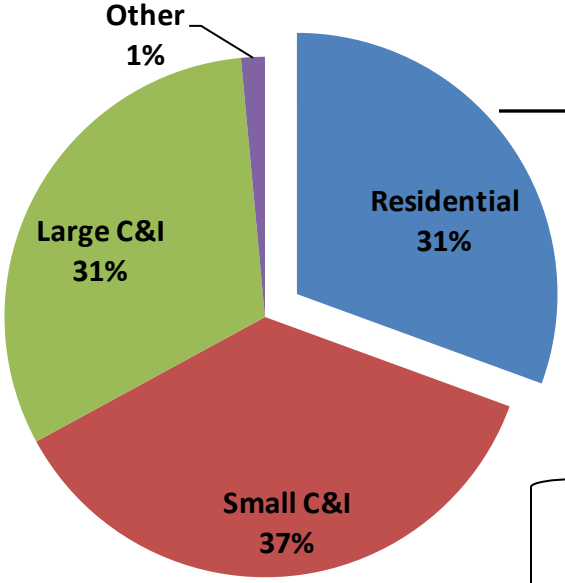
Executive Summary

- ✓ **The purpose of this presentation is to explain how we estimate the effects of non-normal weather conditions related to electricity usage at ComEd.**
  - **Weather adjustment math: Weather normal usage = Actual usage + Weather adjustment. For example, Actual residential usage in July 2011 was 3,900 GWh, but it was warmer than normal (444 CDD actual vs. 283 CDD normal). The estimated weather adjustment was (800) GWh resulting in a weather normal usage of 3,100 GWh.**
  - **Weather adjustment is needed because electricity usage in the Chicago area is significantly affected by weather conditions given the combination of wide weather variances during the year and the significant amount of residential and commercial cooling and heating load.**
- ✓ **ComEd uses a daily zone model to determine the weather adjustment for each day of the year.**
  - **The daily model is preferred as the weather relationships are clearer at the daily level than using a monthly model. The model has very good statistics and performed well over time.**
  - **Weather adjustment provides management with "clarity of the past" or what load growth would be after taking into account non-normal weather. Our forecasts are enhanced because weather relationships are better defined in our econometric forecasting models.**
- ✓ **We assume normal weather conditions based on the past 30-year time period ending in the year 2010.**
  - **We appreciate the collective wisdom of the experts in advising us as to what is the appropriate normal weather to be used for weather adjustment and forecasting purposes.**

ComEd Customer and Weather Characteristics

- ✓ **ComEd is a subsidiary of Exelon Corporation and it provides electrical service to the northern quarter of Illinois, which represents approximately 70% of the state's population. The service territory covers Chicago, the surrounding suburbs and rural areas extending to the Mississippi River.**
- ✓ **The breakdown of electricity usage by the major customer classes:**



- **Over 90% of the residential customers have either room or central air conditioning.**
- **Approximately 9% of the residential customer usage is related to electric-space heating.**

- ✓ **HDD/CDD ranges since 1960 at Chicago O' Hare.**

	HDD		
	Year	Actual	Normal
Coldest January	1971	1,679	1,333
Warmest January	2006	896	1,333

	CDD		
	Year	Actual	Normal
Coldest July	1962	128	279
Warmest July	2011	444	279

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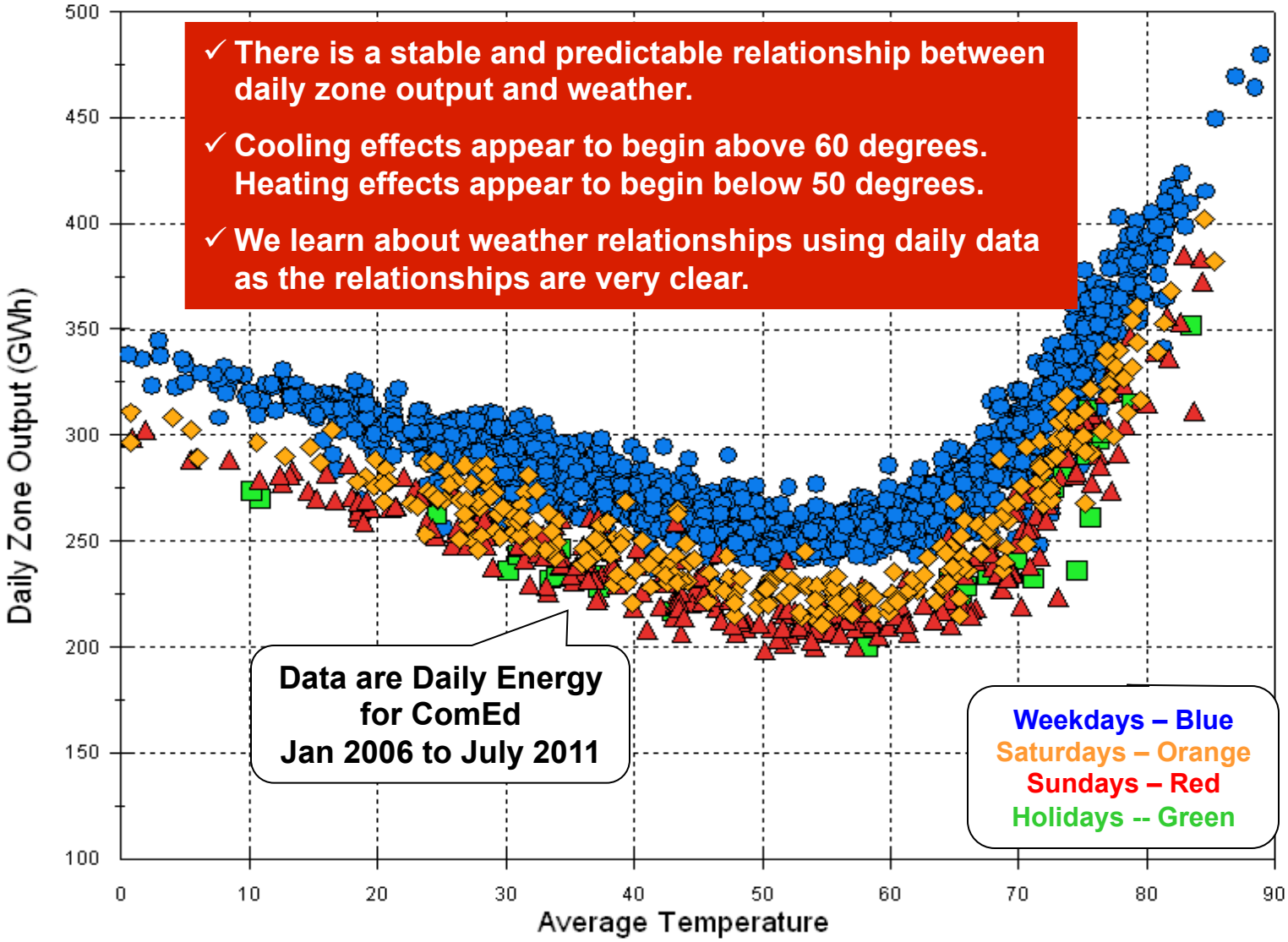
Daily Weather Adjustment

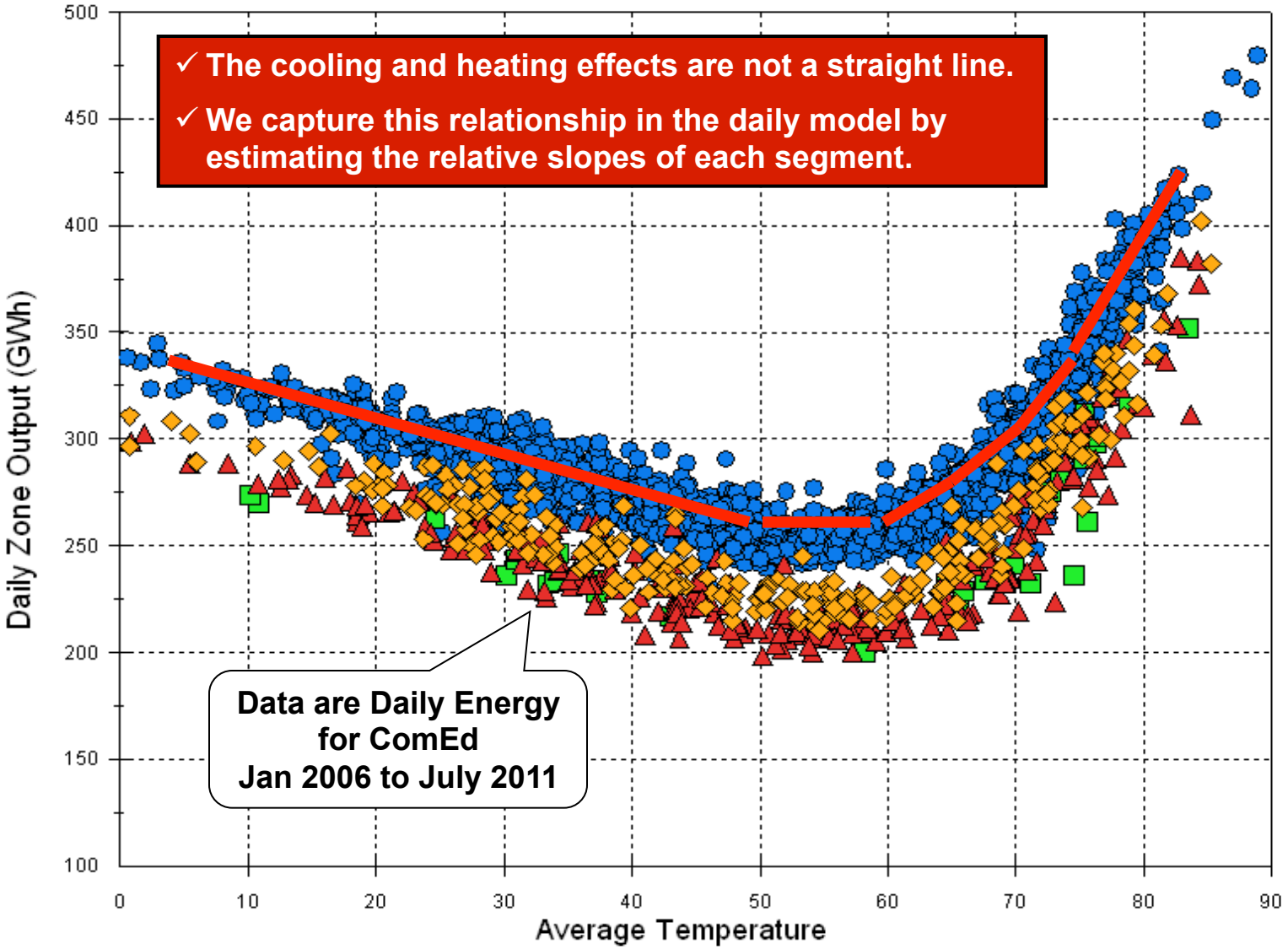
Signature Graph: ComEd Daily Zone and Temperature



Shown to the left is a plot of the ComEd daily zone output (usage) and average daily temperature for the years 2006 to July 2011.

The weekdays are shown in blue with the weekends and holidays in other colors.

Weather is not a Straight Line



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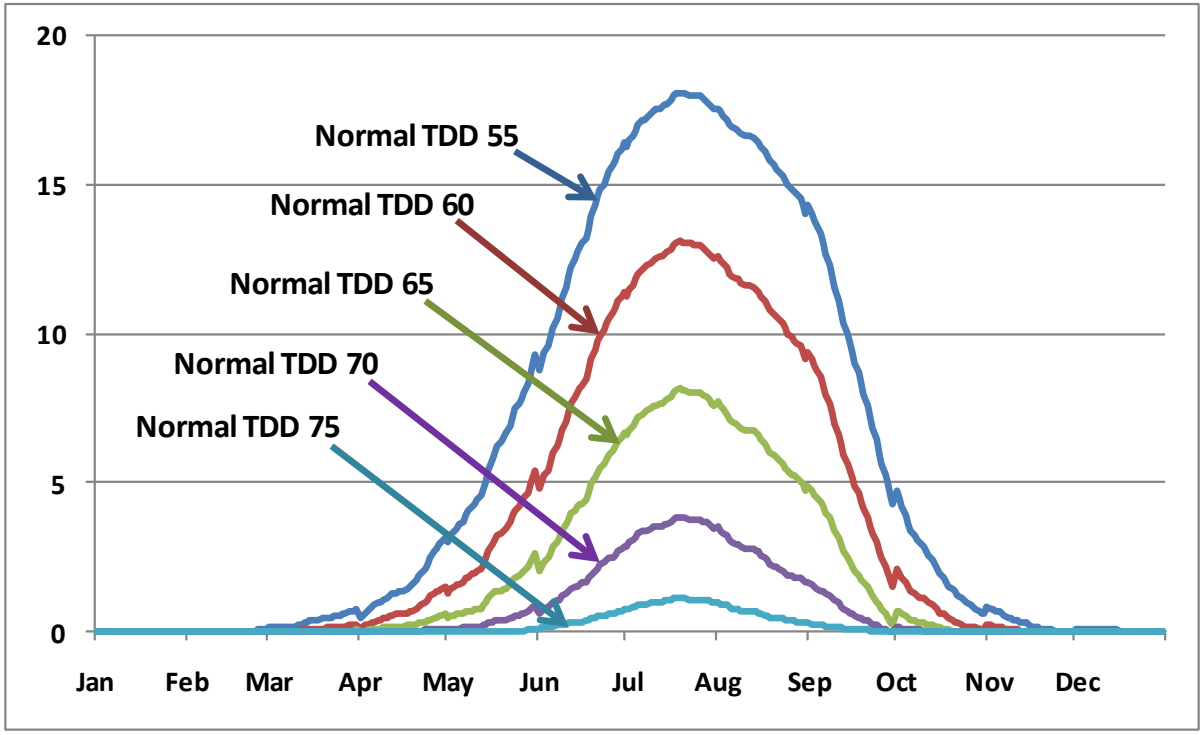
Spline Process Example

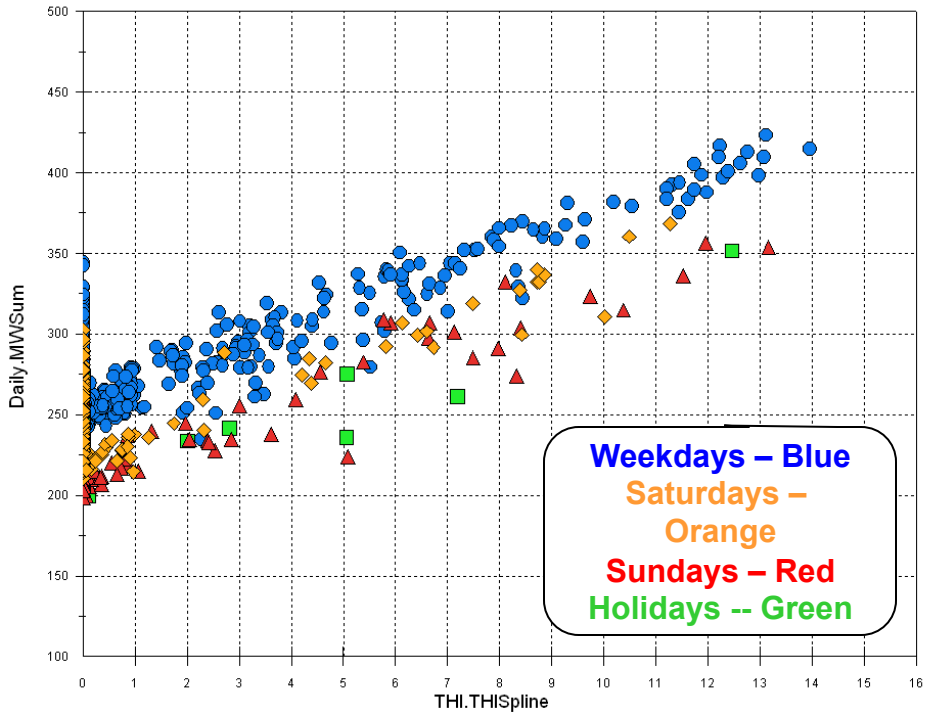
Cooling (THI) Degrees	Coefficient	Weights
Degrees above 55	0.781	8.0%
Degrees above 60	0.669	6.9%
Degrees above 65	3.103	31.9%
Degrees above 70	3.635	37.3%
Degrees above 75	1.549	15.9%

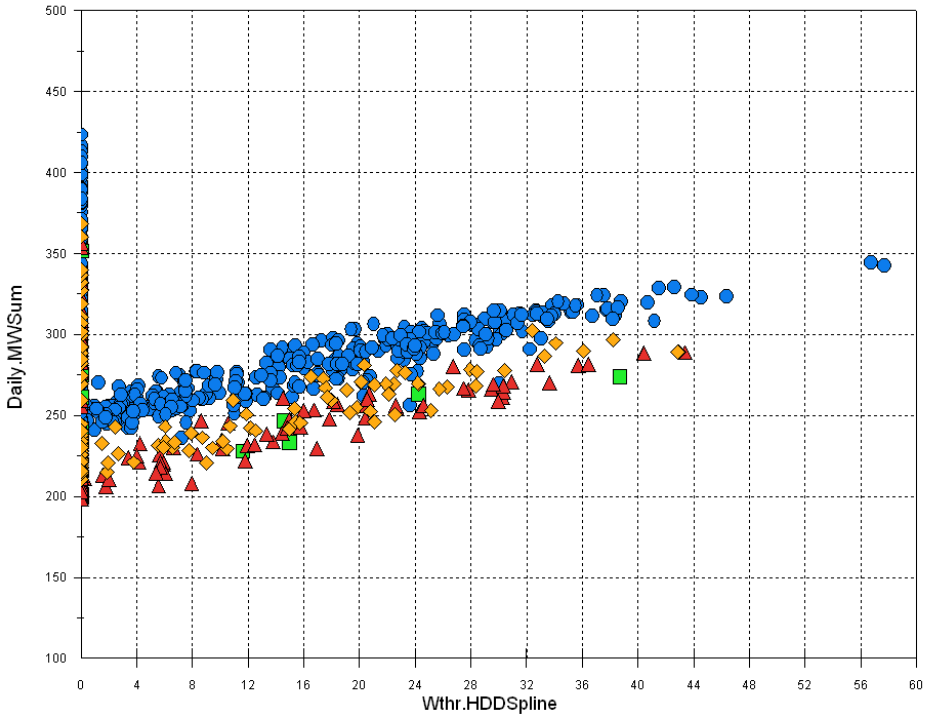
- ✓ The main weather variables in the daily model have a "spline" notation, which is a weighting of several variables to capture the changing slope shown on the prior slide.
- ✓ Because humidity matters we use a Temperature Humidity Index (THI).
- ✓ The equivalent of a CDD variable is created using THI, but with different bases (shown to the left).



- ✓ The coefficients from the various THI based variables are weighted to total to 100%. Note the strength of variables greater than 65 degrees.
- ✓ The weighting of each THI base is multiplied by the number of THI degree days in a day to get the spline value for a day. Shown to the left is the "normal" distribution of the THI degree bases in a year based on a 30-year average.

Linear Relationship between Spline and Usage





- ✓ The spline variable should have a linear relationship to usage.
- ✓ Shown above is the THIspline and HDDspline plot against daily usage. The blue dots (weekdays) have a linear relationship with both variables. The same is true of the weekend and holiday usages.
- ✓ The reason for going through the spline process is to make it easier to interact the weather variables with a monthly binary because weather usage does change with the month of the year.

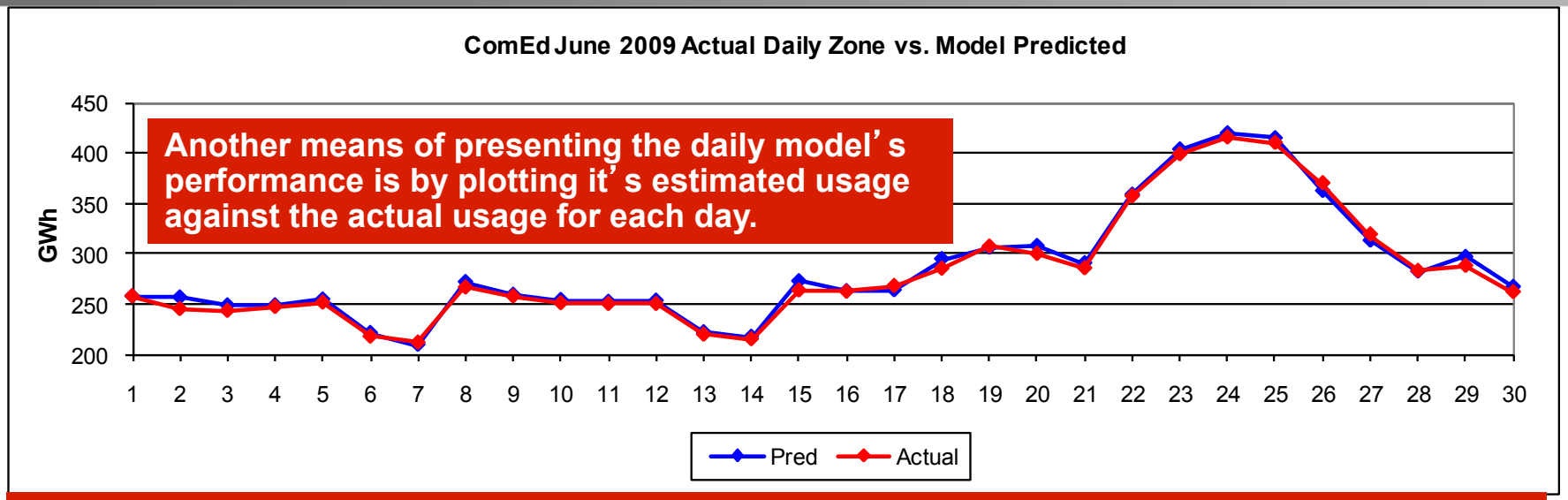
Daily Tracker Model - Variables

- ✓ The daily model includes numerous variables to capture daily usage patterns (shown to the right are the model variables).
- ✓ The main weather variables are:
  - THI and HDD with the spline process
  - Also, wind speed and cloud cover are used in the model
- ✓ The model also includes a lagged weather variable because yesterday's weather affects today's load.
- ✓ The model has an R-square of 0.989 and a MAPE of 1.19 (more statistics are found in the Appendix)

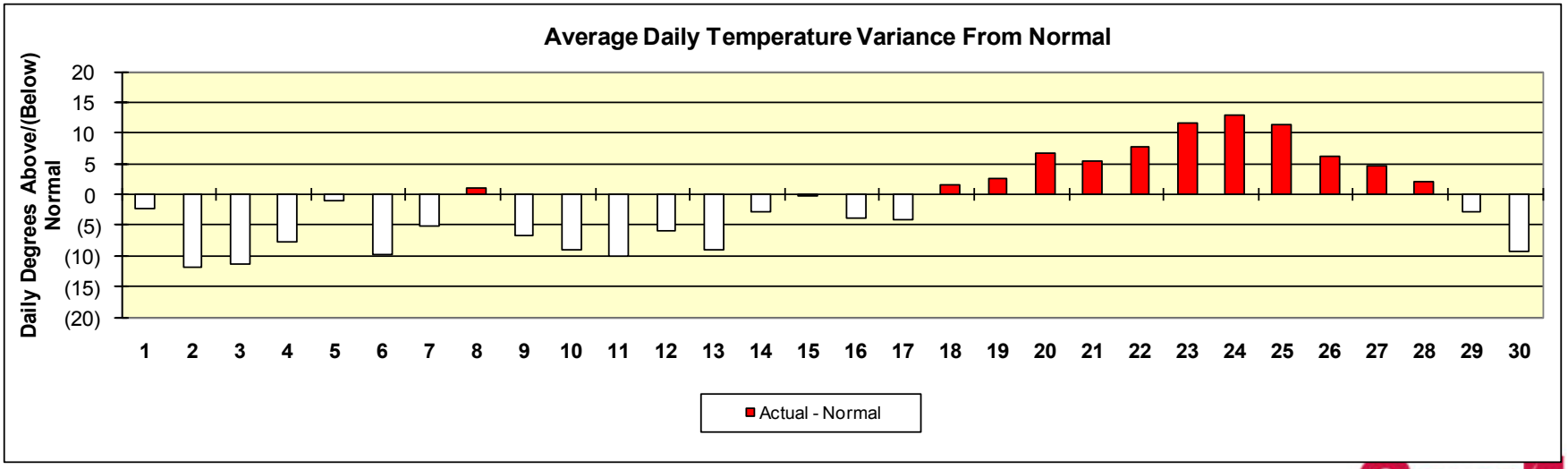
Variable	Coefficient	T-Statistic
Constant	223.05	152.64
Monday Binary	40.45	121.25
Tues Wed Thurs Binary	42.97	120.43
Friday Binary	39.93	107.25
Saturday Binary	12.01	46.40
January	(2.76)	(1.67)
February	(5.35)	(3.13)
March	(12.11)	(7.72)
April	(17.88)	(11.66)
May	(16.87)	(11.00)
June	(8.92)	(5.57)
July	(6.79)	(3.96)
August	(6.81)	(3.99)
September	(8.22)	(5.18)
October	(10.68)	(6.94)
November	(6.59)	(4.26)
MartinLutherKingDay	(4.91)	(3.19)
PresidentsDay	(4.68)	(3.05)
GoodFriday	(12.65)	(8.74)
MemorialDay	(43.80)	(28.05)
July4th	(47.15)	(25.69)
LaborDay	(44.72)	(26.80)
Thanksgiving	(52.43)	(29.72)
FridayAfterThanksgiving	(33.95)	(18.00)
XMasWkBefore	(18.94)	(7.05)
ChristmasEve	(30.09)	(11.87)
ChristmasDay	(49.20)	(21.41)
XMasWk	(32.08)	(14.34)
NewYearsEve	(33.18)	(13.69)
NewYearsDay	(46.82)	(22.19)
XMasLights	0.45	6.07
Daylight Saving Time - Spring	(7.38)	(5.17)
Daylight Saving Time - Fall	8.86	5.82

Variable	Coefficient	T-Statistic
TimeTrend	3.09	11.05
FinCrisis	(9.74)	(11.56)
May09Plus	(8.23)	(9.73)
Yr2007Plus	(0.21)	(0.26)
Blizzard2011	(35.90)	(9.00)
FallHDD	0.29	1.66
NovHDD	0.62	7.35
DecHDD	0.61	10.28
JanHDD	0.70	13.19
FebHDD	0.64	10.05
MarHDD	0.65	9.11
SpringHDD	0.42	3.60
LagHDD	0.39	14.78
Lag2HDD	0.10	4.04
WkEndHDD	0.14	6.20
HDDSplineTrend	0.05	6.16
CC_HDDSpline	0.00	10.49
DailyWSP_HDDSpline	0.03	11.83
AprilTHI	6.33	14.20
MayTHI	10.39	46.43
JuneTHI	11.11	63.16
JulyTHI	11.30	63.34
AugTHI	11.44	65.41
SepTHI	11.30	52.64
FallTHI	10.53	31.51
LagTHI	2.86	42.79
Lag2THI	0.39	6.08
THIWkEnd	(0.64)	(9.21)
TrendTHI	(0.03)	(1.08)
2006Plus_Shift	(0.23)	(1.51)
CC_THISpline	(0.01)	(12.30)
DailyWSP_THISpline	(0.07)	(8.63)
AR(1)	0.53	31.72

Daily Model – June 2009 Performance



The blue line is the model's estimated usage for the day based on actual weather for that day and the red is the actual daily usage. The two lines are tightly aligned under various weather conditions (shown below).



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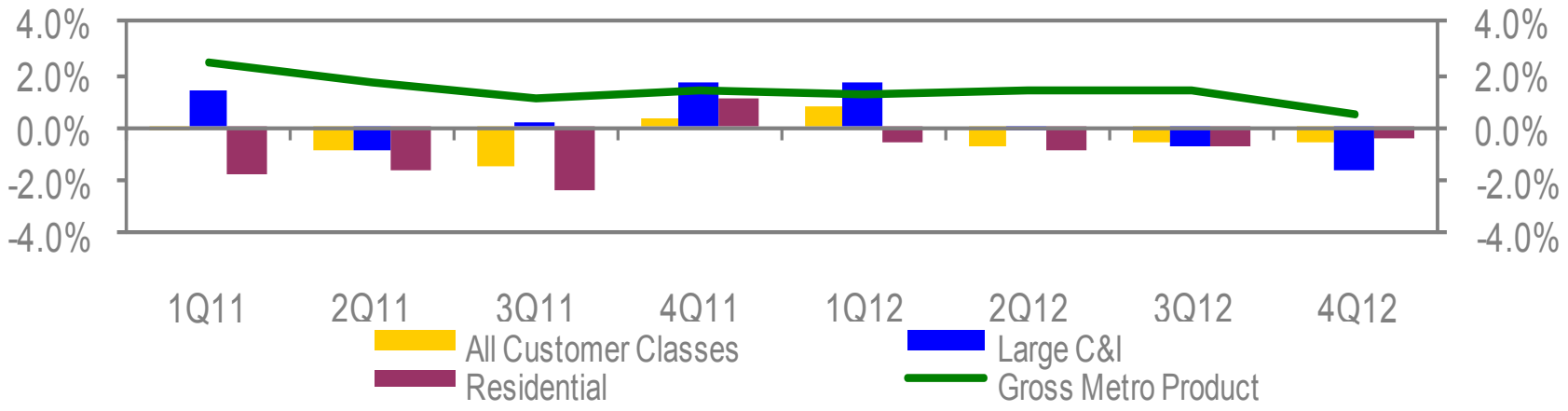
ComEd Load Trends: 2011 4th Qtr. Earnings Release

Weather-Normalized Load Year-over-Year (3)



Key Economic Indicators

	Chicago	U.S.
Unemployment rate (1)	10.5%	8.5%
2011 annualized growth in gross domestic/metro product (2	1.7%	1.8%

(1) Source: U.S. Dept. of Labor (Dec 2011) and Illinois Department of Security (November 2011)
(2) Source: Global Insight (November 2011)
(3) Not adjusted for leap year

Weather-Normalized Load

	4Q11	2011	2012E (3)
Average Customer Growth	0.3%	0.4%	0.4%
Average Use-Per-Customer	0.9%	(1.7%)	(1.0%)
Total Residential	1.2%	(1.3%)	(0.6%)
Small C&I	(1.2%)	(0.8%)	0.0%
Large C&I	1.8%	0.6%	(0.2%)
All Customer Classes	0.4%	(0.5%)	(0.2%)

Note: C&I = Commercial & Industrial

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Appendix

Daily Tracker Model – Regression Statistics

Regression Statistics	
Iterations	14
Adjusted Observations	2767
Deg. of Freedom for Error	2701
R-Squared	0.989
Adjusted R-Squared	0.988
AIC	3.0311256
BIC	3.1724643
F-Statistic	3638.659
Prob (F-Statistic)	0
Log-Likelihood	-8,053.77
Model Sum of Squares	4,786,546.63
Sum of Squared Errors	54,662.84
Mean Squared Error	20.238002
Std. Error of Regression	4.498667
Mean Abs. Dev. (MAD)	3.297307
Mean Abs. % Err. (MAPE)	1.19%
Durbin-Watson Statistic	2.116
Durbin-H Statistic	#NA
Ljung-Box Statistic	187.95
Prob (Ljung-Box)	0
Skewness	0.059
Kurtosis	4.972
Jarque-Bera	449.941
Prob (Jarque-Bera)	0