

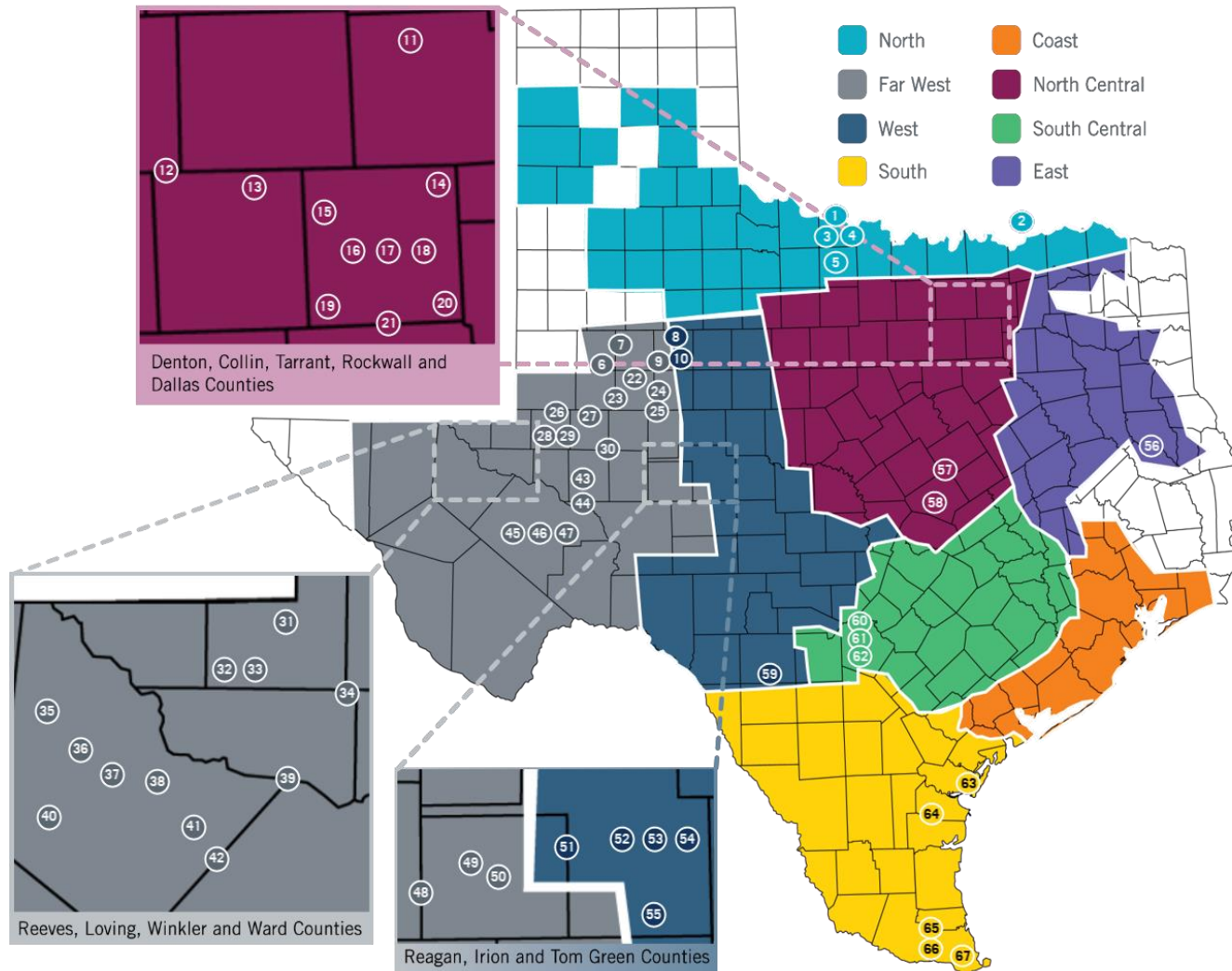


2021 RTP – Final Update

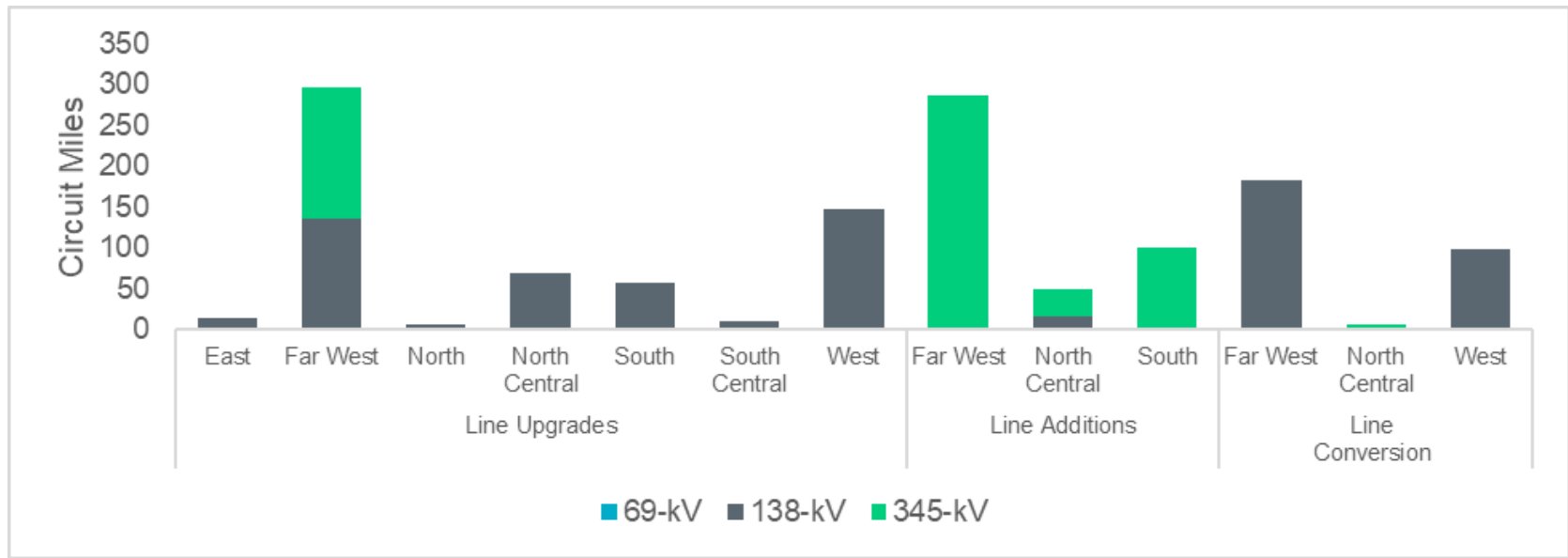
Ping Yan
Supervisor, Regional Transmission Planning

January 2022

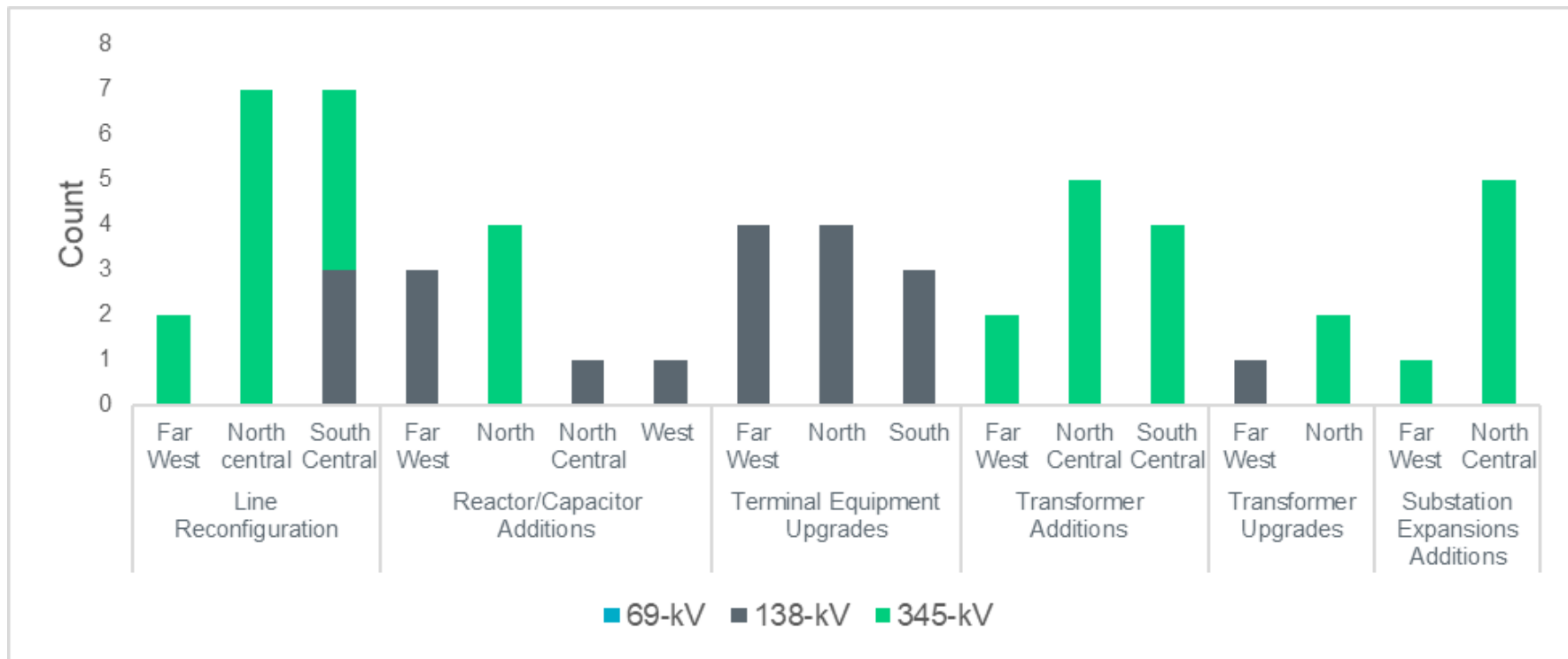
2021 RTP Reliability Project Locations



Line Upgrades, Additions, and Conversions

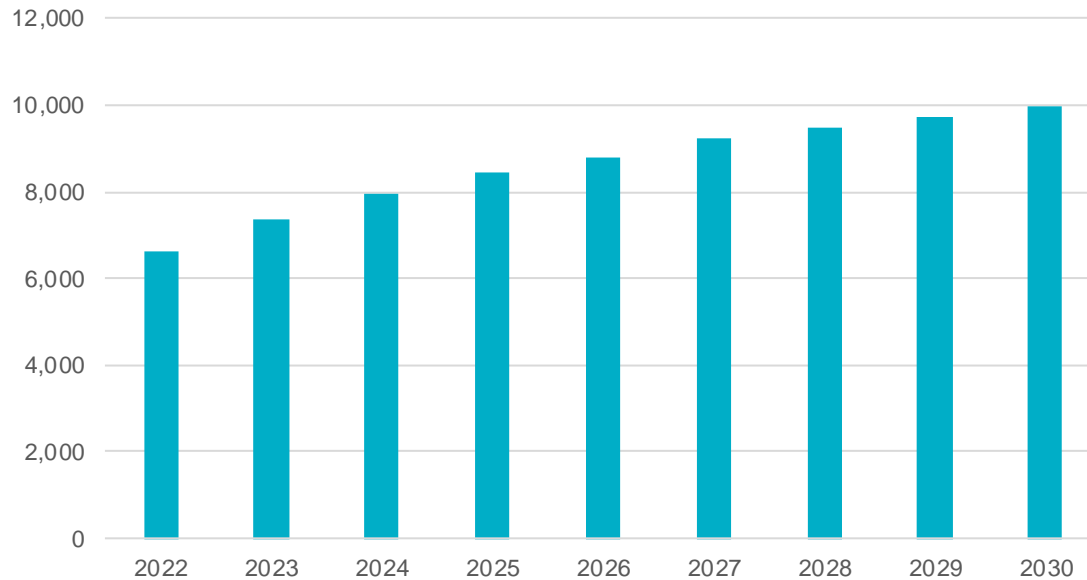


Other Upgrades and Additions



West Texas Study Findings

- Permian Basin load forecast from IHS Markit study was adopted in 2021 RTP



IHS Markit Study Permian Basin Summer Peak Load Forecast (MW)

- 40 reliability projects were identified for the West and Far West study region

West Texas Study Findings Cont'd

- New Bearkat to North McCamey to Sand Lake 345-kV double-circuit line addition in Glasscock, Upton, Crane, and Winkler Counties^{1,2,3} (Project Index: 2021-FW15)
- Midland County Northwest to Midland East to Falcon Seaboard to Morgan Creek to Tonkawa Switch 345-kV existing circuit rebuild and second circuit addition in Midland, Howard, Mitchell, and Scurry Counties^{2,3} (Project Index: 2021-WFW2)
- Morgan Creek to Longshore 345-kV line upgrade in Mitchell and Howard Counties^{2,3} (Project Index: 2021-FW19)
- Quail Switch to Odessa 345-kV line upgrade in Ector County^{2,3} (Project Index: 2021-FW18)
- IH20 345-kV substation expansion and new 345/138-kV transformer additions with the Solstice to Sand Lake 345-kV existing double-circuit line loop in at the expanded IH20 345-kV substation in Winkler and Pecos Counties^{2,3} (Project Index: 2021-FW22)

¹ Stage 2 transmission enhancement in the [ERCOT Delaware Basin Load Integration Study](#) transmission roadmap

² ERCOT preferred projects in the [ERCOT Permian Basin Load Interconnection Study](#)

³ Reliability needs were identified under the no solar conditions

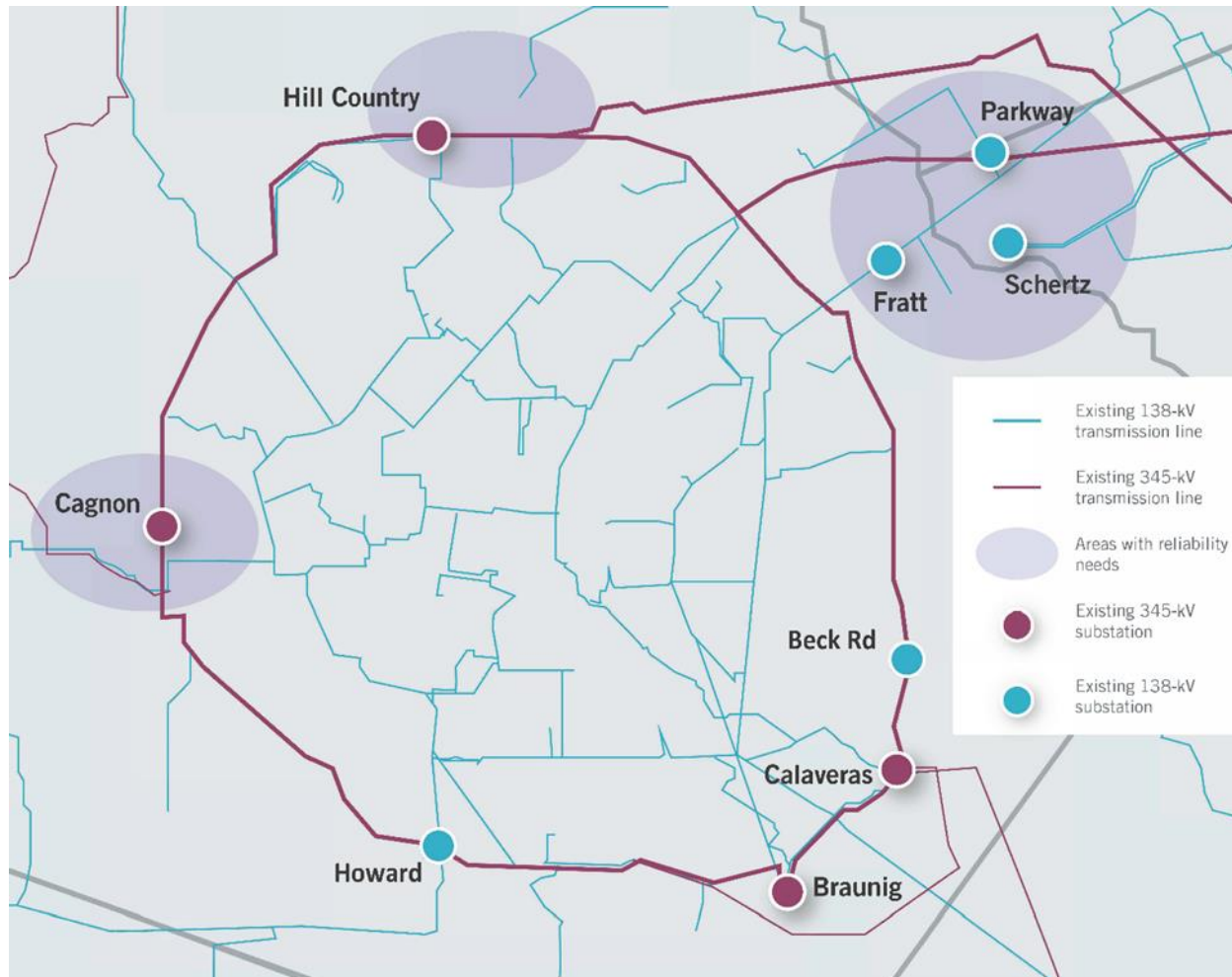
San Antonio Area Study Findings

- Generators taken offline prior to Notification of Suspension of Operations (NSO)

Study Year	Total Capacity Affected (MW)
2023	420
2024 MIN	420
2024	420
2026	1,279
2027	2,354

[Generation Resources Unavailable in Planning Studies Prior to NSO](#)

San Antonio Area Study Findings Cont'd



San Antonio Area Study Findings Cont'd

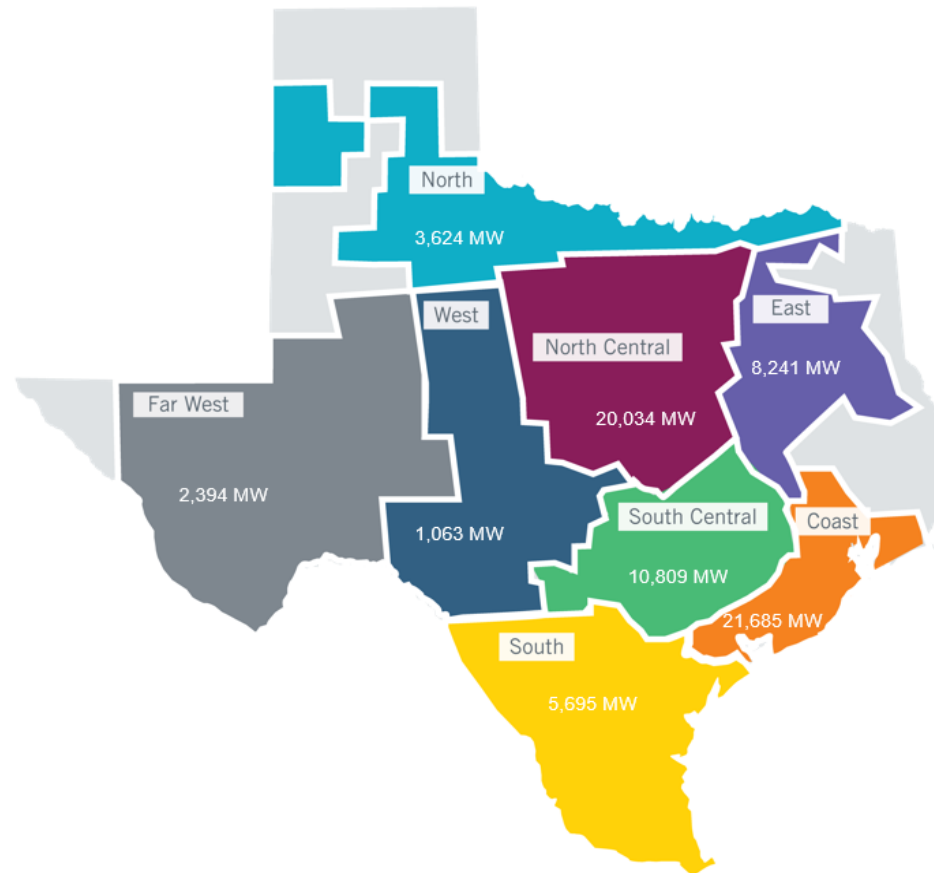
- Expand the existing Howard Road and Beck Road 138-kV substations to 345/138-kV substations, add new 345/138-kV transformers at the two stations, and add double-circuit line from Howard Road to San Miguel
 - Placeholder project to address the reliability needs observed
 - Howard Road 345-kV substation expansion and 345/138-kV transformer additions at the expanded Howard Road substation were needed by summer 2026 while the rest of the upgrades were needed by summer 2027
 - The “Howard Road 345/138 kV Switching Station Project” submitted by CPS Energy was accepted by RPG in December 2021 as a first step in addressing the reliability needs in the area

Deliverability Assessment Under ERCOT Coincident Summer Peak Load Conditions

- Identify any additional reliability needs in order to ensure the full deliverability of Resources meeting the following criteria
 - Any Generation Resource utilizing combined cycle, steam turbine, combustion turbine, or reciprocating engine technology
 - Energy Storage Resources (ESRs) with a minimum duration of 4 hours at their maximum discharge capability

Deliverability Assessment Under ERCOT Coincident Summer Peak Load Conditions Cont'd

- Total MW capacity of the Generation Resources meeting the defined criteria



Deliverability Assessment Under ERCOT Coincident Summer Peak Load Conditions Cont'd

- The purpose of this sensitivity is to provide understanding of potential system impacts under the assumed system conditions rather than recommend specific projects
- Key takeaways:
 - Additional local transmission upgrades were needed to facilitate the full deliverability of the Resources meeting the defined criteria
 - Transmission upgrades were identified for Cherokee, Rusk, and Smith Counties in the East weather zone
 - Transmission upgrades were identified for Dallas, Ellis, and Bosque Counties in the North Central weather zone
 - Transmission upgrades were identified in San Patricio County in the South weather zone

Stressed Resource Availability Under Off-Peak Load Conditions

- Generation Resource availability assumptions
 - Renewable generation including both wind and solar were assumed to be offline
 - ESRs were assumed to be offline
 - Approximately 14 GW of conventional generation capacity were assumed to be offline due to planned outages

Stressed Resource Availability Under Off-Peak Load Conditions Cont'd

- Planned outages capacity by weather zones



Stressed Resource Availability Under Off-Peak Load Conditions

- The purpose of this sensitivity is to provide understanding of potential system impacts under the assumed system conditions rather than recommend specific projects
- Key takeaways:
 - Additional local transmission upgrades were needed to facilitate the full deliverability of the Resources meeting the defined criteria
 - Transmission upgrades were identified for Henderson County in the East weather zone
 - Transmission upgrades were identified for Denton County in the North Central weather zone
 - Transmission upgrades were identified for Edwards County in the West weather zone

2021 RTP Report Posting

- 2021 RTP report and final reliability cases were posted on December 23, 2021
- Public version of the report was posted to the following location (<http://www.ercot.com/gridinfo/planning>)

Questions / Comments

- Please send questions and/or comments to:
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 - John.Bernecker@ercot.com