



Report on the Capacity, Demand and Reserves (CDR) in the ERCOT Region, 2019-2028

December 4, 2018

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Notes on Changes Relative to the Last CDR, Published May 2018

- 1 Wind Summer Peak Average Capacity Contribution Percentages (WINDPEAKPCT) were updated to include summer 2018 data. The Non-coastal region increased from 14% to 15% and the Coastal region decreased from 59% to 58%.
- 2 The solar Summer Peak Average Capacity Contribution Percentage (SOLAR_PEAK_PCT) decreased from 75% to 74% after being updated for summer 2018 data.
- 3 The following Planned Resources have been moved to Operational Status since the release of the May 2018 CDR report:

Project Name	Unit Code	County	Fuel	Zone	Installed Capacity MW	Summer Capacity MW
PHR PEAKERS (BAC)	BAC_CTG	GALVESTON	GAS	GALVESTON	329	329
DENTON ENERGY CENTER	DEC_AGR	DENTON	GAS	NORTH	226	226
FRIENDSWOOD G	FEGC_UNIT1	HARRIS	GAS	HOUSTON	119	119
FLAT TOP WIND I	FTWIND_UNIT_1	MILLS	WIND	NORTH	200	30
HICKMAN (SANTA RITA WIND)	HICKMAN	REGAN AND IRION	WIND	WEST	300	45
RTS WIND	RTS_U1	MCCULLOCH	WIND	SOUTH	160	24
CASTLE GAP SOLAR	CASL_GAP_UNIT1	UPTON	SOLAR	WEST	180	133
RIGGINS (SE BUCKTHORN WESTEX SOLAR)	RIGGINS_UNIT1	PECOS	SOLAR	WEST	150	111
SOLAIREHOLMAN 1	LASSO_UNIT1	BREWSTER	SOLAR	WEST	50	37
TOTAL					1,714	1,054

- 4 The following Planned Resources have met the requirements to be added to the CDR report (Signed SGIA, acquisition of required air emission permits, submission of proof of adequate water supplies for thermal units):

Project Name	GENERATION INTERCONNECTION PROJECT CODE	County	Fuel	Zone	Year of Projected Commercial Operations ^{1/}	Capacity MW	Summer Capacity MW
VICTORIA PORT (VICTPORT)	17INR0045	CALHOUN	GAS	COASTAL	2019	100	100
ARMSTRONG WIND	18INR0029	ARMSTRONG	WIND	PANHANDLE	2020	253	38
BARROW RANCH (JUMBO HILL WIND)	18INR0038	ANDREWS	WIND	WEST	2019	160	24
BLUE SUMMIT II	18INR0070	WILBARGER	WIND	WEST	2019	102	15
CANYON WIND	18INR0030	SCURRY	WIND	WEST	2020	301	45
DARMSTADT	18INR0023	SCHLEICHER	WIND	WEST	2019	201	30
EASTER WIND	15INR0063	CASTRO	WIND	PANHANDLE	2020	308	46
HART WIND	16INR0033	CASTRO	WIND	PANHANDLE	2020	150	23
KONTIKI 1 WIND	19INR0099a	GLASSCOCK	WIND	WEST	2019	255	38
KONTIKI 2 WIND	19INR0099b	GLASSCOCK	WIND	WEST	2020	255	38
MAVERICK CREEK I	20INR0045	CONCHO	WIND	WEST	2020	252	38
MAVERICK CREEK II	20INR0046	CONCHO	WIND	WEST	2020	252	38
MESTENO WIND	16INR0081	STARR	WIND	SOUTH	2019	202	30
NORTHDRAW WIND	13INR0025	RANDALL	WIND	PANHANDLE	2019	150	23
OVEJA WIND	18INR0033	IRION	WIND	WEST	2019	300	45
PRAIRIE HILL WIND	19INR0100	LIMESTONE	WIND	NORTH	2020	300	45
RANCHERO WIND	20INR0011	CROCKETT	WIND	WEST	2019	300	45
TG EAST WIND	19INR0052	KNOX	WIND	WEST	2019	276	41
VERA WIND	19INR0051	KNOX	WIND	WEST	2019	243	36
CHALUPA WIND	20INR0042	CAMERON	WIND-C	COASTAL	2020	174	101
CRANEL WIND	19INR0112	REFUGIO	WIND-C	COASTAL	2019	220	128
LAS MAJADAS WIND	17INR0035	WILLACY	WIND-C	COASTAL	2020	273	158
RAYMOND WIND	18INR0059	WILLACY	WIND-C	COASTAL	2019	202	117
ARAGORN SOLAR	19INR0088	CULBERSON	SOLAR	WEST	2020	186	138
HOLSTEIN SOLAR	19INR0009	NOLAN	SOLAR	WEST	2020	204	151
LONG DRAW SOLAR	18INR0055	BORDEN	SOLAR	WEST	2020	225	167
MISAE SOLAR	18INR0045	CHILDRESS	SOLAR	PANHANDLE	2019	241	178
OBERON SOLAR	19INR0083	ECTOR	SOLAR	WEST	2019	180	133
PHOEBE SOLAR	19INR0029	WINKLER	SOLAR	WEST	2019	250	185
QUEEN SOLAR	19INR0102	UPTON	SOLAR	WEST	2019	400	296
RAMBLER SOLAR	19INR0114	TOM GREEN	SOLAR	WEST	2019	150	111
SODA LAKE SOLAR 1	18INR0040	CRANE	SOLAR	WEST	2020	200	148
SODA LAKE SOLAR 2	20INR0143	CRANE	SOLAR	WEST	2020	200	148
TOTAL					7,463	2,897	

^{1/} This date is based on the projected Commercial Operations Date (COD) reported by the project developer. In contrast, a unit's first summer CDR forecast year (reported in the SummerCapacities sheet) is defined as the first year in which the capacity is available for the entire summer Peak Load Season. (The summer Peak Load Season constitutes the months of June, July, August and September.) For example, if a unit has a projected COD of July 1, 2015, the first summer CDR forecast year would be 2016.

Recently cancelled planned projects:

Natural Gas:

785 MW Pinecrest Energy Center Project had a projected COD of April 2020 and was cancelled on 9/21/18.

654 MW Indeck Wharton Energy Center had a projected COD of Sep 2021 and was cancelled 9/4/2018

324 MW Bethel CAES Project had a projected COD of Nov 2020 and was cancelled on 9/7/2018.

5 Wind:

300 MW Pullman Road Wind had a projected COD of Oct 2019 and was cancelled on 8/29/2018.

218 MW Mariah Del Sur had a projected COD of Dec 2018 and was cancelled on 8/31/2018.

203 MW Unity Wind had a projected COD of Oct 2019 and was cancelled on 9/21/2018.

188 MW Grandview Wind 3 (Conway) had a projected COD of Dec 2019 and was cancelled on 10/9/2018.

160 MW Longhorn South had a projected COD of Dec 2020 and was cancelled on 8/29/2018.

The following units moved from Operational status to Seasonal Mothballed status:

6

SPENCER (STG U4, STG U5) [118 MW] as of 10/3/2018 (operation period Jun 1st to Sep 30th)

The following units moved from Operational status to Mothballed status:

7

GIBBONS CREEK U1 (GIBCRK_GIB_CRG1) [470 MW] on 10/1/18. (scheduled to return between May-June 2019)

8

Seasonal capacity ratings for battery energy storage systems are now being listed in the 'SummerCapacities' and 'WinterCapacities' worksheets. These resources are not included in the reserve margin calculations in the 'Summary' worksheets because they are assumed to provide regulation reserves rather than sustained capacity available to meet peak loads.

9

Capacity changes due to planned repower projects are reflected in the operational units' ratings upon project completion.

Definitions

Available Mothballed Capacity based on Owner's Return Probability

Mothballed capacity with a return-to-service probability of 50% or greater for a given season of the year, as provided by its owner, constitutes available mothballed generation. Return probabilities for individual units are considered protected information under the ERCOT Protocols and therefore are not included in this report.

Energy Efficiency Program Savings Forecast

ERCOT's energy efficiency forecast uses the PUCT's annual verified energy efficiency program savings estimates as the starting point. (See the definition for verified energy efficiency program savings below.) Annual incremental growth in energy efficiency savings is calculated by multiplying ERCOT's peak load forecast by an energy efficiency penetration factor. The current factor is 0.0018, and is derived using the following assumptions:

- The unadjusted penetration rate for energy efficiency is 0.4% of total load for all residential and commercial consumers (including NOIEs)
- A 50% adjustment is applied to account for actual program effectiveness and program savings that may already be accounted for in the load forecast model
- A 90% adjustment is applied to represent the proportion of the total load forecast that is commercial and residential customers

Energy efficiency impacts from meeting the Texas Legislature's goals are assumed to accumulate for seven years from the time that the annual goals must first be met (December 31, 2013).

Finally, ERCOT incorporates annual energy efficiency estimates from municipal utilities and electric cooperatives provided to the State Energy Conservation Office (SECO) or directly to ERCOT. Annual SECO report submission by these entities is required under S.B. No. 924. If annual reports for the previous calendar year are not available at the time the CDR is prepared, ERCOT incorporates report data for the most recently available reporting year.

If energy efficiency capacity amounts are not grossed up to reflect avoided distribution and transmission (T&D) line losses, then ERCOT applies an 8% gross-up factor. The gross-up factor comes from ERCOT's annual Transmission and Distribution Loss Factors reports.

Mothballed Unit

A generation resource for which a generation entity has submitted a Notification of Suspension of Operations, for which ERCOT has declined to execute an RMR agreement, and for which the generation entity has not announced retirement of the generation resource. A seasonal mothballed unit is one in which the generation entity requests a seasonal operation period that must include the summer Peak Load Season, June 1 through September 30.

Mothballed Capacity

Capacity that is designated as mothballed by a generating unit's owner as described above, and which is not available for operations during the summer Peak Load Season (June, July, August and September) or winter Peak Load Season (December, January and February).

Forecast Zone

Forecast Zones generally have the same boundaries as the 2003 Congestion Management Zones with the following exceptions: A) Panhandle Zone for resources in the Texas Panhandle counties and outside the 2003 Congestion Management Zones, and B) Coastal Zone for resources in 11 counties along the Texas Gulf Coast and formerly in the South Zone of the 2003 Congestion Management Zones.

Full Interconnection Study (FIS)

The set of studies conducted by a Transmission Service Provider (TSP) for the purpose of identifying any electric system improvements or enhancements required to reliably interconnect a new All-Inclusive Generation Resource consistent with the provisions of Planning Guide Section 5, Generation Resource Interconnection or Change Request. These studies may include steady-state studies, system protection (short-circuit) studies, dynamic and transient stability studies, facility studies, and sub-synchronous oscillation studies.

LRs (Load Resources)

Load capable of reducing or increasing the need for electrical energy or providing Ancillary Services to the ERCOT System, as described in the ERCOT Protocols, Section 3.6, Load Participation. These Resources may provide the following Ancillary Services: Regulation Up Service, Regulation Down Service, Responsive Reserve Service, and Non-Spinning Reserve Service. The Resources must be registered and qualified by ERCOT and will be scheduled by a Qualified Scheduling Entity (QSE).

Peak Load Seasons

Summer months are June, July, August, and September; winter months are December, January, and February.

Private Use Networks

An electric network connected to the ERCOT transmission grid that contains load that is not directly metered by ERCOT (i.e., load that is typically netted with internal generation).

Non-Synchronous Tie

A non-synchronous transmission interconnection between ERCOT and non-ERCOT electric power systems.

Reliability Must-Run (RMR) Unit

A generation resource unit operated under the terms of an agreement with ERCOT that would not otherwise be operated except that they are necessary to provide voltage support, stability or management of localized transmission constraints under first contingency criteria.

Signed SGIA (Standard Generation Interconnection Agreement)

An agreement that sets forth requirements for physical connection between an eligible transmission service customer and a transmission or distribution service provider.

Switchable Generation Resource (SGR)

A generation resource that can be connected to either the ERCOT transmission grid or a grid outside the ERCOT Region.

Verified Energy Efficiency Program Savings

The total megawatt (MW) amount of verified peak load capacity reductions due to residential and commercial sector energy efficiency incentive programs that are reported by electric utilities in the ERCOT Region to the Public Utility Commission of Texas. See Utilities Code Section 39.905.

Wind Peak Average Capacity Contribution

The seasonal net capacity rating of wind resources multiplied by the Seasonal Peak Average Capacity Percentage for non-coastal and coastal regions.

Wind Seasonal Peak Average Capacity Percentage

The average wind capacity available for the summer and winter Peak Load Seasons for a region (non-coastal / coastal) divided by the installed capacity for the region, expressed as a percentage. Details for the derivation of the percentages are outlined in ERCOT Protocol Section 3.2.6.2.2 (see http://www.ercot.com/content/wcm/current_guides/53528/03-110118_Nodal.docx).

Wind Regions

The coastal wind region comprises the following 11 Texas counties along the southern Gulf Coast: Cameron, Willacy, Kenedy, Kleberg, Nueces, San Patricio, Refugio, Aransas, Calhoun, Matagorda, and Brazoria. The non-coastal region consists of all other counties in the ERCOT Region.

CDR Report - Executive Summary

Based on updates to ERCOT's load forecast and resource availability, planning reserve margins are projected to be lower than those cited in the May 2018 CDR report. For example, the 2019 summer reserve margin is projected to be 8.1%, a reduction of 2.9 percentage points. The reserve margin decreases are primarily due to higher expected seasonal peak loads along with additional delays and cancellations of planned projects.

This CDR report is based on a new long-term load forecast prepared in November 2018. The 2019 summer peak load is now projected to be 74,853 MW, reflecting a 651 MW increase relative to the load forecast prepared in November 2017. This increase is mainly driven by greater oil and gas production in the Far West Weather Zone.* For later years, expectations for greater economic growth in the Coast and South Central Weather Zones contribute most of the peak load difference between forecasts. Additionally, the forecast for Emergency Response Service (ERS) capacity decreased by 350 MW, resulting in a corresponding increase in the firm peak load forecast.

Regarding planned generation projects, three gas-fired projects totaling 1,763 MW and five wind projects totalling 1,069 MW were cancelled since the release of the May 2018 CDR report. Delayed projects include a 419 MW gas-fired resource whose in-service date has been moved to June 2021 as well as several planned wind and solar projects with a total summer peak average capacity contribution of 551 MW. The total installed capacity of the delayed renewable projects was 2,066 MW. Also contributing to lower reserve margins was a decrease in capacity ratings for several operational gas-fired units, totalling 402 MW.

Since the release of the May 2018 CDR report, resources totaling 1,714 MW have been approved by ERCOT for commercial operations. Wind and solar resource installed capacity represents 1,040 MW of this total, translating to an expected summer peak average capacity contribution of 380 MW. The remaining 674 MW consists of three gas-fired plants. Planned resources that became newly eligible for inclusion in this CDR report total 7,463 MW of installed capacity, including 5,127 MW of wind resources, 2,236 MW of solar resources, and 100 MW of gas resources.

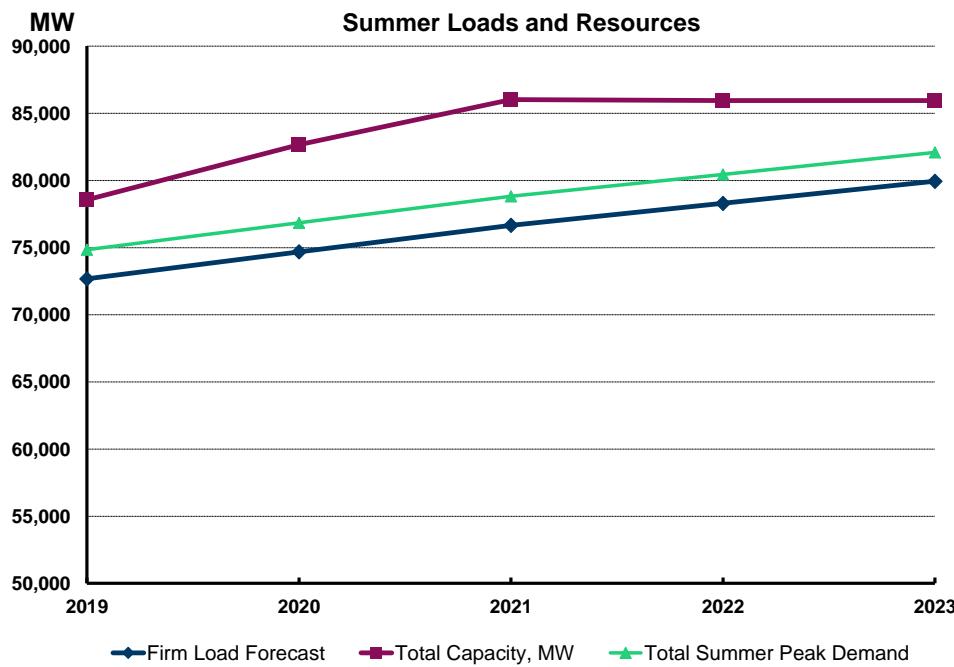
The methodology for developing most of this report is defined in Section 3.2.6 of the ERCOT Protocols (see: http://www.ercot.com/content/wcm/current_guides/53528/03-110118_Nodal.docx). Market Participant information available to ERCOT as of November 30, 2018, is reflected in the report.

* An ERCOT Weather Zone map is available at: <http://www.ercot.com/about/weather>

Report on the Capacity, Demand and Reserves in the ERCOT Region

Summer Summary: 2019-2023

Load Forecast, MW:	2019	2020	2021	2022	2023
Summer Peak Demand (based on normal weather)	74,853	76,845	78,824	80,455	82,101
plus: Energy Efficiency Program Savings Forecast	1,544	1,822	2,104	2,389	2,679
Total Summer Peak Demand (before Reductions from Energy Efficiency Programs)	76,397	78,668	80,928	82,844	84,780
less: Load Resources providing Responsive Reserves	-1,125	-1,125	-1,125	-1,125	-1,125
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-773	-753	-753	-753	-753
less: TDSP Standard Offer Load Management Programs	-282	-282	-282	-282	-282
less: Energy Efficiency Program Savings Forecast	-1,544	-1,822	-2,104	-2,389	-2,679
Firm Peak Load, MW	72,674	74,686	76,664	78,295	79,942
Resources, MW:	2019	2020	2021	2022	2023
Installed Capacity, Thermal/Hydro	65,422	65,787	65,864	65,864	65,864
Switchable Generation Resource Capacity, MW	3,516	3,516	3,516	3,516	3,516
less: Switchable Capacity Unavailable to ERCOT, MW	-789	-844	-544	-544	-544
Available Mothballed Capacity, MW	118	118	118	0	0
Capacity from Private Use Networks	3,325	3,289	3,260	3,320	3,320
Non-Coastal Wind, Peak Average Capacity Contribution (15%)	2,837	2,837	2,837	2,837	2,837
Coastal Wind, Peak Average Capacity Contribution (58%)	1,519	1,519	1,519	1,519	1,519
Solar Utility-Scale, Peak Average Capacity Contribution (74%)	1,099	1,099	1,099	1,099	1,099
Storage, Peak Average Capacity Contribution (0%)	0	0	0	0	0
RMR Capacity to be under Contract	0	0	0	0	0
Capacity Pending Retirement, MW	0	0	0	0	0
Operational Generation Capacity, MW	77,047	77,322	77,670	77,612	77,612
Capacity Contribution - Non-Synchronous Ties, MW	430	430	430	430	430
Planned Thermal Resources with Signed IA, Air Permits and Water Rights, MW	301	301	1,926	1,926	1,926
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (15%)	236	1,315	1,700	1,700	1,700
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (58%)	342	990	1,250	1,250	1,250
Planned Solar Utility-Scale, Peak Average Capacity Contribution (74%)	199	2,293	3,042	3,042	3,042
Planned Storage, Peak Average Capacity Contribution (0%)	0	0	0	0	0
Total Capacity, MW	78,555	82,652	86,016	85,958	85,958
Reserve Margin					
(Total Resources - Firm Load Forecast) / Firm Load Forecast	8.1%	10.7%	12.2%	9.8%	7.5%



Unit Capacities - Summer

UNIT NAME	GENERATION INTERCONNECTION PROJECT CODE	UNIT CODE	COUNTY	FUEL	ZONE	IN-SERVICE YEAR	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
							269.4	3,099.2	4,110.5	4,110.5	4,110.5	4,110.5	4,110.5	4,110.5	4,110.5	4,110.5
803 Planned Capacity Total (Solar)		SOLAR_PL_PEAK_PCT	%			74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0
804 Solar Peak Average Capacity Percentage																
805																
806 Planned Storage Resources with Executed SGIA																
807 Planned Capacity Total (Storage)		STORAGE_PEAK_PCT	%				0	0	0	0	0	0	0	0	0	0
808 Storage Peak Average Capacity Percentage							0	0	0	0	0	0	0	0	0	0
809																
810 Seasonal Mothballed Resources																
811 SPENCER STG U4	SPNCER_SPNCE_4	DENTON	GAS	NORTH	1966	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
812 SPENCER STG U5	SPNCER_SPNCE_5	DENTON	GAS	NORTH	1973	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
813 Total Seasonal Mothballed Capacity						118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0
814																
815 Mothballed Resources																
816 J T DEELY U1 (AS OF 12/31/2018)	CALAVERS_JTD1_M	BEXAR	COAL	SOUTH	1977	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0
817 J T DEELY U2 (AS OF 12/31/2018)	CALAVERS_JTD2_M	BEXAR	COAL	SOUTH	1978	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0	420.0
818 S R BERTRON U1 (SINCE 5/15/2013)	SRB_SR_B1	HARRIS	GAS	HOUSTON	1958	112.0	112.0	112.0	112.0	112.0	112.0	112.0	112.0	112.0	112.0	112.0
819 S R BERTRON U2 (SINCE 5/15/2013)	SRB_SR_B2	HARRIS	GAS	HOUSTON	1956	168.0	168.0	168.0	168.0	168.0	168.0	168.0	168.0	168.0	168.0	168.0
820 Total Mothballed Capacity						1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0
821																
822 Retiring Resources Unavailable to ERCOT (since last CDR/SARA)						-	-	-	-	-	-	-	-	-	-	-
823 Total Retiring Capacity																

Notes:

Capacity changes due to planned repower projects are reflected in the operational units' ratings upon project completion.
 Although seasonal capacity ratings for battery energy storage systems are reported above, the ratings are not included in the operational capacity formula.
 These resources are assumed to provide regulation reserves rather than sustained capacity available to meet peak loads.

Summer Fuel Types - ERCOT

Fuel type is based on the primary fuel. Capacity contribution of the wind resources is included at 15% for Non-Coastal and 58% for Coastal counties, while the solar capacity contribution is 74%. Private Use Network, Hydro and Non-Synchronous Tie resources are included based on the three-year average historical capability for each Summer Season's 20 peak load hours. Non-Synchronous Tie resources are categorized as Other. Mothballed resource capacity is excluded except for Available Mothball Capacity based on a Seasonal Availability Schedule or Owner's reported Return Probability. Private Use Network is categorized as gas.

In MW

Fuel_Type	Capacity_Pct	2019	2020	2021	2022	2023
Biomass	100%	202	202	202	202	202
Coal	100%	14,768	14,768	14,768	14,650	14,650
Gas	100%	51,864	51,774	53,746	53,806	53,806
Nuclear	100%	4,960	4,960	4,960	4,960	4,960
Other	100%	430	430	430	430	430
Hydro	83%	463	463	463	463	463
Wind	15%	3,073	4,153	4,537	4,537	4,537
Wind-C	58%	1,862	2,510	2,769	2,769	2,769
Solar	74%	1,299	3,393	4,141	4,141	4,141
Storage	0%	-	-	-	-	-
Total		78,920	82,652	86,016	85,958	85,958

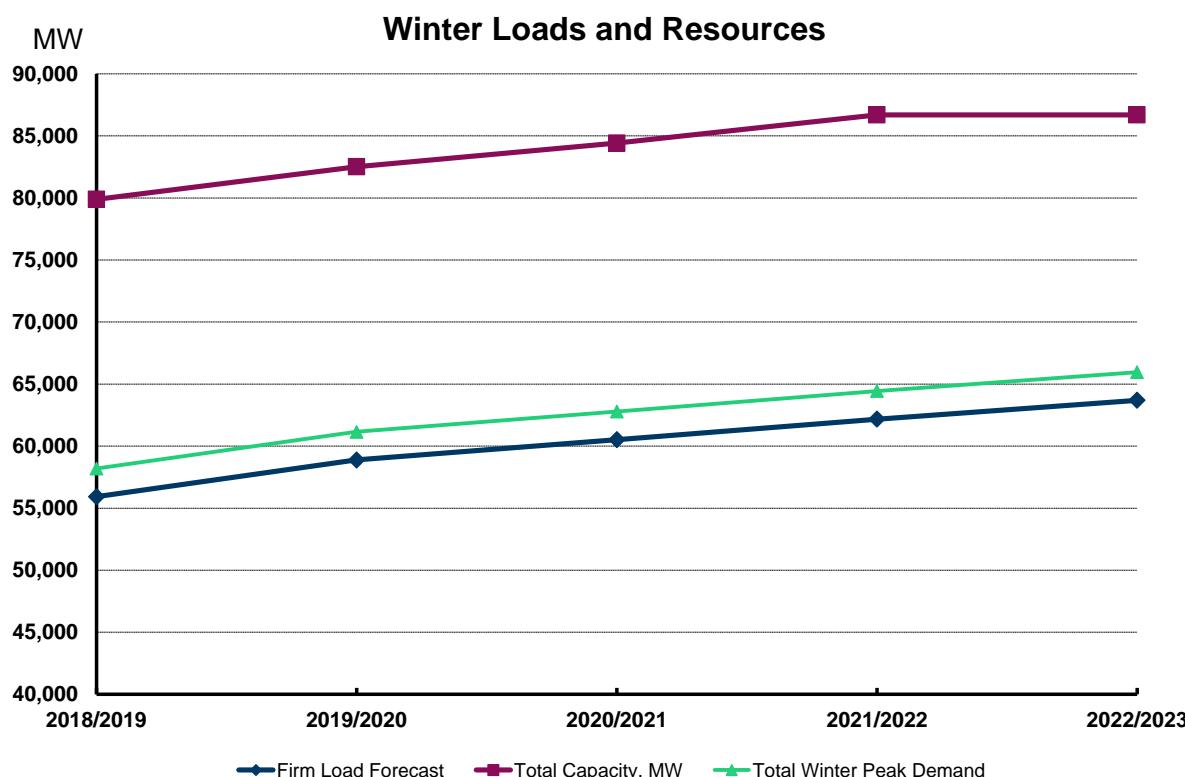
In Percentages

Fuel_Type	2019	2020	2021	2022	2023
Biomass	0.3%	0.2%	0.2%	0.2%	0.2%
Coal	18.7%	17.9%	17.2%	17.0%	17.0%
Natural Gas	65.7%	62.6%	62.5%	62.6%	62.6%
Nuclear	6.3%	6.0%	5.8%	5.8%	5.8%
Other	0.5%	0.5%	0.5%	0.5%	0.5%
Hydro	0.6%	0.6%	0.5%	0.5%	0.5%
Wind	3.9%	5.0%	5.3%	5.3%	5.3%
Wind-C	2.4%	3.0%	3.2%	3.2%	3.2%
Solar	1.6%	4.1%	4.8%	4.8%	4.8%
Storage	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

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Winter Summary: 2018/2019 through 2022/2023

Load Forecast, MW:	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Winter Peak Demand (based on normal weather)	58,196	61,150	62,782	64,449	65,967
plus: Energy Efficiency Program Savings Forecast	1,544	1,822	2,104	2,389	2,679
Total Winter Peak Demand (before Reductions from Energy Efficiency Programs)	59,740	62,972	64,886	66,838	68,646
less: Load Resources providing Responsive Reserves	-1,317	-1,317	-1,317	-1,317	-1,317
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-958	-953	-953	-953	-953
less: TDSP Standard Offer Load Management Programs	0	0	0	0	0
less: Energy Efficiency Program Savings Forecast	-1,544	-1,822	-2,104	-2,389	-2,679
Firm Peak Load, MW	55,921	58,880	60,512	62,178	63,697
Resources, MW:	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Installed Capacity, Thermal/Hydro	68,275	68,745	69,136	69,218	69,218
Switchable Generation Resource Capacity, MW	3,736	3,736	3,736	3,736	3,736
less: Switchable Capacity Unavailable to ERCOT	-802	-858	-858	-558	-558
Available Mothballed Capacity	0	0	0	0	0
Capacity from Private Use Networks	3,305	3,269	3,240	3,300	3,300
Non-Coastal Wind, Peak Average Capacity Contribution (20%)	3,783	3,783	3,783	3,783	3,783
Coastal Wind, Peak Average Capacity Contribution (43%)	1,126	1,126	1,126	1,126	1,126
Solar Utility-Scale, Peak Average Capacity Contribution (12%)	178	178	178	178	178
Storage, Peak Average Capacity Contribution (0%)	0	0	0	0	0
RMR Capacity to be under Contract	0	0	0	0	0
Capacity Pending Retirement, MW	0	0	0	0	0
Operational Generation Capacity, MW	79,602	79,980	80,342	80,784	80,784
Capacity Contribution - Non-Synchronous Ties	287	287	287	287	287
Planned Resources (not wind or solar) with Signed IA, Air Permits and Water Rights	0	307	307	1,932	1,932
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (20%)	0	1,364	2,187	2,278	2,278
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (43%)	0	381	852	926	926
Planned Solar Utility-Scale, Peak Average Capacity Contribution (12%)	0	200	445	493	493
Planned Storage, Peak Average Capacity Contribution (0%)	0	0	0	0	0
Total Capacity, MW	79,889	82,519	84,420	86,700	86,700
Reserve Margin		42.9%	40.1%	39.5%	39.4%
(Total Resources - Firm Load Forecast) / Firm Load Forecast					36.1%



Winter Fuel Types - ERCOT

Fuel type is based on the primary fuel. Capacity contribution of the wind resources is included at 20% for Non-Coastal and 43% for Coastal counties, while the solar capacity contribution is 12%. Private Use Network, Hydro and Non-Synchronous Tie resources are included based on the three-year average historical capability for each Summer Season's 20 peak load hours. Non-Synchronous Tie resources are categorized as Other. Mothballed resource capacity is excluded except for Available Mothball Capacity based on a Seasonal Availability Schedule or Owner's reported Return Probability. Private Use Network is categorized as gas.

Fuel_Type	Capacity_Pct	In MW				
		2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Biomass	100%	202	202	202	202	202
Coal	100%	14,252	14,722	14,722	14,722	14,722
Gas	100%	54,855	55,070	55,041	57,107	57,107
Nuclear	100%	5,140	5,140	5,140	5,140	5,140
Other	100%	287	287	287	287	287
Hydro	82%	457	457	457	457	457
Wind	20%	3,783	5,147	5,971	6,061	6,061
Wind-C	43%	1,126	1,507	1,978	2,053	2,053
Solar	12%	178	379	624	672	672
Storage	0%	-	-	-	-	-
Total		80,280	82,910	84,420	86,700	86,700

Fuel_Type	In Percentages				
	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Biomass	0.3%	0.2%	0.2%	0.2%	0.2%
Coal	17.8%	17.8%	17.4%	17.0%	17.0%
Gas	68.3%	66.4%	65.2%	65.9%	65.9%
Nuclear	6.4%	6.2%	6.1%	5.9%	5.9%
Other	0.4%	0.3%	0.3%	0.3%	0.3%
Hydro	0.6%	0.6%	0.5%	0.5%	0.5%
Wind	4.7%	6.2%	7.1%	7.0%	7.0%
Wind-C	1.4%	1.8%	2.3%	2.4%	2.4%
Solar	0.2%	0.5%	0.7%	0.8%	0.8%
Storage	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Capacity of Proposed Generation Resources Based on Interconnection Milestone Status

Planned Resource Category	Cumulative Summer Capacity Contribution (in MW) of Resources Available by June 1 of the Reporting Year				
	2019	2020	2021	2022	2023
Commissioning Plan Submitted	522	522	522	522	522
Planning Guide 6.9 Criteria plus completed Full Interconnect Study	896	1,821	1,821	1,821	1,821
Meets Planning Guide Sec. 6.9 Criteria (CDR plus TSP Financial Security Posted and Notice to Proceed)	919	2,728	3,227	3,227	3,227
CDR Eligible (signed IA, air permits, proof of adequate water supply)	1,078	4,900	7,917	7,917	7,917
Signed Interconnection Agreement with the TSP	1,078	4,900	7,917	8,659	8,659
Full Interconnect Study Requested	1,208	12,328	24,867	27,745	28,041

Notes:

(1) Resource categories are listed by highest to lowest likelihood that the resource capacity will be in commercial operation in the reported year. For example, resources in the Commissioning Plan Submitted category have reached the "substantially completed construction" phase, and associated transmission switchyard facilities are operational. Conversely, resources in the Full Interconnection Study Requested category include projects that are generally in the development proposal stage and have a significant risk of interconnection request cancellation or project development delays.

(2) The data presented here is based upon the latest information provided to ERCOT by resource developers and can change without notice.

(3) Resource developers may execute an Interconnection Agreement with a TSP prior to completion of the Full Interconnection Study. This is most common with wind and solar projects.

(4) Wind and solar resource capacities reflect their estimated summer on-peaking average values as determined by the methodologies in Protocol section 3.2.6.2.2.

(5) Battery storage projects are assumed to provide no seasonal sustained peak-hour capacity contributions, and are thus reported as zero MW.

Capacity, Demand and Reserves, 2024 Through Winter 2027/2028

The summer and winter capacity summaries below show the reserve margin impact of not adding any new resources during the latter half of the CDR forecast period. Since project developers typically submit interconnection requests no more than three to five years before the facility is expected to enter commercial operations, reserve margins reported beyond this window always show a declining trend. Also note that the reserve margin impact of potential future unit retirements and mothballing, and associated market responses to replace retired units, are not accounted for here or elsewhere in this CDR report.

	Summer				
	2024	2025	2026	2027	2028
Load Forecast, MW:					
Summer Peak Demand (based on normal weather)	83,716	85,327	86,940	88,508	90,021
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	2,974	3,272	3,577	3,890	4,177
Total Summer Peak Demand (before Reductions from Energy Efficiency Programs)	86,690	88,599	90,518	92,397	94,198
less: Load Resources providing Responsive Reserves	-1,125	-1,125	-1,125	-1,125	-1,125
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-753	-753	-753	-753	-753
less: TDSP Standard Offer Load Management Programs	-282	-282	-282	-282	-282
less Energy Efficiency Programs	-2,974	-3,272	-3,577	-3,890	-4,177
Firm Peak Load, MW	81,557	83,167	84,781	86,348	87,861
Resources, MW:					
Installed Capacity, Thermal/Hydro	65,864	65,864	65,864	65,864	65,864
Switchable Capacity, MW	3,516	3,516	3,516	3,516	3,516
less: Switchable Capacity Unavailable to ERCOT, MW	-544	-544	-544	-544	-544
Available Mothballed Capacity, MW	0	0	0	0	0
Capacity from Private Use Networks	3,310	3,310	3,310	3,310	3,310
Non-Coastal Wind, Peak Average Capacity Contribution (15%)	2,837	2,837	2,837	2,837	2,837
Coastal Wind, Peak Average Capacity Contribution (58%)	1,519	1,519	1,519	1,519	1,519
Solar Utility-Scale, Peak Average Capacity Contribution (74%)	1,099	1,099	1,099	1,099	1,099
RMR Capacity to be under Contract	0	0	0	0	0
Capacity Pending Retirement, MW	0	0	0	0	0
Operational Generation Capacity, MW	77,602	77,602	77,602	77,602	77,602
Capacity Contribution - Non-Synchronous Ties, MW	430	430	430	430	430
Planned Thermal Resources with Signed IA, Air Permits and Water Rights, MW	1,926	1,926	1,926	1,926	1,926
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (15%)	1,700	1,700	1,700	1,700	1,700
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (58%)	1,250	1,250	1,250	1,250	1,250
Planned Solar Utility-Scale, Peak Average Capacity Contribution (74%)	3,042	3,042	3,042	3,042	3,042
Total Capacity, MW	85,948	85,948	85,948	85,948	85,948
Reserve Margin	5.4%	3.3%	1.4%	-0.5%	-2.2%
(Total Resources - Firm Load Forecast) / Firm Load Forecast					

	Winter				
	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Load Forecast, MW:					
Winter Peak Demand (based on normal weather)	67,491	69,002	70,544	72,072	73,546
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	2,974	3,272	3,577	3,890	4,177
Total Winter Peak Demand (before Reductions from Energy Efficiency Programs)	70,464	72,274	74,121	75,961	77,724
less: Load Resources providing Responsive Reserves	-1,317	-1,317	-1,317	-1,317	-1,317
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-953	-953	-953	-953	-953
less: TDSP Standard Offer Load Management Programs	0	0	0	0	0
less Energy Efficiency Programs	-2,974	-3,272	-3,577	-3,890	-4,177
Firm Peak Load, MW	65,220	66,732	68,274	69,801	71,276
Resources, MW:					
Installed Capacity, Thermal/Hydro	69,218	69,218	69,218	69,218	69,218
Switchable Capacity	3,736	3,736	3,736	3,736	3,736
less: Switchable Capacity Unavailable to ERCOT	-558	-558	-558	-558	-558
Available Mothballed Capacity	0	0	0	0	0
Capacity from Private Use Networks	3,290	3,290	3,290	3,290	3,290
Non-Coastal Wind, Peak Average Capacity Contribution (20%)	3,783	3,783	3,783	3,783	3,783
Coastal Wind, Peak Average Capacity Contribution (43%)	1,126	1,126	1,126	1,126	1,126
Solar Utility-Scale, Peak Average Capacity Contribution (12%)	178	178	178	178	178
RMR Capacity to be under Contract	0	0	0	0	0
Capacity Pending Retirement, MW	0	0	0	0	0
Operational Generation Capacity, MW	80,774	80,774	80,774	80,774	80,774
Capacity Contribution - Non-Synchronous Ties	287	287	287	287	287
Planned Resources (not wind or solar) with Signed IA, Air Permits and Water Rights	1,932	1,932	1,932	1,932	1,932
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (20%)	2,278	2,278	2,278	2,278	2,278
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (43%)	926	926	926	926	926
Planned Solar Utility-Scale, Peak Average Capacity Contribution (12%)	493	493	493	493	493
Total Capacity, MW	86,690	86,690	86,690	86,690	86,690

Reserve Margin

(Total Resources - Firm Load Forecast) / Firm Load Forecast

32.9% 29.9% 27.0% 24.2% 21.6%