----------|--------------|------------------|
| Meets ERCOT and NERC Reliability Criteria        | Yes      | Yes      | Yes          | Yes              |
| Improves Long-Term Load Serving Capability       | Yes      | Yes      | Yes (Better) | Yes (Better)     |
| Improves Operational Flexibility                 | Yes      | Yes      | Yes          | Yes (Marginally) |
| Additional transfer circuits from Southern Texas | 2        | 2        | 2            | 1                |
| Requires CCN* (miles)                            | ~103.2   | ~89.4    | ~87          | ~58              |
| Project Feasibility                              | Yes      | Yes      | Yes          | Yes              |
| Cost Estimate* (\$M)                             | ~631     | ~570     | ~492         | ~353**           |

\* Cost estimates were provided by Transmission Service Providers (TSPs)

\*\* Option 14 cost does not yet include the ~12 mile 345-kV Double Circuit from Pawnee to Tango

- Final Short-list: Options 10 and 14

# Additional Sensitivity Analyses

- Generation Addition Sensitivity Analysis
  - Per Planning Guide Section 3.1.3(4)(a), ERCOT performed a generation addition sensitivity by adding the generation listed below to the Option 10 and Option 14 cases. The additional resources were modeled following the 2023 RTP methodology. ERCOT determined relevant generators do not impact either option

| GINR      | Project Name             | Fuel Type | Capacity (MW) | County   |
|-----------|--------------------------|-----------|---------------|----------|
| 16INR0112 | Loma Pinta Wind          | WIN       | 197.01        | La Salle |
| 21INR0391 | Grandslam Solar          | SOL       | 121.89        | Atascosa |
| 22INR0559 | Honeycomb Solar          | SOL       | 61.1          | Bee      |
| 23INR0035 | Starling Solar           | SOL       | 123           | Gonzales |
| 23INR0207 | El Patrimonio Solar      | SOL       | 146.85        | Bexar    |
| 23INR0231 | Rocinante Solar          | SOL       | 95            | Gonzales |
| 25INR0503 | Uhland Maxwell Expansion | GAS       | 188.4         | Caldwell |

- Load Scaling Sensitivity Analysis
  - Per Planning Guide Section 3.1.3(4)(b), ERCOT performed a load scaling sensitivity and concluded that the load scaling did not have a material impact on project need

# Congestion Analyses

- Congestion Analysis was performed based on Options 10 and 14 to determine if the transmission upgrades resulted in new congestion within the study area
- Options 10 and 14 did not create any new congestion within the study area

# Next Steps and Tentative Timeline

- ERCOT will select a preferred option, complete evaluation on the preferred option, and provide status updates at future RPG meetings
  - Subsynchronous Resonance (SSR) Assessment
    - Nodal Protocol Section 3.22.1.3(2)
- Tentative timeline
  - Final recommendation – Q2 2024

*Thank you!*



Stakeholder comments also welcomed through:

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## Appendix A – Transmission Projects Added to Study Case

| TPIT No | Project Name  | Tier   | Project ISD | TSP         | County        |
|---------|---|--------|-------------|-------------|---------------|
| 67992   | CPSE_345-<br>kV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_U<br>pgrade,CPSE_Medina_to_36th_Street_Upgrade | Tier 3 | 26-Jan      | CPS         | Bexar         |
| 71873   | CPSE_Hill Country Auto# 2 Impedance Upgrade   | Tier 3 | 25-Jun      | CPS         | Bexar         |
| 71917   | Upgrade STEC Castroville to Pearson to 138-kV   | Tier 2 | 25-May      | STEC        | Medina        |
| 71935   | STEC_71935_HCCastrovl138  | Tier 2 | 25-Feb      | STEC        | Medina        |
| 72882   | LCRATSC_Lockhart_Luling_69kV_TL_Overhaul  | Tier 4 | 25-Jun      | LCRA<br>TSC | Caldwell      |
| 73050   | LCRATSC_JohnDumas_Substation_Addition   | Tier 4 | 25-Feb      | LCRA<br>TSC | Caldwell      |
| 73053   | Wimberley Loop to New Substation  | Tier 2 | 27-May      | PEC         | Hays          |
| 73417   | LCRATSC_Schumansville_SheriffsPosse_StormHardening  | Tier 4 | 25-May      | LCRA<br>TSC | Guadalup<br>e |
| 73793   | LCRATSC_McCartyLaneEast_Zorn_TL_Storm_Hardening   | Tier 4 | 25-May      | LCRA<br>TSC | Hays          |
| 73838   | LCRATSC_Redwood_SanMarcos_TL_Upgrade  | Tier 4 | 25-May      | LCRA<br>TSC | Hays          |
| 75682   | Add Branch between Libra and Elm Creek  | Tier 4 | 23-Nov      | CPS         | Wilson        |
| 76790   | Upgrade Pearsall Auto   | Tier 4 | 27-May      | STEC        | Frio          |
| 73025   | CPSE_NEW_SHAULA   | Tier 4 | 24-Nov      | CPS         | Dewitt        |

## Appendix B – RTP Placeholder Projects Removed from Study Case

| RTP Project ID | 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,<br>AEP,<br>LCRA,<br>ONCOR | San Patricio, Bee,<br>Karnes, Wilson,<br>Guadalupe, Comal,<br>Hays, Travis,<br>Williamson |
| 2023-SC10      | Wiseman 138-kV Substation Addition and CPS Multiple Cap Bank Additions | CPS                            | Bexar, Comal  |



## Appendix C – Generation Added to Study Case

| GINR      | Project Name                  | Fuel | Project COD | Capacity (MW) | County    |
|-----------|-------------------------------|------|-------------|---------------|-----------|
| 22INR0366 | BRP Libra BESS                | OTH  | 01/26/2024  | 206.21        | Guadalupe |
| 22INR0368 | Padua Grid BESS               | OTH  | 12/01/2024  | 51.39         | Bexar     |
| 22INR0422 | Ferdinand Grid BESS           | OTH  | 05/31/2026  | 202.65        | Bexar     |
| 23INR0027 | Cachena Solar SLF             | SOL  | 12/31/2025  | 600           | Wilson    |
| 23INR0154 | Ebony Energy Storage          | OTH  | 04/01/2024  | 203.5         | Comal     |
| 23INR0381 | Soportar ESS                  | OTH  | 03/15/2025  | 102.11        | Bexar     |
| 24INR0427 | CPS AvR CT1 Rotor Replacement | GAS  | 01/30/2024  | 11.3          | Bexar     |
| 25INR0223 | Uhland Maxwell                | GAS  | 04/15/2025  | 181.1         | Caldwell  |
| 22INR0251 | Shaula I Solar                | SOL  | 10/30/2025  | 205.2         | DeWitt    |
| 22INR0267 | Shaula II Solar               | SOL  | 05/30/2026  | 205.2         | DeWitt    |

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

| G-1 Generators  | X-1 Transformers                   |
|---|------------------------------------|
| Guadalupe –<br>GUADG_GAS1<br>GUADG_GAS2<br>GUADG_STM5 | Hill Country – Ckt 1<br>345/138-kV |
| San Miguel –<br>SAN_SANMIGG1                          | Marion – Ckt 1<br>345/138-kV       |
| Spruce –<br>CALAVER_JKS2                              | San Miguel – Ckt 1<br>345/138-kV   |
|   | Skyline – Ckt 1<br>345/138-kV      |