Resource Adequacy Assessment December Update

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TAC
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Context

- Capacity, Demand and Reserves (CDR) Report typically released in December and May
- Analysis of peak days this summer noted differences between May CDR inputs / assumptions and actual reserve availability during August 2011
- At the September Board meeting, ERCOT proposed several improvements to the CDR, as well as the creation of a new report – the *Seasonal Assessment of Resource Adequacy* (SARA) – to facilitate understanding of near-term risks
  - SARA would be based on most-current available projections of inputs
  - Inputs to SARA would be deterministic ranges; comparison would not be made to target reserve margin
- These concepts have continued to evolve over last two months, through discussions with the Generation Adequacy TF, the Regional Planning Group, and during the formulation of the reports

Outline

- **Capacity, Demand and Reserves (CDR) Update**
  - Changes since May 2011 CDR
  - Load Forecast
  - CDR
  - Interconnection Queue Project Status Update
- **Seasonal Assessment of Resource Adequacy (SARA) for Winter 2011/2012**
  - Sensitivities
  - Winter SARA
- **Release Schedule for future SARAs and CDRs**

Changes that affect Reserve Margin since June 2011 CDR (for Summer 2012)

The Peak Demand forecast has been updated (increase in Firm Load Forecast of 738 MW for 2012)

-1% reserve margin impact

Additional Mothballed Units	**Capacity (MW)**
Greens Bayou 5	-406
Midlothian 5	-225
Monticello 1	-565
Monticello 2	-565
Sam Bertron 3	-230
Sam Bertron 4	-230
Sam Bertron T2	-13
Change in Prob. Of Return %s	717
	-1517

Mothballed Units Returned to Service	
Spencer 4	61
Spencer 5	61
Sam Bertron 1	174
Sam Bertron 2	174
	470

Planned Units		
09INR0001-Sandy Creek 1	-925	Delayed
09INR0029-CFB Power Plant Units 11&12	-260	In-service, but zero net capacity to grid
11INR0086-RRE Austin Solar	-60	Delayed
08INR0011-Senate Wind Project	-13	Delayed 150 MW Unit at 8.7%
Misc DG Units	25	New
	-1234	

Changes to Unit Maximum Sustainable Limits reported in RARFs	
Net Change	**339**

Change to PUN Available Generation based on Aug 2011 Actuals		
Net Change	**-681**	Based on Aug 2011 Actual Output

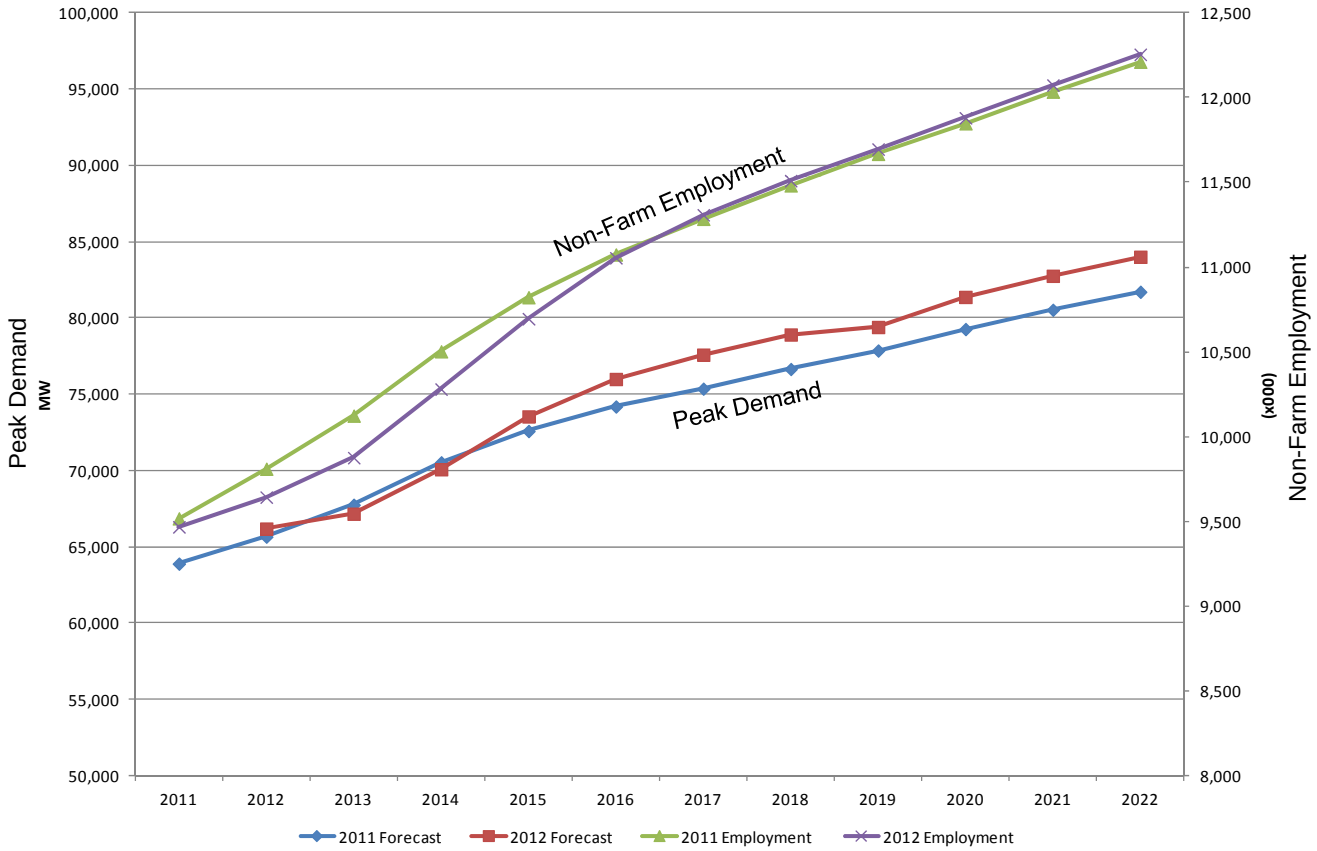
Total Change in Resources Available	**-2623**

-4% reserve margin impact

Jack County 2 (565MW) and Sherbino Mesa Wind 2 (150MW with ELCC of 13MW) moved from Planned to Installed)

Load Forecast

- **Updated economic forecast from Moody's**
  - Slower growth in near-term
- **Updated assessment of normal weather profile**



CDR Summary

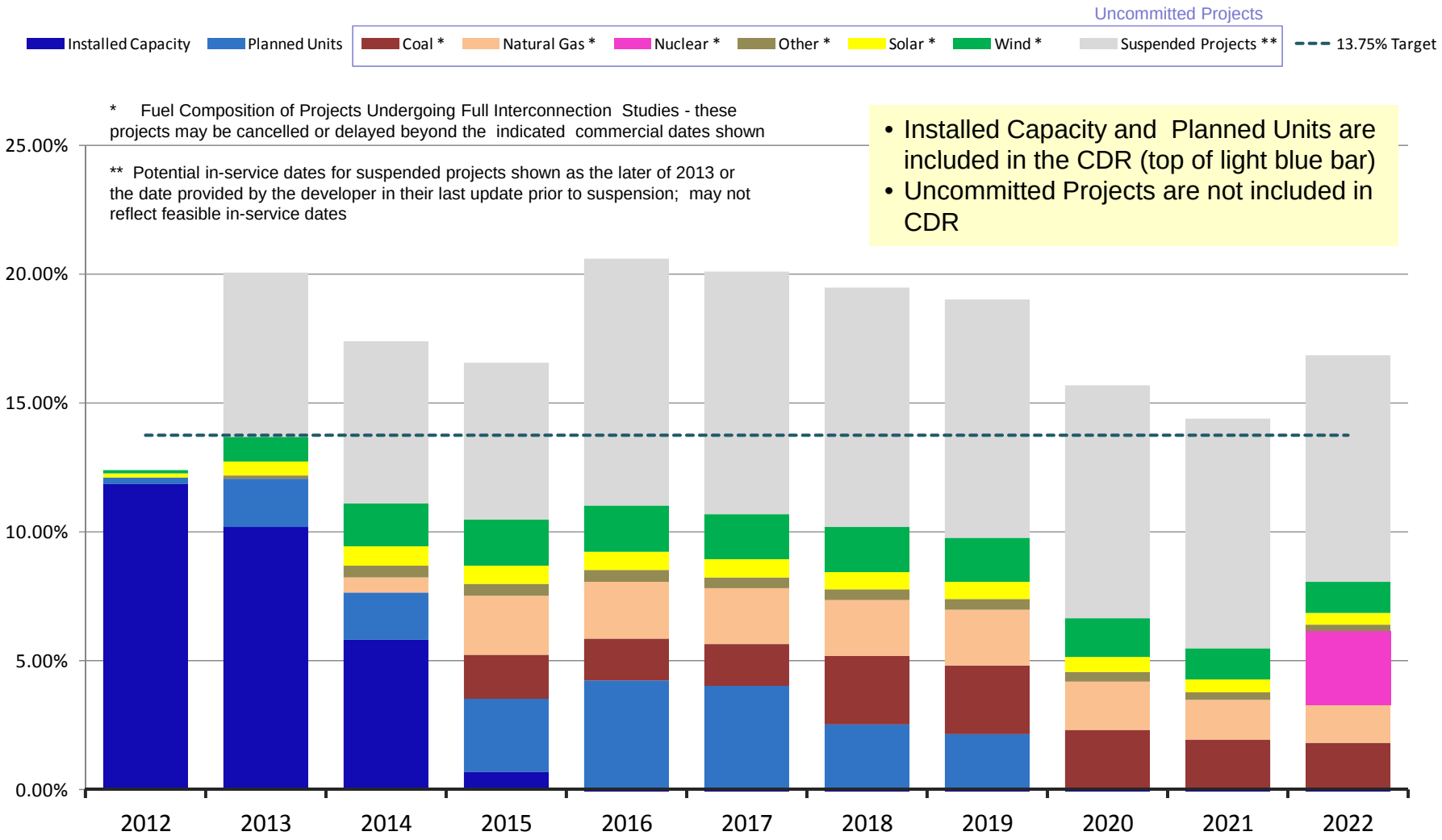
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Load Forecast:											
Summer Peak Demand (Normal weather basis), MW	66,195	67,168	70,087	73,552	76,001	77,596	78,919	79,411	81,382	82,765	84,013
less Energy Efficiency Programs (per SB1125)	119	240	366	498	635	775	917	1,060	1,206	1,355	1,506
less LAARs Serving as Responsive Reserve, MW	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
less Emergency Interruptible Load Service	420	462	509	559	615	677	745	819	901	991	1,000
Firm Load Forecast, MW	64,618	65,428	68,174	71,457	73,713	75,106	76,219	76,494	78,237	79,381	80,469
Resources:											
Installed Capacity, MW	63,025	63,025	63,025	63,025	63,025	63,025	63,025	63,025	63,025	63,025	63,025
Capacity from Private Networks, MW	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390
ELCC* of Wind Generation, MW	836	836	836	836	836	836	836	836	836	836	836
RMR Units to be under Contract, MW	-	-	-	-	-	-	-	-	-	-	-
Operational Generation, MW	68,251	68,251	68,251	68,251	68,251	68,251	68,251	68,251	68,251	68,251	68,251
Non-Synchronous Ties, MW	553	553	553	553	553	553	553	553	553	553	553
Switchable Units, MW	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962
Available Mothballed Generation , MW	826	651	690	509	570	592	592	592	592	592	592
Planned Units (not wind) with IA and Air Permit, MW	130	1,115	1,115	1,895	4,675	5,955	5,955	5,955	5,955	5,955	5,955
ELCC* of Planned Wind Units with Signed IA, MW	39	112	129	140	140	140	140	140	140	140	140
Total Resources, MW	72,761	73,644	73,700	74,309	77,150	78,453	78,453	78,453	78,453	78,453	78,453
less Switchable Units Unavailable to ERCOT, MW	317	317	317	317	317	317	317	317	317	-	-
less future Unit Retirements, MW	-	-	-	-	-	-	-	-	-	-	-
Resources, MW	72,444	73,327	73,383	73,992	76,833	78,136	78,136	78,136	78,136	78,453	78,453
Reserve Margin (Resources - Firm Load Forecast)/Firm Load Forecast	12.11%	12.07%	7.64%	3.55%	4.23%	4.03%	2.51%	2.15%	-0.13%	-1.17%	-2.51%

Generation Interconnection Queue Update

- **ERCOT requested each Transmission Service Provider (TSP) perform a comprehensive assessment/update of the current status of each of their assigned generation interconnection studies.**
- **Several studies had been cancelled, and others had been "suspended" by agreement between the TSP and the generation developer, but could be reactivated and completed by similar agreement.**
- **The table below shows the MW by fuel type of interconnection studies that were changed from "active" to either "cancelled" or "suspended" as a result of this survey:**

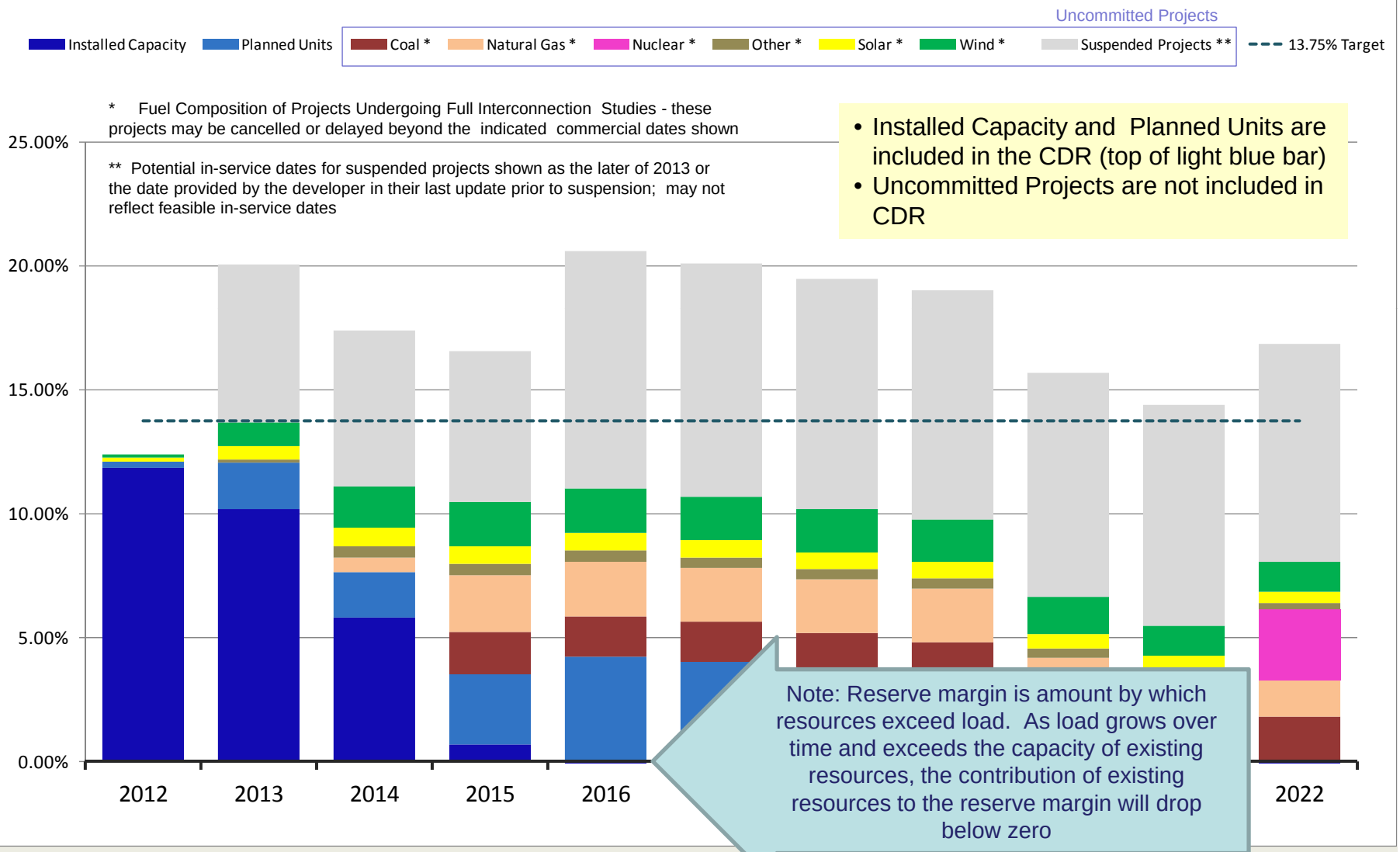
Fuel Type	Cancelled Studies (MW)	Suspended Studies (MW)
Gas-AllOther		
Gas-CombinedCycle	1,939	2,890
Total Gas	1,939	2,890
Nuclear		2,700
Coal		
Wind	4,525	12,554
Solar	236	353
Biomass		50
Other	700	
Grand Total	7,400	18,547

Reserve Margin, with Potential Resources from Queue



- Installed Capacity and Planned Units are included in the CDR (top of light blue bar)
- Uncommitted Projects are not included in CDR

Reserve Margin, with Potential Resources from Queue



Seasonal Assessment of Resource Adequacy (SARA) for Winter 2011/2012

SARA Concept

- **The Seasonal Assessment of Resource Adequacy (SARA) report is a deterministic approach to considering resource adequacy for a near-term season**
  - 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 – information that is not available for the long-term timeframe of the CDR.
- **The SARA report is intended to illustrate the range of resource adequacy outcomes that might occur. 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.

SARA Calculation

- **Calculate available reserves based on available resources (excluding resources that are only used in EEA) and normal weather load forecast from CDR**
- **Evaluate range of uses of reserves in a deterministic manner**
  - Uses of reserves:
    - Higher peak demands due to above normal weather
    - Forced generation outages
    - Planned generation outages
    - Atypical issues like drought
    - Lower wind availability
- **Determine the extent by which reserves exceed the uses of reserves, in comparison to the 2300 MW level at which EEA would be declared**

Boundary Scenarios

Seasonal Assessment of Resource Adequacy for the ERCOT Region

Winter 2011-2012

Draft 1 - Released December 1, 2011

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				

Future CDR and SARA Releases

- **CDR**
  - June release for Year+1 to Year+10 summer and winter (e.g. June 2012 release will not include 2012 summer)
  - December release Year+1 to Year+10 summer
  - This is same schedule as previous
- **SARA**
  - Preliminary release 3 ½ months prior to season and final release 1 ½ months prior to season
    - February 15th – release Final Spring 2012 SARA and Preliminary Summer 2012 SARA
    - April 15th – release Final Summer 2012 SARA
    - May 15th – release Preliminary Fall SARA
    - August 15th – release Final Fall SARA and Preliminary Winter SARA

Questions?