**Seasonal Assessment of Resource Adequacy for the ERCOT Region**
**Winter 2011-2012**

Released December 1, 2011

## SUMMARY

The ERCOT Region should have sufficient installed generating capacity for the Winter 2011/2012 season to cover peak demands resulting from normal or extreme weather conditions with a historically-typical amount of generation outages. However, if extreme weather results in a significantly-higher than normal number of forced generation outages and high electrical demand, the ERCOT system could have insufficient resources available to serve that demand. This insufficiency would result in the need for rotating outages to maintain the integrity of the system as a whole.

In addition, the continuing drought has resulted in the water sources for over 11,000 MW of generation to be at historically-low levels. Low water levels could result in some portion of this generating capacity becoming unavailable during the winter. Such unavailability would reduce the severity of forced outages or demand at which rotating outages could be required.

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## Range of Likely Risks

| | | | |
|---|---|---|---|
| | Installed Capacity, MW | 64,363 | Based on current Seasonal Maximum Sustainable Limits reported through Registration process |
| | Planned Units (not wind) with Signed IA and Air Permit, MW | 30 | Based on in-service dates provided by developers of generation resources |
| | Capacity from Private Networks, MW | 4,390 | Based on actual net PUN output during non-EEA periods of August 2011 |
| | Switchable Units, MW | 3,168 | Installed capacity of units that can switch to other Regions |
| | less Switchable Units Unavailable to ERCOT, MW | (317) | Based on survey response of Switchable Unit owners |
| | RMR Units to be under Contract, MW | - | |
| | Effective Load-Carrying Capability (ELCC) of Wind Generation, MW | 834 | Based on 8.7% of installed capacity (Effective Load Carrying Capability) of wind per Planning Guide Section 8 |
| | ELCC of Planned Wind Units with Signed IA, MW | - | Based on in-service dates provided by developers of generation resources |
| | 50% of Non-Synchronous Ties, MW | 553 | Based on 50% of installed capacity of ties, per Planning Guide Section 8 |
| a | **Total Resources, MW** | **73,021** | |
| b | **Winter Peak Demand, MW** | **53,562** | Updated 50% Probability forecast based on recent Moody's economic forecast and revised weather profile including 2011 impacts |
| c | **Reserve Capacity (a -b), MW** | **19,459** | |

| | | Base Case | Extreme Conditions | Extreme/ Full Drought Impact * | * - Column added due to current drought risk |
|---|---|---|---|---|---|
| | Extreme Load Range | - | 6,427 | 6,427 | |
| | Typical Maintenance Outages | 5,268 | 5,268 | 5,268 | |
| | 90th Percentile Maintenance Outages | - | 4,244 | 4,244 | |
| | Typical Forced Outages | 3,759 | 3,759 | 3,759 | |
| | 90th Percentile Forced Outages | | 2,645 | 2,645 | |
| | Forced Outages due to Drought (minimum) | 24 | 24 | | |
| | Forced Outages due to Drought (maximum) | - | | 11,464 | |
| d | **Total Uses of Reserve Capacity** | **9,051** | **22,367** | **33,807** | |
| e | **Capacity Available for Operating Reserves (c-d), MW** | **10,408** | **(2,908)** | **(14,348)** | |
| | Less than 2300 MW indicates risk of EEA1 | | | | |

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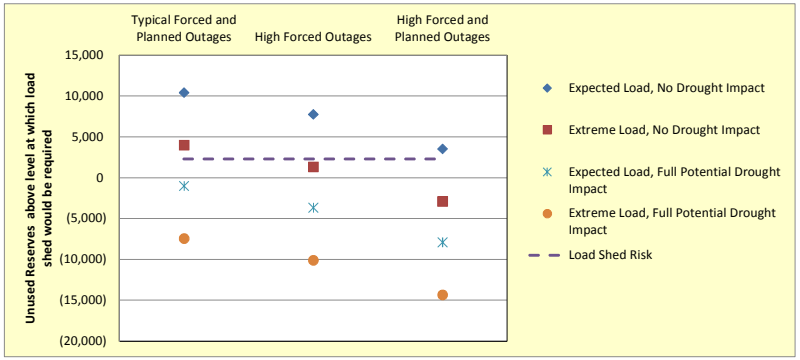
## Analysis of All Sensitivities

| | | | |
|---|---|---|---|
| | Installed Capacity, MW | 64,363 | Based on current Seasonal Maximum Sustainable Limits reported through Registration process |
| | Planned Units (not wind) with Signed IA and Air Permit, MW | 30 | Based on in-service dates provided by developers of generation resources |
| | Capacity from Private Networks, MW | 4,390 | Based on actual net PUN output during non-EEA periods of August 2011 |
| | Switchable Units, MW | 3,168 | Installed capacity of units that can switch to other Regions |
| | less Switchable Units Unavailable to ERCOT, MW | (317) | Based on survey response of Switchable Unit owners |
| | RMR Units to be under Contract, MW | - | |
| | Effective Load-Carrying Capability (ELCC) of Wind Generation, MW | 834 | Based on 8.7% of installed capacity (Effective Load Carrying Capability) of wind per Planning Guide Section 8 |
| | ELCC of Planned Wind Units with Signed IA, MW | - | Based on in-service dates provided by developers of generation resources |
| | 50% of Non-Synchronous Ties, MW | 553 | Based on 50% of installed capacity of ties, per Planning Guide Section 8 |
| a | **Total Resources, MW** | **73,021** | |
| b | **Winter Peak Demand, MW** | **53,562** | Updated 50% Probability forecast based on recent Moody's economic forecast and revised weather profile including 2011 impacts |
| c | **Reserve Capacity (a -b), MW** | **19,459** | |

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Expected Load, No Drought Impact** | | | **Extreme Load, No Drought Impact** | | | **Expected Load, Full Potential Drought Impact** | | | **Extreme Load, Full Potential Drought Impact** | | |
| | | **Typical Forced and Planned Outages** | **High Forced Outages** | **High Forced and Planned Outages** | **Typical Forced and Planned Outages** | **High Forced Outages** | **High Forced and Planned Outages** | **Typical Forced and Planned Outages** | **High Forced Outages** | **High Forced and Planned Outages** | **Typical Forced and Planned Outages** | **High Forced Outages** | **High Forced and Planned Outages** |
| | | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** | **19,459** |
| | Extreme Load Range | - | - | - | 6,427 | 6,427 | 6,427 | - | - | - | 6,427 | 6,427 | 6,427 |
| | Typical Maintenance Outages | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 | 5,268 |
| | 90th Percentile Maintenance Outages | | | 4,244 | | | 4,244 | | | 4,244 | | | 4,244 |
| | Typical Forced Outages | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 | 3,759 |
| | 90th Percentile Forced Outages | | 2,645 | 2,645 | | 2,645 | 2,645 | | 2,645 | 2,645 | | 2,645 | 2,645 |
| | Forced Outages due to Drought (minimum) | 24 | 24 | 24 | 24 | 24 | 24 | | | | | | |
| | Forced Outages due to Drought (maximum) | | | | | | | 11,464 | 11,464 | 11,464 | 11,464 | 11,464 | 11,464 |
| d | **Total Uses of Reserve Capacity, MW** | **9,051** | **11,696** | **15,940** | **15,478** | **18,123** | **22,367** | **20,491** | **23,136** | **27,380** | **26,918** | **29,563** | **33,807** |
| e | **Capacity Available for Operating Reserves (c-d), MW** | **10,408** | **7,763** | **3,519** | **3,981** | **1,336** | **(2,908)** | **(1,032)** | **(3,677)** | **(7,921)** | **(7,459)** | **(10,104)** | **(14,348)** |
| | Less than 2300 MW indicates risk of EEA1 | | | | | | | | | | | | |



## Winter Inputs

| | 2012 | |
|---|---|---|
| **Load Forecast:** | | |
| Total Summer Peak Demand, MW | 53,562 | Updated 50% Probability forecast based on recent Moody's economic forecast and revised weather profile including 2011 impacts |
| less Energy Efficiency Programs (per SB1125) | 119 | Projected based on SB1125 assuming that 50% of the energy efficiency target is included in the model |
| less LAARs Serving as Responsive Reserve, MW | 1,038 | Projected based on Planning Guide Section 8 |
| less Emergency Interruptible Load Service | 420 | Projected based on Planning Guide Section 8 |
| Firm Load Forecast, MW | 51,985 | |
| **Resources:** | | |
| Installed Capacity, MW | 64,363 | Based on current Seasonal Maximum Sustainable Limits reported through Registration process |
| Capacity from Private Networks, MW | 4,390 | Based on actual net PUN output during non-EEA periods of August 2011 |
| ELCC* of Wind Generation, MW | 834 | Based on 8.7% of installed capacity (Effective Load Carrying Capability) of wind per Planning Guide Section 8 |
| RMR Units to be under Contract, MW | - | |
| Operational Generation, MW | 69,587 | |
| Non-Synchronous Ties, MW | 553 | Based on 50% of installed capacity of ties, per Planning Guide Section 8 |
| Switchable Units, MW | 3,168 | Installed capacity of units that can switch to other Regions |
| Available Mothballed Generation , MW | 496 | Based on sum of Installed Capacity of each Mothballed Unit times Probability of Return to Service from survey response by owner of the Unit |
| Planned Units (not wind) with IA and Air Permit, MW | 30 | Based on in-service dates provided by developers of generation resources |
| ELCC* of Planned Wind Units with Signed IA, MW | - | Based on in-service dates provided by developers of generation resources |
| Total Resources, MW | 73,834 | |
| less Switchable Units Unavailable to ERCOT, MW | 317 | Based on survey response of Switchable Unit owners |
| less future Unit Retirements, MW | - | |
| Resources, MW | 73,517 | |
| **Reserve Margin** (Resources - Firm Load Forecast)/Firm Load Forecast | 41.42% | |

*Effective Load-Carrying Capability

| Scenario Inputs | | | |
|---|---|---|---|
| | Expected Load Adder | - | |
| | Extreme Load Adder | 6,427 | Based on load forecast using actual extreme weather year (2011) temperatures |
| | Typical Maintenance Outages | 5,268 | Based on average of historic planned outages for hour ending 7-10 of Dec,Jan,Feb weekdays |
| | 90th Percentile Maintenance Outages | 4,244 | Based on historic planned outages for hour ending 7-10 of Dec,Jan,Feb weekdays |
| | Typical Forced Outages | 3,759 | Based on average of historic forced and maint-level outages for hour ending 7-10 of Dec,Jan,Feb weekdays |
| | 90th Percentile Forced Outages | 2,645 | Based on historic forced and maint-level outages for hour ending 7-10 of Dec,Jan,Feb weekdays |
| | Low Wind | | |
| | Forced Outages due to Environmental Restrictions | | Monticello 1&2 mothballing already included in Installed Capacity |
| | Forced Outages due to Drought (minimum) | 24 | Current unavailability |
| | Forced Outages due to Drought (maximum) | 11,464 | MW of generation with water sources that are currently at historic lows |
| | **Total Uses of Reserves** | | |

**Seasonal Assessment of Resource Adequacy for the ERCOT Region**

## Background

The Seasonal Assessment of Resource Adequacy (SARA) report is a deterministic approach to considering the impact of potential variables that may impact the sufficiency of installed resources to meet the peak electrical demand on the ERCOT System during a particular season.

The standard approach to assessing resource adequacy for one or more years into the future is to account for projected load and resources on a normalized basis and to require sufficient reserves (resources in excess of peak demand, on this normalized basis) to cover the uncertainty in peak demand and resource availability to meet a one-in-ten-years loss-of-load event criteria on a probabilistic basis.

For seasonal assessments that look ahead less than a year, specific information may be available (such as seasonal climate forecasts or anticipated common-mode events such as drought) which can be used to consider the range of resource adequacy in a more deterministic manner.

The SARA report is intended to illustrate the range of resource adequacy outcomes that might occur. Several sensitivity analyses are developed by varying the value of certain parameters that affect resource adequacy. The variation in these parameters is either based on historic values of these parameters, adjusted by any known or expected change.