Net Benefit Test Methodology Revision (FERC Order No.745)

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Market Mitigation and Analysis

Market Information Working Group

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Background

- NYISO presented an overview of the Net Benefit Test methodology on 12/06/2018 MIWG.
- NYISO discussed some challenges with the existing methodology and proposed solution.
- This presentation is intended to address stakeholders' comments on clarifying the proposed solution and providing more data and results.

Net Benefit Test Methodology

Definition of Time Periods

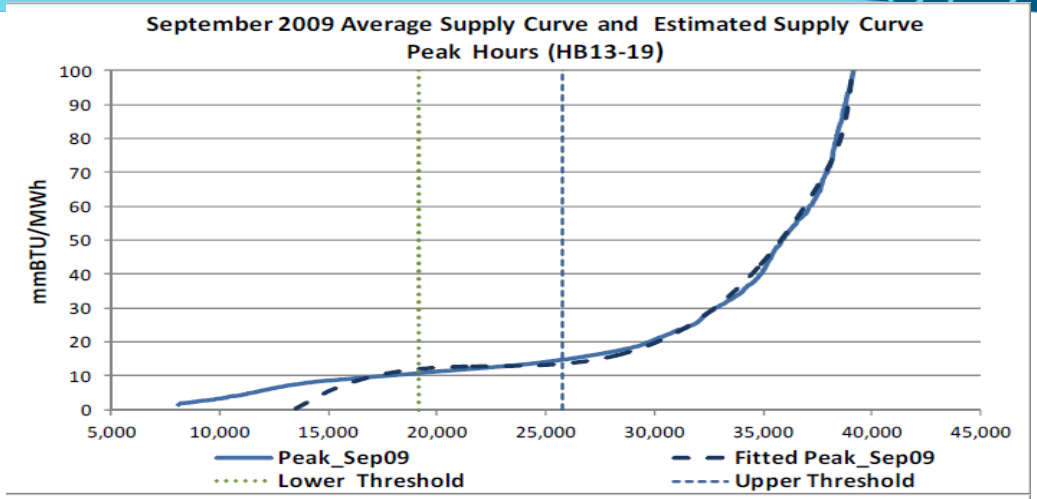
- Analysis Month/Publishing Month- Current month during which the analysis is done. *E.g.: February, 2019*
- Study Month – Next month for which the offer floor is being calculated. *E.g.: March, 2019*
- Reference Month – The study month of the previous year, the data used for analysis. *E.g. March, 2018*

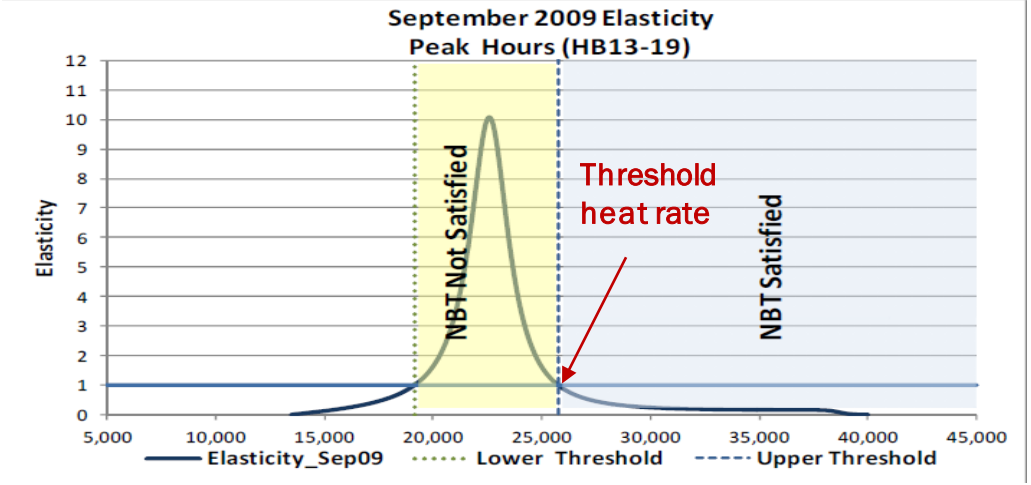
Net Benefit Test Methodology

- 1. Compile Supply Offers for the Reference Month.
- 2. Update Supply Offers for Changes in Resource Availability.
- 3. Create Hourly Supply Curves from Hourly Supply Offers.
- 4. Adjust Supply Offers for Changes in Fuel Prices.

Net Benefit Test Methodology

- 5. Create an Average Supply Curve from Hourly Heat Rate Supply Curves.
- 6. Smooth the Average Supply Curve using a numerical method.
- 7. Identify Heat Rate Net Benefit Threshold.
- 8. Calculate Net Benefit Threshold LBMP.





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Methodology Limitation and Revision

Research Background

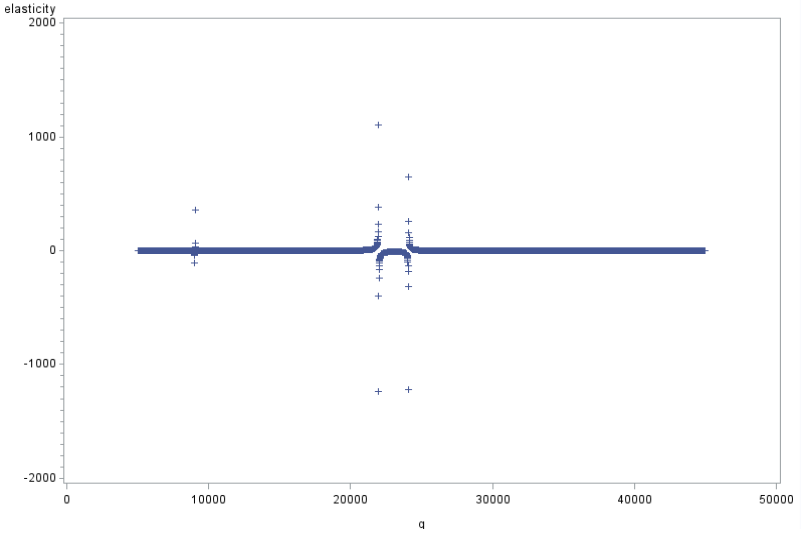
- The Net Benefit Test Methodology was originally filed in on August 19, 2011. The methodology was later provided as Tech Bulletin 245.
- The background research for developing the methodology was done using 2009-2011 data.
- The research found that, although the raw offers can range between -$1,000 and $1,000 the model fits the data well within a specific offer range.
- The best model fit is obtained by limiting the offers to a range where majority of the offers is expected to fall (>90%).

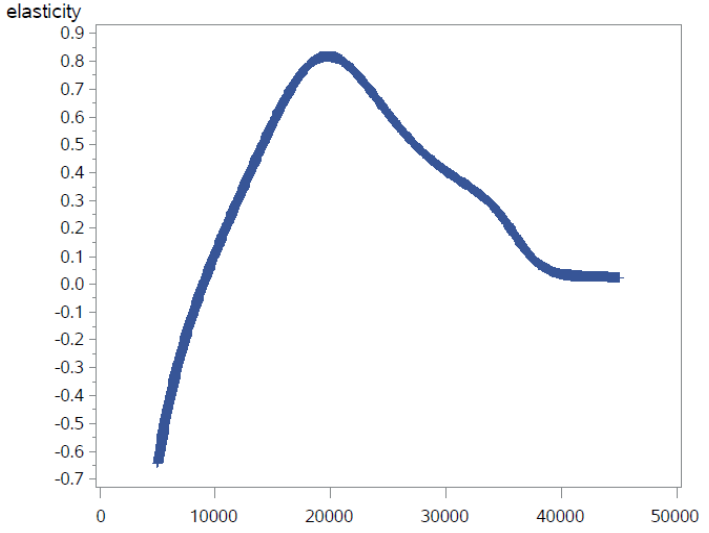
Research Background Contd.

- Based on the research, the methodology limited the range of offers to only those between $5-$350 per MWh to form the supply curves.
- This offer range was chosen based on the min-max LBMP that was observed in 2010.
- Limiting offers was intended to eliminate outliers and avoid distortion of the fitted supply curve which leads to failure of the elasticity criterion for choosing the threshold heat rate.
- However, analyses of recent months found that the static offer range of $5-$350 per MWh produced distorted curves, hence led to a breakdown of the methodology.

Limitations of the Current Offer Range

- There are several months where a model fit failed to satisfy the threshold heat rate identification criterion.

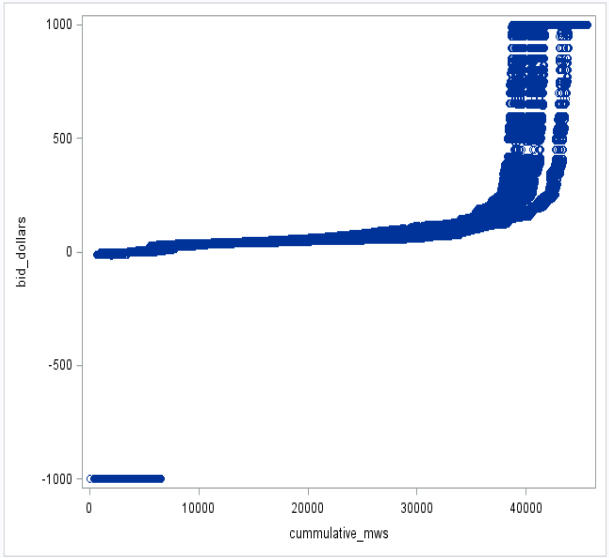




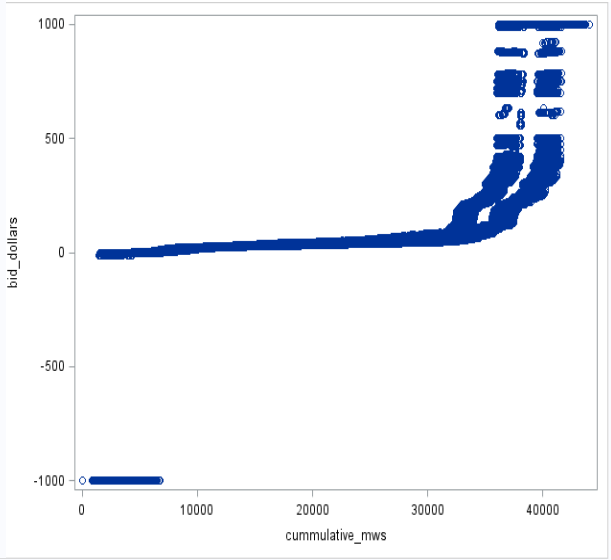
Limitations of the Current Offer Range

- The analyses of recent months' data identified two factors as the source of the fitting issue:
  - The offer range which varies from month to month.
  - The heat rate range which is dependent on offers and gas prices.
- There are several factors which impact offers that change with season and with time; such as fuel prices, resource types, system changes, etc.
- Therefore, using the same static range for each month/year has not produced expected outcomes.

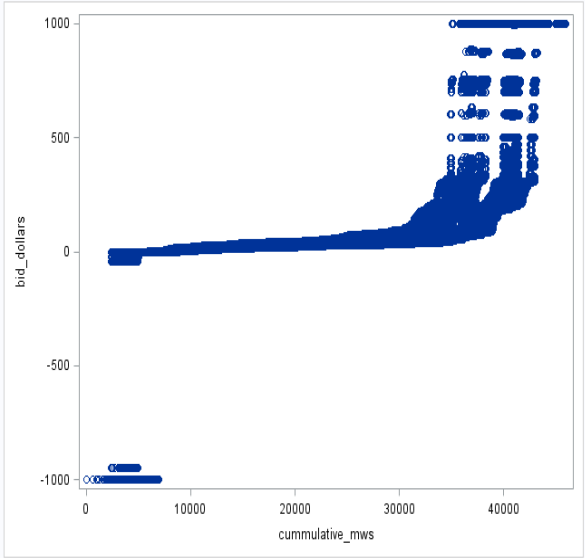
Distribution of Offers Across Years



September 2010



September 2017



September 2018

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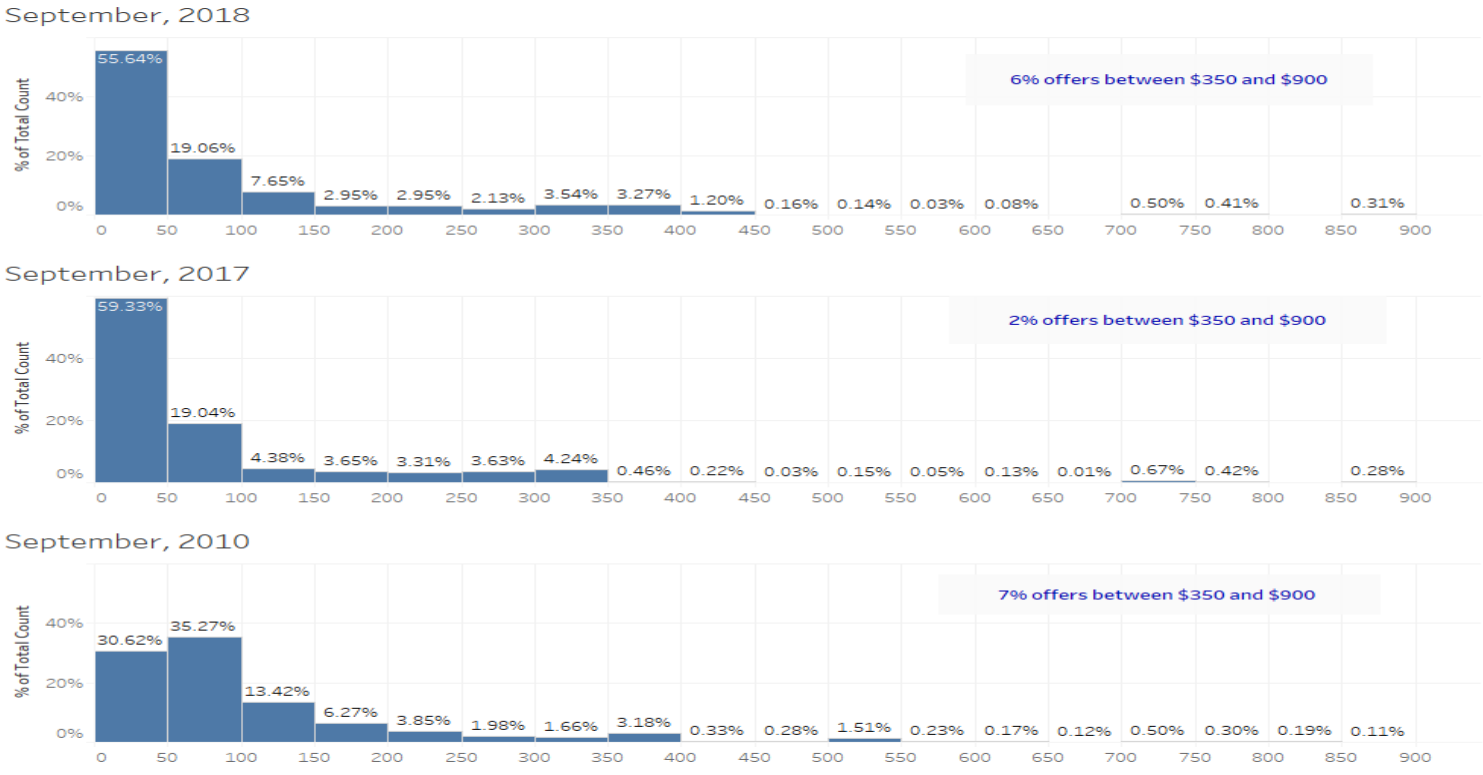
Distribution of Offers Across Years



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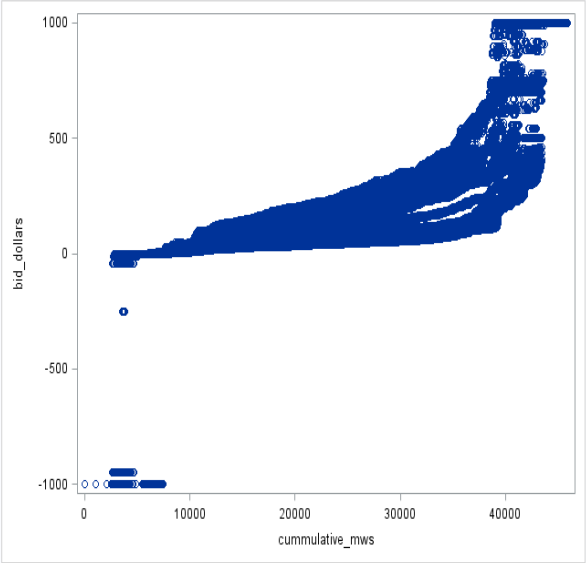
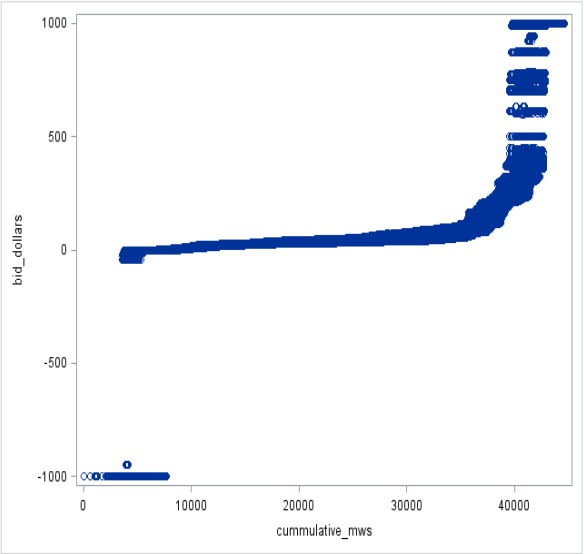
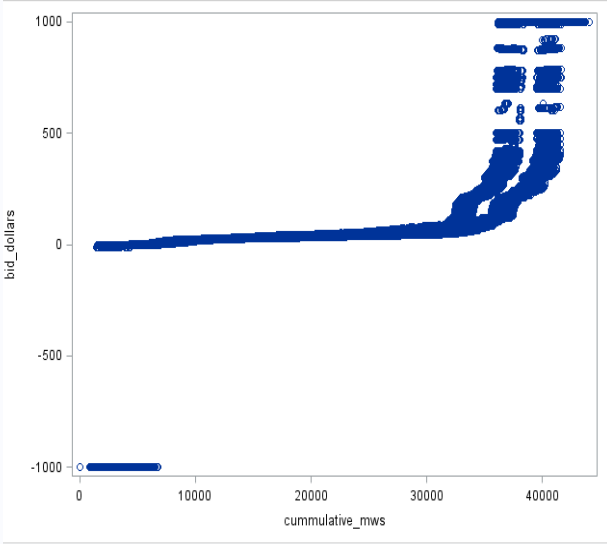
Distribution of Offers Across Month within a Year



January 2018



June 2018



September 2018

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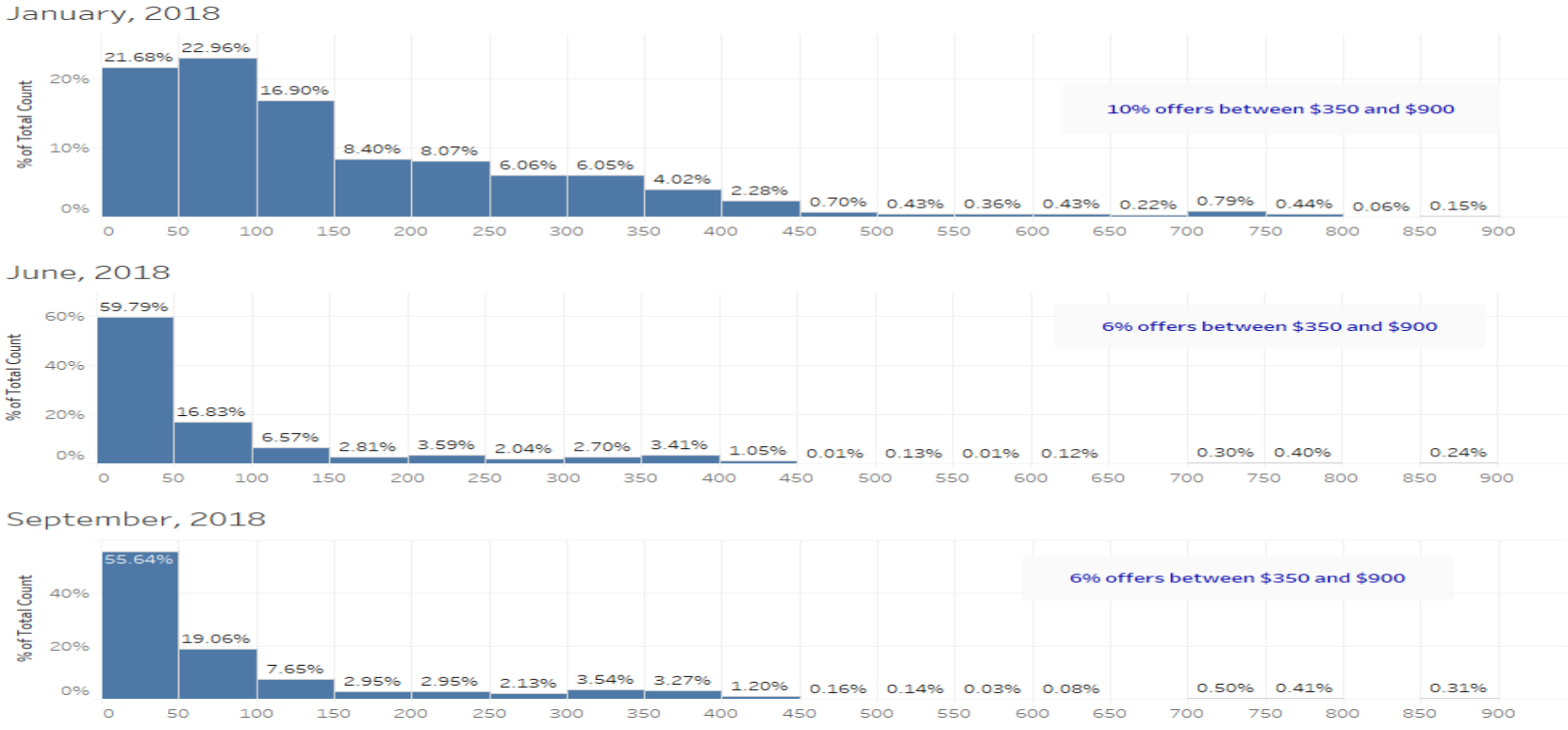
Distribution of Offers Across Month, Same Year



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Solution

- **In order to avoid fitting issue, the following conditions are implemented:**
  - A dynamic offer range is used to form the supply curves
    - The offer range will vary each month. The analyses will include all the offers between **$5 and the maximum generator DAM LBMP for the reference month**.
  - In addition, a heat rate cap will also be used
    - The heat rates will be capped at the monthly maximum DAM Generator LBMP observed.

Rationale for Heat Rate Cap

- If gas price is greater than $1, then heat rate cap will be automatically capped at the offer cap range.
- However, when gas price are below $1, then heat rate range could be above the offer cap range.
- E.g.: Heat rate =(offer $/Gas price)

  = ($200/$0.45)=444
- This will re-introduce the fitting issue that the offer cap was intended to eliminate.

Results Using Alternative Offer Caps

Study Month	Reference Month	Offer Cap = Max. Generator DAM LBMP			Offer Cap = $350	
		Max Gen DAM LBMP	Max. Heat Rate	Threshold Heat Rate	Max. Heat Rate	Threshold Heat Rate
July, 2018	July, 2017	304.96	176.48	15.97	201.03	15.17
August, 2018	August, 2017	364.58	224.27	15.48	224.27	15.48
September, 2018	September, 2017	282.77	238.76	13.17	298.22	13.07
October, 2018	October, 2017	252.93	187.98	13.41	253.92	13.44
November, 2018	November, 2017	105.18	81.69	13.11	273.14	12.64
December, 2018	December, 2017	455.13	174.71	11.58	133.41	11.82
Janyary, 2019	Janyary, 2018	652.36	201.82	9.27	110.54	8.06
February, 2019	February, 2018	299.33	122.2	14.98	142.16	14.83
March, 2019	March, 2018	202.26	79.03	14.42	137.17	x
April, 2019	April, 2018	129.60	53.81	14.09	137.71	x
May, 2019	May, 2018	429.09	191.39	12.86	155.50	x
June, 2019	June, 2018	387.75	165.2	13.58	145.85	x

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Next Steps

Comments/Feedback

- **NYISO received the following comments on 12/06 MIWG:**
  - More results and data demonstrating the issue at hand
  - Clarifying the solution being applied
  - Exploring other avenues to solve the issue, such as using daily LBMP vs Monthly LBMP etc.
- **NYISO addressed the methodology limitation which was feasible within a short time frame.**
- **NYISO encourages stakeholders to provide feedback on whether a long term solution is necessary based on further research.**

Questions or Feedback?

Email: CDAS@NYISO.COM

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Appendix

References

- **Technical Bulletin:**

http://www.nyiso.com/public/webdocs/markets_operations/documents/Technical_Bulletins/Technical_Bulletins/Technical_Bulletins/TB-245.pdf

- **Web Posting**

https://www.nyiso.com/documents/20142/1395792/Monthly-Net-Benefit-Offer-Floor-Prices.pdf/4b041dca-9528-3c5f-2943-cee3810e44e0

- **Previous Presentation:**

www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2017-03-28/Order%20745%20Update_w_Appendix%20-%20MIWG%2020170328.pdf

- **Compliance Filing:**

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13328902

GENERATOR DAM LBMP Summary

Reference Month	Avg. DAM LBMP	Min. Dam LBMP	Max. Dam LBMP
July, 2017	$31.30	$0.01	$304.96
August, 2017	$26.97	$3.51	$364.58
September, 2017	$24.88	$0.01	$282.77
October, 2017	$24.85	-$14.00	$252.93
November, 2017	$27.87	$2.12	$105.18
December, 2017	$45.61	$2.74	$455.13
Janyary, 2018	$84.03	$4.94	$652.36
February, 2018	$31.07	-$10.74	$299.33
March, 2018	$27.28	$0.38	$202.26
April, 2018	$32.30	$0.48	$129.60
May, 2018	$25.43	-$34.54	$429.09
June, 2018	$27.84	-$58.45	$387.75

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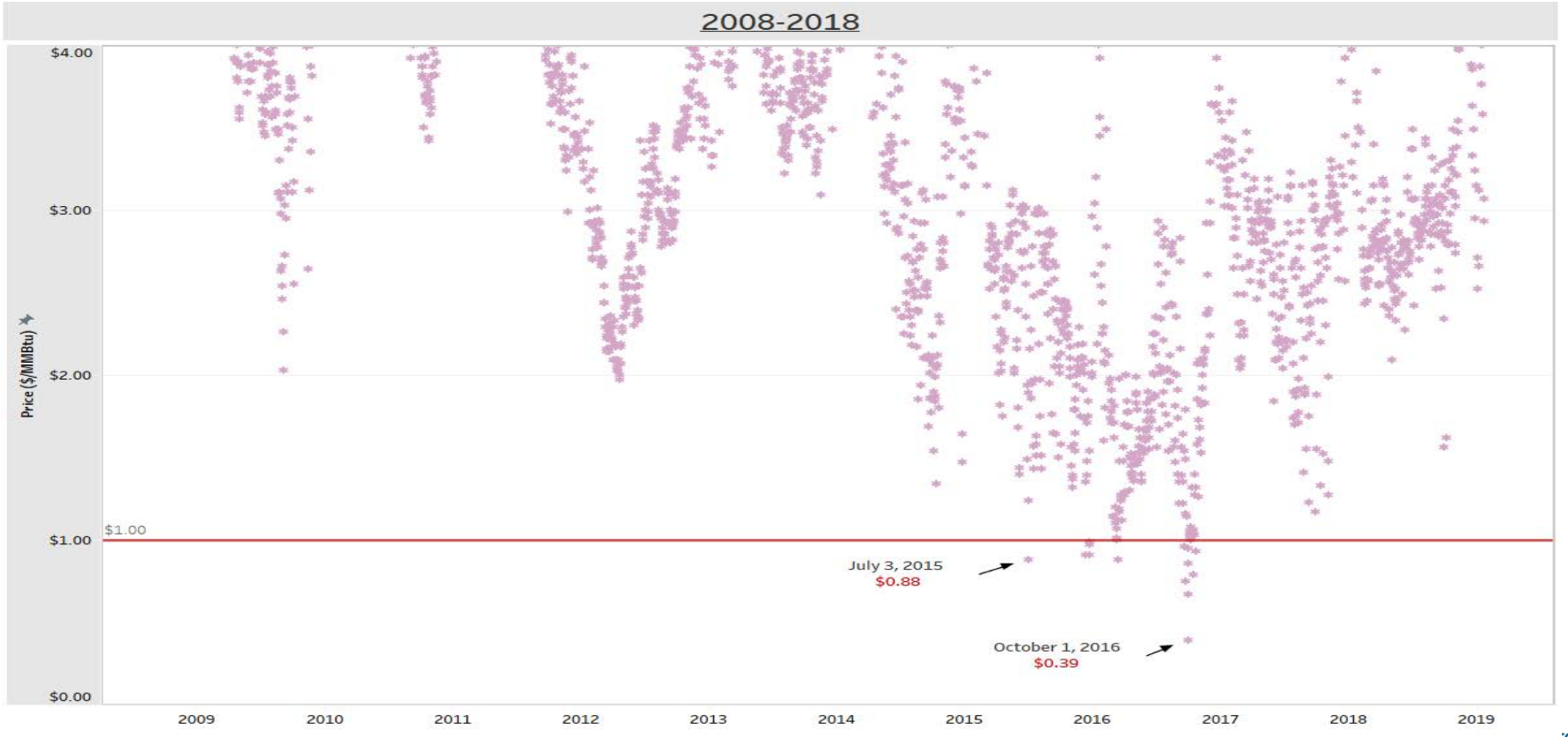
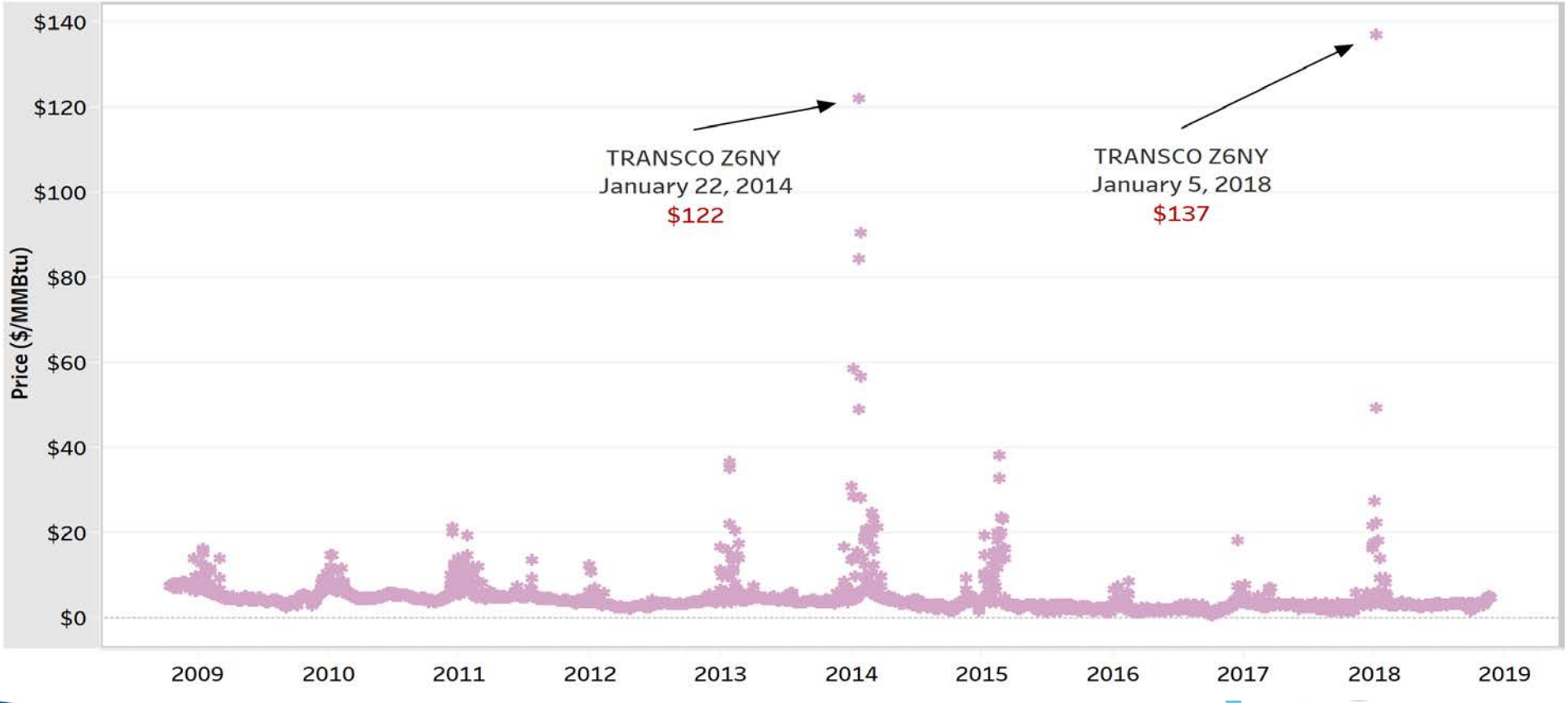
GAS Price Summary

Reference Month	Avg. Gas price	Min. NG Price	Max. NG Price
July, 2017	$2.51	$1.70	$3.23
August, 2017	$2.25	$1.41	$3.15
September, 2017	$2.38	$1.17	$3.17
October, 2017	$2.49	$1.33	$2.95
November, 2017	$2.98	$1.27	$5.75
December, 2017	$5.55	$2.57	$21.28
Janyary, 2018	$15.11	$3.10	$136.72
February, 2018	$3.24	$2.40	$8.11
March, 2018	$2.87	$2.54	$3.84
April, 2018	$2.80	$2.36	$3.19
May, 2018	$2.61	$2.09	$2.87
June, 2018	$2.80	$2.27	$3.37

Transco Z6NY Prices (2008-2018) – Low Prices



Transco Z6NY Prices (2008-2018) – High Prices



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Background

Date	Discussion points and links to materials
March 15, 2011	FERC issued Order 745
August 19, 2011	NYISO initial compliance filing
May 16, 2013	FERC order on NYISO initial compliance filing
June 17, 2013	NYISO filed request for rehearing and alternative requests for clarification and compliance waiver
August 14, 2013	NYISO's second compliance filing
January 30, 2017	FERC order on clarification, rehearing and compliance*
October 15, 2018	First offer floor published to be effective for November, 2018.

*NYISO's proposed tariff revisions to comply with Order 745 are now accepted

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