



## **2023 RTP Economic Analysis Study Report**

## Table of Contents

1. 2023 RTP Economic Project Evaluation Results .....	1
1.1. West Texas Export Interface and Panhandle Interface (Projects 1-8) .....	1
1.2. South Weather Zone Congestions .....	3
a. Loyola to Driscoll 69-kV Area Upgrades (Project 9) .....	3
b. Lon Hill to Angstrom 345-kV Line Upgrade (Project 10) .....	3
1.3. North and Far West Weather Zone Congestions .....	4
a. Farmland to Wett Long Draw 345-kV Line Upgrade (Project 11) .....	4
b. Lubbock Area 115-kV Line Upgrades (Project 12) .....	5
1.4. Coast Area Congestions .....	6
a. WA Parish to Obrien 345-kV Line Upgrade (Project 13) .....	7
b. New South Texas Project to Bailey to Ph Robinson 345-kV Lines (Project 14) .....	7
c. South Texas Project to Hillje 345-kV Double-Circuit Line Upgrade (Project 16) .....	8
d. Coast Area 345-kV Line Upgrades and Additions (Project 20) .....	9
1.5. North Central Weather Zone Congestions .....	10
a. Killeen Area 138-kV Line Upgrades (Project 15) .....	10
b. Lewisville- Dunham 345-kV Line Upgrade (Project 17) .....	11
1.6. South Central Weather Zone Congestion .....	11
a. San Miguel to Marion 345-kV Double-Circuit Line Upgrade (Project 18) .....	12
b. South to Central Texas Reliability Project (Project 19) .....	12

## 1. 2023 RTP Economic Project Evaluation Results

This section describes the detailed results of the evaluation of the 20 economic transmission project improvements studied for the 2023 RTP.

### 1.1. West Texas Export Interface and Panhandle Interface (Projects 1-8)

The West Texas (WTX) Export interface was one of the top congested elements observed for both the 2025 and 2028 study years. The WTX interface transfer limit used in the 2023 RTP economic study base cases was set at 11,016 MW based on the results from ERCOT's Long-Term West Texas Export Special Study<sup>1</sup>. In the base cases, this interface was congested for approximately 9.75% and 5.94% of hours in the 2025 and 2028 study years, respectively. Table 1 includes details of the congestion on the WTX Export interface.

Table 1: WTX Export Interface Congestion Details

Congested Element	WTX Export Interface			
	Capacity (MVA)	Study Year	% of Time Congested	Congestion Rent (\$M)
	11,016	2025	9.75	149
		2028	5.94	66

The Panhandle stability limit was reintroduced based on the 2023 Q3 Quarterly Stability Assessment (QSA) findings. It was one of the top congested elements for both 2025 and 2028 study years. The interface limit used in the 2023 RTP economic study was set at 3,487.5 MW based on the 2023 Q3 QSA results. In the base cases, this interface was congested for 14.37% and 13.47% of hours in the 2025 and 2028 study years, respectively. Table 2 includes details of the congestion on the Panhandle interface.

Table 2: Panhandle Interface Congestion Details

Congested Element	Panhandle Interface			
	Capacity (MVA)	Study Year	% of Time Congested	Congestion Rent (\$M)
	3487.5	2025	14.37	56
		2028	13.47	56

Table 3 lists the economic projects tested to improve one or both constraints. Among them, projects 1 and 2 are the same projects studied as a part of ERCOT Long-Term West Texas Export Special Study with some modifications.

Table 4 summarizes the economic study results of the interface-related projects. All projects showed significant production cost savings (PCS). However, due to the large capital cost of these projects,

<sup>1</sup> <https://www.ercot.com/files/docs/2022/01/14/Long-Term-West-Texas-Export-Study-Report.pdf>

they failed to pass the PCS test. All the proposed projects increased the generation revenue and therefore they failed in the generator revenue reduction (GRR) test.

Table 3: Summary of WTX and Panhandle Interface Limits<sup>2</sup> of Studied Projects

Index	Project Description	WTX Limit (MW)	Panhandle Limit (MW)
	Base Case	11,016	3,487.5
Project 1	4 AC lines proposed by Long -Term West Texas Export Study Report (LTWTX) plus the upgrade of the Nevill Road Switch to North McCamey and Bakersfield 345-kV line	14,940	3,877
Project 2	3 AC lines plus Tesla to King 1500 MW HVDC proposed by LTWTX plus the upgrade of the Nevill Road Switch to North McCamey and Bakersfield 345-kV line	15,354	N/A <sup>3</sup>
Project 3	New White River to Long Draw and Black Water to Dermott double-circuit 345-kV lines	11,016	N/A <sup>2</sup>
Project 4	New Tesla to Graham to Royse double-circuit 345-kV line	11,799	4,050
Project 5	New Tesla to King 1500 MW HVDC	12,411	N/A <sup>2</sup>
Project 6	New Brown to Bell County East Switch double-circuit 345-kV	11,970	3,487.5
Project 7	New Tesla to Marion 1500 MW HVDC	12,411	N/A <sup>2</sup>
Project 8	New Tesla to WA Parish 1500 MW HVDC	12,411	N/A <sup>2</sup>

Table 4: Economic Analysis Results Summary for Interface Projects

Index	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
Project 1	39.7	37.4	283.3	-171.3	-161.4	N/A <sup>4</sup>
Project 2	45.7	43.1	326.3	-327.3	-308.4	N/A <sup>3</sup>
Project 3	13.0	12.3	93.1	-77.4	-72.9	N/A <sup>3</sup>
Project 4	16.7	15.8	119.5	-93.3	-88.0	N/A <sup>3</sup>
Project 5	40.6	38.2	289.6	-255.2	-240.5	N/A <sup>3</sup>
Project 6	8.9	8.4	63.5	-62.7	-59.1	N/A <sup>3</sup>
Project 7	21.5	20.3	153.7	-136.3	-128.5	N/A <sup>3</sup>
Project 8	37.2	35.0	265.5	-186.5	-175.7	N/A <sup>3</sup>

<sup>2</sup> These limits are 90% of stability limits. Consistent with the ERCOT Transmission and Security Operating Procedure found at <http://www.ercot.com/mktrules/guides/procedures>.

<sup>3</sup> Based on generation included in the 2023 economic cases.

<sup>4</sup> Break-even capital cost was not provided as the project did not result in any generator revenue reduction.

## 1.2. South Weather Zone Congestions

Heavy congestions were observed on the Loyola Sub to Riviera Sub 69-kV line and the Lon Hill to Whitepoint 345-kV line for both 2025 and 2028 due to the increased interconnection of renewable resources in the South Weather Zone. Projects 9 and 10 were evaluated to relieve these congestions.

### a. Loyola to Driscoll 69-kV Area Upgrades (Project 9)

Congestion was observed on the Loyola Sub to Riviera Sub 69-kV line. The line was congested under the contingency loss of the 138-kV line from Loyola Sub to Kleberg AEP. Table 5 includes details of the congestion on this line.

Table 5: Loyola Sub to Riviera Sub 69-kV Line Congestion Details

<b>Congested Element</b>	Loyola Sub to Riviera Sub 69-kV line			
<b>Most Severe Contingency</b>	Loss of Loyola Sub to Kleberg AEP 138-kV line			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	40	2025	25.4	7.3
		2028	34.2	16.0

Upgrading the Loyola Sub to Riviera Sub line resulted in more power flowing down the 69-kV path and caused congestion on the downstream 69-kV path. Upgrading approximately 24 miles of 69-kV lines from Loyola Sub through Riviera Sub to Ricardo Sub and from Ricardo Sub to Driscoll Sub alleviated the congestion in the area.

The project was evaluated in both the 2025 and 2028 economic cases, and the economic analysis results are included in Table 6. The project demonstrated an annual decrease of \$3.53 million in production cost and the break-even capital cost is \$26.76 million. The project caused an increase of \$7.81 million in the generator annual revenue.

Table 6: Economic Analysis Results for Loyola to Driscoll 69-kV Area Upgrades

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
0.61	7.01	3.53	26.76	0.44	-17.43	-7.81	N/A <sup>3</sup>

### b. Lon Hill to Angstrom 345-kV Line Upgrade (Project 10)

Congestion was observed on the Lon Hill to Whitepoint 345-kV line. The line was congested under the contingency loss of the 345-kV line from Angstrom to Grissom. Table 7 provides details of the congestion of this line.

Table 7: Lon Hill to Whitepoint 345-kV Line Congestion Details

<b>Congested Element</b>	Lon Hill to Whitepoint 345-kV line			
<b>Most Severe Contingency</b>	Loss of Angstrom to Grissom 345-kV line			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,057	2025	11.2	27.3
		2028	9.9	16.9

The upgrade of the Lon Hill to Whitepoint 345-kV line resulted in more power flowing towards Whitepoint which caused congestion on the 345-kV line from Whitepoint to Angstrom. Thus, the upgrades of the Lon Hill to Whitepoint and Whitepoint to Angstrom 345-kV lines were tested, to alleviate the congestion in the area.

The project was evaluated in both the 2025 and 2028 economic cases, and the economic analysis results are included in Table 8. This project increased the production cost by \$0.1 million annually while resulting in a generator revenue decrease of \$3.64 million.

Table 8: Economic Analysis Results for Lon Hill to Angstrom 345-kV Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – GRR
-0.97	0.82	-0.10	N/A <sup>5</sup>	7.04	0.43	3.64	28.22

### 1.3. North and Far West Weather Zone Congestions

Within North and Far West Weather Zones, heavy congestion was observed on the 345-kV line from Farmland to Wett Long Draw and the 115-kV lines from Dunbar Substation to Holly Substation and from Mackenzie Substation to Northeast Substation. Projects 11 and 12 were evaluated to resolve these observed congestions.

#### a. Farmland to Wett Long Draw 345-kV Line Upgrade (Project 11)

The 345-kV line from Farmland to Wett Long Draw was congested under the contingency loss of the 345-kV double-circuit line from White River to Cottonwood. Table 9 shows the details of the congestion of this line.

<sup>5</sup> Break-even capital cost was not provided as the project did not result in any production cost saving.

Table 9: Farmland to Wett Long Draw 345-kV Line Congestion Details

<b>Congested Element</b>	Farmland to Wett Long Draw 345-kV line			
<b>Most Severe Contingency</b>	Loss of White River to Cottonwood 345-kV double-circuit line			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,072	2025	5.9	13.8
		2028	9.0	28.6

The upgrade of the line was evaluated in the 2028 economic case, and the economic analysis results are included in Table 10. The project resulted in a \$0.21 million reduction of the production cost and an \$8.92 million increase of the generator revenue.

Table 10: Economic Analysis Results for Farmland to Wett Long Draw 345-kV Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – GRR
-	0.22	0.21	1.59	-	-9.47	-8.92	N/A <sup>3</sup>

## b. Lubbock Area 115-kV Line Upgrades (Project 12)

The Dunbar Substation to Holly Substation 115-kV line was congested under the contingency loss of Double Mountain Switch to Fiddlewood Switch 345-kV line. Table 11 includes details of the congestion.

Table 11: Dunbar Substation to Holly Substation 115-kV Line Congestion Details

<b>Congested Element</b>	Dunbar Substation to Holly Substation 115-kV line			
<b>Most Severe Contingency</b>	Loss of Double Mountain Switch to Fiddlewood Switch 345-kV line			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	198	2025	0.1	0.6
		2028	2.7	18.5

The Mackenzie Substation to Northeast Substation 115-kV line was congested under the contingency loss of Blackwater Draw Switch to Double Mountain Switch 345-kV line. Table 12 includes details on this congestion.



Table 12: Mackenzie Substation to Northeast Substation 115-kV Line Congestion Details

<b>Congested Element</b>	Mackenzie Substation to Northeast Substation 115-kV line			
<b>Most Severe Contingency</b>	Loss of Blackwater Draw Switch to Double Mountain Switch 345-kV line			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	198	2025	0.8	4.0
		2028	3.3	21.5

The upgrade of the two congested lines caused further congestion on the Northeast Substation to Dunbar Substation 115-kV line. Upgrading the 115-kV lines from Mackenzie Substation to Northeast Substation, Northeast Substation to Dunbar Substation, and Dunbar Substation to Holly Substation, was evaluated in both the 2025 and 2028 economic cases to alleviate the congestions observed in the Lubbock area. Economic analysis results are included in Table 13. The project reduced the production cost by \$2.2 million but increased the generator revenue by \$5.17 million.

Table 13: Economic Analysis Results for Lubbock Area 115-kV Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) – GRR
-4.31	9.40	2.22	16.85	-3.84	-7.15	-5.17	N/A <sup>3</sup>

#### 1.4. Coast Area Congestions

Significant congestions were observed in the Coast Weather Zone with three of the top ten congestions located there: South Texas Project to WA Parish 345-kV line, South Texas Project to Jones Creek 345-kV line, and Grant to Plaza 138-kV line. The Centerpoint Energy Tier 4 project (MOD project number 70660) that increases the thermal limit of the Grant to Plaza 138-kV line is expected to resolve the observed congestion on this line. The expected in-service date of this project is May 2024.

The South to Houston import transmission pathway was also heavily congested. This is attributed to a combination of the additions of solar generation south of Houston, the increased new renewable generation in the South Weather Zone, and the load growth in Houston area.

Additionally, the 2023 RTP reliability analysis showed multiple X-1+N-1 and G-1+N-1 criteria violations. The reliability analysis indicated the need to upgrade the South Texas Project to WA Parish 345-kV line as a placeholder project to address the reliability criteria violations.

ERCOT is working on developing projects that address both the reliability and economic needs in the area, and analysis will continue beyond the 2023 RTP. The sections below provide more details on the analysis performed in the 2023 RTP economic study.

### a. WA Parish to Obrien 345-kV Line Upgrade (Project 13)

Congestion was observed on the South Texas Project to WA Parish 345-kV line in both 2025 and 2028 study years. The line was congested under the contingency loss of the 345-kV double-circuit line from WA Parish to Wolf and from Whaley to Cedar Creek. Table 14 shows the details of the observed congestion.

Table 14: South Texas Project to WA Parish 345-kV Line Congestion Details

<b>Congested Element</b>	South Texas Project to WA Parish 345-kV line			
<b>Most Severe Contingency</b>	Loss of the 345-kV double-circuit line from WA Parish to Wolf and from Whaley to Cedar Creek			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,116	2025	11.9	53.2
		2028	14.4	85.0

The upgrade of the South Texas Project to WA Parish 345-kV line (placeholder reliability project) and the WA Parish to Obrien 345-kV line (economic addition) was tested in the 2028 economic case.

The economic addition showed no production cost savings. The economic analysis results of the economic addition are included in Table 15.

Table 15: Economic Analysis Results for WA Parish to Obrien 345-kV Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	-0.12	-0.11	N/A <sup>4</sup>	-	-6.45	-6.08	N/A <sup>3</sup>

### b. New South Texas Project to Bailey to Ph Robinson 345-kV Lines (Project 14)

This project is aimed at addressing the congestions on two 345-kV lines in the Coast Weather Zone, i.e., South Texas Project to Hillje and South Texas Project to Jones Creek. Details of these congestions can be found in Table 16.

To relieve these two congestions, new 345-kV line additions from South Texas Project to Bailey to Ph Robinson, totaling 109 miles, were evaluated in the study year of 2028. The economic analysis results are included in Table 17. The project reduced the production cost by \$19.43 million while increasing the generator revenue by \$184.75 million in 2028.

Table 16: 345-kV Lines Congestions near South Texas Project

<b>Congested Element</b>	South Texas Project to Jones Creek 345-kV line			
<b>Most Severe Contingency</b>	Loss of the 345-kV double-circuit line from WA Parish to Wolf and from Whaley to Cedar Creek			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1450	2025	7.7	13.1
		2028	6.2	16.9
<b>Congested Element</b>	South Texas Project to Hillje 345-kV line			
<b>Most Severe Contingency</b>	Loss of the 345-kV double-circuit line from Jones Creek to South Texas Project and Refuge			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1080	2025	2.2	4.2
		2028	7.7	21.2

Table 17: Economic Analysis Results for New South Texas Project to Bailey to Ph Robinson 345-kV Lines

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	20.62	19.43	147.22	-	-196.06	-184.75	N/A <sup>3</sup>

### c. South Texas Project to Hillje 345-kV Double-Circuit Line Upgrade (Project 16)

One 345-kV circuit from South Texas Project to Hillje was congested under the contingency loss of the 345-kV double-circuit line from Jones Creek to South Texas Project and Refuge. Table 18 shows the details of the observed congestion.

Table 18: South Texas Project to Hillje 345-kV (circuit 1) Line Congestion Detail

<b>Congested Element</b>	South Texas Project to Hillje 345-kV (circuit 1) line			
<b>Most Severe Contingency</b>	Loss of the 345-kV double-circuit line from Jones Creek to South Texas Project and Refuge			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,080	2025	2.2	4.2
		2028	7.7	21.2

To relieve the congestion, the upgrade of the 345-kV double-circuit line from South Texas Project to Hillje was evaluated in the 2028 economic case, and the economic analysis results are included in

Table 19. The project reduced the production cost by \$4.24 million while increasing the generator revenue by \$16.23 million in 2028.

Table 19: Economic Analysis Results for South Texas Project to Hillje 345-kV Double-circuit Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	4.50	4.24	32.13	-	-17.23	-16.23	N/A <sup>3</sup>

#### d. Coast Area 345-kV Line Upgrades and Additions (Project 20)

This proposed project combined project 13, 14 and 16 to improve the congestions on three 345-kV lines in the Coast Weather Zone, i.e., South Texas Project to Hillje, South Texas Project to Jones Creek and South Texas Project to WA Parish. Details of these congestions can be found in the subsections 1.4.a, 1.4.b and 1.4.c. This project consists of two parts, the reliability placeholder project and the economic addition.

The placeholder reliability project includes:

- Upgrade of the 345-kV line from South Texas Project to WA Parish

The economic addition to the project includes:

- Upgrade of the 345-kV double-circuit line from WA Parish to Obrien (Project 13)
- New South Texas Project to Bailey 345-kV line (Project 14)
- New Bailey to Ph Robinson 345-kV line (Project 14)
- Upgrade of the 345-kV double-circuit line from South Texas Project to Hillje (Project 16)

Table 20 shows the economic analysis results for the economic addition of the project. The study results for this project showed a decrease in the production cost by \$14.33 million and an increase in the generator revenue by \$131.52 million in the study year of 2028.

Table 20: Economic Analysis Results for Economic Addition Part of Coast Area 345-kV Line Upgrades and Additions

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	15.21	14.33	108.55	-	-139.57	-131.52	N/A <sup>3</sup>

## 1.5. North Central Weather Zone Congestions

Heavy congestions were observed on the Killeen Switch to Stagecoach 138-kV line, and the Lewisville Switch to Dunham 345-kV line. Projects 15 and 17 were evaluated to relieve the observed congestions.

### a. Killeen Area 138-kV Line Upgrades (Project 15)

The 138-kV line from Killeen Switch to Stagecoach was congested under the contingency loss of the 345-kV double-circuit line from Killeen Switch to Salado Switch. Table 21 shows the details of the observed congestion.

Table 21: Killeen Switch to Stagecoach 138-kV Line Congestion Detail

<b>Congested Element</b>	Killeen Switch to Stagecoach 138-kV line			
<b>Most Severe Contingency</b>	Loss of 345-kV double-circuit line from Killeen Switch to Salado Switch			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	326	2025	10.0	22.4
		2028	6.7	12.2

The project includes the following transmission improvements:

- Upgrade of the 138-kV line from Killeen Switch to Stagecoach
- Upgrade of the 138-kV line from Stagecoach to Killeen Elm
- Upgrade of the 138-kV line from Killeen Elm to Killeen Taft Street
- Upgrade of the 138-kV line from Killeen Taft Street to Harker Height
- Upgrade of the 138-kV line from Harker Height to Nolanville
- Upgrade of the 138-kV line from Nolanville to Belton

The proposed project was then evaluated in both the 2025 and 2028 economic cases, and the economic analysis results are included in Table 22. The project demonstrated an annual decrease of \$2.93 million in production cost and the break-even capital cost is \$22.18 million. The project caused an increase of \$2.62 million in the generator annual revenue.

Table 22: Economic Analysis Results for Killeen Area 138-kV Line Upgrades

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
3.06	3.10	2.93	22.18	0.52	-6.24	-2.62	N/A <sup>3</sup>

## b. Lewisville- Dunham 345-kV Line Upgrade (Project 17)

Congestion was observed on one circuit of the Lewisville Switch to Dunham 345-kV double-circuit line. The most severe contingency causing this congestion is the loss of one of the Lewisville Switch to Dunham 345-kV double-circuit lines. Table 23 shows the details on the investigated congestion.

Table 23: Lewisville Switch to Dunham 345-kV Line Congestion Detail

<b>Congested Element</b>	Lewisville Switch to Dunham 345-kV line			
<b>Most Severe Contingency</b>	Loss of the second circuit in parallel			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,568	2025	2.9	5.1
		2028	1.6	3.3

The upgrade of the line was evaluated in both the 2025 and 2028 study years, and the economic analysis results are included in Table 24. The Lewisville to Dunham 345-kV line upgrade project lowered the production cost annually by \$0.52 million but caused an increase of \$3.37 million in the generator revenue.

Table 24: Economic Analysis Results for Lewisville Switch to Dunham 345-kV Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
0.21	0.90	0.52	3.94	-7.74	0.90	-3.37	N/A <sup>3</sup>

## 1.6. South Central Weather Zone Congestion

Heavy congestions were observed in the South Central Weather Zone, especially along the Calaveras to Pawnee Switching Station 345-kV line, in the study years of 2025 and 2028. In 2025, the line was congested under the contingency loss of the 345-kV double-circuit line from San Miguel Gen to Elmcreek, while in 2028 the line was congested under the contingency loss of the 345-kV double-circuit line from San Miguel Gen to Howard Road. Table 25 includes details of the congestion on this line.

The ERCOT Board of Directors recently endorsed the San Antonio South Reliability Project (RPG Project ID 22RPG048). This is a Tier 1 project with an expected in-service date of June 2027. This project helped to reduce the congestion cost on the Calaveras to Pawnee 345-kV line in the 2028 study year. Project 18 and project 19 were evaluated to further relieve this congestion. Project 18, “Brazos San Miguel to Marion 345-KV Project”, is a Tier 1 project currently under ERCOT’s independent review. Project 19 is a placeholder reliability project identified in the 2023 RTP reliability study for the study year 2029.

Table 25: Calaveras to Pawnee Switching Station 345-kV Line Congestion Detail

<b>Congested Element</b>	Calaveras to Pawnee Switching Station 345-kV line			
<b>Most Severe Contingency</b>	Loss of 345-kV double-circuit line from San Miguel Gen to Elmcreek (2025) or loss of 345-kV double-circuit line from San Miguel Gen to Howard (2028)			
	<b>Capacity (MVA)</b>	<b>Study Year</b>	<b>% of Time Congested</b>	<b>Congestion Rent (\$M)</b>
	1,058	2025	18.4	45.2
		2028	8.8	26.2

#### a. San Miguel to Marion 345-kV Double-Circuit Line Upgrade (Project 18)

The “Brazos San Miguel to Marion 345-KV Project” RPG project with the expected in-service date of 2027 was evaluated in the 2028 economic case. This RPG project includes the following transmission improvements:

- Upgrade the 345-kV double-circuit line from San Miguel to Elmcreek
- Upgrade the 345-kV double-circuit line from Elmcreek to Marion

Table 26 shows the economic analysis results for this project for the study year of 2028. The simulation results for the project showed a production cost saving of \$1.06 million.

Table 26: Economic Analysis Results for San Miguel to Marion 345-kV Double-circuit Line Upgrade

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	1.12	1.06	8.01	-	-2.05	-1.93	N/A <sup>3</sup>

#### b. South to Central Texas Reliability Project (Project 19)

This project was proposed as a placeholder reliability project in the 2023 RTP reliability study for the study year of 2029 to address the South to Central Texas import issues. Accelerating this project to year 2028 was tested to help relieve the congestion on the Calaveras to Pawnee 345-kV line in 2028. The project details can be found in Appendix F.

Table 27 shows the economic analysis results for this project evaluated in the study year of 2028. The project resulted in a production cost saving of \$14.36 million and a generator revenue increase of \$56.16 million.

Table 27: Economic Analysis Results for South to Central Texas Reliability Project

Adj. PCS in 2025 (\$M)	Adj. PCS in 2028 (\$M)	Levelized PCS in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - PCS	Adj. GRR in 2025 (M\$)	Adj. GRR in 2028 (M\$)	Levelized GRR in 2025 Dollars (\$M)	Break-even Capital Cost in 2025 Dollars (\$M) - GRR
-	15.24	14.36	108.76	-	-59.59	-56.16	N/A <sup>3</sup>