



**Report on the Capacity, Demand and Reserves
(CDR) in the ERCOT Region, 2018-2027**

December 18, 2017

Table of Contents

<u>Tab</u>	<u>Notes</u>
<u>Disclaimer</u>	Please read
<u>Changes from previous CDR</u>	List of significant changes relative to the last CDR, published May 2017
<u>Definitions</u>	List of definitions
<u>Executive Summary</u>	Synopsis of considerations for this report
<u>SummerSummary</u>	Shows load forecast, resource capacity and reserve margin for Summer 2018 through Summer 2022
<u>SummerCapacities</u>	List of registered resources and capabilities used in determining the capacity contribution for Summer Peak Season
<u>SummerFuelTypes</u>	Lists generation fuel types by MW and by percentage for Summer 2018 through Summer 2022
<u>WinterSummary</u>	Shows load forecast, resource capacity and reserve margin for Winter 2017/2018 through Winter 2021/2022
<u>WinterCapacities</u>	List of registered resources and capabilities used in determining the capacity contribution for Winter Peak Season
<u>WinterFuelTypes</u>	Lists generation fuel types by MW and by percentage for Winter 2017/2018 through Winter 2021/2022
<u>Supplemental</u>	Shows the capacity of proposed generation resources for the summer of each forecast year based on meeting various interconnection process milestones. Also shows the load forecast, resource capacity and reserve margin for both Summer and Winter seasons for the later half of the CDR forecast period.

Disclaimer

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Notes on Changes Relative to the Last CDR, Published May 2017

- 1 Wind Summer Peak Average Capacity Contribution Percentages (WINDPEAKPCT) were updated based on summer 2017 data. The Non-coastal region remained at 14% while the Coastal region increased from 58% to 59%.
- 2 The solar Summer Peak Average Capacity Contribution Percentage (SOLAR_PEAK_PCT) was updated based on summer 2017 data, and decreased from 77% to 75%.
- 3 The following Planned Resources have been moved to Operational Status since the release of the May 2017 CDR report:

Project Name	Unit Code	County	Fuel	Zone	Installed Capacity MW	Summer Capacity MW
CALHOUN (PORT COMFORT) 1	CALHOUN_UNIT1	CALHOUN	GAS	SOUTH	44	44
CALHOUN (PORT COMFORT) 2	CALHOUN_UNIT2	CALHOUN	GAS	SOUTH	44	44
COLORADO BEND II CT7	CBECII_CT7	WHARTON	GAS	SOUTH	313	313
COLORADO BEND II CT8	CBECII_CT8	WHARTON	GAS	SOUTH	313	313
COLORADO BEND II ST8	CBECII_STG9	WHARTON	GAS	SOUTH	461	461
WOLF HOLLOW 2 CT5	WHCCS2_CT4	HOOD	GAS	NORTH	314	314
WOLF HOLLOW 2 CT6	WHCCS2_CT5	HOOD	GAS	NORTH	318	318
WOLF HOLLOW 2 STG6	WHCCS2_STG6	HOOD	GAS	NORTH	432	432
CASTLEMAN CHAMON 1	CHAMON_CTG_0101	HARRIS	GAS	HOUSTON	44	44
CASTLEMAN CHAMON 2	CHAMON_CTG_0301	HARRIS	GAS	HOUSTON	44	44
BLUE SUMMIT BATTERY	BLSUMMIT_BATTERY	WILBARGER	STORAGE	WEST	-	-
DERMOTT WIND 1_1	DERMOTT_UNIT1	SCURRY	WIND	WEST	127	18
DERMOTT WIND 1_2	DERMOTT_UNIT2	SCURRY	WIND	WEST	127	18
FALVEZ ASTRA WIND	ASTRA_UNIT1	RANDALL	WIND	PANHANDLE	163	23
FLUVANNA RENEWABLE 1 A	FLUVANNA_UNIT1	SCURRY	WIND	WEST	80	11
FLUVANNA RENEWABLE 1 B	FLUVANNA_UNIT2	SCURRY	WIND	WEST	76	11
ROCK SPRINGS VAL VERDE WIND (FERMI) 1	FERMI_WIND1	VAL VERDE	WIND	SOUTH	122	17
ROCK SPRINGS VAL VERDE WIND (FERMI) 2	FERMI_WIND2	VAL VERDE	WIND	SOUTH	27	4
SALT FORK 1 WIND 1	SALTFORK_UNIT1	DONLEY	WIND	PANHANDLE	64	9
SALT FORK 1 WIND 2	SALTFORK_UNIT2	DONLEY	WIND	PANHANDLE	110	15
BUCKTHORN WIND 1 A	BUCKTHRN_UNIT1	ERATH	WIND	NORTH	45	6
BUCKTHORN WIND 1 B	BUCKTHRN_UNIT2	ERATH	WIND	NORTH	56	8
CHAPMAN RANCH WIND IA (SANTA CRUZ)	SANTACRU_UNIT1	NUECES	WIND-C	SOUTH	151	89
CHAPMAN RANCH WIND IB (SANTA CRUZ)	SANTACRU_UNIT2	NUECES	WIND-C	SOUTH	98	58
SP-TX-12-PHASE B	SPTX12B_UNIT1	UPTON	SOLAR	WEST	158	118
BHE SOLAR PEARL PROJECT (SIRIUS 2)	SIRIUS_UNIT2	PECOS	SOLAR	WEST	49	37
TOTAL					3,779	2,769

4 The following Planned Resources have finalized the necessary agreements and permits to be added to the CDR report:

Project Name	GENERATION INTERCONNECTION PROJECT CODE	County	Fuel	Zone	Year of Projected Commercial Operations ^{1/}	Capacity MW	Summer Capacity MW
DENTON ENERGY CENTER	18INR0013	DENTON	GAS	NORTH	2018	226	225.8
MIRAGE	17INR0022	HARRIS	GAS	HOUSTON	2018	11	11.0
STAKED PLAINS WIND 1	18INR0025	LYNN	WIND	WEST	2018	505	70.7
RIO BRAVO I WIND	17INR0005	STARR	WIND	SOUTH	2018	238	33.3
EDMONDSON RANCH WIND	18INR0043	GLASSCOCK	WIND	WEST	2019	293	41.0
HEART OF TEXAS WIND	18INR0016	MCCULLOCH	WIND	SOUTH	2018	150	21.0
STELLA 1 WIND	15INR0035	KENEDY	WIND-C	COASTAL	2018	201	118.6
PFLUGERVILLE SOLAR	15INR0090	TRAVIS	SOLAR	SOUTH	2018	120	90.0
WAYMARK SOLAR	16INR0115	PECOS	SOLAR	WEST	2018	182	136.5
TOTAL						1,926	748

^{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.

5 A planned wind project (PAMPA WIND,500 MW) that was scheduled to be operational by Summer 2018 in the May CDR was recently cancelled.

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

- GIBBONS CREEK U1 (GIBCRK_GIB_CRG1) [470 MW] on 10/17/17. (Scheduled to return between May-June 2018)
- B M DAVIS STG U1 (B_DAVIS_B_DAVIG1) [330 MW] on 12/31/2017.
- SPENCER (STG U4, STG U5) [118 MW] as of 1/3/2018.

7 The following units moved from Operational status to Permanently Retired status:

PEARSALL (PEARSALL_PEAR_1, PEAR_2, PEAR_3) [61 MW] as of 8/1/2017.

8 The following units moved from Mothballed status to Permanently Retired:

- GREENS BAYOU STG U5 (GBY_GBY_5) [371 MW] as of 12/31/2017.
- S R BERTRON (SRB_SRBGT_2, SRB_SRB_G3, SRB_SRB_G4) [420 MW] as of 12/31/2017.

9 The following operational units are set to retire before the 2018 Summer season:

- MONTICELLO (MNSSES_UNIT1, MNSSES_UNIT2, MNSSES_UNIT3) [1,865 MW]. Retirement Date: 1/4/2018
- SANDOW (SDSSES_UNIT4, SD5SES_UNIT5) [1,200 MW]. Retirement Date: 1/11/2018
- BIG BROWN (BBSSES_UNIT1, BBSSES_UNIT2) [1,208 MW]. Retirement Date: 2/12/2018

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 6, Ancillary Services. These Resources may provide the following Ancillary Services: Responsive Reserve Service, Non-Spinning Reserve Service, Replacement Reserve Service, and Regulation 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

Any 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 Unit

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/53528/03-120717_Nodal.doc).

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

The methodology for developing this report is defined in Section 3.2.6 of the ERCOT Protocols (see: http://www.ercot.com/content/wcm/current_guides/53528/03-120717_Nodal.doc). ERCOT developed this report using data provided by resource developers and owners. Although ERCOT works to ensure that the data provided are as accurate and current as possible, it cannot independently verify all of the information. Information available to ERCOT as of December 15 is included in this report.

This CDR report reflects an updated long-term load forecast prepared in November 2017. The 2018 summer peak demand forecast is 72,974 MW. The 2018 forecast starts lower than the forecast prepared in late 2016 but ends higher, growing at an average annual growth rate of 1.7%. See the [2018 Long Term Hourly Peak Demand and Energy Forecast](http://www.ercot.com/content/wcm/lists/143010/2018_Long-Term_Hourly_Peak_Demand_and_Energy_Forecast_Final.pdf) report for more forecast details, available at http://www.ercot.com/content/wcm/lists/143010/2018_Long-Term_Hourly_Peak_Demand_and_Energy_Forecast_Final.pdf.

Based on the resource update, the 2018 summer planning reserve margin is projected to be 9.3%, a reduction of 9.6 percentage points compared to the reserve margin reported in the May 2017 CDR report. The decrease is primarily due to the retirement of the following units: Monticello 1-3, Sandow 4-5, Big Brown 1-2, Pearsall 1-3 — totaling 4,334 MW (summer rating). Other major resource changes include 1,143 MW of operational capacity being placed on extended outage or mothballed status, and delays in planned resources. The in-service dates for three planned gas-fired resources, totalling 1,193 MW, were delayed beyond summer 2018. Several planned renewable generation projects were delayed as well, with a total summer peak average capacity contribution of 881 MW. The total installed capacity of the delayed renewable projects is 3,488 MW. One wind project, with an installed capacity of 500 MW, was cancelled.

Since the release of the May 2017 CDR report, resources totaling 3,779 MW have been approved by ERCOT for commercial operations. Wind and solar resource installed capacity represents 1,451 MW of this total, translating to an expected summer peak average capacity contribution of 441 MW. Planned resources that became newly eligible for inclusion in this CDR report total 1,926 MW of installed capacity, including 1,387 MW of wind resource, 302 MW of solar resources, and 237 MW of gas resources.

As ERCOT receives information from generation owners about planned operational changes, it will incorporate this information in future CDR reports.

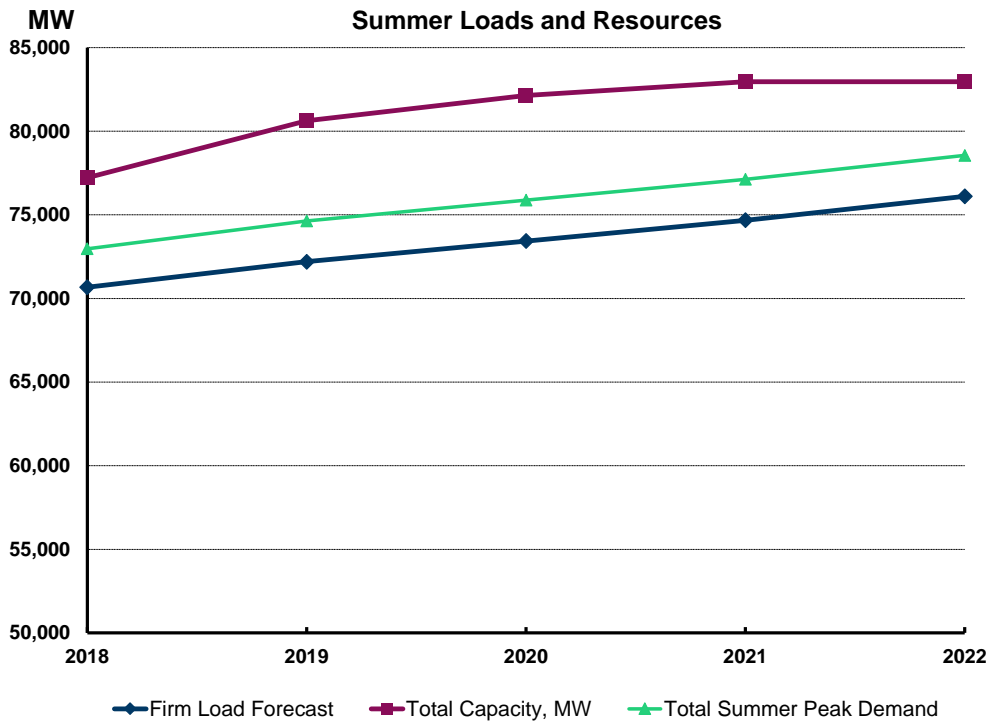
Report on the Capacity, Demand and Reserves in the ERCOT Region

Summer Summary: 2018-2022

Load Forecast, MW:	2018	2019	2020	2021	2022
Summer Peak Demand (based on normal weather)	72,974	74,639	75,879	77,125	78,556
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	1,589	1,848	2,108	2,366	2,623
Total Summer Peak Demand (before Reductions from Energy Efficiency Programs)	74,563	76,487	77,986	79,491	81,179
less: Load Resources providing Responsive Reserves	-1,119	-1,119	-1,119	-1,119	-1,119
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-979	-1,123	-1,123	-1,123	-1,123
less: TDSP Standard Offer Load Management Programs	-203	-203	-203	-203	-203
less: Energy Efficiency Program Savings Forecast	-1,589	-1,848	-2,108	-2,366	-2,623
Firm Peak Load, MW	70,674	72,194	73,434	74,681	76,111

Resources, MW:	2018	2019	2020	2021	2022
Installed Capacity, Thermal/Hydro	65,258	64,418	64,418	64,418	64,418
Switchable Capacity, MW	3,516	3,516	3,516	3,516	3,516
less: Switchable Capacity Unavailable to ERCOT, MW	-844	-844	-844	-544	-544
Available Mothballed Capacity, MW	118	118	118	118	118
Capacity from Private Use Networks	3,341	3,270	3,241	3,301	3,301
Non-Coastal Wind, Peak Average Capacity Contribution (14%)	2,493	2,493	2,493	2,493	2,493
Coastal Wind, Peak Average Capacity Contribution (59%)	1,411	1,411	1,411	1,411	1,411
Solar Utility-Scale, Peak Average Capacity Contribution (75%)	753	753	753	753	753
RMR Capacity to be under Contract	0	0	0	0	0
Operational Generation Capacity, MW	76,045	75,134	75,105	75,465	75,465
Capacity Contribution - Non-Synchronous Ties, MW	389	389	389	389	389
Planned Thermal Resources with Signed IA, Air Permits and Water Rights, MW	130	2,923	3,708	4,032	4,032
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (14%)	152	719	1,069	1,069	1,069
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (59%)	135	438	544	544	544
Planned Solar Utility-Scale, Peak Average Capacity Contribution (75%)	367	1,013	1,314	1,464	1,464
Total Capacity, MW	77,218	80,617	82,129	82,963	82,963

Reserve Margin 9.3% 11.7% 11.8% 11.1% 9.0%
 (Total Resources - Firm Load Forecast) / Firm Load Forecast



Summer Fuel Types - ERCOT

Fuel type is based on the primary fuel. Capacity contribution of the wind resources is included at 14% for Non-Coastal and 59% for Coastal counties, while the solar capacity contribution is 75%. 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	2018	2019	2020	2021	2022
Biomass	100%	202	202	202	202	202
Coal	100%	15,511	14,671	14,671	14,671	14,671
Gas	100%	50,230	52,952	53,708	54,692	54,692
Nuclear	100%	4,960	4,960	4,960	4,960	4,960
Other	100%	389	389	389	389	389
Hydro	84%	467	467	467	467	467
Wind	14%	2,645	3,213	3,562	3,562	3,562
Wind-C	59%	1,546	1,849	1,955	1,955	1,955
Solar	75%	1,120	1,766	2,067	2,217	2,217
Storage	0%	-	-	-	-	-
Total		77,069	80,468	81,980	83,114	83,114

In Percentages

Fuel_Type	2018	2019	2020	2021	2022
Biomass	0.3%	0.3%	0.2%	0.2%	0.2%
Coal	20.1%	18.2%	17.9%	17.7%	17.7%
Natural Gas	65.2%	65.8%	65.5%	65.8%	65.8%
Nuclear	6.4%	6.2%	6.1%	6.0%	6.0%
Other	0.5%	0.5%	0.5%	0.5%	0.5%
Hydro	0.6%	0.6%	0.6%	0.6%	0.6%
Wind	3.4%	4.0%	4.3%	4.3%	4.3%
Wind-C	2.0%	2.3%	2.4%	2.4%	2.4%
Solar	1.5%	2.2%	2.5%	2.7%	2.7%
Storage	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

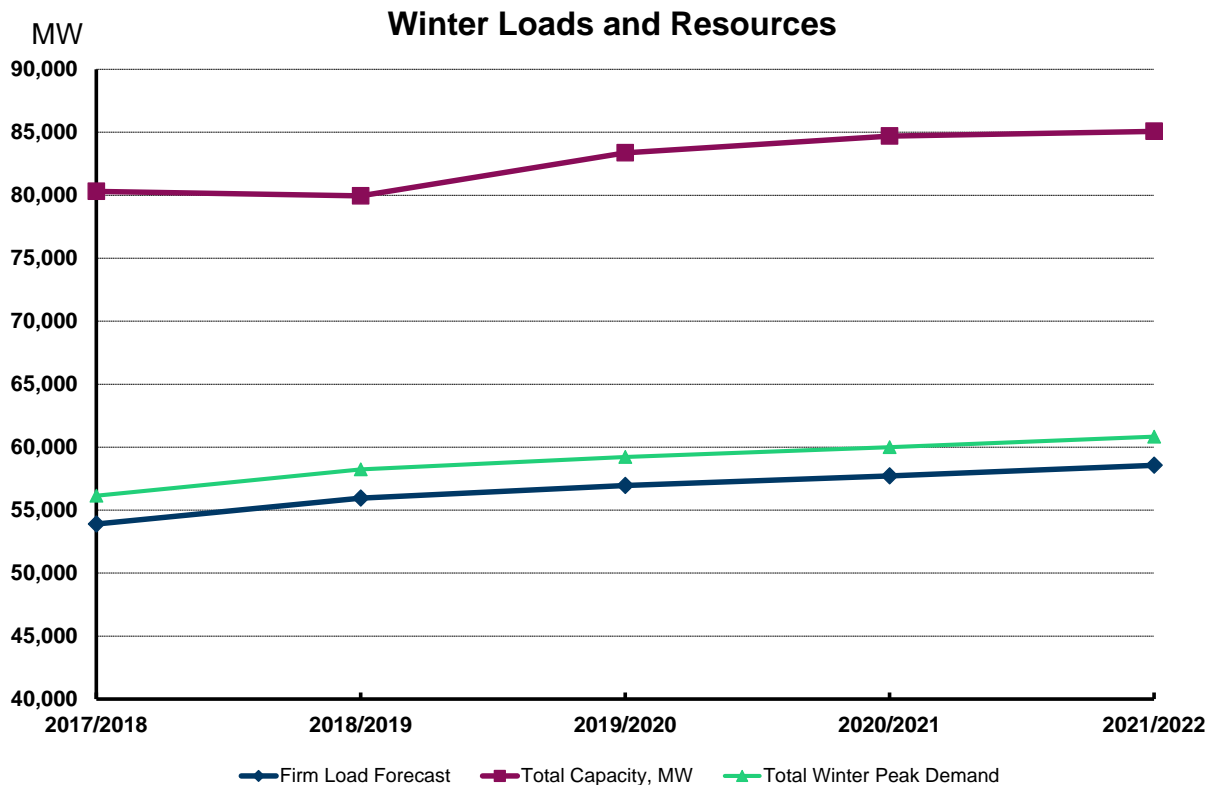
Report on the Capacity, Demand and Reserves in the ERCOT Region

Winter Summary: 2017/2018 through 2021/2022

Load Forecast, MW:	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Winter Peak Demand (based on normal weather)	56,143	58,229	59,222	59,991	60,833
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	1,589	1,848	2,108	2,366	2,623
Total Winter Peak Demand (before Reductions from Energy Efficiency Programs)	57,732	60,078	61,330	62,357	63,457
less: Load Resources providing Responsive Reserves	-1,348	-1,348	-1,348	-1,348	-1,348
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-899	-928	-928	-928	-928
less: TDSP Standard Offer Load Management Programs	0	0	0	0	0
less: Energy Efficiency Program Savings Forecast	-1,589	-1,848	-2,108	-2,366	-2,623
Firm Peak Load, MW	53,896	55,953	56,947	57,715	58,558

Resources, MW:	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Installed Capacity, Thermal/Hydro	68,777	67,199	67,199	67,199	67,199
Switchable Capacity	3,736	3,736	3,736	3,736	3,736
less: Switchable Capacity Unavailable to ERCOT	-858	-858	-858	-858	-558
Available Mothballed Capacity	118	118	118	118	118
Capacity from Private Use Networks	3,561	3,557	3,486	3,457	3,517
Non-Coastal Wind, Peak Average Capacity Contribution (20%)	3,562	3,562	3,562	3,562	3,562
Coastal Wind, Peak Average Capacity Contribution (42%)	1,004	1,004	1,004	1,004	1,004
Solar Utility-Scale, Peak Average Capacity Contribution (9.8%)	98	98	98	98	98
RMR Capacity to be under Contract	0	0	0	0	0
Operational Generation Capacity, MW	79,999	78,417	78,346	78,317	78,677
Capacity Contribution - Non-Synchronous Ties	166	166	166	166	166
Planned Resources (not wind or solar) with Signed IA, Air Permits and Water Rights	0	746	3,014	4,123	4,123
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (20%)	46	454	1,309	1,527	1,527
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (42%)	96	96	387	387	387
Planned Solar Utility-Scale, Peak Average Capacity Contribution (9.8%)	0	73	152	172	191
Total Capacity, MW	80,307	79,951	83,374	84,691	85,071

Reserve Margin (Total Resources - Firm Load Forecast) / Firm Load Forecast	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
	49.0%	42.9%	46.4%	46.7%	45.3%



UNIT NAME	GENERATION INTERCONNECTION PROJECT CODE	UNIT CODE	COUNTY	FUEL	ZONE	IN-SERVICE YEAR	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
							458.0	2,498.6	7,467.0	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5
720 Planned Capacity Total (Wind)							458.0	2,498.6	7,467.0	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5	8,554.5
721																	
722 Planned Wind Capacity Sub-total (Non-Coastal Counties)		WIND_PLANNED_NC					230.0	2,270.6	6,545.1	7,632.6	7,632.6	7,632.6	7,632.6	7,632.6	7,632.6	7,632.6	7,632.6
723 Wind Peak Average Capacity Percentage (Non-Coastal)		WIND_PL_PEAK_PCT_NC	%				20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
724																	
725 Planned Wind Capacity Sub-total (Coastal Counties)		WIND_PLANNED_C					228.0	228.0	921.9	921.9	921.9	921.9	921.9	921.9	921.9	921.9	921.9
726 Wind Peak Average Capacity Percentage (Coastal)		WIND_PL_PEAK_PCT_C	%				42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
727																	
728 Planned Solar Resources with Executed SGIA																	
729 FS BARILLA SOLAR 1B [HOVEY_UNIT2]	12INR0059b		PECOS	SOLAR	WEST	2017	-	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
730 SE BUCKTHORN WESTEX SOLAR (RIGGINS SOLAR)	15INR0045		PECOS	SOLAR	WEST	2018	-	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
731 NAZARETH SOLAR	16INR0049		CASTRO	SOLAR	PANHANDLE	2019	-	-	201.0	201.0	201.0	201.0	201.0	201.0	201.0	201.0	201.0
732 PECOS SOLAR POWER I	15INR0059		PECOS	SOLAR	WEST	2019	-	-	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0
733 BNB LAMESA SOLAR (PHASE I)	16INR0023		PECOS	SOLAR	WEST	2017	-	101.6	101.6	101.6	101.6	101.6	101.6	101.6	101.6	101.6	101.6
734 LAMESA SOLAR (PHASE II)	16INR0023b		DAWSON	SOLAR	WEST	2018	-	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
735 CAPRICORN RIDGE SOLAR	16INR0019		COKE	SOLAR	WEST	2018	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
736 CASTLE GAP SOLAR	16INR0065		UPTON	SOLAR	WEST	2018	-	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0
737 SOLAIREHOLMAN 1	15INR0061		BREWSTER	SOLAR	WEST	2018	-	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
738 RE MAPLEWOOD 2A SOLAR	17INR0020a		PECOS	SOLAR	WEST	2018	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
739 RE MAPLEWOOD 2B SOLAR	17INR0020b		PECOS	SOLAR	WEST	2019	-	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
740 RE MAPLEWOOD 2C SOLAR	17INR0020c		PECOS	SOLAR	WEST	2019	-	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
741 RE MAPLEWOOD 2D SOLAR	17INR0020d		PECOS	SOLAR	WEST	2020	-	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
742 RE MAPLEWOOD 2E SOLAR	17INR0020e		PECOS	SOLAR	WEST	2020	-	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
743 UPTON SOLAR	16INR0114		UPTON	SOLAR	WEST	2018	-	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
744 WEST OF PECOS SOLAR	14INR0044		REEVES	SOLAR	WEST	2018	-	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0
745 PFLUGERVILLE SOLAR	15INR0090		TRAVIS	SOLAR	SOUTH	2018	-	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
746 WAYMARK SOLAR	16INR0115		PECOS	SOLAR	WEST	2018	-	-	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
747 Planned Capacity Total (Solar)							-	741.0	1,552.0	1,752.0	1,952.0	1,952.0	1,952.0	1,952.0	1,952.0	1,952.0	1,952.0
748 Solar Peak Average Capacity Percentage		SOLAR_PL_PEAK_PCT	%				9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
749																	
750 Seasonal Mothballed Resources																	
751 N/A																	
752 Total Seasonal Mothballed Capacity							-	-	-	-	-	-	-	-	-	-	-
753																	
754 Mothballed Resources																	
755 SPENCER STG U4 (AS OF 1/3/2018)		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
756 SPENCER STG U5 (AS OF 1/3/2018)		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
757 B M DAVIS STG U1 (AS OF 12/31/2017)		B_DAVIS_B_DAVIC1	NUECES	GAS	COASTAL	1974	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0
758 GIBBONS CREEK U1 (AS OF 10/17/17; ENDING MID-MAY TO MID-JUNE 2018)		GIBCRK_GIB_CRG1	GRIMES	COAL	NORTH	1983	470.0	470.0	470.0	470.0	470.0	470.0	470.0	470.0	470.0	470.0	470.0
759 J T DEELY U1 (AS OF 12/31/2018)		CALAVERS_JTD1_M	BEXAR	COAL	SOUTH	1977	430.0	430.0	430.0	430.0	430.0	430.0	430.0	430.0	430.0	430.0	430.0
760 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
761 S R BERTRON U1 (SINCE 5/15/2013)		SRB_SRB_G1	HARRIS	GAS	HOUSTON	1958	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0
762 S R BERTRON U2 (SINCE 5/15/2013)		SRB_SRB_G2	HARRIS	GAS	HOUSTON	1956	174.0	174.0	174.0	174.0	174.0	174.0	174.0	174.0	174.0	174.0	174.0
763 Total Mothballed Capacity							2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0	2,060.0
764																	
765 Retiring Resources Unavailable to ERCOT (since last CDR/SARA)																	
766 GREENS BAYOU STG U5 (AS OF 12/31/2017)		GBY_GBY_5	HARRIS	GAS	HOUSTON	2016	371.0	371.0	371.0	371.0	371.0	371.0	371.0	371.0	371.0	371.0	371.0
767 S R BERTRON CTG 2 (AS OF 12/31/2017)		SRB_SRBGT_2	HARRIS	GAS	HOUSTON	1967	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
768 S R BERTRON U3 (AS OF 12/31/2017)		SRB_SRB_G3	HARRIS	GAS	HOUSTON	1959	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0
769 S R BERTRON U4 (AS OF 12/31/2017)		SRB_SRB_G4	HARRIS	GAS	HOUSTON	1960	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0
770 Total Retiring Capacity							806.0	806.0	806.0	806.0	806.0	806.0	806.0	806.0	806.0	806.0	806.0

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 42% for Coastal counties, while the solar capacity contribution is 9.8%. 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				
		2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Biomass	100%	202	202	202	202	202
Coal	100%	16,325	14,747	14,747	14,747	14,747
Gas	100%	53,144	53,886	56,083	57,163	57,823
Nuclear	100%	5,140	5,140	5,140	5,140	5,140
Other	100%	166	166	166	166	166
Hydro	78%	432	432	432	432	432
Wind	20%	3,608	4,016	4,871	5,088	5,088
Wind-C	42%	1,100	1,100	1,392	1,392	1,392
Solar	9.8%	98	171	250	270	290
Storage	0%	-	-	-	-	-
Total		80,215	79,859	83,282	84,599	85,279

Fuel_Type	In Percentages				
	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Biomass	0.3%	0.3%	0.2%	0.2%	0.2%
Coal	20.4%	18.5%	17.7%	17.4%	17.3%
Gas	66.3%	67.5%	67.3%	67.6%	67.8%
Nuclear	6.4%	6.4%	6.2%	6.1%	6.0%
Other	0.2%	0.2%	0.2%	0.2%	0.2%
Hydro	0.5%	0.5%	0.5%	0.5%	0.5%
Wind	4.5%	5.0%	5.8%	6.0%	6.0%
Wind-C	1.4%	1.4%	1.7%	1.6%	1.6%
Solar	0.1%	0.2%	0.3%	0.3%	0.3%
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

Cumulative Summer Capacity Contribution (in MW) of Resources Available by June 1 of the Reporting Year

Planned Resource Category

	2018	2019	2020	2021	2022
Commissioning Plan Submitted	448	772	772	772	772
Meets Planning Guide Sec. 6.9 Criteria (CDR-eligible plus Financial Security Posted and Notice-to-Proceed Given)	783	2,325	2,721	2,871	2,871
CDR-Eligible (signed IA, air permits received, proof of adequate water supplies provided)	783	5,093	6,634	7,108	7,108
Signed Interconnection Agreement with the TSP and Full Interconnection Study completed and accepted by ERCOT	783	3,649	3,871	3,871	3,871
Signed Interconnection Agreement with the TSP	783	7,035	11,329	12,674	12,674
Full Interconnection Study Requested	1,163	12,763	25,039	28,903	29,703

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-peak 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, 2023 Through Winter 2026/2027

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					
	2023	2024	2025	2026	2027
Load Forecast, MW:					
Summer Peak Demand (based on normal weather)	79,959	81,200	82,376	83,704	85,035
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	2,880	3,137	3,393	3,651	3,911
Total Summer Peak Demand (before Reductions from Energy Efficiency Programs)	82,838	84,337	85,769	87,354	88,946
less: Load Resources providing Responsive Reserves	-1,119	-1,119	-1,119	-1,119	-1,119
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-1,123	-1,123	-1,123	-1,123	-1,123
less: TDSP Standard Offer Load Management Programs	-203	-203	-203	-203	-203
less Energy Efficiency Programs	-2,880	-3,137	-3,393	-3,651	-3,911
Firm Peak Load, MW	77,514	78,756	79,931	81,259	82,591
Resources, MW:					
Installed Capacity, Thermal/Hydro	64,418	64,418	64,418	64,418	64,418
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	118	118	118	118	118
Capacity from Private Use Networks	3,291	3,291	3,291	3,291	3,291
Non-Coastal Wind, Peak Average Capacity Contribution (14%)	2,493	2,493	2,493	2,493	2,493
Coastal Wind, Peak Average Capacity Contribution (59%)	1,411	1,411	1,411	1,411	1,411
Solar Utility-Scale, Peak Average Capacity Contribution (75%)	753	753	753	753	753
RMR Capacity to be under Contract	0	0	0	0	0
Operational Generation Capacity, MW	75,455	75,455	75,455	75,455	75,455
Capacity Contribution - Non-Synchronous Ties, MW	389	389	389	389	389
Planned Thermal Resources with Signed IA, Air Permits and Water Rights, MW	4,032	4,032	4,032	4,032	4,032
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (14%)	1,069	1,069	1,069	1,069	1,069
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (59%)	544	544	544	544	544
Planned Solar Utility-Scale, Peak Average Capacity Contribution (75%)	1,464	1,464	1,464	1,464	1,464
Total Capacity, MW	82,953	82,953	82,953	82,953	82,953
Reserve Margin	7.0%	5.3%	3.8%	2.1%	0.4%
(Total Resources - Firm Load Forecast) / Firm Load Forecast					

Winter

Load Forecast, MW:	<u>2022/2023</u>	<u>2023/2024</u>	<u>2024/2025</u>	<u>2025/2026</u>	<u>2026/2027</u>
Winter Peak Demand (based on normal weather)	61,742	62,591	63,349	64,143	64,999
plus: Energy Efficiency Program Savings Forecast, per Utilities Code Section 39.905 (b-4)	2,880	3,137	3,393	3,651	3,911
Total Winter Peak Demand (before Reductions from Energy Efficiency Programs)	64,622	65,728	66,742	67,794	68,910
less: Load Resources providing Responsive Reserves	-1,348	-1,348	-1,348	-1,348	-1,348
less: Load Resources providing Non-Spinning Reserves	0	0	0	0	0
less: Emergency Response Service (10- and 30-min ramp products)	-928	-928	-928	-928	-928
less: TDSP Standard Offer Load Management Programs	0	0	0	0	0
less Energy Efficiency Programs	-2,880	-3,137	-3,393	-3,651	-3,911
Firm Peak Load, MW	59,466	60,315	61,073	61,867	62,723
Resources, MW:	<u>2022/2023</u>	<u>2023/2024</u>	<u>2024/2025</u>	<u>2025/2026</u>	<u>2026/2027</u>
Installed Capacity, Thermal/Hydro	67,199	67,199	67,199	67,199	67,199
Switchable Capacity, MW	3,736	3,736	3,736	3,736	3,736
less: Switchable Capacity Unavailable to ERCOT, MW	-558	-558	-558	-558	-558
Available Mothballed Capacity, MW	118	118	118	118	118
Capacity from Private Use Networks	3,517	3,507	3,507	3,507	3,507
Non-Coastal Wind, Peak Average Capacity Contribution (20%)	3,562	3,562	3,562	3,562	3,562
Coastal Wind, Peak Average Capacity Contribution (42%)	1,004	1,004	1,004	1,004	1,004
Solar Utility-Scale, Peak Average Capacity Contribution (9.8%)	98	98	98	98	98
RMR Capacity to be under Contract	0	0	0	0	0
Operational Generation Capacity, MW	78,677	78,667	78,667	78,667	78,667
Capacity Contribution - Non-Synchronous Ties, MW	166	166	166	166	166
Planned Thermal Resources with Signed IA, Air Permits and Water Rights, MW	4,123	4,123	4,123	4,123	4,123
Planned Non-Coastal Wind with Signed IA, Peak Average Capacity Contribution (20%)	1,527	1,527	1,527	1,527	1,527
Planned Coastal Wind with Signed IA, Peak Average Capacity Contribution (42%)	387	387	387	387	387
Planned Solar Utility-Scale, Peak Average Capacity Contribution (9.8%)	191	191	191	191	191
Total Capacity, MW	85,071	85,061	85,061	85,061	85,061
Reserve Margin	43.1%	41.0%	39.3%	37.5%	35.6%
(Total Resources - Firm Load Forecast) / Firm Load Forecast					