



## **Item 9.1: System Planning and Weatherization Update**

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Reliability and Markets Committee Meeting

ERCOT Public

December 2, 2024

# Overview

- **Purpose**

Provide an update on recent activity related to planning, modeling, generation interconnection, resource adequacy and weatherization

- **Voting Items / Requests**

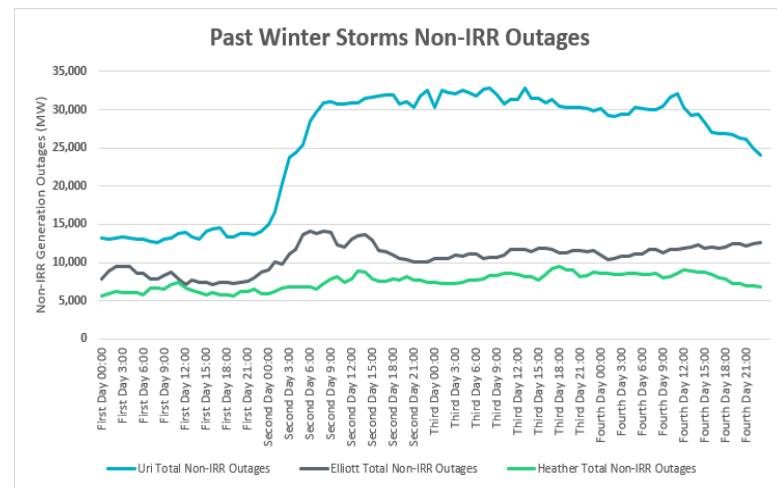
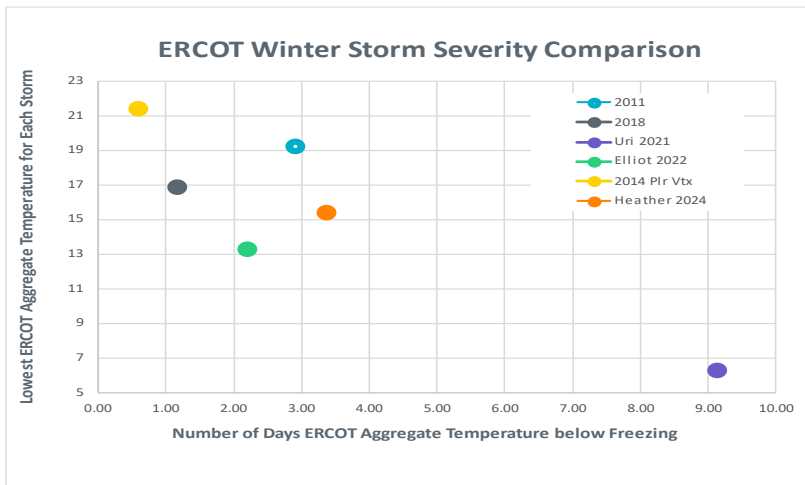
No action is requested of the Reliability and Markets (R&M) Committee or Board; for discussion only

- **Key Takeaways**

- Winter weatherization inspection work is underway to prepare for the upcoming season.
- Probabilistic modeling results indicate a low risk of having to declare an Energy Emergency Alert under normal system conditions during the months of December and January.
- The 2024 Regional Transmission Plans will be completed by the end of January.
- Solar and Energy Storage Resources (ESRs) continue to account for the vast percentage of generation capacity requesting new interconnection studies. All sixteen Texas Energy Fund projects recommended for due diligence by the PUC are registered with ERCOT and in various phases of the generation interconnection process.
- The queue of large loads requesting to connect to the grid continues to increase.
- Since Commission approval of the Reliability Standard framework, ERCOT has continued to develop project plans for future assessments as well as work with Commission Staff and Transmission Operators to establish a recommended magnitude criterion.

# Winter Weatherization Work is Underway

- ERCOT utilizes a risk-based approach to conduct weatherization inspections of generation and transmission facilities. Inspections will begin in December.
- To prepare for the upcoming season, ERCOT has focused on collaboration:
  - Facilitated two winter weatherization workshops in October for Resources and Transmission Service Providers (TSPs) to share best practices.
  - Hosted a NERC Cold Weather Project Technical Conference which reached approximately 300 individuals.
- Market Participant declarations of Winter Weather Preparedness are being submitted through December 1<sup>st</sup>.



**Key Takeaway:** The benefits of the weatherization standard have been demonstrated through recent winter storms.

# Monthly Outlook on Resource Adequacy (MORA)

Probabilistic modeling results indicate a low risk of having to declare an Energy Emergency Alert (EEA). There is some EEA risk during the evening and early morning hours when solar production is unavailable.

Dec

Hour Ending (CST)	Chance of Normal System Conditions Probability of CAFOR being above 3,000 MW	EMERGENCY LEVEL	
		Chance of an Energy Emergency Alert Probability of CAFOR being less than 2,500 MW	Chance of Ordering Controlled Outages Probability of CAFOR being less than 1,500 MW
1 a.m.	98.90%	0.79%	0.66%
2 a.m.	98.84%	0.89%	0.79%
3 a.m.	98.72%	0.95%	0.79%
4 a.m.	98.63%	1.06%	0.89%
5 a.m.	98.63%	1.09%	0.97%
6 a.m.	98.24%	1.38%	1.24%
7 a.m.	97.90%	1.75%	1.54%
8 a.m.	96.95%	2.51%	2.35%
9 a.m.	97.68%	1.79%	1.63%
10 a.m.	98.55%	1.08%	0.92%
11 a.m.	99.23%	0.56%	0.50%
12 p.m.	99.55%	0.22%	0.18%
1 p.m.	99.78%	0.14%	0.09%
2 p.m.	99.92%	0.05%	0.04%
3 p.m.	99.93%	0.02%	0.02%
4 p.m.	99.89%	0.02%	0.02%
5 p.m.	99.80%	0.06%	0.04%
6 p.m.	96.89%	1.24%	0.84%
7 p.m.	94.94%	2.30%	1.61%
8 p.m.	91.36%	4.90%	3.94%
9 p.m.	92.13%	4.80%	3.91%
10 p.m.	93.35%	3.88%	3.08%
11 p.m.	96.98%	1.36%	0.87%
12 a.m.	99.46%	0.17%	0.09%

Note: Probabilities are not additive.

Jan

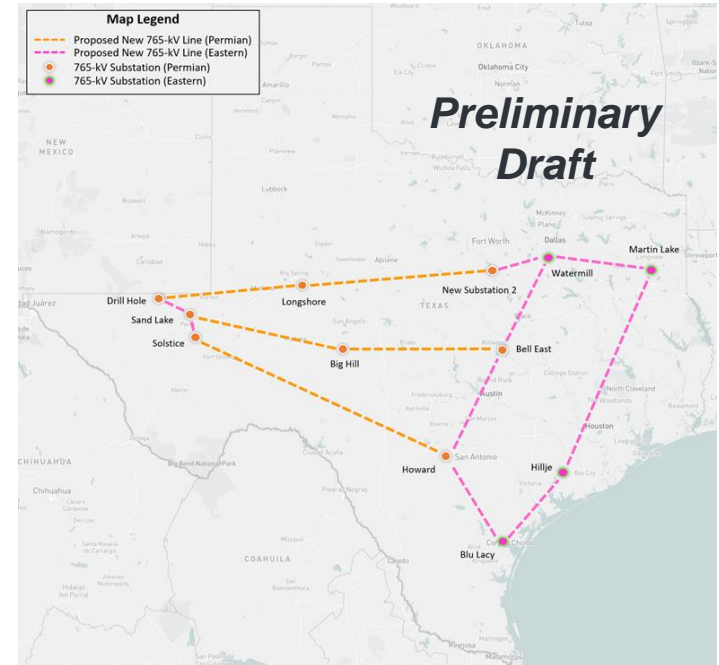
Hour Ending (CST)	Chance of Normal System Conditions Probability of CAFOR being above 3,000 MW	EMERGENCY LEVEL	
		Chance of an Energy Emergency Alert Probability of CAFOR being less than 2,500 MW	Chance of Ordering Controlled Outages Probability of CAFOR being less than 1,500 MW
1 a.m.	98.21%	1.45%	1.31%
2 a.m.	98.70%	0.87%	0.76%
3 a.m.	98.65%	0.93%	0.80%
4 a.m.	98.69%	0.89%	0.75%
5 a.m.	98.41%	1.11%	0.99%
6 a.m.	98.10%	1.49%	1.38%
7 a.m.	95.93%	2.81%	2.46%
8 a.m.	87.56%	8.51%	7.12%
9 a.m.	94.36%	3.69%	3.13%
10 a.m.	97.93%	1.35%	1.16%
11 a.m.	99.48%	0.27%	0.22%
12 p.m.	99.62%	0.20%	0.16%
1 p.m.	99.82%	0.11%	0.09%
2 p.m.	99.94%	0.02%	0.01%
3 p.m.	99.95%	0.01%	0.00%
4 p.m.	99.90%	0.02%	0.02%
5 p.m.	99.83%	0.06%	0.05%
6 p.m.	97.97%	0.98%	0.63%
7 p.m.	93.93%	2.82%	2.08%
8 p.m.	93.02%	3.65%	2.78%
9 p.m.	96.29%	1.95%	1.65%
10 p.m.	96.12%	2.14%	1.67%
11 p.m.	98.79%	0.54%	0.41%
12 a.m.	99.64%	0.19%	0.14%

Note: Probabilities are not additive.



# New Era of Planning Update – EHV Considerations

- An evolving generation mix has resulted in increased distance between generation sites and demand centers.
- With the current capacity of the transmission system and the increase in large loads projected to move to Texas, the preliminary 2024 Regional Transmission Plan (RTP) study results indicate a need for substantial new transmission infrastructure to serve the forecasted load growth, regardless of the decision of which voltages to incorporate.
- ERCOT is nearing completion of two RTPs (traditional build with 345-kV and an alternative that includes a 765-kV Core Plan as well as supporting 345-kV)
- The 2024 RTP plans will be completed in December and supporting cost-benefit comparisons will be filed with the PUC in January for further consideration of next steps.



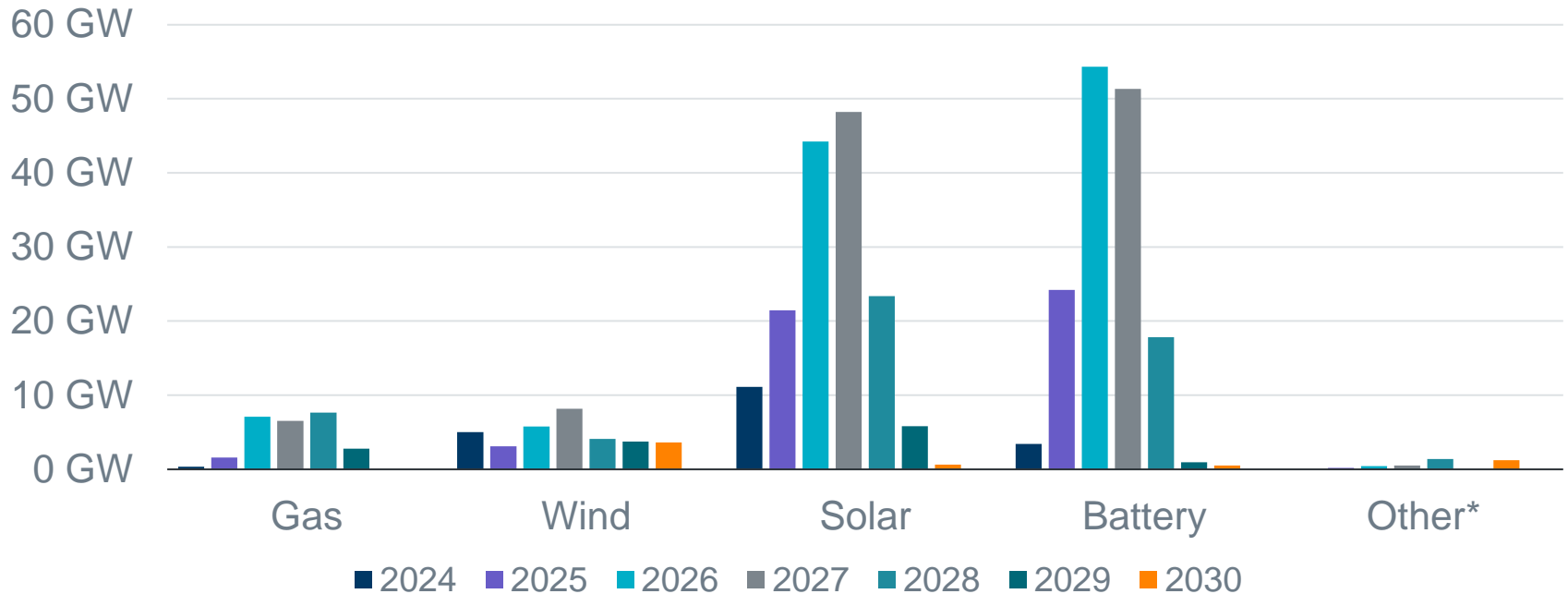
*Geographic locations for proposed new lines are meant to demonstrate general electrical point-to-point connections. Specific routing of any new transmission infrastructure is determined by the Public Utility Commission as part of the CCN process with Transmission Service Providers.*

**Key Takeaway:** Forecasted load growth coupled with the evolution of generation types and locations have led to EHV infrastructure consideration to reliably and efficiently facilitate large power transfer across the system.

# Generation Interconnection Requests

1,872 active generation interconnection requests totaling 371 GW as of October 31, 2024  
 (Solar 155 GW, Wind 33 GW, Gas 26 GW, and Battery 153 GW)

(Excludes capacity associated with projects designated as Inactive per Planning Guide Section 5.2.5)



A break-out by zone can be found in the monthly Generator Interconnection Status (GIS) reports available on the ERCOT Resource Adequacy Page: <http://www.ercot.com/gridinfo/resource>

\* Other includes petroleum coke (pet coke), hydroelectric, fuel oil, geothermal energy, other miscellaneous fuels reported by developers, and fuel cells that use fuels other than natural gas.

**Key Takeaway:** Solar and Battery Energy Storage account for approximately 83% of the amount of generation seeking interconnection.



# Texas Energy Fund Status (as of November 15, 2024)

All sixteen projects recommended for Due Diligence by the PUC are in various phases of the generation interconnection process.

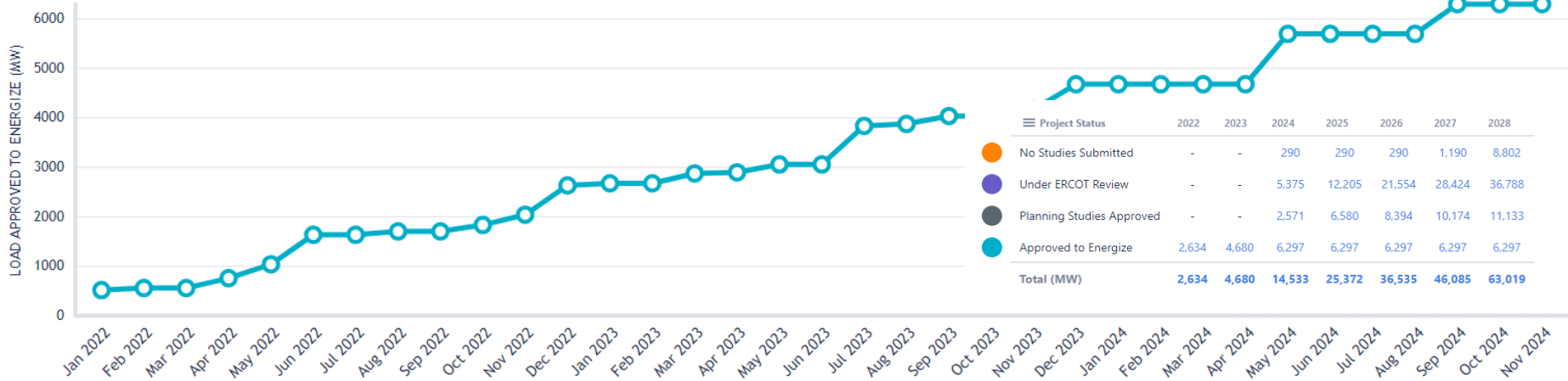
Application	Parent Company Name	Max GEN MW	Status
APP-128	Calpine Corporation	459	Projects have completed all FIS studies. APP-128 and APP-017 have signed SGIAs.
APP-215	WattBridge	612	
APP-017	NRG Energy, Inc.	456	
APP-143	Constellation Energy Generation, LLC	306.32	Projects have completed one or more FIS studies.
APP-031	CPV Group	1390	
APP-219	Reliability Design and Development, LLC	225.6	
APP-129	LS Power Equity Advisors, LLC	660	
APP-131	EmberClear	900	Projects have submitted Screening study applications. APP-115 FIS application under review.
APP-223	ENGIE	930	
APP-007	Howard Midstream Energy Partners, LLC	271	
APP-115	Rayburn Country Electric Cooperative, Inc.	570	
APP-122	FRONTIER GROUP OF COMPANIES	188	
APP-201	Kerrville Public Utility Board Public Facility Corporation	121.8	
APP-194	MPH Bastrop Peakers, LLC	1104	
APP-021	Hunt Energy Network, LLC	132	
APP-245	Vistra Corp.	440	

**Key Takeaway:** All sixteen projects are registered with ERCOT and are advancing through the interconnection process. Four projects have completed all Full Interconnection Studies (FIS) and two projects have Signed Generation Interconnection Agreements (SGIAs).



# Large Load Integration Overview

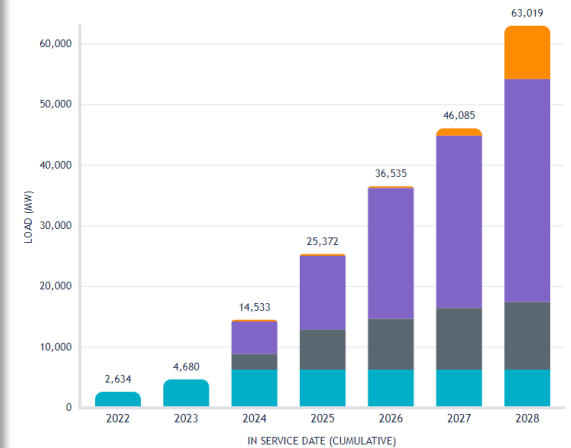
Large Loads Approved to Energize - Growth Since 2022



## Key Takeaways

- ERCOT is tracking approximately 63k MW of Large Loads seeking interconnection.
- ERCOT has reviewed and approved studies for the interconnection of over 17,000 MW of Large Loads in the past two years.
  - 6,297 MWs have been approved to energize
    - Of these, 3,697 MW is believed to be operational (approximately 416 MW more than reported in October)
    - Remaining 2,600 MW may energize at any time without additional approval

Actual and Projected Large Load Growth 2022-2028





# Large Load approved to energize and observed Load

Amount (in MW) of Large Load that is Approved to Energize

6,297

Peak (non-simultaneous) observed consumption for approved loads

3,697

Approved to Energize Load by Project Type



Load Type	Load (MW)
Standalone	5,222
Co-Located	1,075
<b>Total</b>	<b>6,297</b>

Non-Simultaneous Peak Observed Load by Project Type



Load Type	Peak Observed Load (MW)
Standalone	2,630.1
Co-Located	1,066.9
<b>Total</b>	<b>3,697</b>

# Reliability Standard Implementation Update

Current implementation activities for the Reliability Standard:

- In consultation with the Commission Staff and Transmission Operators, ERCOT is preparing an estimate of the maximum amount of load shed that can be safely rotated during a loss of load event to establish the Reliability Standard's magnitude criterion.
  - This year's magnitude estimation exercise provides the opportunity to develop best practices for standardized load shed capability reporting needed to support future Reliability Standard reliability assessments.
  - Since September, ERCOT has issued two RFIs and held numerous collaboration calls.
  - Given the process is new and to ensure consistent and accurate information, ERCOT, with support of Commission Staff, requested a good cause exception to extend the deadline for filing the magnitude information from December 1 to January 31.
- Developing a project plan to update ERCOT's probabilistic system reliability model to support the first reliability assessment starting in January 2026.

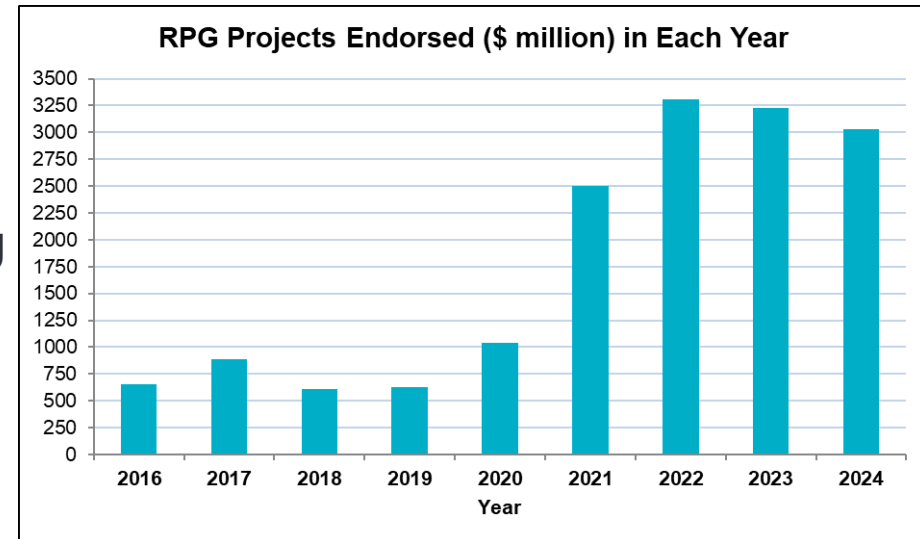
**Key Takeaway:** Since Commission approval of the Reliability Standard framework, ERCOT has continued develop project plans for future assessments as well as work with Commission Staff and Transmission Operators to establish a recommended magnitude criterion.



# Appendix

# Transmission Planning Summary

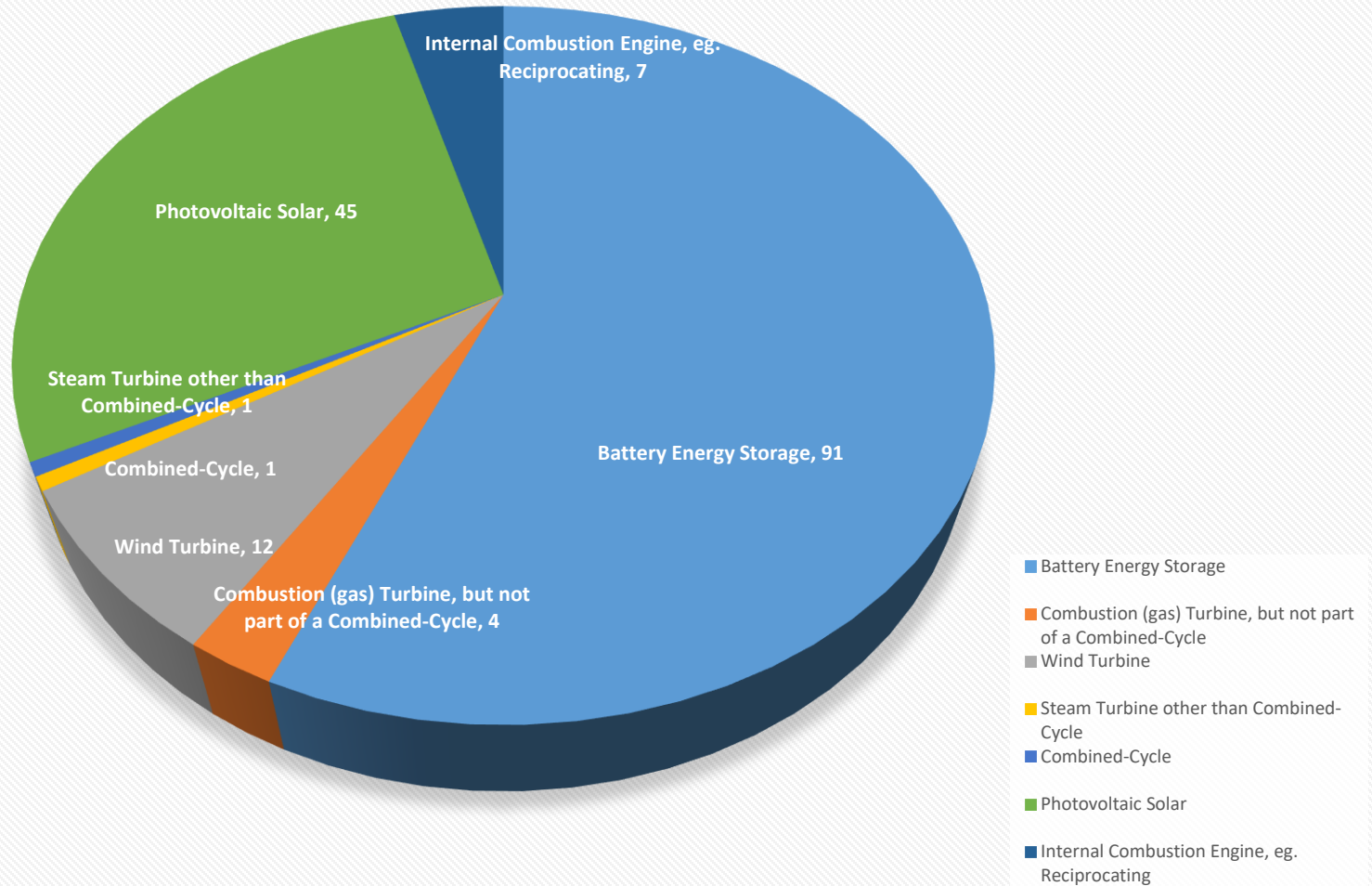
- As of October 1, 2024, projects energized in 2024 total about \$2.435 billion.
  - \$1.553 billion energized in all of 2023
- As of October 31, 2024, ERCOT has endorsed transmission projects totaling \$3.034 billion in 2024.
  - Total endorsed transmission projects in 2023 equaled \$3.231 billion
- As of October 31, 2024, projects in engineering, routing, licensing, and construction total about \$16.504 billion.



**Key Takeaway:** Transmission buildout as well as project endorsement continues at a record pace with almost \$1 billion more projects energized by October than were energized in all of 2023.

# Generation Interconnection Activity (as of November 15, 2024)

## Applications Received in the last 60 days by Fuel



**Key Takeaway:** Battery Energy Storage continues to be the most active generation type requesting interconnection studies.

# Generation Resource Project MWs by Fuel Type and Interconnection Stage (as of November 15, 2024)

