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# Item 14.1: Recommendation Regarding AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Regional Planning Group (RPG) Project

*Kristi Hobbs*
Vice President, System Planning and Weatherization

Board of Directors Meeting
December 8-9, 2025

- **Purpose**
  Provide an overview of the $9.384 billion AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Tier 1 Reliability Project. Per ERCOT Protocol Section 3.11.4.7 Tier 1 projects require Board endorsement

- **Voting Items / Request**
  ERCOT staff requests and recommends that the Board of Directors (Board) endorse the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone RPG Project, which is a subset of the 765-kV Strategic Transmission Expansion Plan (STEP) Core Plan, based on North American Electric Reliability Corporation (NERC) and Electric Reliability Council of Texas, Inc (ERCOT) reliability planning criteria

**Key Takeaways**

- Ensuring ERCOT's leadership for grid reliability and resilience, the Project has completed RPG review and received an independent assessment from ERCOT staff and endorsed by the Technical Advisory Committee (TAC)
- The 2024 Regional Transmission Plan (RTP) performed a comprehensive evaluation for determining the 765-kV STEP Core Plan to satisfy the reliability need by 2030.

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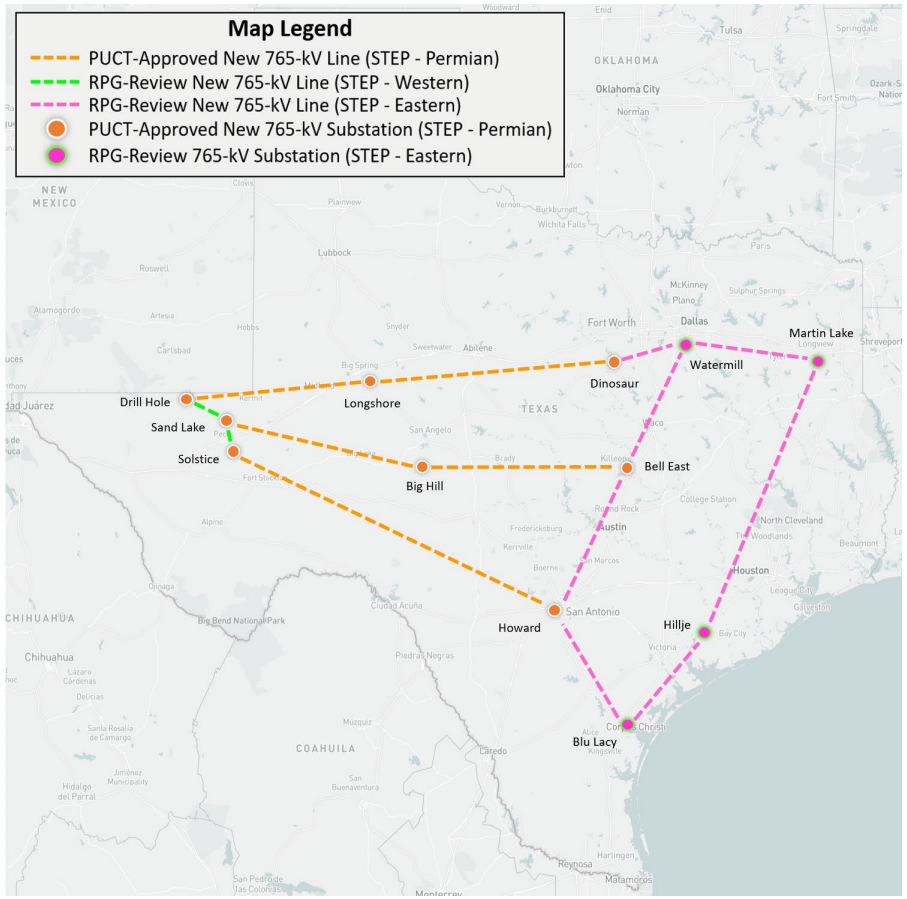
# Texas 765-kV Strategic Transmission Expansion Plan (STEP)




**Key Takeaway:** The Texas 765-kV STEP has been under evaluation by ERCOT and stakeholders during the 2024 and 2025 RTP review cycles.

Forecasted summer peak demand for 2030 exceeded 150 GW, of which approximately 50 GW was large load.

ERCOT analyzed two options: a 345-kV plan and a 765-kV STEP Core Plan during 2024.

2025 evaluation milestones:

- Jan 27: Published 2024 Regional Transmission Plan (RTP) 345-kV Plan and Texas 765-kV Strategic Transmission Expansion Plan Comparison which captured the results of the year long 2024 detailed RTP analysis.
- April 24: Public Utility Commission of Texas approved 765-kV Permian Basin import paths.
- July 7 & 17: Texas 765-kV STEP Western Loop and Eastern Backbone Projects submitted to RPG, respectively.
- November 11: ERCOT final recommendation at RPG.
- November 19: TAC endorsement.
- December 8-9: Presentation to ERCOT Board.

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# 2024 RTP Comparison of 345-kV vs 765-kV STEP Core Plan

| TX 765-kV STEP | vs | 345-kV Plan |
|---|---|---|
| **1,443 fewer miles** *of existing system work* | Existing System Upgrades | - |
| - | New ROW | **434 fewer miles** *of new ROW* |
| - | Estimated New Construction Costs | **$2.24B less** construction cost |
| **$890M** *less in outage-related construction costs* | Live/Hot Construction to Facilitate Existing Upgrades | - |
| **$229M/year** *more consumer energy cost savings (annually)* | Estimated Consumer Energy Cost Savings | - |
| **$28M/year** *more production* cost savings *for energy (annually)* | Estimated Production Cost Savings | - |
| **560 GWh/year** *less energy losses ($16.2M annual savings)* | Estimated System Loss Reduction | - |
| **600 to 3,000 MW** *increases in power transfer capability* | Incremental Transfer Capability | - |

**Key Takeaway:** The 765-kV STEP Core Plan continues to address additional new load growth and ensure reliability under NERC and ERCOT Planning Guide criteria.

The 765-kV STEP Core Plan:

- Reduced impact to current grid for upgrades
- Demonstrated lower line losses
- Estimated more transmission congestion savings
- Provided additional future power transfer capability
- Fulfilled project need even under sensitivity scenarios where projected load growth was less than forecasted

The 765-kV STEP Core Plan was included in the 2025 RTP 2030 and 2031 base cases to address violations.

The 2025 RTP has indicated continued benefit of the 765-kV STEP Core Plan in addressing additional new load growth.

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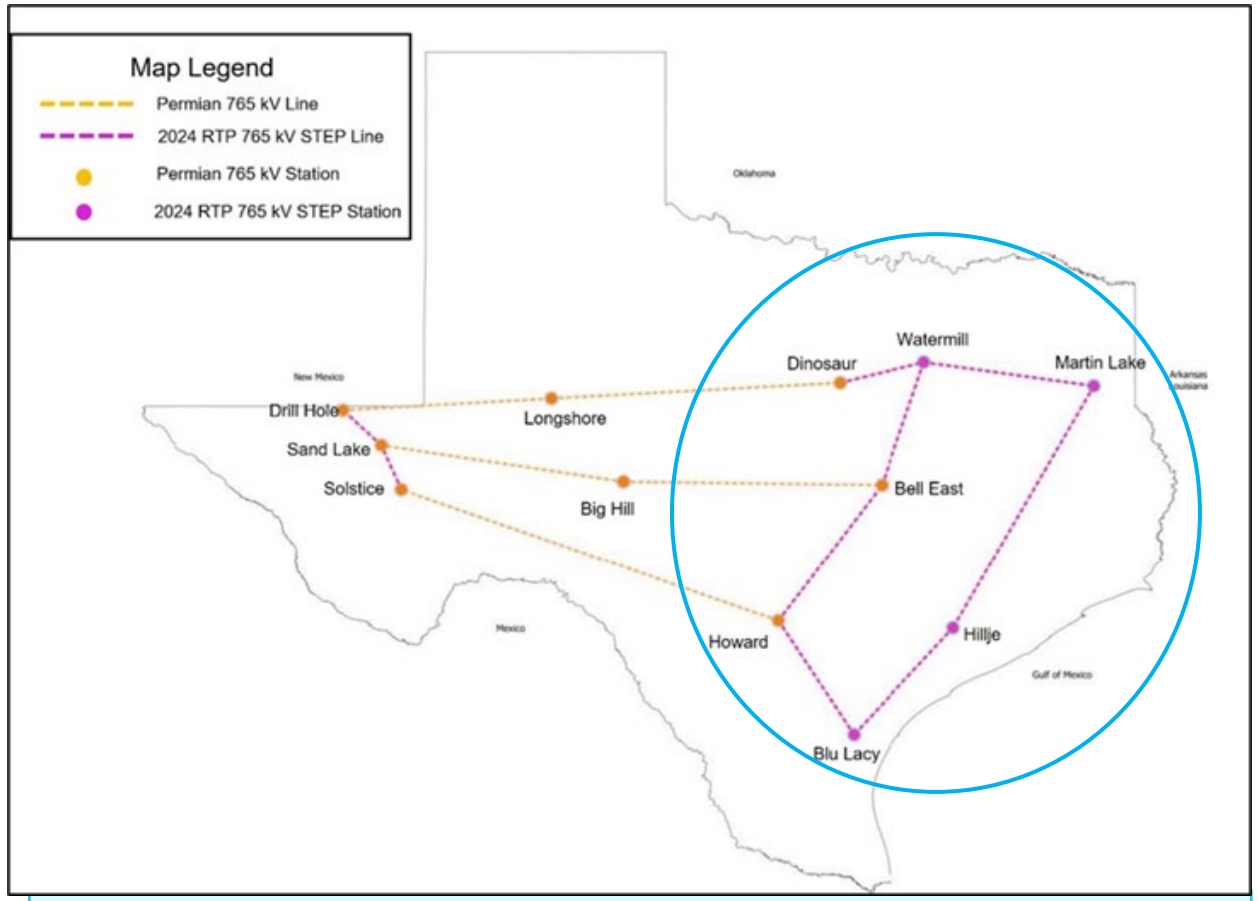
# AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone RPG Project




**Key Takeaway:** The AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Project has completed RPG review and received endorsement by TAC.

- The July 2025 joint project submission is a subset of the 765-kV STEP Core Plan
- The 2024 RTP developed the 765-kV Strategic Transmission Expansion Plan (STEP) Core Plan to address the 2030 base case reliability needs and verified the validity of the plan to meet a reduced demand sensitivity
- ERCOT's endorsement of the project is based on the reliability need to meet the statewide reliability needs driven by rapidly growing electrical demand
- ERCOT presented the project and TAC voted to endorse (with 2 No votes and 2 Abstentions) the project on November 19, 2025

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# Overall Project Summary

- Four (4) new 765-kV substations
- Approximately 1,109 miles of new 765-kV single-circuit transmission lines
- Eleven (11) new 765/345-kV transformers
- Five (5) 300 MVAr Bus Switch Shunt Reactors (1,500 MVAr total)
- Six (6) 300 MVAr Line Switch Shunt Reactors (1,800 MVAr total)
- Forty-Three (43) new 765-kV Circuit Breakers
- Twenty-Six (26) new 345-kV Circuit Breakers

**Key Takeaway:**

The AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Project will meet the statewide reliability needs driven by rapidly growing electrical demand.

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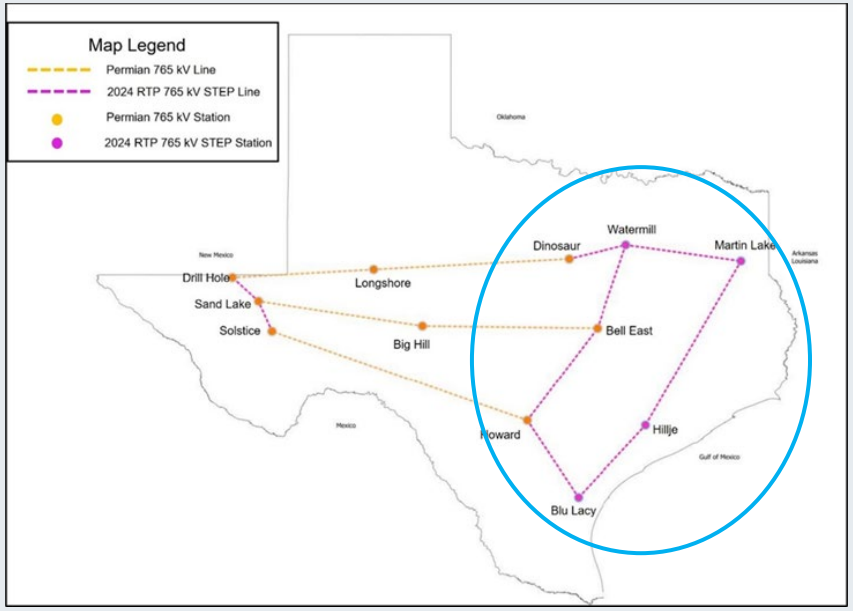
# Request for Board Vote

ERCOT staff requests and recommends that the Board:

- Endorse the need for the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Project, which is a subset of the 765-kV STEP Core Plan, based on NERC and ERCOT reliability planning criteria
- The ERCOT Independent Review (EIR) is included as ***Attachment A*** to the Board Decision Template

**Key Takeaway:** ERCOT performed a comprehensive evaluation for determining the 765-kV STEP Core Plan, of which the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV STEP Eastern Backbone Project is a subset of.

## ERCOT Recommendation



**Date:** December 1, 2025
**To:** Board of Directors
**From:** Kristi Hobbs, Vice President, System Planning and Weatherization (ERCOT)
**Subject:** AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Regional Planning Group (RPG) Project

# Issue for the ERCOT Board of Directors

**ERCOT Board of Directors Meeting Date: December 8-9, 2025**

**Item No.:** 14.1

**Issue:**
Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to endorse the need for the Tier 1 American Electric Power (AEP) Texas, CPS Energy, Oncor and CenterPoint (CNP) Texas 765-kV-STEP Eastern Backbone Regional Planning Group (RPG) Project, which is a subset of the 765-kV Strategic Transmission Expansion Plan (STEP) Core Plan, in order to meet the statewide reliability needs driven by rapidly growing electrical demand, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted to endorse.

**Background/History:**
AEP Texas, CPS Energy, Oncor and CNP jointly proposed the Texas 765-kV-STEP Eastern Backbone Project in July 2025, a $9.384 billion, Tier 1 project with the expected in-service date between 2030 and 2032, to meet the statewide reliability needs driven by rapidly growing electrical demand. Protocol Section 3.11.4.7, Processing of Tier 1 Projects, requires ERCOT to independently review submitted projects. ERCOT performed an independent review of the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Project, reviewed the comprehensive evaluation in the 2024 Regional Transmission Plan (RTP) for determining the 765-kV STEP Core Plan and performed additional assessments. ERCOT recommends the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Project, which is a subset of the 765-kV STEP Core Plan, a $9.384 billion, Tier 1 project with the expected in-service date between 2030 and 2032 to meet the statewide reliability needs driven by rapidly growing electrical demand with the following ERCOT System improvements:

- Construct a new Blu Lacy 765/345-kV Substation and Install;
  - Five (5) 765-kV Circuit Breakers in a ring bus configuration expandable to breaker-and-a-half configuration;
  - Four (4) 765-kV, 300 MVAr Switch Shunt Reactors (100 MVAr/phase);
    - Two (2) Bus Switch Shunts each with a Circuit Breaker; and
    - Two (2) Line Switch Shunts each with a Circuit Breaker.
  - Eleven (11) 345-kV Circuit Breakers in a seven-position (7) breaker-and-a-half configuration; and
  - Three (3) 765/345-kV transformers rated at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Watermill 765-kV Switchyard and Install;
  - Twelve (12) Circuit Breakers in a double-bus, double-breaker configuration; and
  - Reactive device on 765-kV line[1].
- At Existing Watermill 345-kV Substation;
  - Install six (6) Circuit Breakers in a breaker-and-a-half configuration.
- At Watermill 765/345-kV Substation Install;
  - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Martin Lake 765-kV Switchyard and Install;
  - Eight (8) Circuit Breakers in a double-bus, double-breaker configuration; and
  - Reactive device on 765-kV line[1].
- At Existing Martin Lake 345-kV Substation;
  - Install four (4) Circuit Breakers in a double-bus, double-breaker configuration.
- At Martin Lake 765/345-kV Substation Install;
  - Two (2) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Hillje 765-kV Substation and Install;
  - Install eight (8) Circuit Breakers in a breaker-and-a-half configuration.
- At Existing Hillje 345-kV Substation;
  - Expand breaker-and-a-half configuration by adding two (2) new bays; and

[1] Potential additional reactive support for operational support and flexibility

- Install five (5) Circuit Breakers in expanded breaker-and-a-half configuration.
- At Hillje 765/345-kV Substation Install;
  - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency;
  - Two (2) 300 MVAr Line Shunt Reactors; and
  - Two (2) 300 MVAr Bus Shunt Reactors.
- Install two (2) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at New Substation 2 [Dinosaur];
- Install reactive device on 765-kV line at New Substation 2 [Dinosaur][2];
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at East Bell Substation;
- Install reactive device on 765-kV line at East Bell Substation2;
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at Howard 765-kV Substation;
  - Install two (2) 300 MVAr 765-kV Line Shunt Reactors at Howard Substation; and
  - Install one (1) 300 MVAr 765-kV Bus Shunt Reactor at Howard Substation.
- Construct a new Dinosaur to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new right of way (ROW), approximately 78.0-mile;
- Construct a new Watermill to Martin Lake 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 152.4-mile;
- Construct a new Martin Lake to Hillje 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 292.8-mile;
- Construct a new Hillje to Blu Lacy 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 142.8-mile;
- Construct a new Blu Lacy to Howard 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 139.2-mile;

[2] Potential additional reactive support for operational support and flexibility

- Construct a new Howard to Bell East 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 170.4-mile; and
- Construct a new Bell East to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 133.2-mile.

ERCOT's independent review utilized the comprehensive evaluation in the 2024 RTP study for determining the 765-kV STEP Core Plan, performed additional analyses and assessments to verify the reliability need for the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Project to meet the statewide extra-high voltage reliability needs driven by rapidly growing electrical demand.

RPG considered project overviews during meetings in September 2025 and November 2025. Between September 2025 and November 2025, ERCOT staff presented scope and status updates at RPG meetings in September, October and November. Pursuant to paragraph (2) of Protocol Section 3.11.4.9, Regional Planning Group Acceptance and ERCOT Endorsement, ERCOT presented the Tier 1 project to the Technical Advisory Committee (TAC) for review and comment, and on November 19, 2025, TAC endorsed (with 2 No votes and 2 Abstentions) the project as recommended by ERCOT. Pursuant to paragraph (1)(a) of Protocol Section 3.11.4.3, Categorization of Proposed Transmission Projects, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Protocol Section 3.11.4.7(2) requires endorsement by the Board. Pursuant to Section 3.11.4.9, ERCOT's endorsement of a Tier 1 project is obtained upon affirmative vote of the Board.

ERCOT's assessment of the Sub-Synchronous Resonance (SSR) of existing facilities, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSR impacts to the existing and planned generation resources at the time of the study. Results of the congestion analysis ERCOT conducted pursuant to Planning Guide Section 3.1.3, Project Evaluation, indicated no significant new congestion in the area with the addition of the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Project.

The project completion date is subject to change based on several factors, including environmental assessments, licensing requests, regulatory approvals, ROW acquisitions, and/or construction processes.

The report describing the ERCOT Independent Review of the AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Project, including ERCOT staff's recommendation, is included as Attachment A.

**Key Factors Influencing Issue:**

1. ERCOT System improvements are needed to meet the statewide reliability needs driven by rapidly growing electrical demand.
2. ERCOT staff found the recommended set of improvements to be the most efficient solution for meeting the planning reliability criteria and facilitating future transmission expansion for future load in the area.
3. Protocol Section 3.11.4.7 requires Board endorsement of a Tier 1 project, which is a project with an estimated capital cost of $100 million or greater pursuant to Protocol Section 3.11.4.3(1)(a).
4. TAC voted to endorse the Tier 1 AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Regional Planning Group (RPG) Project, as recommended by ERCOT, on November 19, 2025.

**Conclusion/Recommendation:**

ERCOT staff recommends that the Board endorse the need for the Tier 1 AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone RPG Project, which is a subset of the 765-kV STEP Core Plan, which ERCOT staff has independently reviewed, and which TAC has voted to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria.

## ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.

## BOARD OF DIRECTORS RESOLUTION

WHEREAS, pursuant to Section 3.11.4.3(1)(a) of the Electric Reliability Council of Texas, Inc. (ERCOT) Protocols, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Section 3.11.4.7 requires endorsement by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) deems it desirable and in the best interest of ERCOT to accept ERCOT staff's recommendation to endorse the need for the Tier 1 AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Regional Planning Group Project, which is a subset of the 765-kV STEP Core Plan, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED, that ERCOT is hereby authorized and approved to endorse the need for the Tier 1 AEP Texas, CPS Energy, Oncor and CNP Texas 765-kV-STEP Eastern Backbone Regional Planning Group Project, which is a subset of the 765-kV STEP Core Plan, which ERCOT staff has independently reviewed, and which TAC has voted to endorse based on NERC and ERCOT reliability planning criteria.

## CORPORATE SECRETARY'S CERTIFICATE

I, Brandon Gleason, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its _____ meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of _____, 2025.

_____

Brandon Gleason

Assistant Corporate Secretary

# ERCOT Independent Review of the AEPTX, CPS, Oncor and CenterPoint Texas 765-kV-STEP Eastern Backbone Project

# Document Revisions

| Date | Version | Description | Author(s) |
|---|---|---|---|
| 11/12/2025 | 1.0 | Final | Ben Richardson |
| | | Reviewed by | Robert Golen, Prabhu Gnanam |

# Executive Summary

AEP Texas (AEPTX), CPS Energy (CPS), Oncor Electric Delivery and CenterPoint Energy Houston Electric, LLC (CEHE) jointly submitted the Texas 765-kV-STEP Eastern Backbone Project for Regional Planning Group (RPG) review in July. This proposed project is designed to address the statewide extra-high voltage reliability needs driven by rapidly growing electrical demand.

The ERCOT System is experiencing rapid changes, including trends of notable growth in demand and penetration of intermittent Generation Resources. The trend of rising demand is driven by factors such as continued interest in connecting large loads to the ERCOT system as well as the further electrification of oil and gas processes in the Permian Basin. In the 2024 Regional Transmission Plan (RTP) study cycle, the forecasted summer peak demand for 2030 exceeded 150 GW, of which approximately 50 GW is large load.

This unprecedented load growth prompted discussions about introducing a 765-kV backbone infrastructure to the ERCOT Transmission Grid. In addition to the traditional 345-kV plan, ERCOT conducted extensive engineering analysis of the 765-kV plan and obtained substantial review and input from Transmission and Distribution Service Providers (TDSPs) and other stakeholders in the ERCOT region through the RPG meetings. As a culmination of these efforts, ERCOT has proposed the 765-kV Strategic Transmission Expansion Plan (STEP) Core Plan[1] in the 2024 RTP study.

In July 2024, ERCOT filed the Permian Basin Reliability Plan Study[2] with Public Utilities Commission of Texas (PUCT), which included a plan with 765-kV import paths to the Permian Basin area. On April 24, 2025, the PUCT approved the plan to build the ERCOT region's first 765-kV extra high voltage transmission lines proposed in the ERCOT Permian Basin Reliability Plan Study. The approved plan includes three 765-kV import paths into the Permian Basin region: New Substation 2 (Dinosaur) to Longshore to Drill Hole 765-kV transmission line; Bell East to Big Hill to Sand Lake 765-kV transmission line; and Howard to Solstice 765-kV transmission line.

The proposed AEPTX, CPS, Oncor and CEHE Texas 765-kV-STEP Eastern Backbone Project constructs new 765-kV substations and transmission lines to extend the PUCT approved 765-kV transmission lines into a new 765-kV Eastern Backbone. The reliability need of this project was identified and included in 2024 RTP. The proposed AEPTX, CPS, Oncor, CEHE Texas 765-kV-STEP Eastern Backbone Project aligns with the 2024 RTP 765-kV STEP Core Plan. The proposed project is estimated to cost approximately $9.384 billion, was classified as a Tier 1 project per ERCOT Protocol Section 3.11.4.3, and the proposed project includes approximately 1,108.8 miles of new right of way (ROW) and will require a Certificate of Convenience and Necessity (CCN) application.

[1] *https://www.ercot.com/calendar/01272025-EHV-765-kV-ERCOT*
[2] *Reliability Plan for the Permian Basin under PURA § 39.167,* PUCT Project No. 55718, ERCOT Permian Basin Reliability Plan Study (July 25, 2024).

ERCOT performed an Independent Review by utilizing the study results in 2024 RTP and assessing the need for further analysis. Based on this Independent Review, ERCOT recommends the following project as jointly submitted by AEPTX, CPS, Oncor and CEHE:

- Construct a new Blu Lacy 765/345-kV Substation and Install;
    - Five (5) 765-kV Circuit Breakers in a ring bus configuration expandable to breaker-and-a-half configuration;
    - Four (4) 765-kV, 300 MVAr Switch Shunt Reactors (100 MVAr/phase);
        - Two (2) Bus Switch Shunts each with a Circuit Breaker; and
        - Two (2) Line Switch Shunts each with a Circuit Breaker.
    - Eleven (11) 345-kV Circuit Breakers in a seven-position (7) breaker-and-a-half configuration; and
    - Three (3) 765/345-kV transformers rated at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Watermill 765-kV Switchyard and Install;
    - Twelve (12) Circuit Breakers in a double-bus, double-breaker configuration; and
    - Reactive device on 765-kV line[3].
- At Existing Watermill 345-kV Substation;
    - Install six (6) Circuit Breakers in a breaker-and-a-half configuration.
- At Watermill 765/345-kV Substation Install;
    - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Martin Lake 765-kV Switchyard and Install;
    - Eight (8) Circuit Breakers in a double-bus, double-breaker configuration; and
    - Reactive device on 765-kV line[3].
- At Existing Martin Lake 345-kV Substation;
    - Install four (4) Circuit Breakers in a double-bus, double-breaker configuration.
- At Martin Lake 765/345-kV Substation Install;
    - Two (2) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Hillje 765-kV Substation and Install;
    - Install eight (8) Circuit Breakers in a breaker-and-a-half configuration.
- At Existing Hillje 345-kV Substation;
    - Expand breaker-and-a-half configuration by adding two (2) new bays; and
    - Install five (5) Circuit Breakers in expanded breaker-and-a-half configuration.
- At Hillje 765/345-kV Substation Install;
    - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency;
    - Two (2) 300 MVAr Line Shunt Reactors; and

[3] Potential additional reactive support for operational support and flexibility

  - Two (2) 300 MVAr Bus Shunt Reactors.
- Install two (2) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at New Substation 2 [Dinosaur];
- Install reactive device on 765-kV line at New Substation 2 [Dinosaur][4];
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at East Bell Substation;
- Install reactive device on 765-kV line at East Bell Substation[4];
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at Howard 765-kV Substation;
  - Install two (2) 300 MVAr 765-kV Line Shunt Reactors at Howard Substation; and
  - Install one (1) 300 MVAr 765-kV Bus Shunt Reactor at Howard Substation.
- Construct a new Dinosaur to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new right of way (ROW), approximately 78.0-mile;
- Construct a new Watermill to Martin Lake 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 152.4-mile;
- Construct a new Martin Lake to Hillje 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 292.8-mile;
- Construct a new Hillje to Blu Lacy 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 142.8-mile;
- Construct a new Blu Lacy to Howard 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 139.2-mile;
- Construct a new Howard to Bell East 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 170.4-mile; and
- Construct a new Bell East to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 133.2-mile.

The cost estimate for this project is approximately $9.384 billion and is classified as Tier 1 project per ERCOT Protocol Section 3.11.4.3(1)(a). One or more CCN applications will be required for the construction of the new 765-kV single-circuit transmission lines from Dinosaur to Watermill to Martin Lake to Hillje to Blu Lacy to Howard to Bell East to Watermill due to approximately 1,108.8 miles of new ROW. The expected ISD of this project is between 2030 and 2032. However, AEPTX, CPS, Oncor and CEHE have advised that the projected ISD may change based on several factors,

[4] Potential additional reactive support for operational support and flexibility

including environmental assessments, licensing requests, regulatory approvals, ROW acquisitions, and/or construction processes. The specifications may be modified following additional study or during detailed design. TSP(s) shall notify ERCOT of the details of any modifications to the endorsed project.

# Table of Contents

# 1 Introduction

In July 2025, AEP Texas (AEPTX), CPS Energy (CPS), Oncor Electric Delivery and CenterPoint Energy Houston Electric, LLC (CEHE) jointly submitted the Texas 765-kV-STEP Eastern Backbone Project to the Regional Planning Group (RPG) to address statewide extra-high voltage reliability needs driven by rapidly growing electrical demand. Substations included in the proposed project are located in Bexar, Dallas, Bell, Kleberg, Rusk, Wharton counties with 765-kV transmission lines crossing other counties but all within the North Central, South, Central, Southern, Coast, and East Weather Zones.

This AEPTX, CPS, Oncor and CEHE jointly proposed project was classified as a Tier 1 project pursuant to ERCOT Protocol Section 3.11.4.3, with an estimated cost of approximately $9.384 billion. One or more Certificate of Convenience and Necessity (CCN) applications will be required for the construction of the new 765-kV single-circuit transmission lines from Dinosaur to Watermill to Martin Lake to Hillje to Blu Lacy to Howard to Bell East to Watermill due to approximately 1,108.8 miles of new right of way (ROW). The expected in-service date (ISD) of the project is between 2030 and 2032.

The unprecedented load growth in the ERCOT system has driven the need for substantial amount of new transmission infrastructure. The forecasted summer peak demand for 2030 exceeds 150 GW, of which approximately 50 GW is large load growth. The 2024 Regional Transmission Plan (RTP) performed a comprehensive evaluation for determining the 765-kV transmission plan to satisfy the reliability need by 2030. Figure 1.1 shows the map of 765-kV Strategic Transmission Expansion Plan (STEP) Core Plan proposed in the 2024 RTP. The yellow transmission lines and substations are the Permian Basin 765-kV import paths approved by the Public Utilities Commission of Texas (PUCT) in April 2025: New Substation 2 (Dinosaur) to Longshore to Drill Hole 765-kV transmission line; Bell East to Big Hill to Sand Lake 765-kV transmission line; and Howard to Solstice 765-kV transmission line. The western part of the plan is the Drill Hole to Sand Lake to Solstice 765-kV Line Project jointly submitted by Oncor and AEPSC. The eastern portion of the 765-kV STEP Core Plan is this Texas 765-kV-STEP Eastern Backbone Project jointly submitted by AEPTX, CPS, Oncor, and CEHE.

ERCOT conducted an Independent Review for this RPG project by utilizing the 2024 RTP study and performed additional analyses and assessment. This report describes the study assumptions, methodology, and the results of the ERCOT Independent Review of the project.

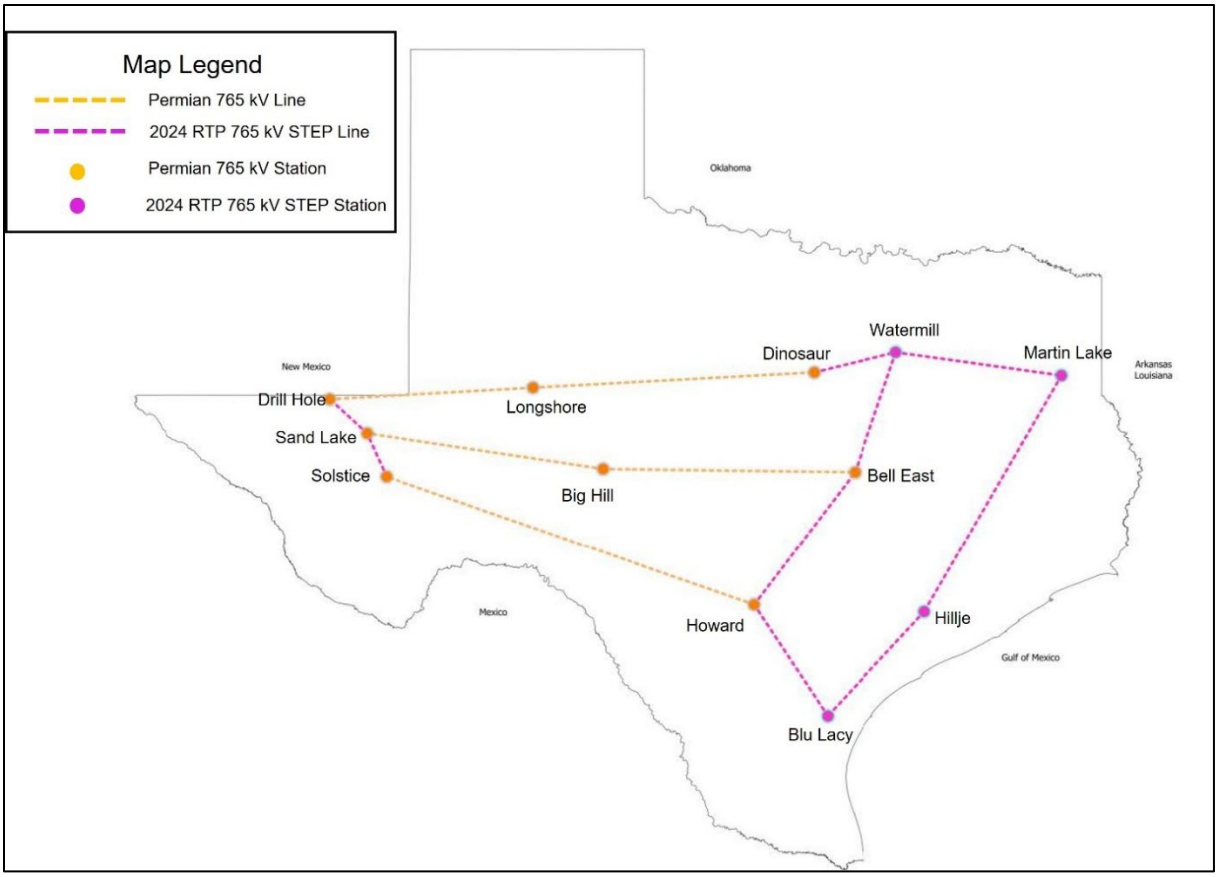



**Figure 1.1: Map of the 765-kV STEP Core Plan Proposed in 2024 RTP**

# 2 Study Assumptions and Methodology

To address the rapid changes experienced in the ERCOT system, which include trends of substantial growth in demand and increasing penetration of Inverter-Based Resources (IBRs), ERCOT's 2024 RTP evaluated 765-kV transmission network in addition to the traditional 345-kV infrastructure. ERCOT conducted extensive engineering analysis of the 765-kV plan and obtained substantial review and input from Transmission and Distribution Service Providers (TDSPs) and other stakeholders in the ERCOT region through the RPG meetings. As a culmination of these efforts, ERCOT has proposed the 765-kV STEP Core Plan during 2024 RTP study.

ERCOT performed a comprehensive evaluation for determining the 765-kV transmission plan to satisfy the need in the 2024 RTP evaluation. The start case for the 765-kV STEP Core Plan incorporated all local transmission projects needed by 2030 in the Permian Basin Reliability Plan Study, along with the three Permian Basin 765-kV import paths. All the local transmission projects and the three Permian Basin 765-kV import paths have been approved by PUCT in April 2025. In addition, ERCOT considered over 75 alternatives in different phases of the 2024 RTP analysis before determining the final 765-kV STEP Core Plan and potential future 765-kV expansions. The 765-kV contingency analyses were performed in accordance with North American Electric Reliability

Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria, specifically the N-1 contingency conditions, prior outage of a generator or 345/138-kV transformer followed by N-1 contingency conditions, maintenance outages at the 300-kV and above voltage level, and extreme events.

As such, ERCOT has decided to utilize the 2024 RTP study for this independent review and perform additional analyses required by the Tier 1 project. The following sections highlight the studies and cost effectiveness of the 765-kV STEP Core Plan performed in the 2024 RTP evaluation.

## 2.1 Steady-State Reliability Studies

To serve both current and future load growth by 2030 reliably and efficiently, several miles of new transmission build as well as upgrades to existing transmission lines will be required. The 2024 RTP developed 765-kV STEP Core Plan to address statewide reliability needs driven by unprecedented load growth in the ERCOT system.

The steady-state reliability studies and cost effectiveness of the 765-kV STEP Core Plan:

- The total construction cost estimate for 765-kV STEP Core Plan is approximately $32.99 billion;
- The total new ROW mileage at all voltage levels for 765-kV STEP Core Plan is approximately 3,441 miles;
- The total existing line upgrade mileage at all voltage levels for 765-kV STEP Core Plan is approximately 2,831 miles;
- The 765-kV transmission lines significantly reduce power losses by transmitting electricity at a higher voltage. Power loss calculations showed that the 765-kV STEP Core Plan can reduce annual systemwide transmission losses by about 5% compared to the 345-kV Plan (about 560 GWh each year, which is approximately equivalent to a 128 MW thermal unit operating at a 50% capacity factor);
- A transfer capability analysis was conducted to compare the ability to move power across the system without causing thermal overloads or voltage collapse from a steady-state perspective. The steady-state transfer capability analysis indicates that the 765-kV STEP Core Plan provides higher regional transfer capability compared to the 345-kV Plan, providing a more robust solution for meeting future demand. With the increasing curtailments of existing generation due to Generic Transmission Constraints (GTCs), such as South Texas Import and Export GTCs, or steady-state thermal limits, enhanced transfer capability will be a benefit. Specifically, the 765-kV STEP Core Plan enhances transfer capability by an additional 600 MW to 3,000 MW across various scenarios evaluated in the analysis. This higher transfer capability could also provide a greater range of siting options for both Generation Resources and large loads; and
- Additional sensitivity analysis was performed to review the reliability need based on varying demand levels. Sensitivity analysis with a reduced load level (~20 GW less overall load)

showed major portions of the 765-kV STEP Core Plan will still be needed to meet the reduced demand.

The final 765-kV STEP Core Plan reliability cases[5] were published on the Market Information System (MIS) on February 6, 2025:

- Summer Peak Case: 2024RTP_2030_SUM_TX765STEP_02062025
- Planned Maintenance Case: 2024RTP_2030_MaintenanceOutage_TX765STEP_02062025

## 2.2 Dynamic Stability Studies

ERCOT conducted a stability analysis to examine the system's ability to return to normal operating conditions after sudden changes or disturbances (e.g., line trip). The analysis evaluated the potential impact to the West Texas Export and McCamey GTCs. The study results indicate that the 765-kV STEP Core Plan would increase the West Texas Export stability constraint limit from 12.7 GW to 16.2 GW. No stability limits were identified for the McCamey area stability constraint with the implementation of the 765-kV STEP Core Plan. Additionally, the study results showed that bypassing all series capacitors had no impact on stability limits. The ability to potentially eliminate some or all series capacitors from the system means greater flexibility in siting and interconnecting generators without concerns about potential sub-synchronous oscillation (SSO) issues.

System strength is increasingly important for a grid's ability to mitigate potential instability risks. IBRs in the ERCOT grid have experienced rapid and sustained growth, driving significant transformations in the energy landscape. The performance of IBRs heavily depends on power electronics controls, which are highly complex and fast-acting, making them particularly sensitive in weaker grids dominated by IBRs with limited or no conventional synchronous generation. Recognizing that adding new major transmission infrastructure, such as 765-kV, can significantly improve system strength, thereby enhancing the grid's ability to support the reliable operation of IBRs and mitigate potential instability risks, ERCOT conducted a system strength analysis to evaluate the performance of the 765-kV STEP Core Plan. The results indicate that the 765-kV STEP Core Plan provides improvement in system strength, measured by weighted short-circuit MVA[6].

## 2.3 Economic Study

An economic study was performed to qualitatively evaluate the economic benefit of the 765-kV STEP Core Plan by using two study year cases, i.e., 2034 and 2039. The 2034 and 2039 economic cases for the Current Trends scenario from the 2024 Long-Term System Assessment (LTSA) were used as the base cases of this economic analysis. The economic benefit of the 765-kV STEP Core Plan was evaluated by comparing to the 345-kV plan. The 345-kV and 765-kV plans were added separately to the base cases to simulate the incremental impact of the proposed transmission addition. Anticipated

[5] 2024 Regional Transmission Plan Postings: https://mis.ercot.com/secure/data-products/grid/regional-planning
[6] https://www.ercot.com/calendar/01272025-EHV-765-kV-ERCOT

responses from price responsive load under system scarcity conditions were modeled in the simulation.

The economic study showed that the 765-kV STEP Core Plan demonstrated more consistent benefits through the years evaluated compared with the 345-kV Plan in both the production cost savings and system-wide consumer energy cost reduction. Key findings from the economic analysis are summarized as follows and monetary numbers are in 2025 dollars:

- For year 2034, both the 345-kV and 765-kV plans showed savings in production cost and consumer energy cost while the 765-kV STEP Core Plan had $133 million more production cost savings but $136 million less savings in system-wide consumer energy cost compared with the 345-kV Plan. The 765-kV STEP Core Plan also had $94 million less congestion rent than the 345-kV Plan; and
- For year 2039, while the 765-kV STEP Core Plan continued to show savings in both production cost and consumer energy cost, the 345-kV Plan showed an increase in the consumer energy cost. The 765-kV STEP Core Plan had $28 million more production cost savings and approximately $229 million more system-wide consumer energy cost reduction than the 345-kV Plan. The 765-kV STEP Core Plan also had $172 million less congestion rent than the 345-kV Plan.

The economic study showed that the 765-kV STEP Core Plan can produce more economic benefits in the long-term planning horizon.

ERCOT also performed a congestion analysis using the 2024 RTP 2029 economic case for the 765-kV STEP Core Plan. The study showed that 765-kV STEP Core Plan does not introduce significant new congestion in the study area.

## 2.4 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols, and ERCOT Planning Criteria.[7]

The following steady-state contingencies were simulated for the study region:

- P0 (System Intact);
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (345-kV and above);
- P3: G-1+N-1 (G-1: generation outage); and
- P6-2: X-1+N-1 (X-1: 345/138-kV transformer and 765/345-kV transformer).

All 115-kV and above buses, 60-kV and above transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

[7] ERCOT Planning Criteria: http://www.ercot.com/mktrules/guides/planning/current

- Thermal limits
  - Rate A (normal rating) for pre-contingency conditions; and
  - Rate B (emergency rating) for post-contingency conditions.
- Voltage limits
  - Voltages exceeding pre-contingency and post-contingency limits; and
  - Voltage deviations exceeding 8% on non-radial load buses.

## 2.5 Study Tools

ERCOT utilized the following software tools to perform the studies:

- PowerWorld Simulator version 23 for Security Constrained Optimal Power Flow (SCOPF) and steady-state contingency analysis;
- TARA version 2302_2 for steady-state transfer analysis; and
- UPLAN version 12.3.0.30786 to perform congestion analysis.

# 3 Additional Analyses and Assessment

The Joint AEPTX, CPS, Oncor, CEHE Texas 765-kV-STEP Eastern Backbone Project, with a cost estimate of approximately $9.384 billion, is categorized as a Tier 1 project, pursuant to ERCOT Protocol 3.11.4.3(1)(a). ERCOT performed generation and load sensitivity studies to identify the project performance, as required under Planning Guide Section 3.1.3(4). Additionally, a Sub-synchronous Resonance (SSR) Assessment was performed.

## 3.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a).

Based on a review of the September 2025 GIS[8] report, 123 units were found within the study area that could have an impact on the identified reliability issues. These units, listed in Table 3.1, were added to the 2024 RTP STEP Core Plan 2030 Summer Peak case following 2024 RTP Methodology. ERCOT determined that the addition of these generators do not impact the jointly submitted project.

**Table 3.1: List of Units that Could Have an Impact on the Identified Reliability Issues**

| GINR | Unit Name | Fuel Type | Max Capacity (~MW) | County |
|---|---|---|---|---|
| 22INR0220 | Lamkin Solar | SOL | 101.5 | Comanche |
| 22INR0426 | LUBIO SOLAR | SOL | 54.5 | Kaufman |
| 22INR0443 | Bowstring BESS | OTH | 155.0 | San Patricio |
| 22INR0466 | Pajarita BESS | OTH | 205.5 | Cameron |
| 22INR0503 | Tidwell Prairie II Batt | OTH | 203.6 | Robertson |
| 22INR0504 | Barton Branch IA | OTH | 203.6 | Robertson |

[8] GIS Report: https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER

| GINR | Unit Name | Fuel Type | Max Capacity (~MW) | County |
|---|---|---|---|---|
| 22INR0605 | Camino Santiago Solar | SOL | 196.3 | Milam |
| 23INR0090 | Iguala Solar | SOL | 250.0 | Victoria |
| 23INR0137 | BRP Diran BESS | OTH | 100.6 | Wharton |
| 23INR0200 | Paradiso BESS | OTH | 100.9 | Atascosa |
| 23INR0261 | Dodd Solar I | SOL | 201.8 | Henderson |
| 23INR0266 | Langer Storage | OTH | 61.5 | Bosque |
| 23INR0342 | Brizo BESS | OTH | 140.8 | Victoria |
| 23INR0467 | Lavender Storage Project | OTH | 231.9 | Bexar |
| 23INR0479 | Taormina Storage | OTH | 231.9 | Bexar |
| 23INR0561 | Cascabel Wind 2 | WIN | 197.8 | Zapata |
| 24INR0065 | Keys Hollow Solar Phase II SLF | SOL | 204.1 | Goliad |
| 24INR0067 | KEYS HOLLOW SOLAR SLF | SOL | 204.1 | Goliad |
| 24INR0108 | Louisa Energy Storage | OTH | 102.8 | Bexar |
| 24INR0150 | Lupinus Solar 1 | SOL | 164.9 | Franklin |
| 24INR0154 | Lupinus Solar 2 | SOL | 244.2 | Franklin |
| 24INR0155 | Lupinus Storage 2 | OTH | 122.9 | Franklin |
| 24INR0156 | Moonstone Solar Project | SOL | 145.8 | Wilson |
| 24INR0160 | Huisache Solar | SOL | 125.6 | Wilson |
| 24INR0178 | Cumulus Grid BESS | OTH | 210.7 | Ellis |
| 24INR0186 | Rowdy Creek Solar | SOL | 351.8 | Lamar |
| 24INR0187 | Rowdy Creek BESS | OTH | 175.9 | Lamar |
| 24INR0188 | Tehuacana Creek Solar | SOL | 505.4 | Navarro |
| 24INR0269 | Bar Candela Solar SLF | SOL | 200.3 | Freestone |
| 24INR0285 | APV Plumwood Storage | OTH | 200.8 | Chambers |
| 24INR0287 | Rockridge Solar Project | SOL | 211.2 | Guadalupe |
| 24INR0330 | TRAVIS KIMBRO BESS | OTH | 36.8 | Travis |
| 24INR0356 | Cibeles Solar | SOL | 251.0 | McLennan |
| 24INR0376 | Huisache BESS | OTH | 100.7 | Wilson |
| 24INR0418 | Middlebrook Solar Limited Liability Company | SOL | 316.2 | Nacogdoches |
| 24INR0422 | Hollow Branch Creek Solar | SOL | 460.0 | Leon |
| 24INR0424 | Cascabel Wind 1 | WIN | 197.8 | Zapata |
| 24INR0471 | McGee Storage | OTH | 151.4 | Henderson |
| 24INR0476 | DOS RIOS ENERGY STORAGE SLF | OTH | 164.5 | Milam |
| 24INR0484 | Lupinus Solar 3 | SOL | 100.8 | Franklin |
| 24INR0490 | Lupinus Storage 3 | OTH | 50.9 | Franklin |
| 24INR0505 | Corralitos Wind 1 | WIN | 196.1 | Zapata |
| 24INR0506 | Corralitos Wind 2 | WIN | 195.4 | Zapata |
| 24INR0528 | Blanquilla BESS | OTH | 200.8 | Nueces |
| 24INR0533 | Padua Grid BESS Unit 2 | OTH | 150.9 | Bexar |
| 24INR0543 | Thomas Cameron BESS | OTH | 201.5 | Lampasas |
| 24INR0584 | Houston IV BESS | OTH | 164.6 | Harris |

| GINR | Unit Name | Fuel Type | Max Capacity (~MW) | County |
|---|---|---|---|---|
| 25INR0101 | Mallard BESS | OTH | 257.3 | Collin |
| 25INR0103 | Elio BESS | OTH | 317.2 | Brazoria |
| 25INR0122 | Vial BESS | OTH | 135.2 | Hill |
| 25INR0164 | Star Dairy Solar | SOL | 125.6 | Lamar |
| 25INR0166 | Padrino Solar | SOL | 201.4 | Hill |
| 25INR0170 | Pinewood Solar | SOL | 150.7 | Brazoria |
| 25INR0204 | Claxton Solar | SOL | 150.6 | Hopkins |
| 25INR0205 | Claxton Storage | OTH | 75.7 | Hopkins |
| 25INR0215 | Middlebrook BESS | OTH | 158.6 | Nacogdoches |
| 25INR0235 | Austin Bayou Storage I | OTH | 150.7 | Brazoria |
| 25INR0236 | Austin Bayou Storage II | OTH | 156.6 | Brazoria |
| 25INR0237 | Austin Bayou Storage III | OTH | 156.6 | Brazoria |
| 25INR0247 | Bluebonnet Prairie Wind | WIN | 173.0 | Navarro |
| 25INR0253 | Whiskey BESS | OTH | 153.7 | Van Zandt |
| 25INR0281 | Cosper Solar | SOL | 148.2 | Bell |
| 25INR0293 | TOCE BESS 1 | OTH | 205.2 | Wharton |
| 25INR0304 | Flying Kite Solar | SOL | 80.4 | Zavala |
| 25INR0319 | Northington Solar | SOL | 129.8 | Wharton |
| 25INR0330 | Clutch City Solar Phase II | SOL | 251.3 | Brazoria |
| 25INR0334 | Star Dairy Storage | OTH | 204.9 | Lamar |
| 25INR0369 | Echols Creek Storage | OTH | 100.6 | Lamar |
| 25INR0370 | Willis Storage | OTH | 176.1 | Rains |
| 25INR0382 | HappyDogSolar | SOL | 85.5 | Milam |
| 25INR0384 | Zorro BESS | OTH | 153.7 | Van Zandt |
| 25INR0391 | Purple Sage BESS 1 | OTH | 156.0 | Collin |
| 25INR0392 | Purple Sage BESS 2 | OTH | 156.0 | Collin |
| 25INR0422 | Waterloo Solar 1 | SOL | 200.6 | Bastrop |
| 25INR0441 | Dios BESS | OTH | 201.1 | Jackson |
| 25INR0442 | Happy Dog Storage | OTH | 104.5 | Milam |
| 25INR0447 | Waterloo BESS 1 | OTH | 105.6 | Bastrop |
| 25INR0480 | Bell Creek BESS | OTH | 200.9 | Brazoria |
| 25INR0494 | Willow Beach Wind | WIN | 202.3 | Brazoria |
| 25INR0554 | Dan Kearney BESS | OTH | 200.8 | Brazoria |
| 25INR0688 | Giga Texas Data Center | OTH | 133.0 | Travis |
| 25INR0706 | Bocanova Power II | OTH | 150.5 | Brazoria |
| 25INR0777 | V4 Palo Alto DGR | OIL | 33.0 | Bexar |
| 26INR0074 | Anila Solar | SOL | 200.8 | Wilson |
| 26INR0077 | Anila BESS | OTH | 209.0 | Wilson |
| 26INR0147 | Seven Springs Solar | SOL | 145.0 | Lampasas |
| 26INR0180 | Cape Rich BESS | OTH | 150.5 | Navarro |
| 26INR0226 | First Capitol BESS | OTH | 257.5 | Brazoria |
| 26INR0241 | Sol Marina Energy Center | SOL | 175.3 | Ellis |

| GINR | Unit Name | Fuel Type | Max Capacity (~MW) | County |
|---|---|---|---|---|
| 26INR0242 | Sol Marina Energy Center BESS | OTH | 57.2 | Ellis |
| 26INR0250 | Duffy BESS | OTH | 235.9 | Matagorda |
| 26INR0314 | Brazos River BESS | OTH | 180.4 | Brazoria |
| 26INR0330 | Alamo City BESS | OTH | 128.3 | Bexar |
| 26INR0333 | VERTUS ENERGY STORAGE | OTH | 207.3 | Galveston |
| 26INR0340 | SOUTHERN SELECT ENERGY STORAGE | OTH | 404.3 | Galveston |
| 26INR0375 | Avalon BESS | OTH | 522.1 | Fort Bend |
| 26INR0380 | Pepper Solar Farm | SOL | 120.7 | McLennan |
| 26INR0405 | Buffalo Creek BESS | OTH | 251.4 | Fort Bend |
| 26INR0407 | Rock Creek BESS | OTH | 251.1 | Kendall |
| 26INR0409 | Lucky 7 Solar | SOL | 100.8 | Hopkins |
| 26INR0417 | GAMAY ENERGY STORAGE | OTH | 418.6 | Brazoria |
| 26INR0431 | Big Rooter West Solar | SOL | 403.4 | Robertson |
| 26INR0474 | Sorghum BESS | OTH | 208.9 | Wharton |
| 26INR0519 | Sky Global West Houston | GAS | 324.6 | Austin |
| 26INR0543 | Three Canes Solar SLF | SOL | 333.0 | Navarro |
| 26INR0551 | Hastings Park BESS | OTH | 256.3 | Brazoria |
| 26INR0675 | A4 Pearsall DGR | OIL | 58.0 | Bexar |
| 26INR0676 | Q1 Valley Road DGR | OIL | 29.0 | Bexar |
| 26INR0681 | K2 Nacogdoches DGR | OIL | 58.0 | Bexar |
| 26INR0683 | Z0 BECK ROAD DGR | OIL | 60.0 | Bexar |
| 26INR0694 | V2 Brooks Field DGR | OIL | 76.5 | Bexar |
| 27INR0118 | Grapefruit Solar | SOL | 291.4 | Hidalgo |
| 27INR0126 | Corvus Solar | SOL | 201.5 | Webb |
| 27INR0173 | Trenno BESS | OTH | 202.6 | Johnson |
| 27INR0224 | Leopard BESS | OTH | 264.2 | Victoria |
| 27INR0243 | Brookview Road BESS | OTH | 203.2 | Harris |
| 27INR0321 | Rock Island Generating (TEF - Due Diligence) | GAS | 121.8 | Colorado |
| 27INR0389 | Sugaree Solar | SOL | 251.4 | Maverick |
| 27INR0399 | Resaca Oasis Storage | OTH | 200.7 | Cameron |
| 27INR0465 | Althea Storage | OTH | 251.3 | Maverick |
| 28INR0024 | Padua Grid BESS Unit 3 | OTH | 201.4 | Bexar |
| 28INR0127 | Half Moon Solar | SOL | 512.5 | Starr |
| 29INR0017 | Big Rooter East Solar | SOL | 554.9 | Robertson |

## 3.2 Load Scaling Sensitivity Analysis

Planning Guide Section 3.1.3(4)(b) requires an evaluation of the potential impact of load scaling on the criteria violations seen in the 2024 RTP study. Before 2024, ERCOT RTP adopted the methodology of developing four sets of summer peak cases with each case representing one study region for each study year. For each summer peak case, the loads outside of the study region may be

scaled down from the respective non-coincident summer peak levels to maintain a certain reserve requirement. This methodology may cause potential impact of load scaling on the criteria violations. Starting 2024, ERCOT RTP adopted a new methodology of having one summer peak case for each study year with non-coincident peaks for each of the Weather Zones, which would eliminate the load scaling impact. As such, load scaling sensitivity analysis is no longer needed.

## 3.3 Sub-synchronous Resonance (SSR) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted an SSR screening for the jointly submitted project and found no adverse SSR impacts to the existing and planned generation resources in the study area.

# 4 Conclusion

ERCOT reviewed the studies in the 2024 RTP 765-kV STEP Core Plan and performed additional assessments. Based on the results of the independent review, ERCOT recommends the AEPTX, CPS, Oncor, CEHE Texas 765-kV-STEP Eastern Backbone Project because it addresses all project needs with no reliability violations and further enhances system reliability.

ERCOT recommended project consists of the following upgrades:

- Construct a new Blu Lacy 765/345-kV Substation and Install;
    - Five (5) 765-kV Circuit Breakers in a ring bus configuration expandable to breaker-and-a-half configuration;
    - Four (4) 765-kV, 300 MVAr Switch Shunt Reactors (100 MVAr/phase);
        - Two (2) Bus Switch Shunts each with a Circuit Breaker; and
        - Two (2) Line Switch Shunts each with a Circuit Breaker.
    - Eleven (11) 345-kV Circuit Breakers in a seven-position (7) breaker-and-a-half configuration; and
    - Three (3) 765/345-kV transformers rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Watermill 765-kV Switchyard and Install;
    - Twelve (12) Circuit Breakers in a double-bus, double-breaker configuration; and
    - Reactive device on 765-kV line[9].
- At Existing Watermill 345-kV Substation;
    - Install six (6) Circuit Breakers in a breaker-and-a-half configuration.
- At Watermill 765/345-kV Substation Install;
    - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Martin Lake 765-kV Switchyard and Install;
    - Eight (8) Circuit Breakers in a double-bus, double-breaker configuration; and

[9] Potential additional reactive support for operational support and flexibility

  - Reactive device on 765-kV line[10].
- At Existing Martin Lake 345-kV Substation;
  - Install four (4) Circuit Breakers in a double-bus, double-breaker configuration.
- At Martin Lake 765/345-kV Substation Install;
  - Two (2) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency.
- Construct a new Hillje 765-kV Substation and Install;
  - Install eight (8) Circuit Breakers in a breaker-and-a-half configuration.
- At Existing Hillje 345-kV Substation;
  - Expand breaker-and-a-half configuration by adding two (2) new bays; and
  - Install five (5) Circuit Breakers in expanded breaker-and-a-half configuration.
- At Hillje 765/345-kV Substation Install;
  - Three (3) 765/345-kV transformers, rated to at least 2,403 MVA Normal and 2,772 MVA Emergency;
  - Two (2) 300 MVAr Line Shunt Reactors; and
  - Two (2) 300 MVAr Bus Shunt Reactors.
- Install two (2) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at New Substation 2 [Dinosaur];
- Install reactive device on 765-kV line at New Substation 2 [Dinosaur][10];
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at East Bell Substation;
- Install reactive device on 765-kV line at East Bell Substation[10];
- Install four (4) 765-kV Circuit Breakers in a double-bus, double-breaker configuration at Howard 765-kV Substation;
  - Install two (2) 300 MVAr 765-kV Line Shunt Reactors at Howard Substation; and
  - Install one (1) 300 MVAr 765-kV Bus Shunt Reactor at Howard Substation.
- Construct a new Dinosaur to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 78.0-mile;
- Construct a new Watermill to Martin Lake 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 152.4-mile;
- Construct a new Martin Lake to Hillje 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 292.8-mile;
- Construct a new Hillje to Blu Lacy 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 142.8-mile;

[10] Potential additional reactive support for operational support and flexibility

- Construct a new Blu Lacy to Howard 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 139.2-mile;
- Construct a new Howard to Bell East 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 170.4-mile; and
- Construct a new Bell East to Watermill 765-kV single-circuit transmission line, with normal and emergency ratings of at least 7,603 MVA, which will require a new ROW, approximately 133.2-mile.

The cost estimate for this project is approximately $9.384 billion and is classified as Tier 1 project per ERCOT Protocol Section 3.11.4.3(1)(a). The expected ISD of this project is between 2030 and 2032. However, AEPTX, CPS, Oncor and CEHE have advised that the projected ISD may change based on several factors, including environmental assessments, licensing requests, regulatory approvals, ROW acquisitions, and/or construction processes. The specifications may be modified following additional study or during detailed design. TSP(s) shall notify ERCOT of the details of any modifications to the endorsed project.

CCN applications will be required for the new 765-kV transmission lines from Dinosaur to Watermill to Martin Lake to Hillje to Blu Lacy to Howard to Bell East to Watermill.

# Appendix A

**Table A.1: Project Related Document**

| No | Document Name | Attachment |
|---|---|---|
| 1 | Joint TSP - Texas 765-kV STEP: Eastern Backbone Project | PDF Joint TSP - TX 765kV STEP Eastern Backbor |