

NYSRC Fall Forecast Update for 2016 Installed Reserve Margin Study - Final

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Rensselaer, NY

Actual and 20-Year Normal Peak-Producing CTHI Statistics – 1996 to 2015

| Statistic | CE | CH | LI | N_Grid | NYPA | NYSEG | OR | RGE | NYCA |
|--------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| Max | 91.90 | 91.40 | 91.70 | 87.34 | 87.54 | 86.31 | 90.92 | 88.28 | 88.59 |
| 20-Yr Avg | 86.54 | 86.55 | 85.41 | 82.83 | 81.87 | 81.61 | 85.20 | 83.42 | 84.01 |
| Min | 81.77 | 81.36 | 78.98 | 77.97 | 76.96 | 76.62 | 80.30 | 78.36 | 78.19 |
| Std | 2.96 | 2.94 | 3.52 | 2.77 | 3.07 | 2.72 | 3.08 | 2.71 | 2.88 |
| | | | | | | | | | |
| 50th | 86.54 | 86.55 | 85.41 | 82.83 | 81.87 | 81.61 | 85.20 | 83.42 | 84.01 |
| 67th: CE, OR | 87.81 | 87.81 | 86.93 | 84.02 | 83.19 | 82.78 | 86.53 | 84.59 | 85.26 |
| 90th | 90.33 | 90.32 | 89.92 | 86.37 | 85.79 | 85.10 | 89.14 | 86.89 | 87.71 |
| | | | | | | | | | |
| 2015 | 84.07 | 84.38 | 82.98 | 82.87 | 83.16 | 81.08 | 82.42 | 82.78 | 82.79 |
| Percentile | 20% | 23% | 25% | 51% | 66% | 42% | 18% | 41% | 34% |
| z(2015) | -0.84 | -0.74 | -0.69 | 0.02 | 0.42 | -0.20 | -0.90 | -0.24 | -0.42 |
| CTHI Delta | -2.47 | -2.17 | -2.43 | 0.04 | 1.30 | -0.53 | -2.78 | -0.64 | -1.22 |

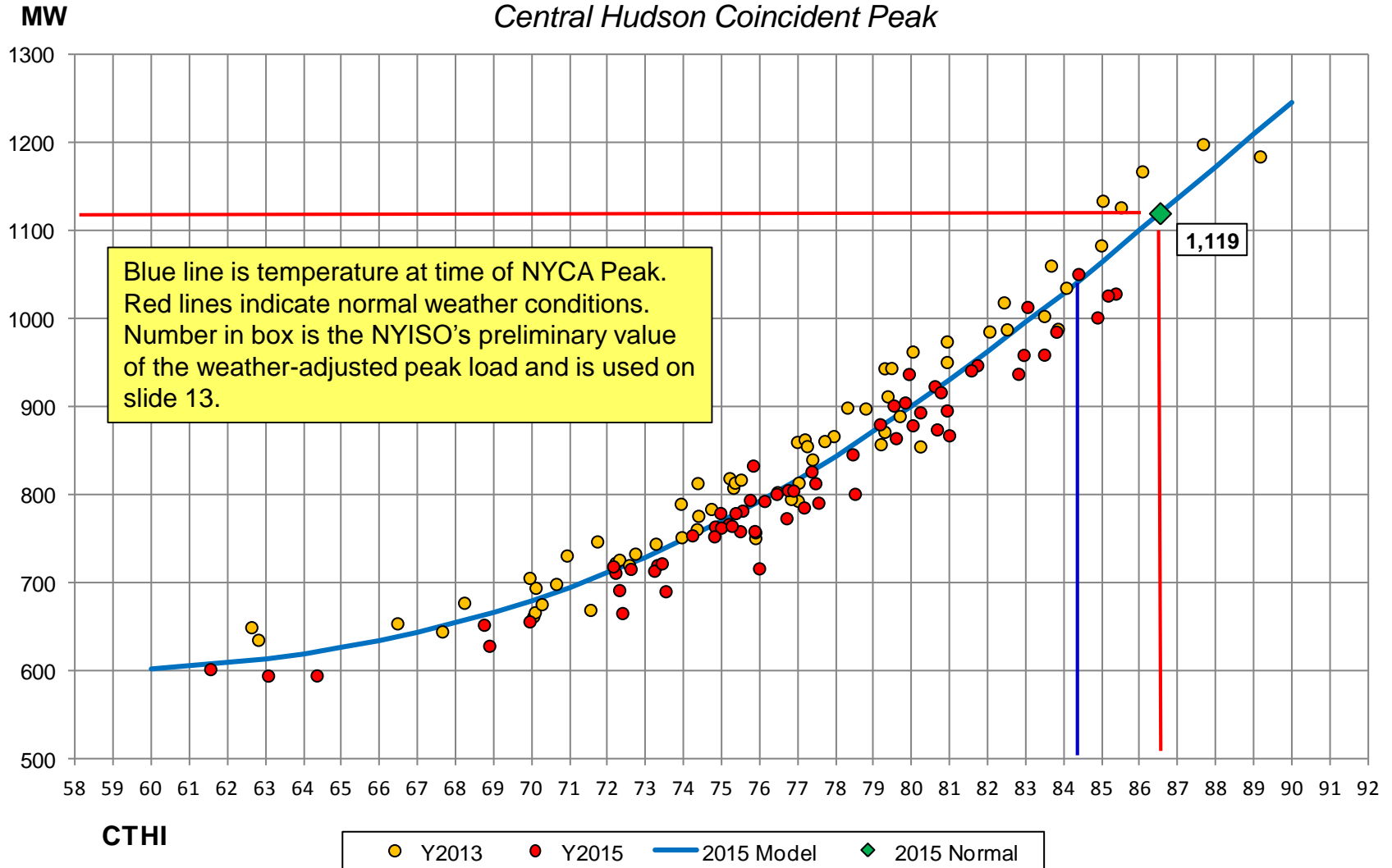
$$Z = \frac{(\text{CTHI} - \text{Avg})}{\text{Std Dev}}$$

Con-Ed and O&R use the 67th percentile for design conditions. All others use the 50th percentile.

The peak-producing CTHI is the Cumulative Temperature-Humidity Index that occurs on the day of the NYCA peak each year.

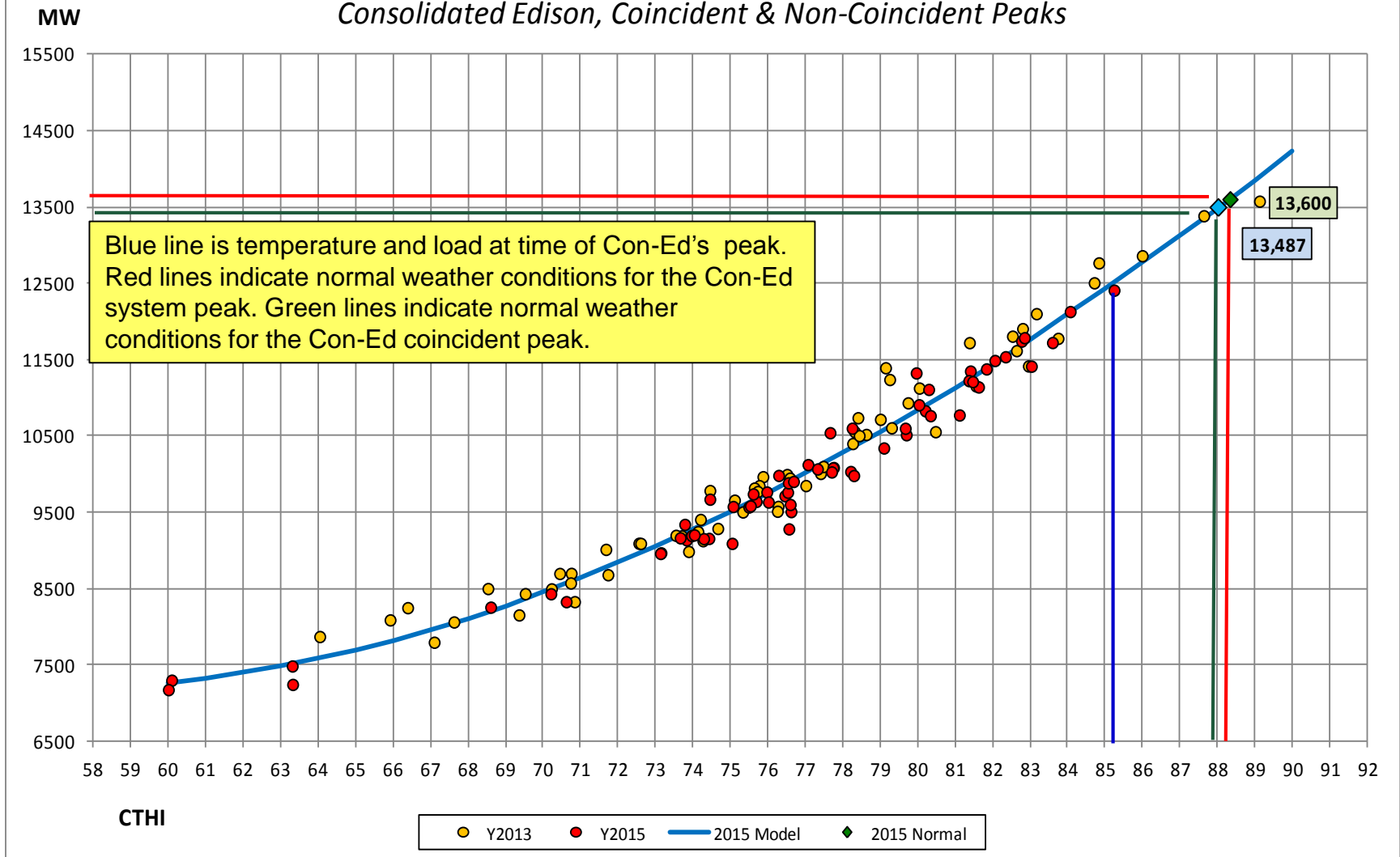
2015 Weather Normalization Model for NYSRC

Central Hudson Coincident Peak



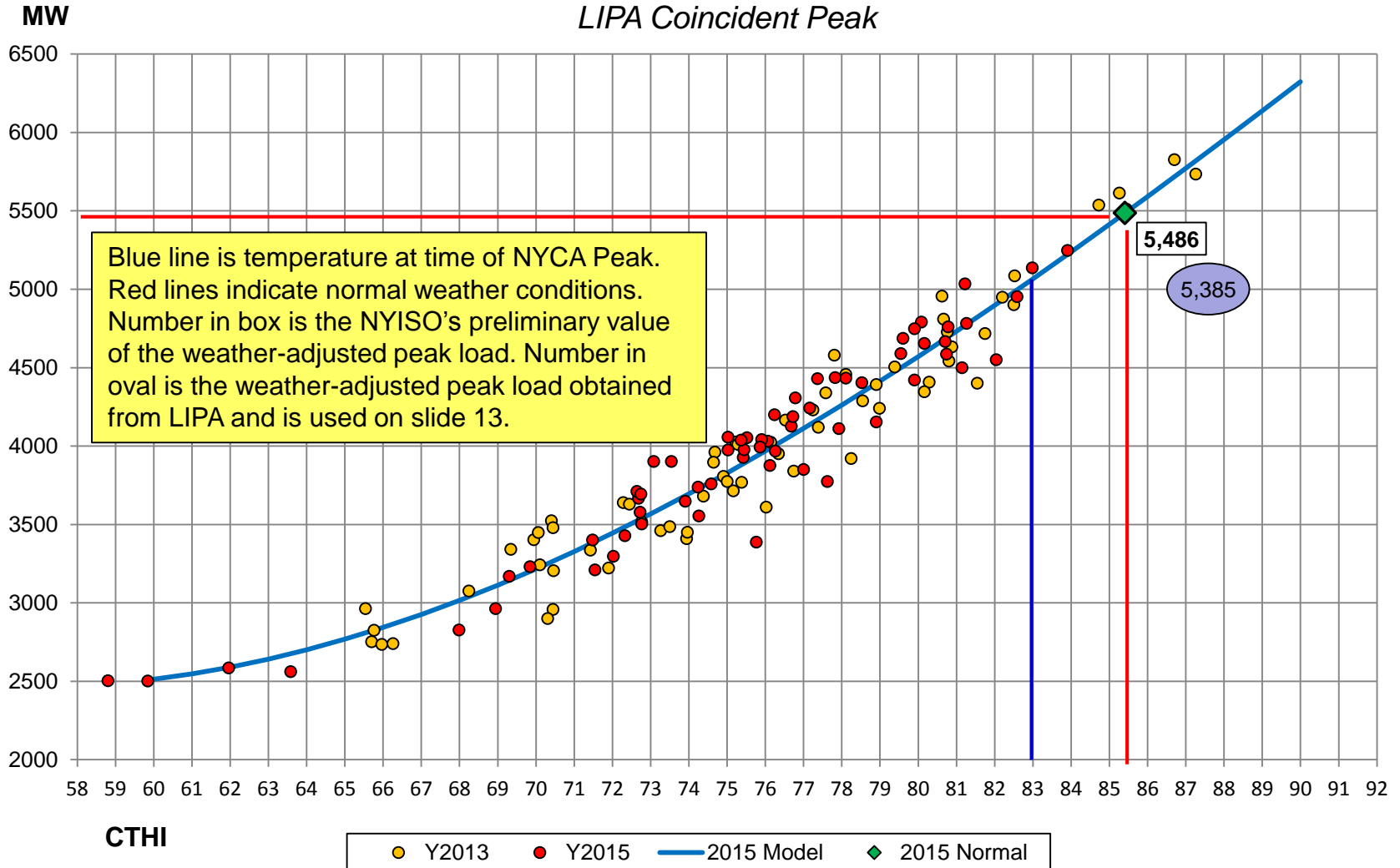
2015 Weather Normalization Model for NYSRC

Consolidated Edison, Coincident & Non-Coincident Peaks



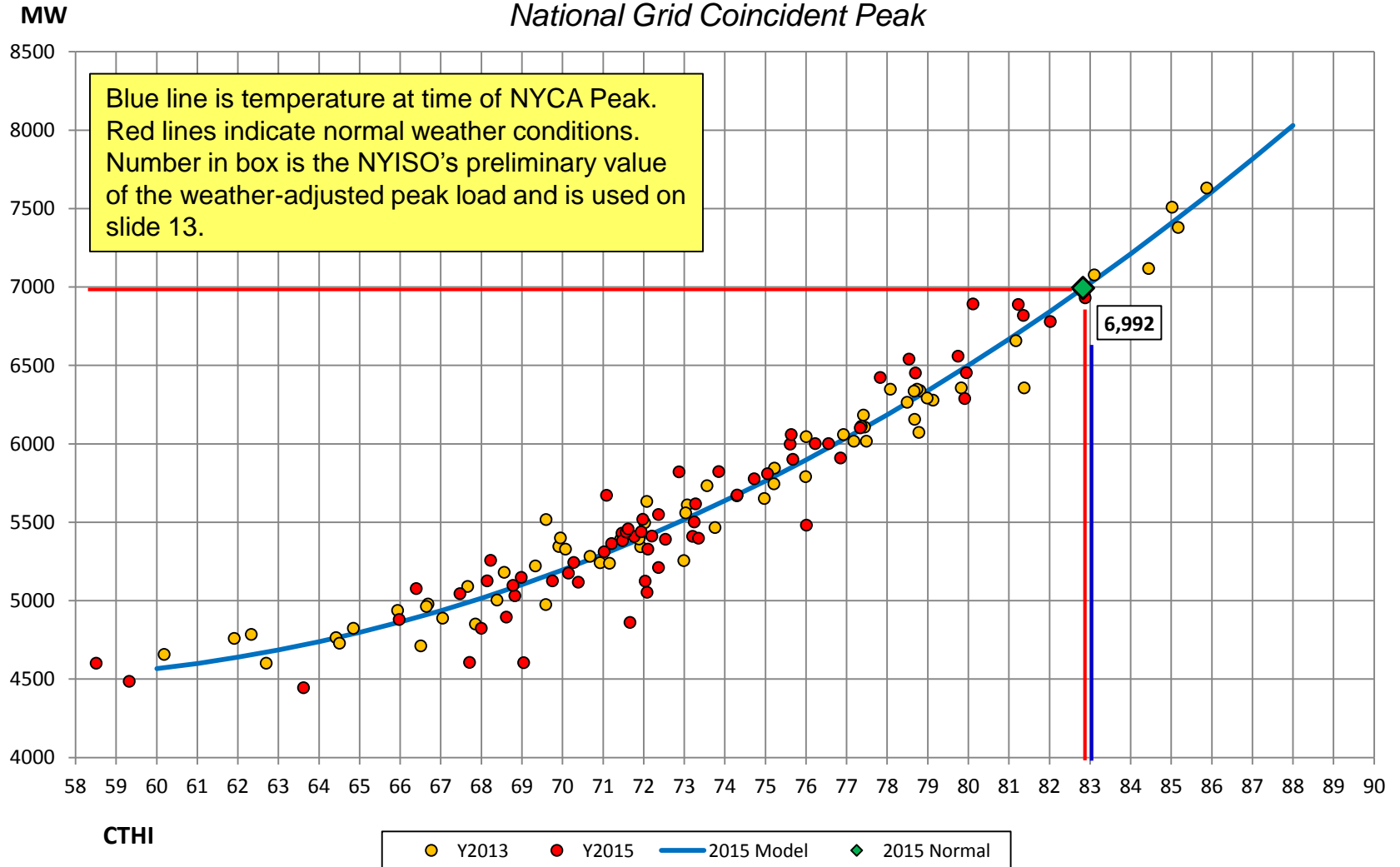
2015 Weather Normalization Model for NYSRC

LIPA Coincident Peak

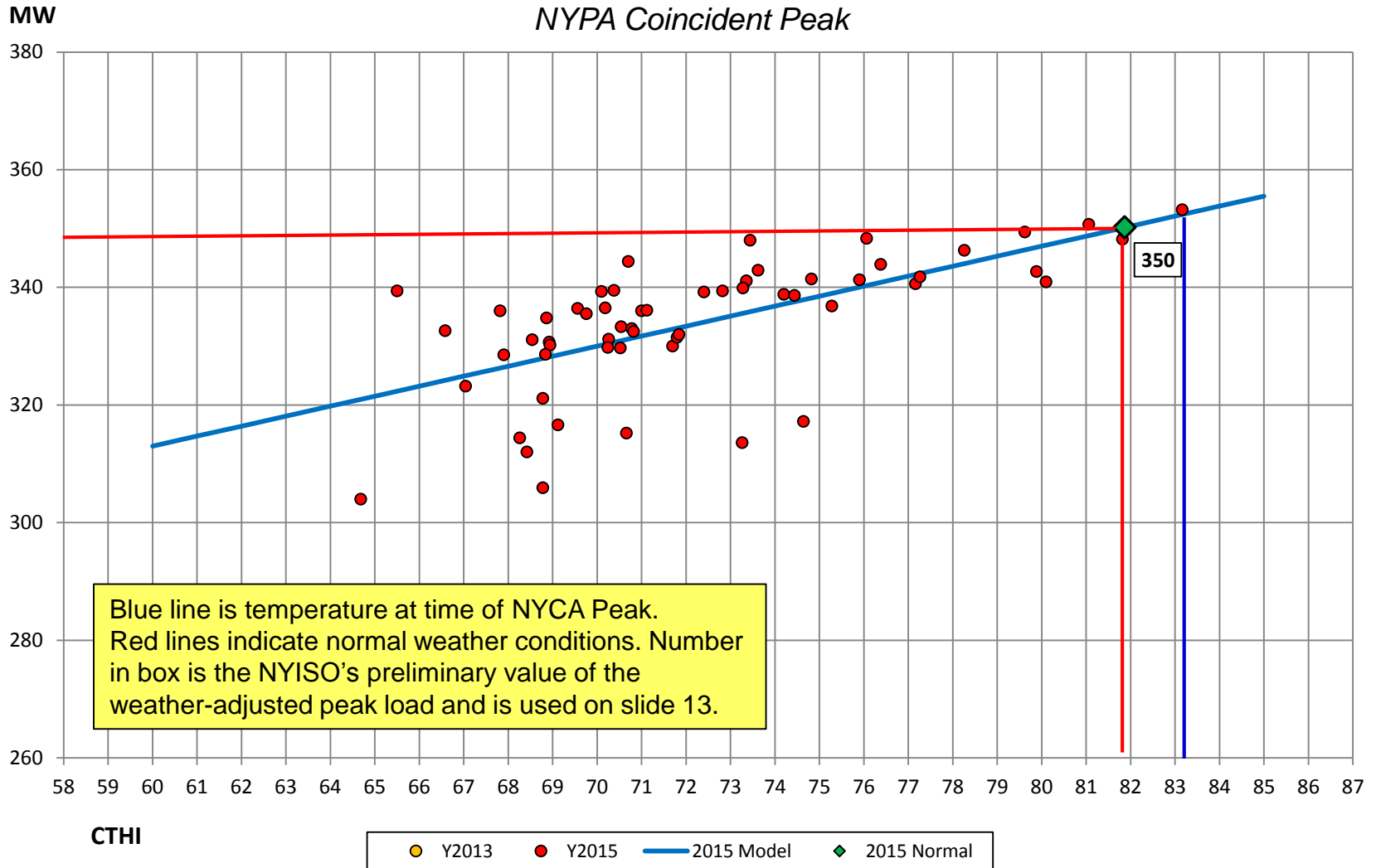


2015 Weather Normalization Model for NYSRC

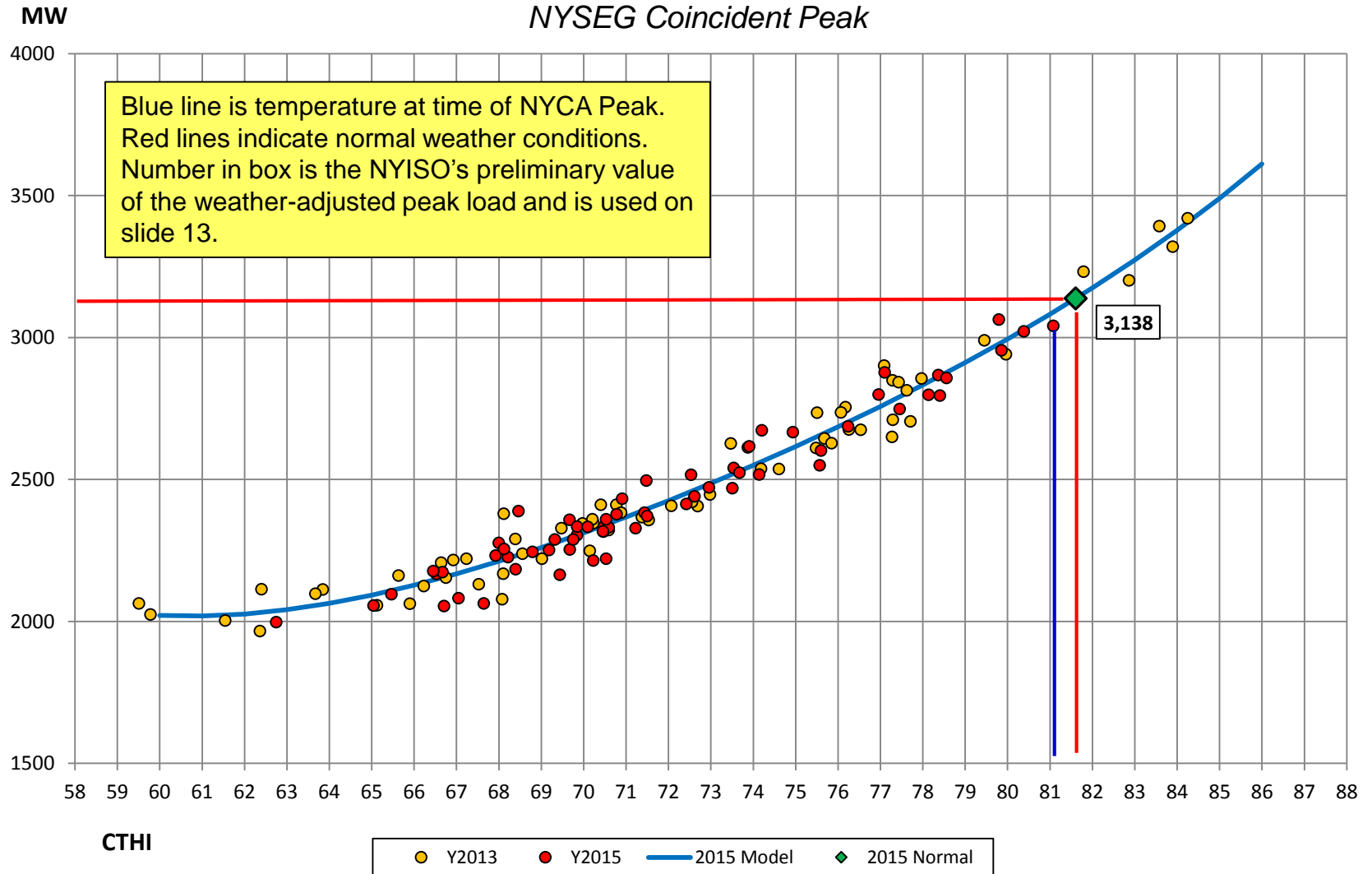
National Grid Coincident Peak



2015 Weather Normalization Model for NYSRC

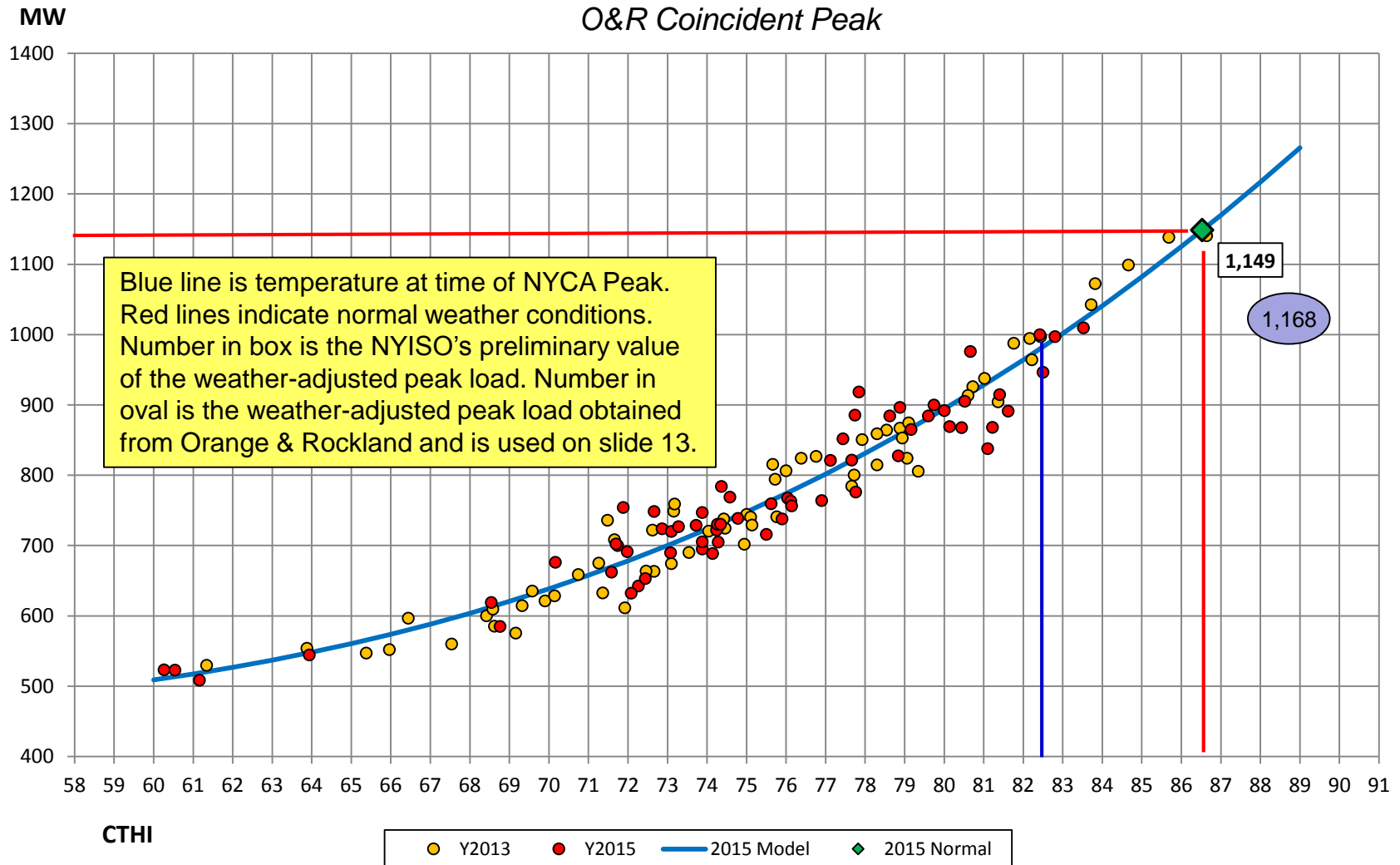


2015 Weather Normalization Model for NYSRC



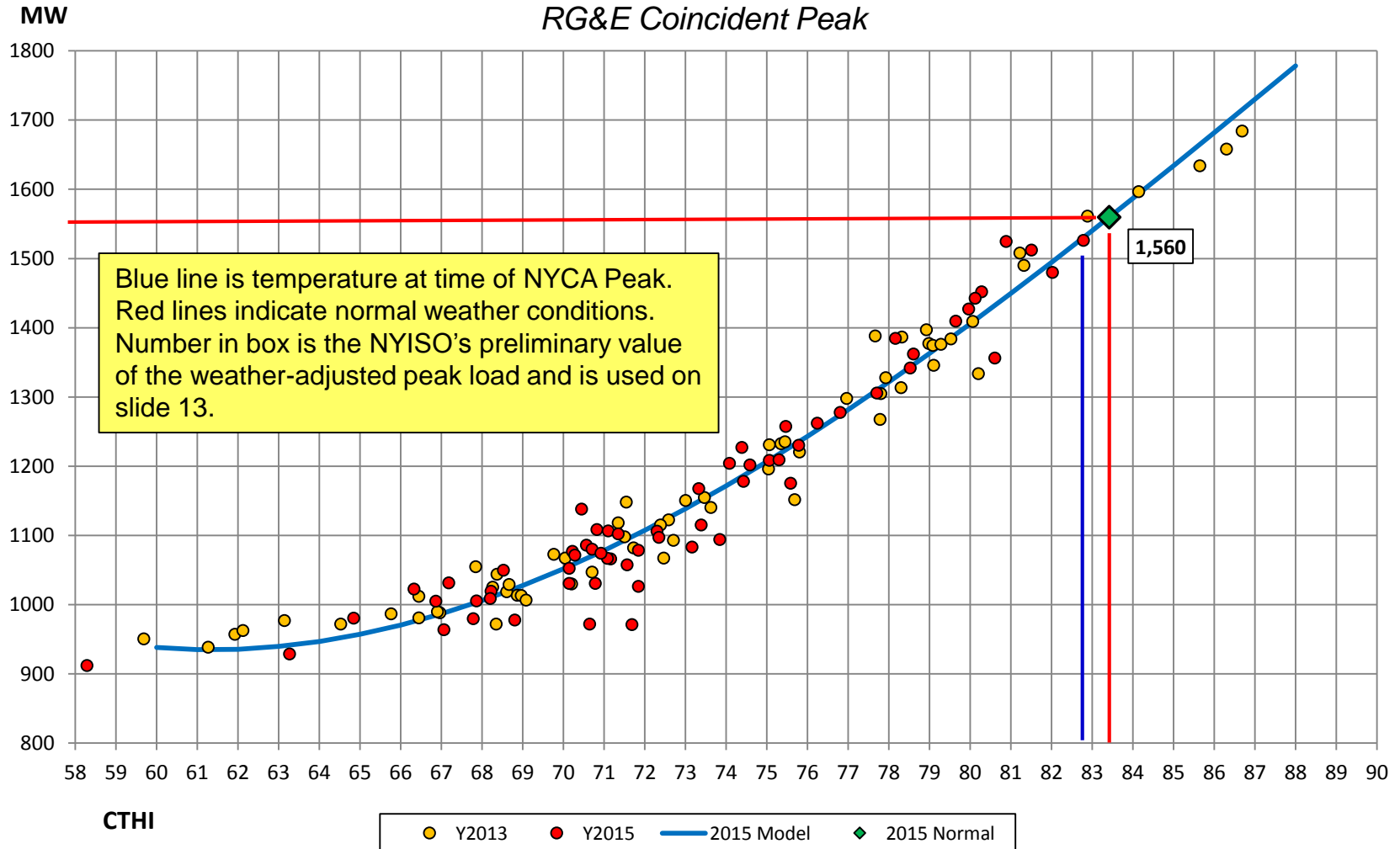
2015 Weather Normalization Model for NYSRC

O&R Coincident Peak



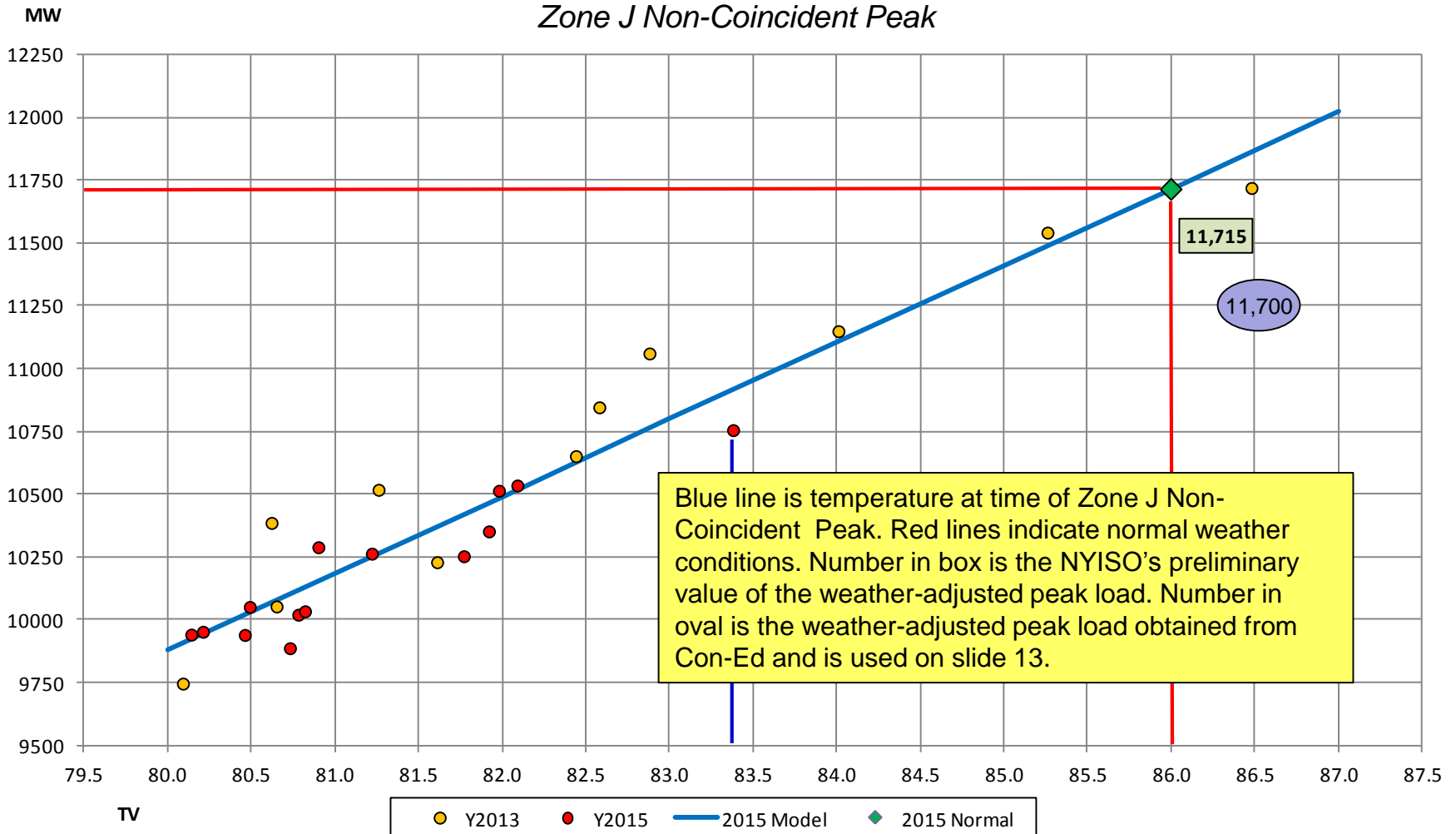
2015 Weather Normalization Model for NYSRC

RG&E Coincident Peak



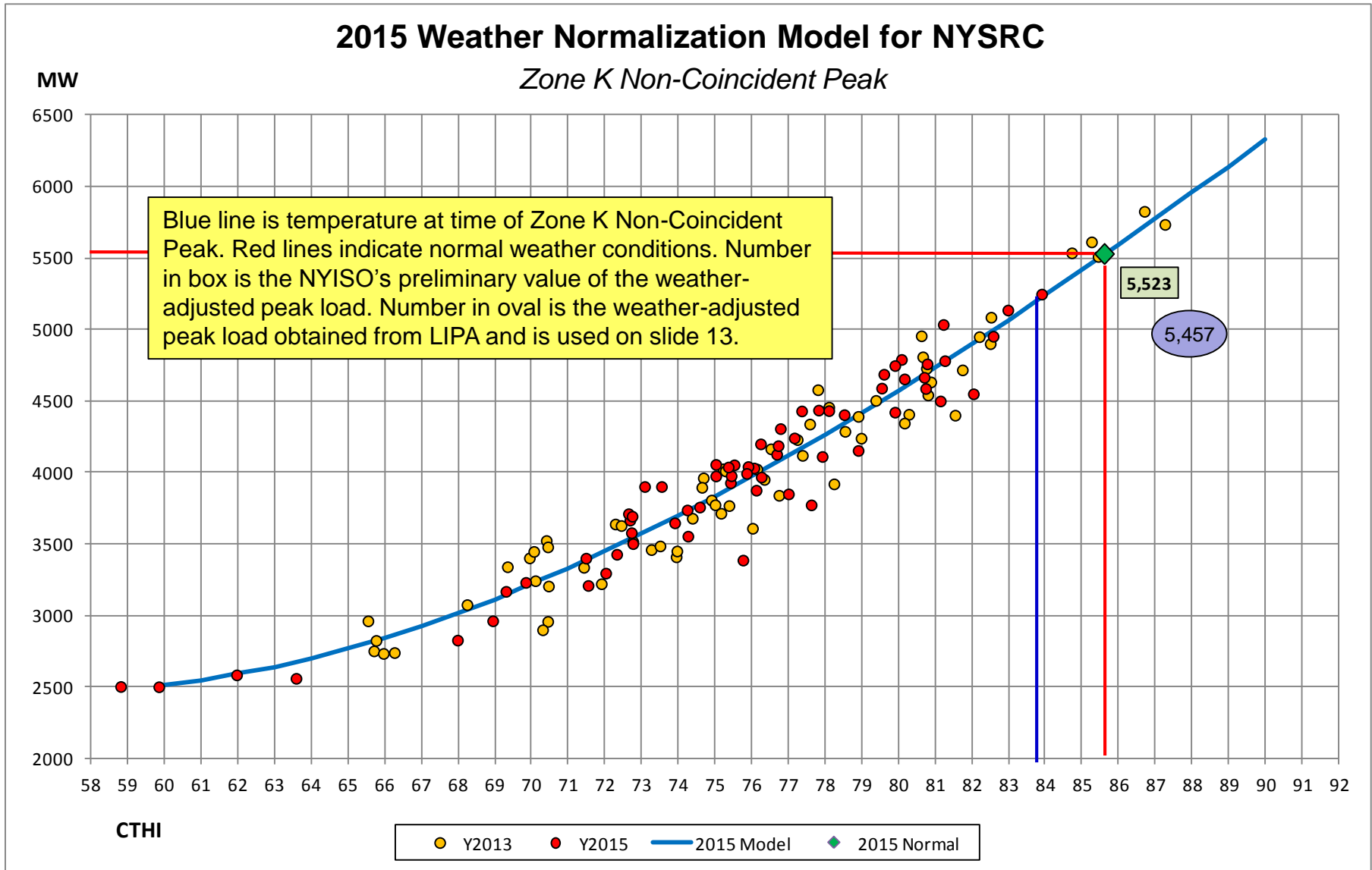
2015 Weather Normalization Model for NYSRC

Zone J Non-Coincident Peak



2015 Weather Normalization Model for NYSRC

Zone K Non-Coincident Peak



2015 Weather Adjusted Peaks & Comparison to 2015 ICAP Forecast

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|--|---------------------------------|---------------------|----------------------|-----------------------|----------------------------|----------------------|----------------------------|-----------------------|---------------|--------------------|
| Transmission District | 2015 Actual MW, 7/29/2015 HB 16 | Adjustments to Load | SCR/EDRP Estimate MW | Weather Adjustment MW | 2015 Weather Normalized MW | Loss Reallocation MW | 2015 WN MW, Adj for Losses | 2015 ICAP Forecast MW | Over/Under MW | Percent Over/Under |
| Cen. Hudson | 1,048 | 0 | 0 | 71 | 1,119 | -7 | 1,112 | 1,084 | 28 | 2.6% |
| Con Ed | 12,050 | 0 | 0 | 1,437 | 13,487 | 166 | 13,653 | 13,793 | -140 | -1.0% |
| LIPA | 5,136 | 0 | 0 | 249 | 5,385 | 53 | 5,438 | 5,541 | -103 | -1.9% |
| NGrid | 6,931 | 0 | 0 | 61 | 6,992 | -251 | 6,741 | 6,880 | -139 | -2.1% |
| NYPA | 344 | 0 | 0 | 6 | 350 | 5 | 355 | 326 | 29 | 8.2% |
| NYSEG | 3,041 | 0 | 0 | 97 | 3,138 | 8 | 3,146 | 3,180 | -34 | -1.1% |
| O&R | 1,000 | 0 | 0 | 168 | 1,168 | 9 | 1,177 | 1,162 | 15 | 1.3% |
| RG&E | 1,526 | 0 | 0 | 34 | 1,560 | 17 | 1,577 | 1,601 | -24 | -1.5% |
| Grand Total | 31,076 | 0 | 0 | 2,123 | 33,199 | 0 | 33,199 | 33,567 | -369 | -1.1% |
| NYCA Load at Time of Peak: 31,138 MW, based on system telemetry. | | | | | | | | | | |

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|--------------|----------------|---------------|----------------------|--------------------------------|------------------|-----------------------|---------------|--------------------|
| Locality | 2015 Actual MW | Other Changes | SCR/EDRP Estimate MW | Locality Weather Adjustment MW | 2015 Adjusted MW | 2015 ICAP Forecast MW | Over/Under MW | Percent Over/Under |
| Zone J - NYC | 10,586 | 0 | 0 | 1,114 | 11,700 | 11,929 | 229 | 2.0% |
| Zone K - LI | 5,235 | 0 | 0 | 222 | 5,457 | 5,539 | 82 | 1.5% |
| Zone GHIJ | 14,730 | 0 | 0 | 1,532 | 16,262 | 16,340 | 78 | 0.5% |

2016 Coincident Peak Forecasts by Transmission District

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|-----------------------|----------------|------------------------------------|----------------------|-----------------------|----------------------------|----------------------|----------------------------|------------------------------|-------------------------|
| Transmission District | 2015 Actual MW | 2015 Estimated SCR & Muni Self-Gen | SCR/EDRP Estimate MW | Weather Adjustment MW | 2015 Weather Normalized MW | Loss Reallocation MW | 2015 WN MW, Adj for Losses | Regional Load Growth Factors | 2016 IRM Final Forecast |
| Central Hudson | 1,048 | 0 | 0 | 71 | 1,119 | -7 | 1,112 | 1.0020 | 1,114 |
| Con Ed | 12,050 | 0 | 0 | 1,437 | 13,487 | 166 | 13,653 | 1.0066 | 13,743 |
| LIPA | 5,136 | 0 | 0 | 249 | 5,385 | 53 | 5,438 | 1.0000 | 5,438 |
| NGrid | 6,931 | 0 | 0 | 61 | 6,992 | -251 | 6,741 | 1.0060 | 6,782 |
| NYPA | 344 | 0 | 0 | 6 | 350 | 5 | 355 | 0.9951 | 353 |
| NYSEG | 3,041 | 0 | 0 | 97 | 3,138 | 8 | 3,146 | 1.0050 | 3,162 |
| O&R | 1,000 | 0 | 0 | 168 | 1,168 | 9 | 1,177 | 1.0161 | 1,196 |
| RG&E | 1,526 | 0 | 0 | 34 | 1,560 | 17 | 1,577 | 1.0080 | 1,590 |
| Final Forecast | 31,076 | 0 | 0 | 2,123 | 33,199 | 0 | 33,199 | 1.0054 | 33,378 |

| | |
|--------------------------|--------|
| Preliminary IRM Forecast | 33,636 |
| Change | -258 |

2016 Locality Peak Forecasts (Non-Coincident)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|------------------|----------------|------------------------------------|----------------------|-----------------------|----------------------------|------------------------------|-------------------------|-----------------------------------|-------------------------------|
| NYCA or Locality | 2015 Actual MW | 2015 Estimated SCR & Muni Self-Gen | SCR/EDRP Estimate MW | Weather Adjustment MW | 2015 Weather Normalized MW | Regional Load Growth Factors | 2016 IRM Final Forecast | 2016 Forecast from 2015 Gold Book | Change: (Current - Gold Book) |
| Zone J - NYC | 10,586 | | 0 | 1,114 | 11,700 | 1.0066 | 11,777 | 12,013 | -236 |
| Zone K - LI | 5,235 | | 0 | 222 | 5,457 | 1.0000 | 5,457 | 5,506 | -49 |
| Zone GHIJ | 14,730 | | 0 | 1,532 | 16,262 | 1.0069 | 16,375 | 16,441 | -66 |

2016 G-to-J Locality Peak Forecast - Details

| (1) 2015 Actual Coincident Peak MW for G-to-J Locality | | | | | |
|--|-----------------|--------------|----------------|-----------------|---------------------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| Transmission District | Zone G | Zone H | Zone I | Zone J | Total, GHJ |
| Cen. Hud. Con Ed | 1,048.0 | 264.0 | 1,332.0 | 10,454.0 | 1,048.0 12,050.0 |
| NYSEG O&R | 22.0 1,000.0 | 335.0 | | | 357.0 1,000.0 |
| Total | 2,070.0 | 599.0 | 1,332.0 | 10,454.0 | 14,455.0 |

| (2) 2015 Weather Normalized Coincident Peak for G-to-J Locality | | | | | |
|---|-----------------|--------------|----------------|-----------------|---------------------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| Transmission District | Zone G | Zone H | Zone I | Zone J | Total, GHJ |
| Cen. Hud. Con Ed | 1,119.0 | 311.0 | 1,573.0 | 11,603.0 | 1,119.0 13,487.0 |
| NYSEG O&R | 22.7 1,168.0 | 345.7 | | | 368.4 1,168.0 |
| Total | 2,309.7 | 656.7 | 1,573.0 | 11,603.0 | 16,142.4 |

| (3) 2015 Weather Normalized Locality Peak for G-to-J Locality | | | | | |
|---|-----------------|---------------|----------------|-----------------|---------------------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| Transmission District | Zone G | Zone H | Zone I | Zone J | Total, GHJ |
| Cen. Hud. Con Ed | 1,127.3 | 313.3 | 1,584.6 | 11,688.9 | 1,127.3 13,586.8 |
| NYSEG O&R | 22.9 1,176.6 | 348.3 | | | 371.2 1,176.6 |
| Total | 2,326.8 | 661.6 | 1,584.6 | 11,688.9 | 16,261.9 |
| NCP/CP Ratio | 1.0074 | 1.0074 | 1.0074 | 1.0074 | 1.0074 |

| (4) 2016 Forecast for G-to-J Locality | | | | | | |
|---------------------------------------|-----------------|--------------|----------------|-----------------|---------------------|------------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Transmission District | Zone G | Zone H | Zone I | Zone J | Total, GHJ | RLGF |
| Cen. Hud. Con Ed | 1,129.6 | 315.4 | 1,595.1 | 11,766.0 | 1,129.6 13,676.5 | 1.0020 1.0066 |
| NYSEG O&R | 23.0 1,195.5 | 350.0 | | | 373.1 1,195.5 | 1.0050 1.0161 |
| Total | 2,348.1 | 665.4 | 1,595.1 | 11,766.0 | 16,374.6 | 1.0069 |

The RLGF is the Regional Load Growth Factor for 2016.

The determination of the NCP/CP ratio is shown on slide 18.

2016 Coincident Peak Forecast – By Zone & TD

| 2016 NYCA Coincident Peak Forecast For All Transmission Districts and by Zone | | | | | | | | | | | | |
|---|----------------|----------------|----------------|--------------|----------------|----------------|----------------|--------------|----------------|-----------------|----------------|-----------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| Transmission District | A | B | C | D | E | F | G | H | I | J | K | NYCA Forecast |
| Cen. Hud. | | | | | | | 1,121.2 | | | | | 1,121.2 |
| Con Ed | | | | | | | | 297.4 | 1,500.7 | 11,777.9 | | 13,576.0 |
| LIPA | | | | | | | | | | | 5,385.0 | 5,385.0 |
| NGrid | 1,963.5 | 418.1 | 1,387.1 | 88.3 | 943.7 | 2,233.4 | | | | | | 7,034.1 |
| NYPA | | | | 348.3 | | | | | | | | 348.3 |
| NYSEG | 711.2 | | 1,408.9 | 114.0 | 406.4 | 143.1 | 22.8 | 347.3 | | | | 3,153.7 |
| O&R | | | | | | | 1,186.8 | | | | | 1,186.8 |
| RG&E | | 1,572.5 | | | | | | | | | | 1,572.5 |
| Total | 2,674.7 | 1,990.6 | 2,796.0 | 550.6 | 1,350.1 | 2,376.5 | 2,330.8 | 644.7 | 1,500.7 | 11,777.9 | 5,385.0 | 33,377.6 |

2015 Proportional Allocation of Losses

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|-----------------------|----------------|------------------|---------------|--------------|---------------------|-------------------|-------------------------|-------------------------|-------------------|
| Transmission District | 2015 Actual MW | 2015 Adjusted MW | Actual Losses | WN Losses | WN Load Less Losses | Proportion of LLL | WN Losses, Proportional | 2014 Adjusted Actual MW | Loss Reallocation |
| Central Hudson | 1,048 | 1,119 | 29.0 | 31.0 | 1,088 | 0.033 | 24.0 | 1,112 | -7.0 |
| Con Ed | 12,050 | 13,487 | 110.0 | 123.0 | 13,364 | 0.411 | 289.0 | 13,653 | 166.0 |
| LIPA | 5,136 | 5,385 | 60.0 | 63.0 | 5,322 | 0.164 | 116.0 | 5,438 | 53.0 |
| NGrid | 6,931 | 6,992 | 391.0 | 394.0 | 6,598 | 0.203 | 143.0 | 6,741 | -251.0 |
| NYPA | 344 | 350 | 3.0 | 3.0 | 347 | 0.011 | 8.0 | 355 | 5.0 |
| NYSEG | 3,041 | 3,138 | 57.0 | 59.0 | 3,079 | 0.095 | 67.0 | 3,146 | 8.0 |
| O&R | 1,000 | 1,168 | 14.0 | 16.0 | 1,152 | 0.035 | 25.0 | 1,177 | 9.0 |
| RG&E | 1,526 | 1,560 | 17.0 | 17.0 | 1,543 | 0.047 | 34.0 | 1,577 | 17.0 |
| Total | 31,076 | 33,199 | 681.0 | 706.0 | 32,493 | 1.000 | 706.0 | 33,199 | 0.0 |

Determination of G-to-J Locality Ratio of Non-Coincident Peak to Coincident Peak

G-to-J Coincident Peak Dates & Times & Zonal MW

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|----------------|----------------|--------|--------|-----------|--------|---------------|
| Year | NYCA Peak Date | Hr Beg | Zone G | Zones H+I | Zone J | G-to-J CP |
| 2006 | 8/2/2006 | 14 | 2,436 | 2,063 | 11,604 | 16,103 |
| 2007 | 8/8/2007 | 17 | 2,316 | 2,033 | 10,971 | 15,320 |
| 2008 | 6/9/2008 | 17 | 2,277 | 2,056 | 10,979 | 15,311 |
| 2009 | 8/17/2009 | 16 | 2,159 | 1,875 | 10,366 | 14,400 |
| 2010 | 7/6/2010 | 17 | 2,399 | 2,187 | 11,600 | 16,186 |
| 2011 | 7/22/2011 | 16 | 2,482 | 2,239 | 11,826 | 16,546 |
| 2012 | 7/17/2012 | 14 | 2,282 | 2,082 | 11,405 | 15,769 |
| 2013 | 7/19/2013 | 17 | 2,384 | 2,253 | 11,736 | 16,373 |
| 2014 | 9/2/2014 | 16 | 2,036 | 1,917 | 10,567 | 14,520 |
| 2015 | 7/29/2015 | 16 | 2,070 | 1,930 | 10,455 | 14,455 |
| Average | | | | | | 15,498 |

G-to-J Locality Peak Dates & Times & Zonal MW

| (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) = (14-7) |
|--|------------------|--------|--------|-----------|--------|---------------|---------------|
| Year | G-to-J Peak Date | Hr Beg | Zone G | Zones H+I | Zone J | G-J NCP | Delta |
| 2006 | 8/2/2006 | 17 | 2,497 | 2,133 | 11,660 | 16,290 | 187 |
| 2007 | 8/8/2007 | 17 | 2,316 | 2,033 | 10,971 | 15,320 | - |
| 2008 | 6/10/2008 | 17 | 2,338 | 2,101 | 11,262 | 15,701 | 390 |
| 2009 | 8/21/2009 | 15 | 2,117 | 1,879 | 10,661 | 14,657 | 257 |
| 2010 | 7/6/2010 | 17 | 2,399 | 2,187 | 11,600 | 16,186 | - |
| 2011 | 7/22/2011 | 16 | 2,482 | 2,239 | 11,826 | 16,546 | - |
| 2012 | 7/18/2012 | 13 | 2,288 | 2,071 | 11,424 | 15,783 | 14 |
| 2013 | 7/19/2013 | 17 | 2,384 | 2,253 | 11,736 | 16,373 | - |
| 2014 | 9/2/2014 | 17 | 2,046 | 1,933 | 10,572 | 14,551 | 32 |
| 2015 | 7/20/2015 | 16 | 2,059 | 1,996 | 10,675 | 14,730 | 275 |
| Average | | | | | | 15,614 | 115 |
| Ratio of G-to-J Locality Peak to G-to-J Coincident Peak (15,614/15,498) | | | | | | | 1.0074 |

Determination of Zone J Locality Ratio of Non-Coincident Peak to Coincident Peak

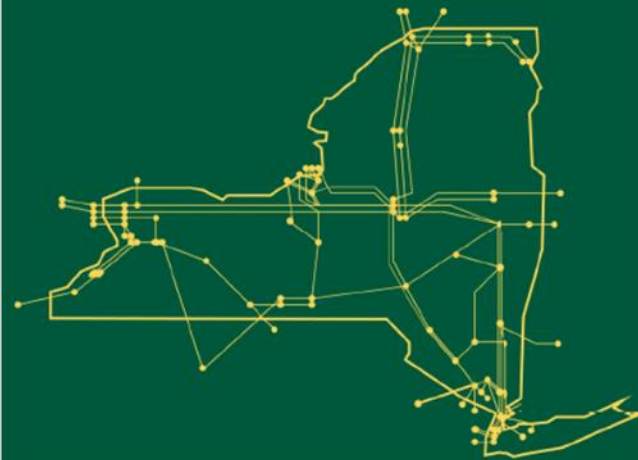
NYCA Coincident Peak Dates & Times & Zonal MW

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|----------------|----------------|--------|--------|-----------|---------------|-----------|
| Year | NYCA Peak Date | Hr Beg | Zone G | Zones H+I | Zone J | G-to-J CP |
| 2006 | 8/2/2006 | 14 | 2,436 | 2,063 | 11,604 | 16,103 |
| 2007 | 8/8/2007 | 17 | 2,316 | 2,033 | 10,971 | 15,320 |
| 2008 | 6/9/2008 | 17 | 2,277 | 2,056 | 10,979 | 15,311 |
| 2009 | 8/17/2009 | 16 | 2,159 | 1,875 | 10,366 | 14,400 |
| 2010 | 7/6/2010 | 17 | 2,399 | 2,187 | 11,600 | 16,186 |
| 2011 | 7/22/2011 | 16 | 2,482 | 2,239 | 11,826 | 16,546 |
| 2012 | 7/17/2012 | 14 | 2,282 | 2,082 | 11,405 | 15,769 |
| 2013 | 7/19/2013 | 17 | 2,384 | 2,253 | 11,736 | 16,373 |
| 2014 | 9/2/2014 | 16 | 2,036 | 1,917 | 10,567 | 14,520 |
| 2015 | 7/29/2015 | 16 | 2,070 | 1,930 | 10,455 | 14,455 |
| Average | | | | | 11,151 | |

Zone J Locality Peak Dates & Times & Zonal MW

| (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) = (13-6) |
|--|------------------|--------|--------|-----------|---------------|----------------------|---------------|
| Year | Zone J Peak Date | Hr Beg | Zone G | Zones H+I | Zone J | G-to-J, Coin. with J | Delta |
| 2006 | 8/2/2006 | 17 | 2,497 | 2,133 | 11,660 | 16,290 | 56 |
| 2007 | 8/8/2007 | 17 | 2,316 | 2,033 | 10,971 | 15,320 | - |
| 2008 | 6/10/2008 | 17 | 2,338 | 2,101 | 11,262 | 15,701 | 283 |
| 2009 | 8/21/2009 | 15 | 2,117 | 1,879 | 10,661 | 14,657 | 294 |
| 2010 | 7/6/2010 | 17 | 2,399 | 2,187 | 11,600 | 16,186 | - |
| 2011 | 7/22/2011 | 12 | 2,375 | 2,107 | 11,876 | 16,358 | 50 |
| 2012 | 7/18/2012 | 15 | 2,115 | 2,002 | 11,438 | 15,554 | 33 |
| 2013 | 7/19/2013 | 17 | 2,384 | 2,253 | 11,736 | 16,373 | - |
| 2014 | 9/2/2014 | 17 | 2,046 | 1,933 | 10,572 | 14,551 | 5 |
| 2015 | 7/20/2015 | 16 | 2,059 | 1,996 | 10,675 | 14,730 | 220 |
| Average | | | | | 11,245 | | 94 |
| Ratio of J Locality Peak to J Coincident Peak (11,245/11,151) | | | | | | | 1.0084 |

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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