



**AEPSC - Corpus Christi North Shore  
Project – ERCOT Independent Review  
Status Update**

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**Regional Planning Group**  
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# Introduction

American Electric Power Service Corporation (AEPSC) submitted the Corpus Christi North Shore Transmission Improvement Project for Regional Planning Group review in September 2019. This is a Tier 1 project that is estimated at \$259.57 Million.

AEPSC is requesting ERCOT designate these upgrades “critical” to the reliability of the system.

- Provide sufficient transmission capacity and address the reliability needs by
  - Adding 345 kV bus work and two 345/138 kV transformers to Resnick substation
  - Adding approximately 44 miles of double-circuit 345 kV transmission lines
  - Reconductoring approximately 1.5 miles of 138 kV transmission lines

# Recap

Scope for ERCOT independent review November 2019 RPG:

<http://www.ercot.com/calendar/2019/11/12/165310-RPG>

December Status Update:

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/165315/AEPSC\\_Corpus\\_North\\_Shore\\_Study\\_StatusUpdate\\_12\\_17\\_2019.pdf](http://www.ercot.com/content/wcm/key_documents_lists/165315/AEPSC_Corpus_North_Shore_Study_StatusUpdate_12_17_2019.pdf)

January Status Update:

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/189694/EIR\\_AEP\\_SC\\_Corpus\\_Christi\\_North\\_Shore\\_Study\\_StatusUpdate\\_01\\_21\\_2020.pdf](http://www.ercot.com/content/wcm/key_documents_lists/189694/EIR_AEP_SC_Corpus_Christi_North_Shore_Study_StatusUpdate_01_21_2020.pdf)

February Status Update:

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/189700/EIR\\_AEP\\_SC\\_Corpus\\_Christi\\_North\\_Shore\\_Study\\_StatusUpdate\\_02\\_18\\_2020.pdf](http://www.ercot.com/content/wcm/key_documents_lists/189700/EIR_AEP_SC_Corpus_Christi_North_Shore_Study_StatusUpdate_02_18_2020.pdf)

March Status Update:

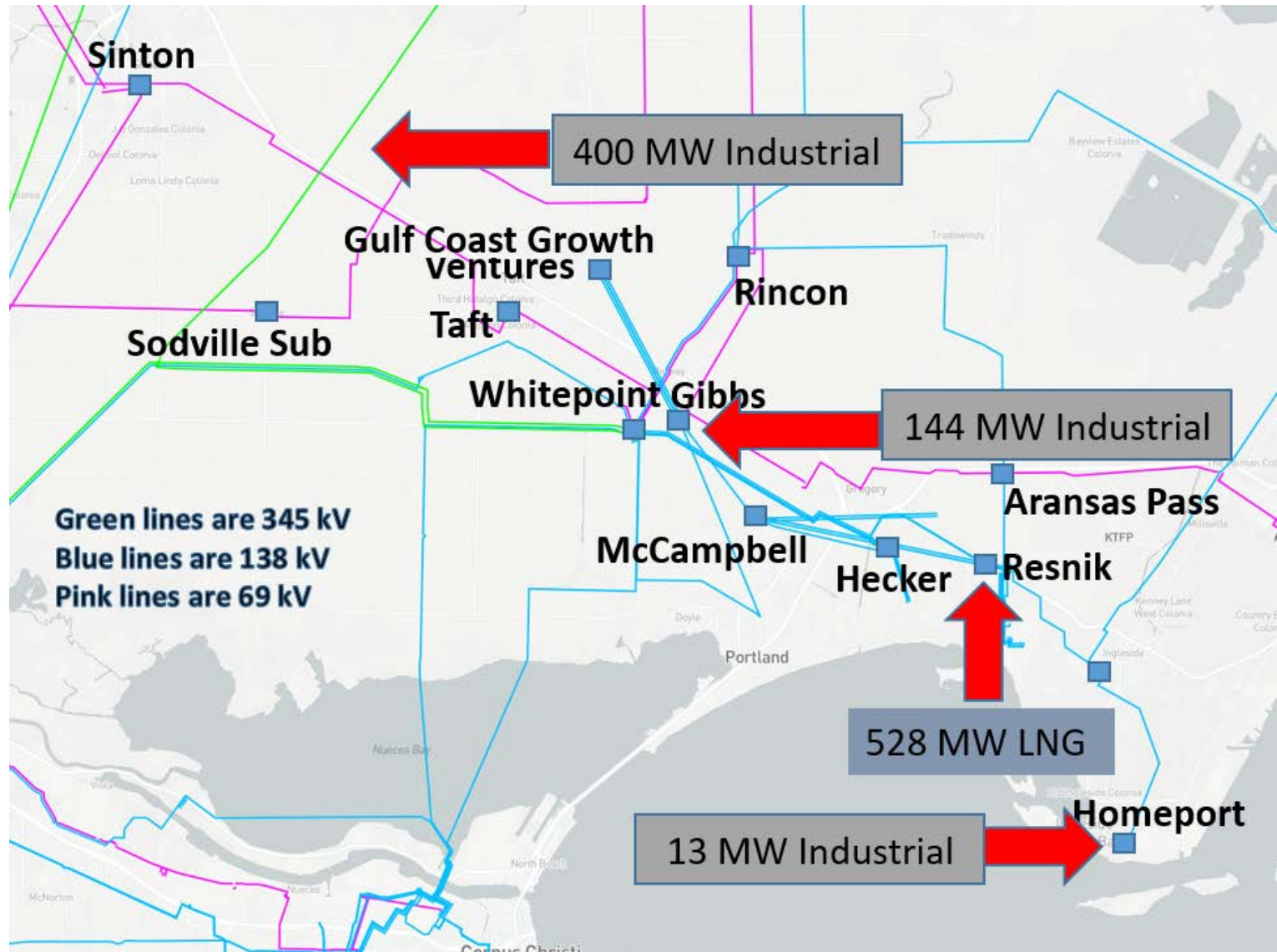
[http://www.ercot.com/content/wcm/key\\_documents\\_lists/189706/EIR\\_AEP\\_SC\\_Corpus\\_Christi\\_North\\_Shore\\_Study\\_StatusUpdate\\_03\\_10\\_2020.pdf](http://www.ercot.com/content/wcm/key_documents_lists/189706/EIR_AEP_SC_Corpus_Christi_North_Shore_Study_StatusUpdate_03_10_2020.pdf)

# Recent Updates by AEP

AEP provided updates in February and March for the study area to revise the proposed project. The changes included:

- Total new confirmed load is increased to 1,085 MW and
- The Angstrom 345-kV station has limitations and cannot accommodate reactive compensation
- New location (Naismith Substation) for 345-kV bus work formerly proposed at Resnick
- A new double-circuit 138-kV line from Naismith to Resnick
- 13 MW of additional confirmed load at Homeport
- Detailed characteristics of new added load is still pending

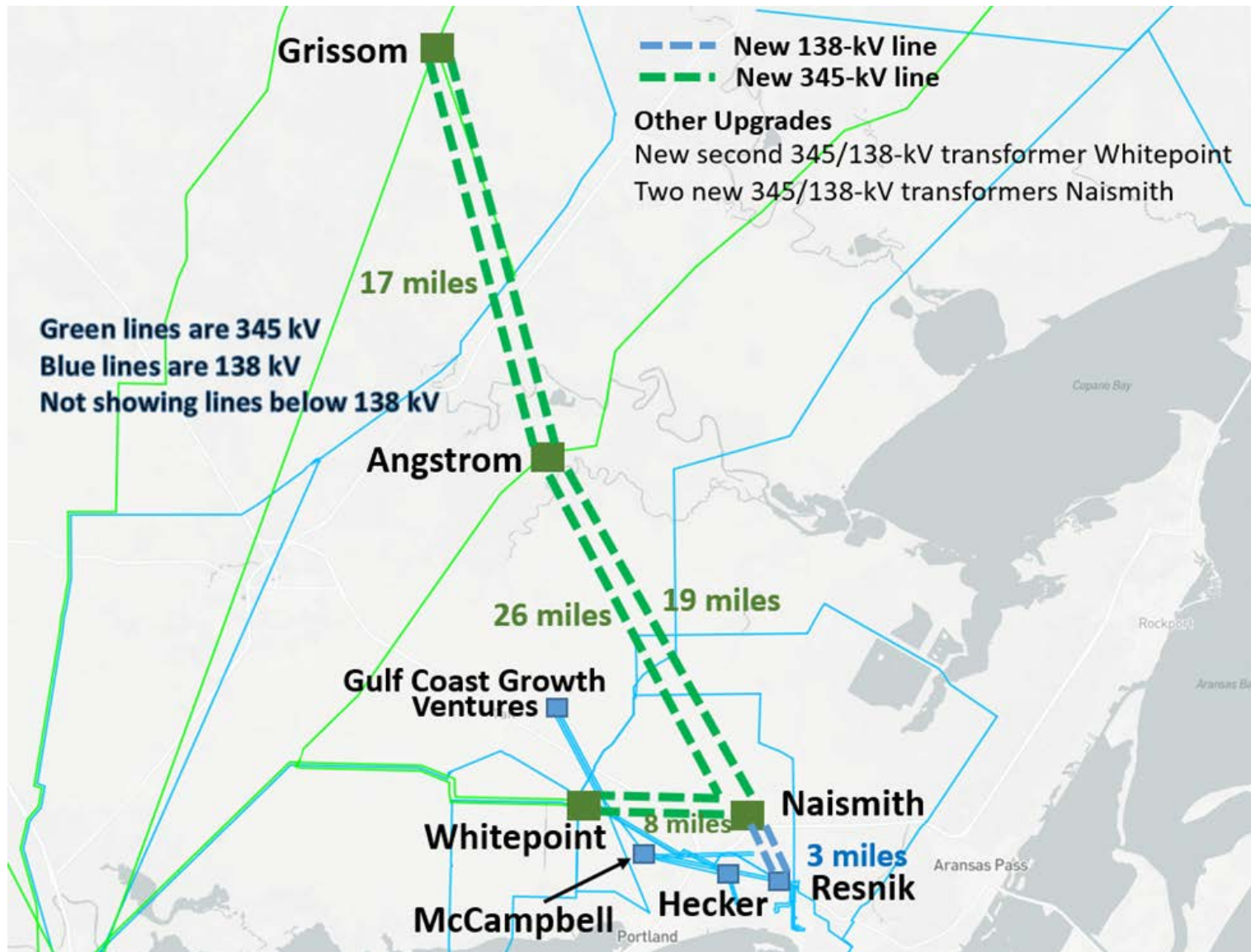
# Study Area and New Confirmed Load Addition



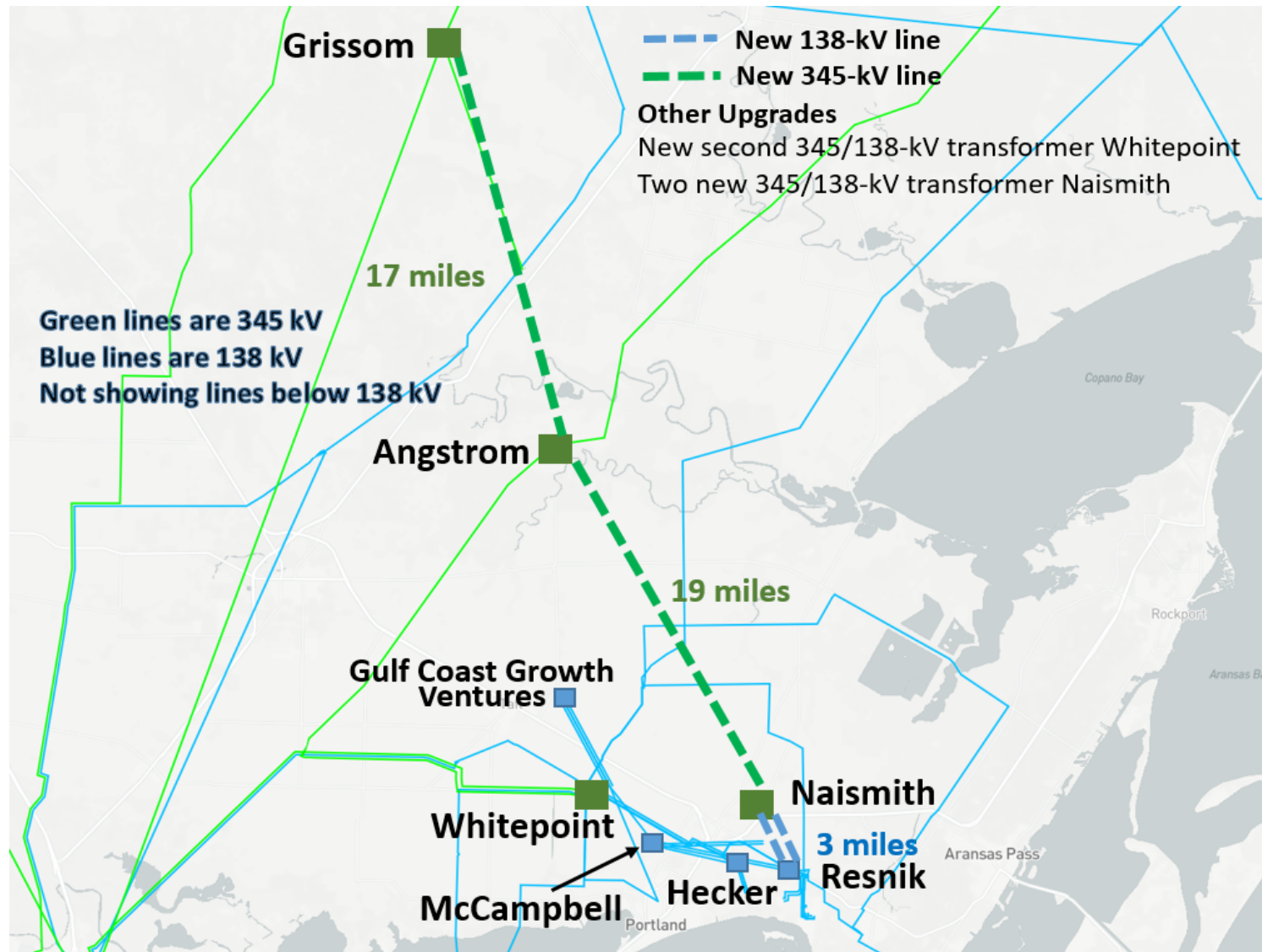
# Assumed Reactive Power Compensation

- Specific power factors were assumed for confirmed load based on input from AEP
- Following reactive compensation devices were assumed as placeholders for all options until more detailed load characteristics can be obtained:
  - 173 Mvar Switched Shunt at Resnik
  - 115 Mvar Switched Shunt at McCampbell
  - 115 Mvar Switched Shunt at Hecker
- Reactive compensation upgrades are anticipated to address local reactive support and are expected to require shorter lead times
- AEP and ERCOT have agreed to re-visit reactive compensation as a separate RPG project
- Focus of this independent review is to identify long lead time system improvements which are not expected to be affected by anticipated reactive compensation upgrades

# Option 3



# Option 4





# Reliability Assessment for short-listed Options

	N-1		X-1 N-1		G-1 N-1	
	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations
Option 3	No	No	No	No	No	No
Option 4	No	No	No	No	No	No

	Unsolved Power Flow	Planned Maintenance Outages Study	
		Thermal Violations	Voltage Violations
Option 3	0	No	No
Option 4	0	No	No

	Incremental Import Limits (MW)	
	Thermal	Voltage Stability
Option 3	72	1,216
Option 4	426	1,035

# Preferred Option

	Option 3	Option 4
Meet ERCOT and NERC Reliability Criteria	Yes	<b>Yes</b>
Improve Operational Flexibility (Planned maintenance outages)	Yes	<b>Yes</b>
Load Serving Capability (Thermal limited)	--	<b>Better</b>
Capital Cost Estimates*	\$291 M	<b>\$215 M</b>

\* Cost estimates were provided by TSP

# SSR Assessment

## Sub-Synchronous Resonance (SSR) Assessment

- Pursuant to Nodal Protocol Section 3.22.1.3(2), ERCOT conducted a SSR assessment for the preferred option (Option 4) and found no adverse SSR impacts to the existing and planned generation resources in the study area

# Sensitivity Analyses

## Generation Addition Sensitivity Analysis

- Per Planning Guide Section 3.1.3(4)(a), ERCOT performed a generation addition sensitivity and determined relevant generators not able to resolve reliability criteria violations

INR	Project Name	Capacity	County
20INR0068	Blackjack Creek Wind	240 MW	Bee
21INR0244	Madero Grid	202 MW	Hidalgo
17INR0031	Espiritu Wind	25 MW	Cameron

## Load Scaling Sensitivity Analysis

- Per to 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

# Sensitivity Analyses (cont.)

## Potential 1,245 MW LNG Load in Valley

- ERCOT performed sensitivity analysis on the preferred Corpus Christi North Shore option (Option 4) to assess impact of adding potential 1,245 MW LNG load in Valley and associated upgrades.

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/165315/LRGV\\_Transmission\\_Expansion\\_Project\\_-\\_Dec\\_17\\_RPG.PDF](http://www.ercot.com/content/wcm/key_documents_lists/165315/LRGV_Transmission_Expansion_Project_-_Dec_17_RPG.PDF)

- Since the potential Valley LNG load is not confirmed these results are for informational purposes only and no system upgrades are recommended to address these potential violations at this time.
  - No voltage violations

Element	Length (miles)	Loading
Spruce to Pawnee 345-kV ckt 1	46	109%
Airco to Melon Creek 138-kV ckt 1	23	100%
Blessing to Palacios 69 kV ckt 1	10	113%
Asherton to Catarina 138-kV ckt 1	8	103%
Holly to Southside 138-kV ckt 1	2	101%
Dilley Switch 138/69-kV transformer	-	103%
Victoria DuPont Switch to Big Three 138-kV ckt 1	4	104%
Victoria to Warburton Rd 138-kV ckt 1	15	104%

# Congestion Analysis

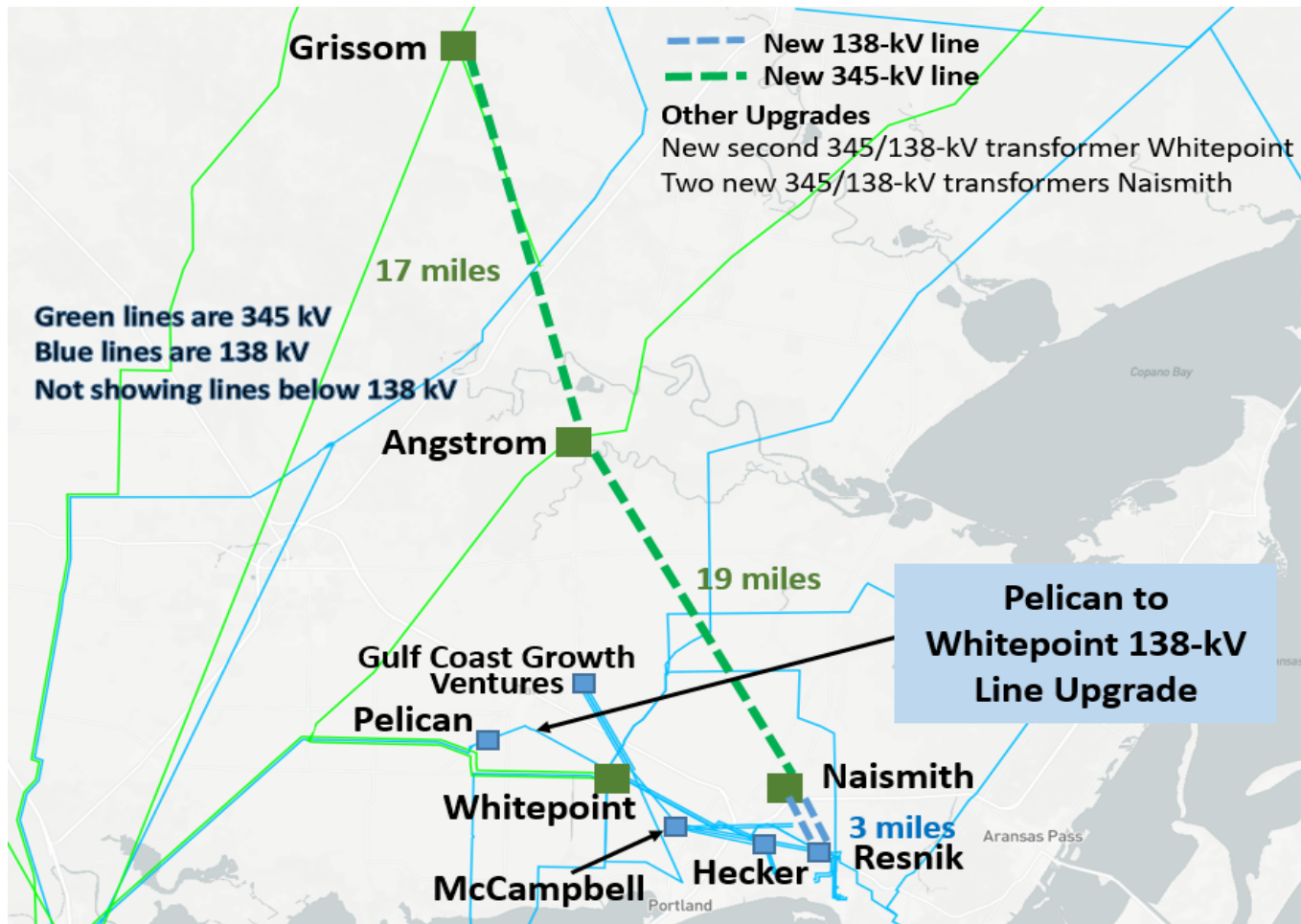
- Conducted congestion analysis, Option 4 did not cause new or additional congestion
- Pelican to Whitepoint 138-kV line remained heavily congested
- Upgrade of Pelican to Whitepoint met economic criteria and was added to Option 4

	Upgraded Pelican to Whitepoint to 489/705 MVA (Summer Normal/Summer Emergency)*
Annual Production Cost Savings (\$M)	1.4
Capital Cost Estimate (\$M)	3.9*
Annual Benefit to Capital Cost Ratio (%)	36%

\* Cost estimates and the line ratings were provided by TSP. Capital cost estimate was \$3.5 Million in 2020 dollars but escalated to 2024 dollars using an annual inflation rate of 2.5%

# Recommended Project

- The recommended project includes Option 4 and upgrading the existing Whitepoint – Pelican 138-kV line. The total cost is estimated to be \$218.5 Million.



# Next Steps

## Tentative Timeline

- ERCOT will seek to designate this project “critical to the reliability of the ERCOT system”
- ERCOT Independent Review recommendation to TAC
  - May 27, 2020
- Seek ERCOT Board of Directors endorsement
  - June 9, 2020





Stakeholder Comments Also Welcomed to Sun Wook Kang:  
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