



2024 LTSA Update

ERCOT Staff
May 16, 2024

2024 LTSA Stakeholder Survey Results

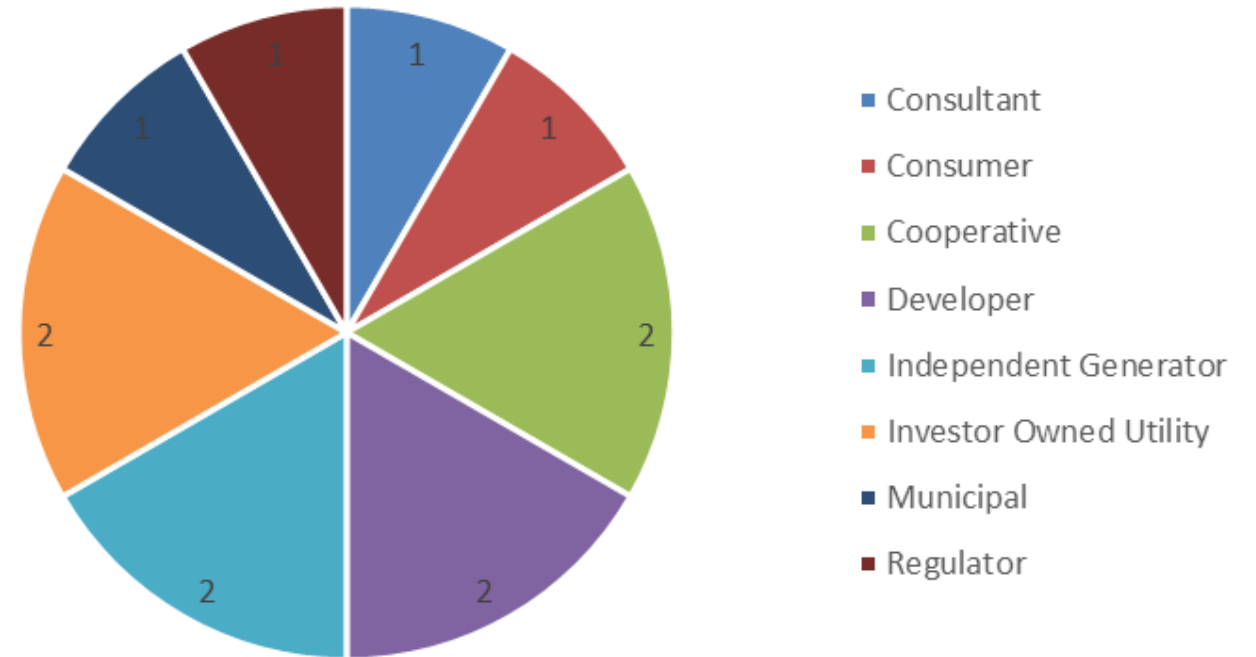
Pengwei Du

Background

- ERCOT presented [2024 LTSA Study Introduction](#) at March 2023 RPG meeting
 - ERCOT solicited comments and feedback for 2024 LTSA scenario development from stakeholders
- This presentation provides a summary of responses to the initial stakeholder input survey and outlines next steps for the 2024 LTSA

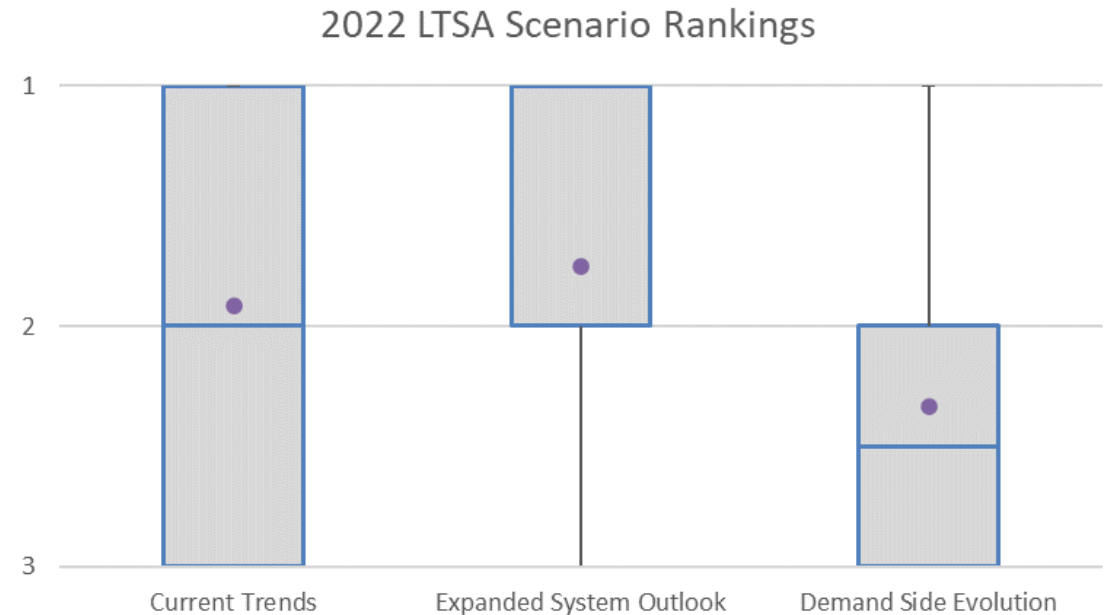
Respondents

- 12 individual responses representing 11 separate entities were received
- Respondents represent a broad range of perspectives



2022 LTSA Feedback

- Stakeholders were asked to provide feedback on what was most valuable from the 2022 LTSA
- Responses varied, but multiple responses considered the value in investigating the effect of load growth and identifying existing system constraints
- ERCOT is considering the feedback provided by stakeholders to inform the 2024 LTSA

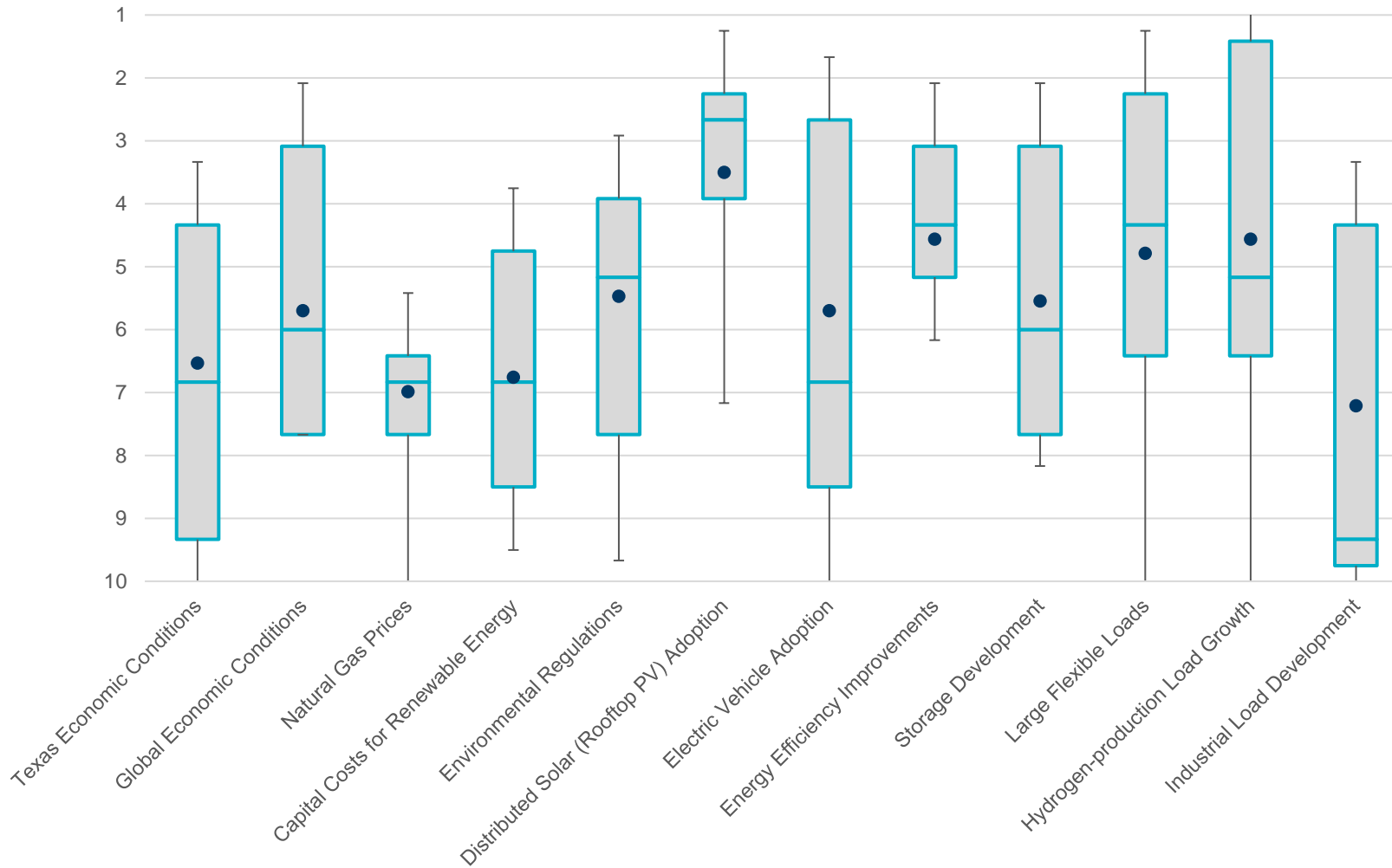


Note: Dark blue dots represent average rankings.
*1 being the highest rank and 3 being the lowest rank

Other Feedback for 2022 LTSA

- In general, respondents consider 2022 LTSA has provided valuable and useful information on scarcity hours, transmission congestion issues and West Texas/Permian Basin improvements.
- In 2022 LTSA study, ERCOT only evaluated the system congestion constraints for the Current Trends scenario.
 - At the time of the analysis, ERCOT's criteria for economic transmission project evaluation was not finalized. As a result, potential transmission projects to alleviate observed congestions in the system were not evaluated.

Long-Term Drivers for 2024 LTSA



*1 being the highest impact and 10 being the lowest impact

Recommendations for 2024 LTSA

- The LTSA is using a scenario-based approach for analysis
 - To identify the most critical trends, drivers, and uncertainties over a ten- to fifteen-year period
- Stakeholders provided recommendations to ERCOT regarding the scenario development and the study focus for 2024 LTSA

	Recommendations
Scenarios	To study the impact of environmental restrictions, demand side evolution and load growth, regulatory and market changes, Inflation Reduction Act, fossil retirement, high/low gas price
Study Focus	To develop a transmission roadmap including economic projects (EHV/HVDC) to address existing and anticipated congestion constraints
Scenario Development Process	To provide resource addition and retirement data for weather zones To communicate the outcomes of the scenario development and study results with stakeholders as work advances To create a short list of scenarios to solicit inputs from stakeholders

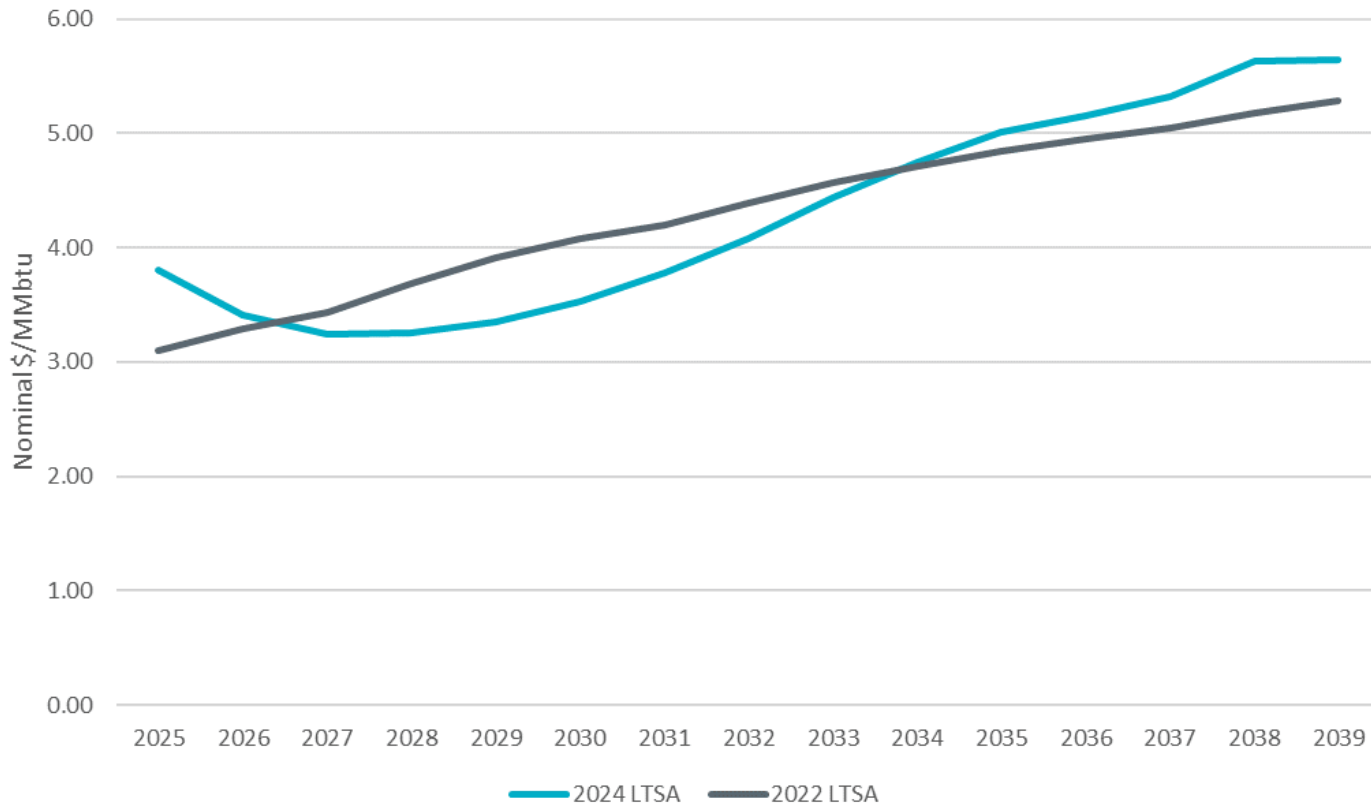
Current Trends Capacity Expansion Input Assumptions

Fred Khodabakhsh

Outline

- Natural Gas Price Comparison
- EV Charging Loads and Profiles
- Settlement-Only Distribution Generators
- Price Responsive Demand
- New Unit Capital Costs
- Starting Capacity Mix and Retirements
- Other Assumptions

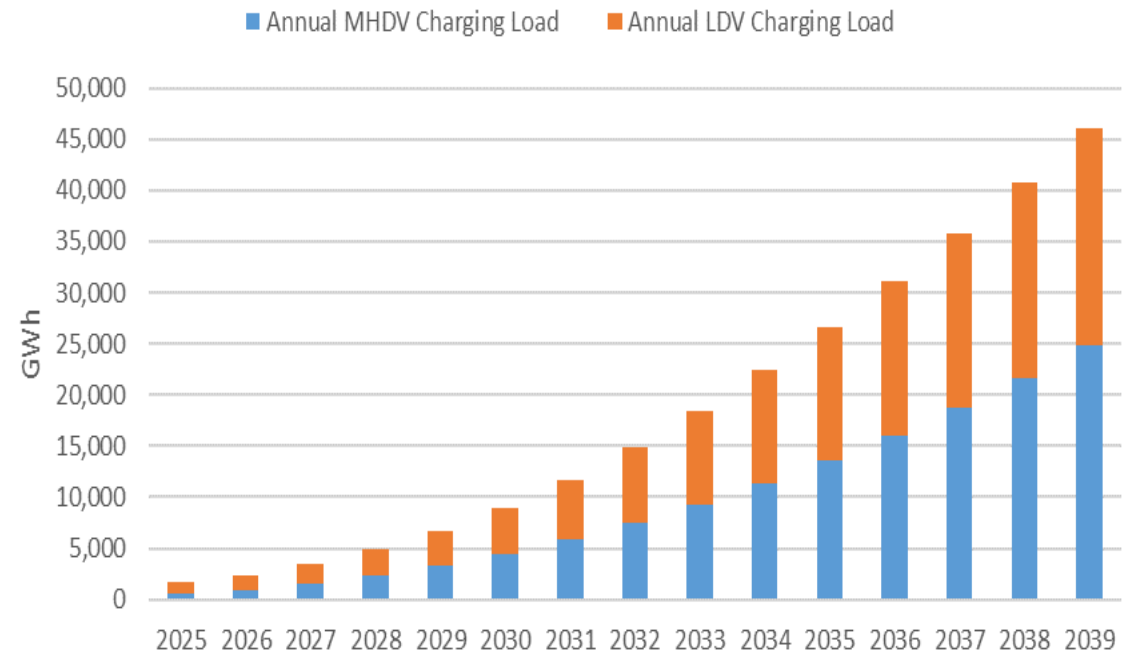
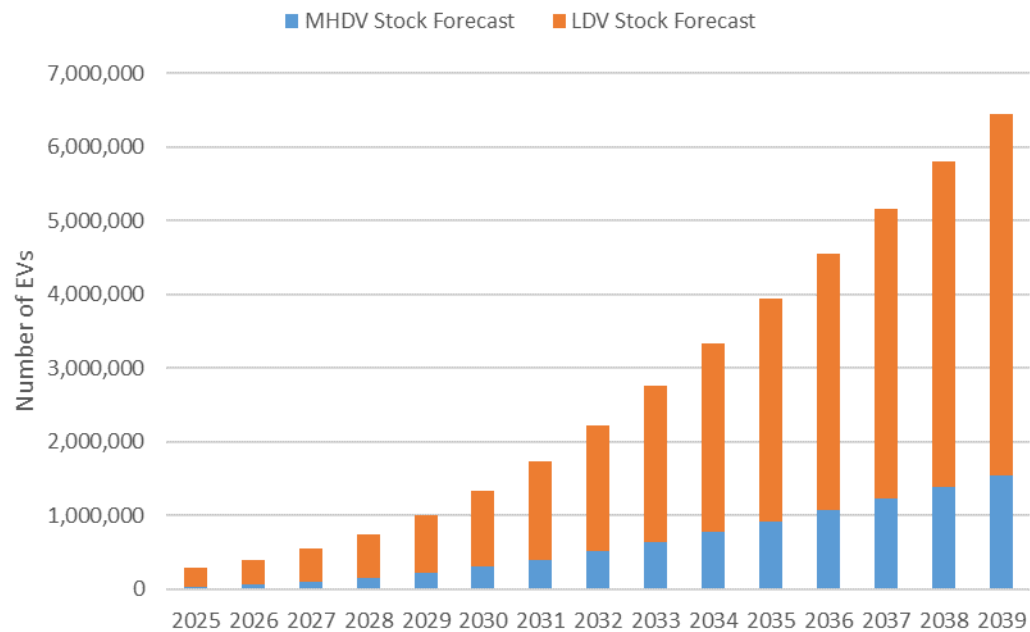
Natural Gas Price Assumptions



- 2022 LTSA natural gas price forecast was based on 2021 EIA-AEO Reference case. The 2024 LTSA is based on 2023 EIA-AEO Reference case.

EV Charging Load

- At October 2022 RPG meeting, Brattle presented their [EV Study](#) methodology and results.
- ERCOT has extended the forecast horizon to 2039 for the ERCOT system-level aggregation.



Settlement Only Distributed Generation

Resource Type	Capacity MW
Wind, Solar and Storage	280
Gas	372
Other	348
Total	1,000

Other resource types include Biomass, Hydro and Diesel.

Based on ERCOT's Protocols Settlement Only Distribution Generators (SODG) are defined as:

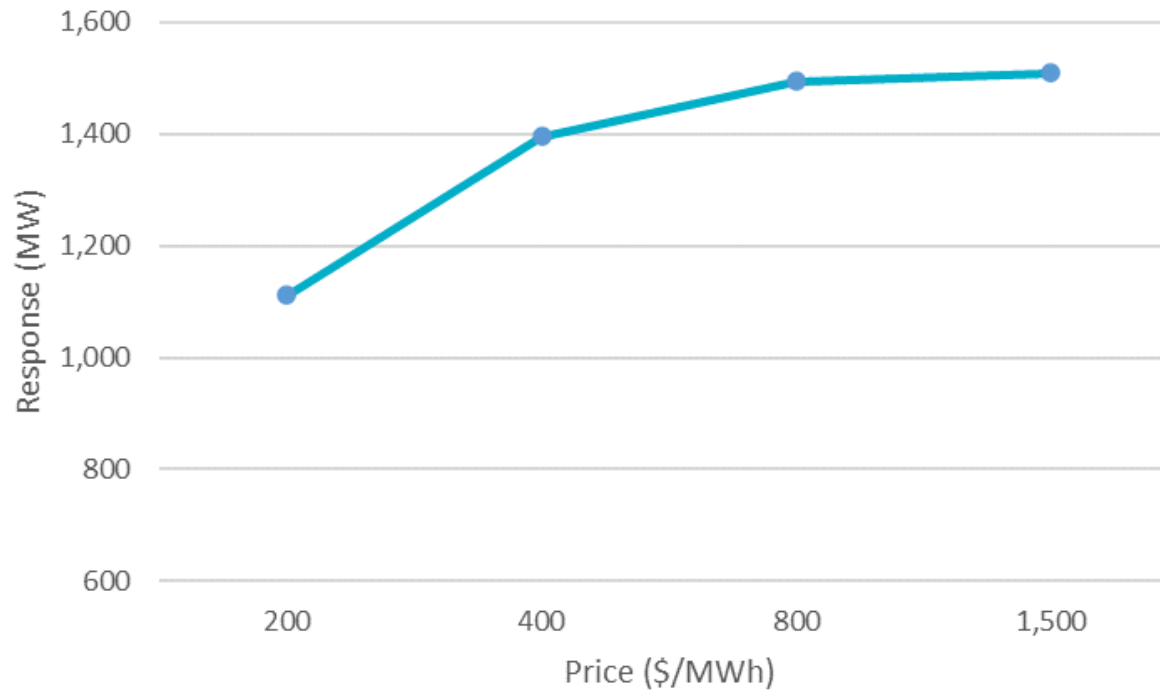
A generator that is connected to the Distribution System with a rating of:

- (1) One MW or less that chooses to register as an SODG; or
- (2) Greater than one and up to ten MW that is capable of providing a net export to the ERCOT System and does not register as a Distribution Generation Resource (DGR).

SODGs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and will be modeled in ERCOT systems for reliability in accordance with Section 3.10.7.2, Modeling of Resources and Transmission Loads.

Price Responsive Demand

- There was 1510 MW PRD based on 2022 PRD Analysis
- 3% growth rate is assumed for PRD, the incremental PRD at each striking price is represented using generator models



New Unit Capital Costs for 2024 LTSA

- Sources of capital cost assumptions:
 - Lazard’s Levelized Cost of Energy Analysis (V16), April 2023
 - NREL Cost Projections for Utility-Scale Battery Storage 2022
 - EIA AEO 2022
- 2, 4, and 8 hour battery candidates are included in 2024 LTSA

Technology	Total overnight cost (2023 \$/kW)
Ultra-supercritical coal (USC)	4,987
Combined-cycle—single-shaft	975
Combined-cycle—multi-shaft	862
Combustion turbine	925
Combustion turbine-Advanced	561
Nuclear—light water reactor	11,200
Wind	1,362
Solar	1,050
Battery storage - 2 hours	891
Battery Storage - 4 hours	1,535
Battery Storage - 8 hours	2,822

Sources:

<https://www.lazard.com/research-insights/levelized-cost-of-energyplus/>

https://atb.nrel.gov/electricity/2022/utility-scale_battery_storage

<https://www.eia.gov/outlooks/aeo/>

Capacity Mix Overview

- Operational resources are obtained from the May 2023 CDR report, and planned resources meeting Planning Guide Section 6.9(1) requirements are obtained from the March 2023 GIS report .

	2022LTSA - Current Trends (MW)				2024LTSA - Current Trends (MW)			
	Operational Resources	Planned Resources	Total Starting Capacity Mix	Retirements	Operational Resources	Planned Resources	Total Starting Capacity Mix	Retirements
Battery	235	1,807	2,042	-	2,335	6,523	8,858	-
Combined Cycle	37,478	86	37,564	1,918	40,288	551	40,839	2,226
CT & IC	12,616	860	13,476	711	11,583	900	12,483	865
Gas Steam	11,620	60	11,680	8,819	11,155	60	11,215	10,766
Solar	4,095	13,332	17,427	-	9,940	23,312	33,252	-
Wind	25,203	11,821	37,024	-	31,495	7,276	38,771	-
Coal	13,630	-	13,630	8,116	13,630	-	13,630	10,987
Hydro	536	-	536	-	593	-	593	-
Nuclear	5,153	-	5,153	-	5,153	-	5,153	-
Other	920	-	920	105	790	-	790	-
Total	111,485	27,965	139,451	19,670	126,961	38,622	165,583	24,844

- Two combined cycles, Midlothian and Hays, are recategorized from CT to Combined Cycles in 2024 LTSA
- Retirements include fixed age retirements (Coal units retire after 45 years and gas units retire after 60 years), permanent mothballed units and unconfirmed retirement capacities from May 2023 CDR
- The 2024 LTSA retirements may change due to the economic retirements from the capacity expansion model run

Other Input Assumption for Current Trends

- The maximum annual capacity expansion build for CCs will be capped at one CC.
- The maximum annual capacity expansion build for CTs will be capped at 800 MW.
- Based on EPA, ERCOT is subject to seasonal NOx only with the seasonal NOx emission cost of \$166/Ton.
- The large flexible loads, curtailment prices for large flexible loads and rooftop solar are still under development for 2024 LTSA.
- Currently working with Energy Exemplar (vendor for the capacity expansion model) to implement the ORDC modifications specified for the market redesign bridging solution.

Questions

- Send questions or comments to:
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