

PJM Load Model Selection for 2017 RRS

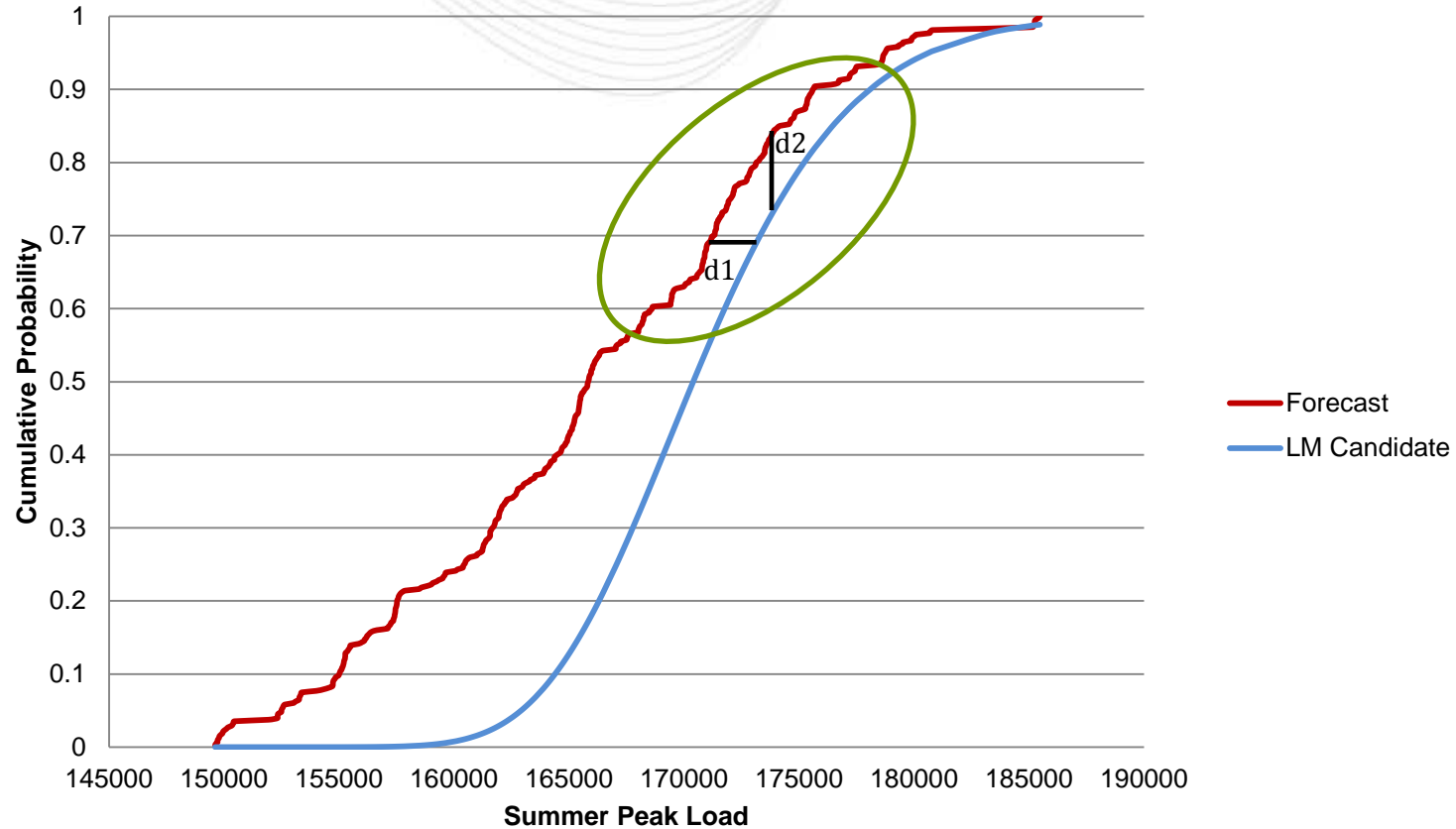
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Resource Adequacy Planning
Planning Committee
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- Load Model Selection is performed due to the fact that the Coincident Peak distributions from the PJM Load Forecast cannot be used directly in PRISM.
- Analysis is based on method approved at June 9, 2016 PC meeting (Appendix V in 2016 RRS Assumptions Letter):
 - Selected Load Model should be a good match of CP1 distribution from PJM load Forecast
 - Consideration of historical PJM / World load diversity
- This year the analysis is based on the 2017 Load Forecast Report. Focus is on 2021/22 Delivery Year.

- Additional considerations:
 - Include most recent data to capture load patterns
 - Include more historical years to reduce sensitivity from abnormal years

Peak Day (CP1) Cumulative Distribution

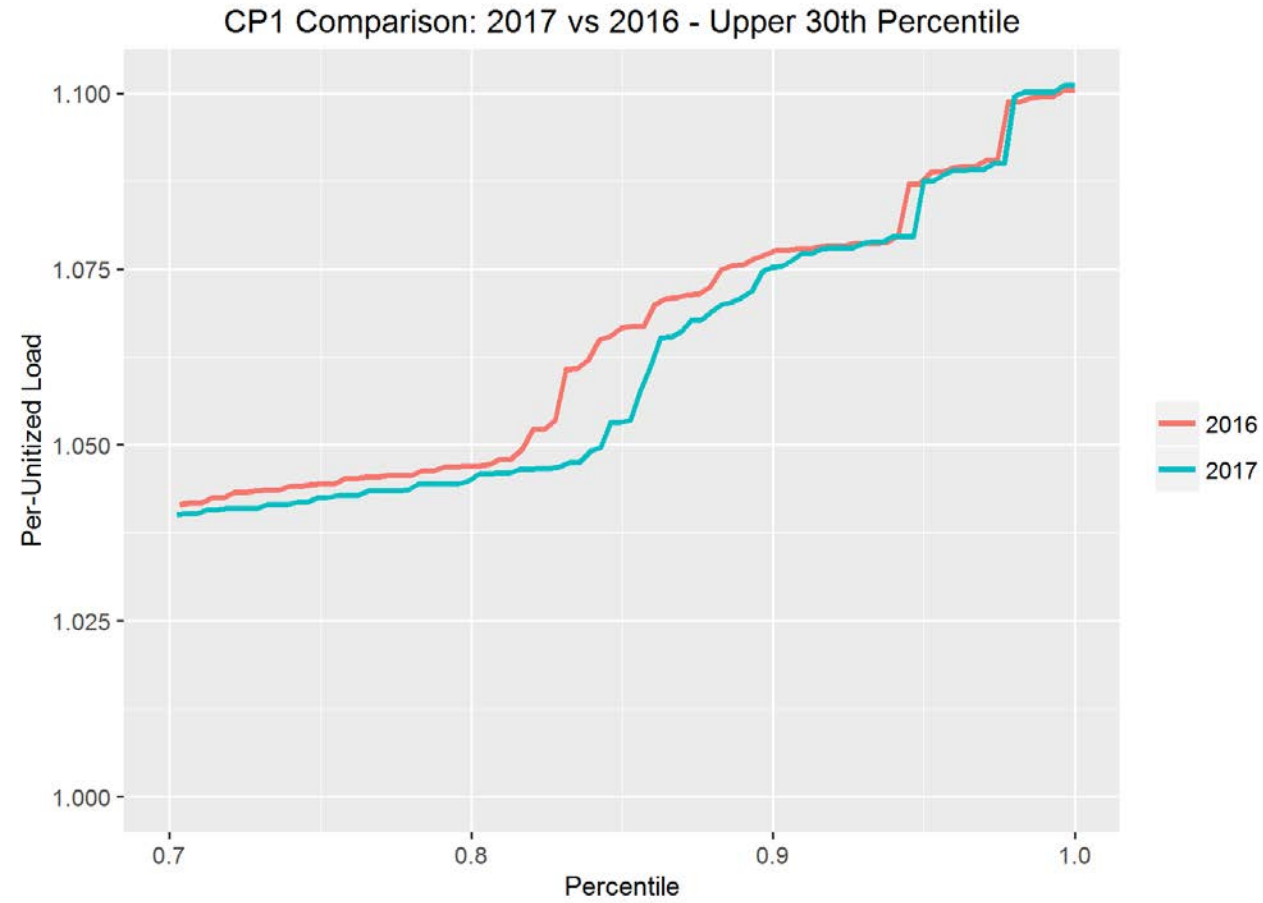




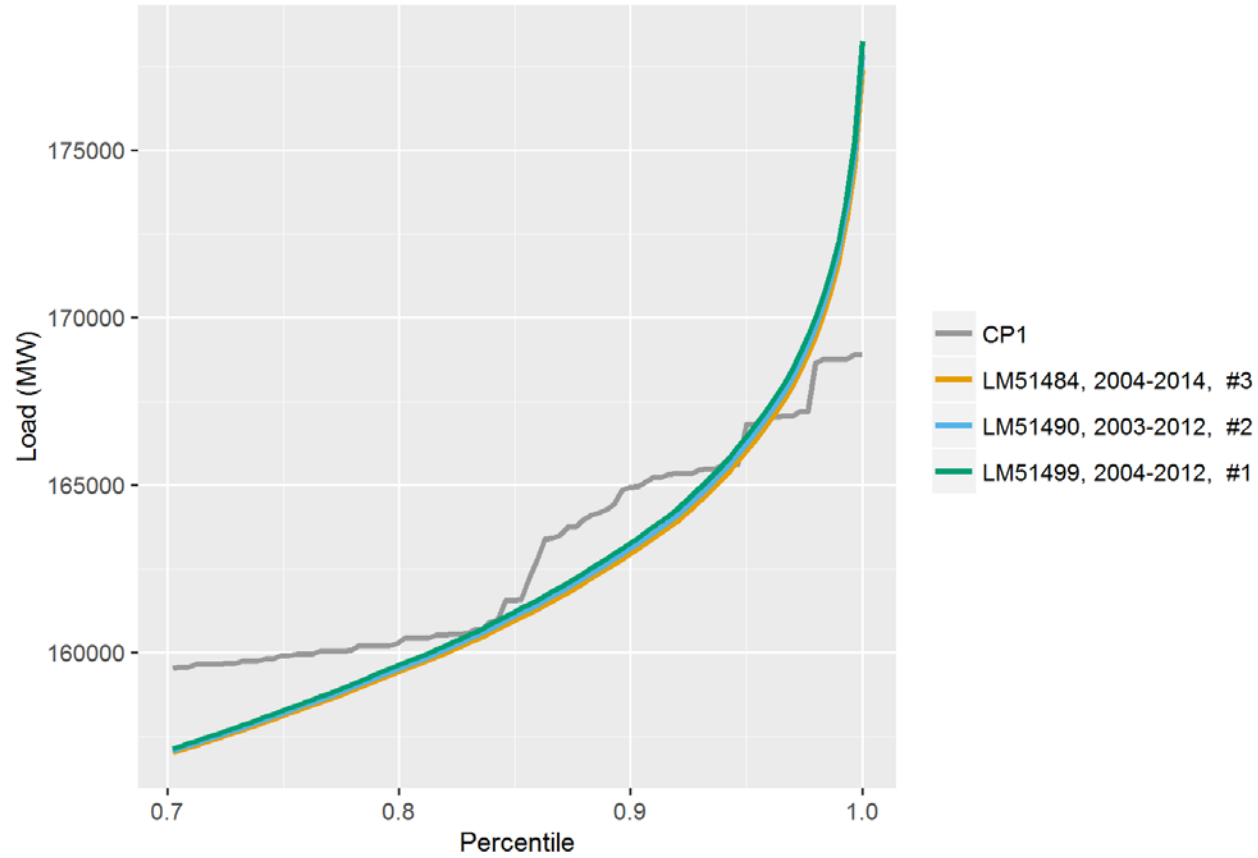
PJM Load Model Combinations to Assess

Load Model #	Description	Load Model #	Description
51456	1998-2014 17 Year LM	51490	2003-2012 10 Year LM
51457	1998-2013 16 Year LM	51491	2004-2013 10 Year LM
51458	1999-2014 16 Year LM	51492	2005-2014 10 Year LM
51460	1998-2012 15 Year LM	51493	1998-2006 9 Year LM
51461	1999-2013 15 Year LM	51494	1999-2007 9 Year LM
51462	2000-2014 15 Year LM	51495	2000-2008 9 Year LM
51463	1998-2011 14 Year LM	51496	2001-2009 9 Year LM
51464	1999-2012 14 Year LM	51497	2002-2010 9 Year LM
51465	2000-2013 14 Year LM	51498	2003-2011 9 Year LM
51466	2001-2014 14 Year LM	51499	2004-2012 9 Year LM
51467	1998-2010 13 Year LM	51500	2005-2013 9 Year LM
51468	1999-2011 13 Year LM	51501	2006-2014 9 Year LM
51469	2000-2012 13 Year LM	51502	1998-2005 8 Year LM
51470	2001-2013 13 Year LM	51503	1999-2006 8 Year LM
51471	2002-2014 13 Year LM	51504	2000-2007 8 Year LM
51472	1998-2009 12 Year LM	51505	2001-2008 8 Year LM
51473	1999-2010 12 Year LM	51506	2002-2009 8 Year LM
51474	2000-2011 12 Year LM	51507	2003-2010 8 Year LM
51475	2001-2012 12 Year LM	51508	2004-2011 8 Year LM
51476	2002-2013 12 Year LM	51509	2005-2012 8 Year LM
51477	2003-2014 12 Year LM	51510	2006-2013 8 Year LM
51478	1998-2008 11 Year LM	51511	2007-2014 8 Year LM
51479	1999-2009 11 Year LM	51512	1998-2004 7 Year LM
51480	2000-2010 11 Year LM	51513	1999-2005 7 Year LM
51481	2001-2011 11 Year LM	51514	2000-2006 7 Year LM
51482	2002-2012 11 Year LM	51515	2001-2007 7 Year LM
51483	2003-2013 11 Year LM	51516	2002-2008 7 Year LM
51484	2004-2014 11 Year LM	51517	2003-2009 7 Year LM
51485	1998-2007 10 Year LM	51518	2004-2010 7 Year LM
51486	1999-2008 10 Year LM	51519	2005-2011 7 Year LM
51487	2000-2009 10 Year LM	51520	2006-2012 7 Year LM
51488	2001-2010 10 Year LM	51521	2007-2013 7 Year LM
51489	2002-2011 10 Year LM	51522	2008-2014 7 Year LM

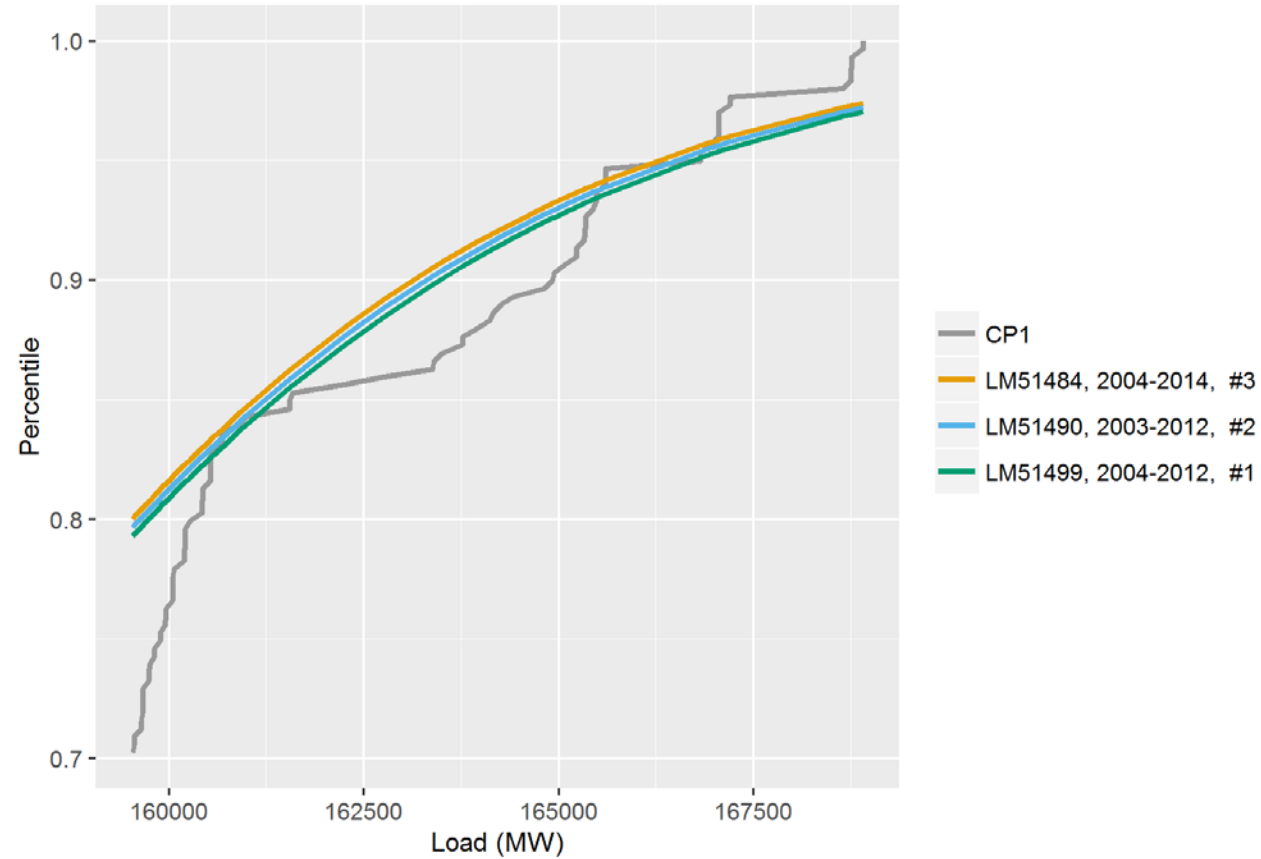
Load Forecast Model CP1 Distribution - 2016 vs 2017



Approach #1 Results



Approach #2 Results



- Load Model (LM) Choices
 - 51499: 2004-2012 9 YR LM
 - 51490: 2003-2012 10 YR LM
 - 51484: 2004-2014 11 YR LM
- Last year's selected LM (2003 – 2012) is one of the top candidates this year.
 - It is a close second place under both approaches.
 - It includes an additional year worth of load data compared to the best ranked LM (2004 – 2012).

- World Load Models were created using PLOTS program, observing the same historic time periods. In so doing, we consider the PJM/World diversity.
 - World Load Models use historic Coincident Peak pattern.
 - World defined as MISO, NY, TVA, and VACAR.



LM #51499 (2004-2012) - PJM vs World Assessment

		PJM RTO LM #51499 9 Yr Load Model - 2004 - 2012	World Region LM #51551
Month	WK #	Per-Unitized Peak	Per-Unitized Peak
June	5	0.8449	0.8819
June	6	0.9259	0.9462
June	7	0.9443	0.9590
July	8	0.8597	0.9113
July	9	0.8997	0.9530
July	10	1.0000	1.0000
July	11	0.9262	0.9705
August	12	0.9698	0.9981
August	13	0.9456	0.9536
August	14	0.8517	0.8759
August	15	0.8188	0.8671



LM #51490 (2003-2012) - PJM vs World Assessment

		PJM RTO LM #51490 10 Yr Load Model - 2003 - 2012	World Region LM #51552
Month	WK #	Per-Unitized Peak	Per-Unitized Peak
June	5	0.8299	0.8779
June	6	0.9443	0.9467
June	7	0.8934	0.9590
July	8	0.8734	0.9073
July	9	0.9034	0.9556
July	10	1.0000	1.0000
July	11	0.9303	0.9738
August	12	0.9698	0.9981
August	13	0.9457	0.9565
August	14	0.8687	0.8893
August	15	0.8375	0.8706



LM #51484 (2004-2014) - PJM vs World Assessment

		PJM RTO LM #51484 11 Yr Load Model - 2004 - 2014	World Region LM #51553
Month	WK #	Per-Unitized Peak	Per-Unitized Peak
June	5	0.8462	0.8827
June	6	0.9121	0.9468
June	7	0.9443	0.9590
July	8	0.8743	0.8891
July	9	0.9001	0.9282
July	10	1.0000	1.0000
July	11	0.9228	0.9446
August	12	0.9698	0.9981
August	13	0.9404	0.9868
August	14	0.8476	0.9038
August	15	0.8148	0.8721



Historical Peak Load Coincidence PJM / World

Year	PJM Peak - Actual Date	World Peak - Actual Date	Peak Coincidence?	CP1-5 Coincidence?
1998	21-Jul-98	21-Jul-98	Yes	No
1999	30-Jul-99	28-Jul-99	No	No
2000	9-Aug-00	31-Aug-00	No	No
2001	9-Aug-01	8-Aug-01	No	No
2002	1-Aug-02	1-Aug-02	Yes	No
2003	21-Aug-03	14-Aug-03	No	No
2004	3-Aug-04	2-Aug-04	No	No
2005	26-Jul-05	3-Aug-05	No	No
2006	2-Aug-06	1-Aug-06	No	No
2007	8-Aug-07	8-Aug-07	Yes	No
2008	9-Jun-08	21-Jul-08	No	No
2009	10-Aug-09	10-Aug-09	Yes	No
2010	7-Jul-10	4-Aug-10	No	No
2011	21-Jul-11	20-Jul-11	No	No
2012	17-Jul-12	17-Jul-12	Yes	No
2013	18-Jul-13	18-Jul-13	Yes	No
2014	7-Jan-14	7-Jan-14	Yes	No
2015	28-Jul-15	28-Jul-15	Yes	No

In the last 18 years, PJM and the World **have not peaked** on the same day 10 times.

		PJM RTO LM #51490 10 Yr Load Model - 2003 - 2012	World Region LM #51552
Month	WK #	Per-Unitized Peak	Per-Unitized Peak
July	8	0.8734	0.9073
July	9	0.9034	0.9556
July	10	1.0000	0.9738
July	11	0.9303	1.0000

World peak week is now on Week 11. Originally, it was in Week 10.

- PJM recommendation to PC on selection of historical time period for load model:
 - **Use 10yr (2003-2012, #51490) Load Model for 2017 RRS Base Case and switch World peak to a different July week so that PJM and World peak on the same month but not on the same week.**
 - It was used in the 2016 RRS.
 - It is a close second place under both approaches but it includes more load data than the load model occupying the first place.
 - Switch in World peak week is performed to match historical diversity observed between PJM and World.

- Endorsement of PJM recommendation to use the **10yr (2003-2012, #51490) Load Model including switch in World peak week for the 2017 RRS Base Case.**
- Recommendation was endorsed by Resource Adequacy Analysis Subcommittee (RAAS) with one objection and no abstentions.