



## **Permian Basin Load Interconnection Study - Study Scope**

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# Introduction

- ERCOT presented the Permian Basin Area Improvement Updates at the December 2020 RPG meeting, and indicated our plan to conduct a study for interconnecting loads associated with oil and gas in the Permian Base area
- The purpose of this study is to identify local transmission upgrades that may be necessary to connect potential local oil and gas loads in the Permian Basin area. The results of this analysis are intended to be indicative of likely future local transmission upgrades within Permian Basin. Some of the upgrades may become RPG projects if submitted
- As presented at the December 2020 RPG meeting, the load forecast from the IHS Markit study will be used for this study. The load forecast is currently under review by TSPs and ERCOT

# Study Case Development

- **Study Area**

- The Permian Basin area within ERCOT system, which include most of Far West Weather Zone and some of West Weather Zone

- **Starting Base Case**

- The 2025 West/Far West (WFW) summer peak preliminary final case from the 2020 RTP (posted in October 2020) will be used as the starting base case in order to develop study cases for year 2025 and 2030

<https://mis.ercot.com/secure/data-products/grid/regional-planning?id=PG7-173-M>

# Study Case Development

- **Generation Updates**

- Planned generators in the West and Far West (WFW) Weather Zones that meet Planning Guide Section 6.9(1) conditions will be added to the starting base case based on December 2020 GIS report posted on January 4, 2021 (*see Appendix*)
- Solar generation in the study area will be turned off since the load growth in the area is mainly driven by the oil and natural gas loads that are expected to operate as a constant load, 24x7
- Battery and wind generation in the study area will be modeled and dispatched consistent with the 2020 RTP methodology
- Generation retired or to be decommissioned will be turned off if it is not already offline in the case

# Study Case Development

- **Load Updates**

- As presented at the December 2020 RPG meeting, the relevant TSPs in the region and ERCOT agreed that the IHS load forecast is reasonable and can be used for the local transmission/load interconnection study
  - IHS Load Forecast Mapping: ERCOT and TSPs will review and represent the IHS load forecast data (e.g. MW/MVAR) in the study case
  - The reactive consumption of the projected new oil and gas load will be based on historical recorded performance of existing oil and gas load in the Permian Basin area: **0.97 power factor of the new oil and gas loads**
  - The total load in the Permian Basin area will be consistent with the IHS load projection in 2025 (8,450 MW) and 2030 (9,970 MW)

# Study Case Development

- **Power Balance**

- If necessary, load outside of the West and Far West Weather Zones will be adjusted in order to maintain the reserve which is consistent with 2020 RTP methodology

- **Transmission Updates**

- Transmission projects in the study area expected to be in-service by 2025 and 2030 will be added based on October 2020 TPIT (see *Appendix*)
- Based on the load levels of the Delaware Base area in the 2025 and 2030 study cases, ERCOT may model the long-lead time transmission upgrades identified in the 2019 Delaware Basin Load Integration Study

# Contingencies and Criteria

- **Contingencies for Study Region**

- NERC TPL-001-4 and ERCOT Planning Criteria

([http://www.ercot.com/content/wcm/current\\_guides/53526/04\\_050115.doc](http://www.ercot.com/content/wcm/current_guides/53526/04_050115.doc)):

- Normal system condition (P0)
- N-1 conditions (P1, P2-1, P7)
- P2, P4, and P5 (EHV only)
- X-1 + N-1 (X-1 represents 345/138-kV transformer outage). Depending on the location of new loads, additional 345/138-kV transformers may be tested
  - ✓ Riverton 345/138-kV transformer 1
  - ✓ Sand Lake 345/138-kV transformer 1
  - ✓ Solstice 345/138-kV transformer 1
  - ✓ Quarry Field 345/138-kV transformer 1
  - ✓ Wolf 345/138-kV transformer 1
  - ✓ Odessa 345/138-kV transformer 1
- G-1 + N-1 (G-1 represents generator outage)
  - ✓ All five Permian Basin units
  - ✓ Odessa combined cycle train 1

# Contingencies and Criteria

- **Criteria**

- Thermal

- Monitor all transmission lines and transformers in study region
    - Use Rate A for pre-contingency conditions
    - Use Rate B for post-contingency conditions

- Voltages

- Monitor all busses 60 kV and above in the study region
    - Voltages exceeding their pre-contingency and post-contingency limits
    - Voltage deviations exceeding 8% on non-radial load busses



# Tentative Timeline and Next Step

- Complete the load interconnection study: 2nd Quarter 2021
- Status updates at the future RPG meetings



Stakeholder Comments Also Welcomed to Sun Wook Kang:  
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# Appendix

- New Generation Addition**

<b>GINR</b>	<b>Project Name</b>	<b>County</b>	<b>Projected COD</b>	<b>Fuel</b>	<b>Capacity (MW)</b>
17INR0052	Horse13 CalID repower	Taylor	12/31/2020	WIN	44
17INR0061	Capricorn IV repower	Sterling	12/31/2020	WIN	9
18INR0079	Woodward I repower	Pecos	12/31/2020	WIN	0
19INR0121	Galloway Solar	Concho	10/01/2021	SOL	250
20INR0046	Maverick Creek II W	Concho	03/23/2021	WIN	118.8
21INR0357	SP TX-12B BESS	Upton	10/31/2021	OTH	22.68
21INR0365	Bat Cave Energy Storage	Mason	06/01/2021	OTH	100.49
21INR0431	Galloway 2 Solar	Concho	04/01/2022	SOL	110
21INR0449	Panther Creek III Repower	Howard	02/02/2021	WIN	15.96

# Appendix

- New Transmission Addition**

ERCOT Project #	Project Title	Transmission Owner	Projected In-Service Date (Month/Yr)	Planning Charter Tier
54255	Rebuild Rio Pecos-Lynx Ckt 2 (1926 ACSS)	TNMP	Dec-20	Tier 4
55372	Conversion of TNMP Gomez to 138kV service.	TNMP	Dec-20	Tier 4
57173	TNMP Soaptree Switching Station	TNMP	Dec-20	Tier 4
52311	Add Gardendale 345 kV Switch	ONCOR	Dec-20	Tier 4
52295	Natural Dam 138 kV Switch	ONCOR	May-21	Tier 4
57797	Athey: Build 138 kV Station	AEP TNC	Sep-21	Tier 4
55367	Wolfcamp: Build 138 kV box bay	AEP TNC	Nov-21	Tier 4
52322	Establish Courtney Creek Switch	ONCOR	Dec-21	Tier 4
58540	Rebuild 16th St - Soaptree	TNMP	Dec-21	Tier 4
6719	Twelvemile Substation Addition	LCRATSC	Sep-22	Tier 4
55470	Bison to Ozona: Rebuild 69 kV line	AEP TNC	Nov-22	Tier 4
51788	Amos Creek Circuit Breaker Addition	LCRATSC	Nov-20	Tier 4
52464	Alamito Creek to Ft. Davis: Rebuild 69 kV line	AEP TNC	May-23	Tier 4