FINANCIAL ANALYTICS USING AMI DATA

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Western Load Research Association
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FINANCIAL ANALYTICS USING AMI DATA

The presentation has two parts

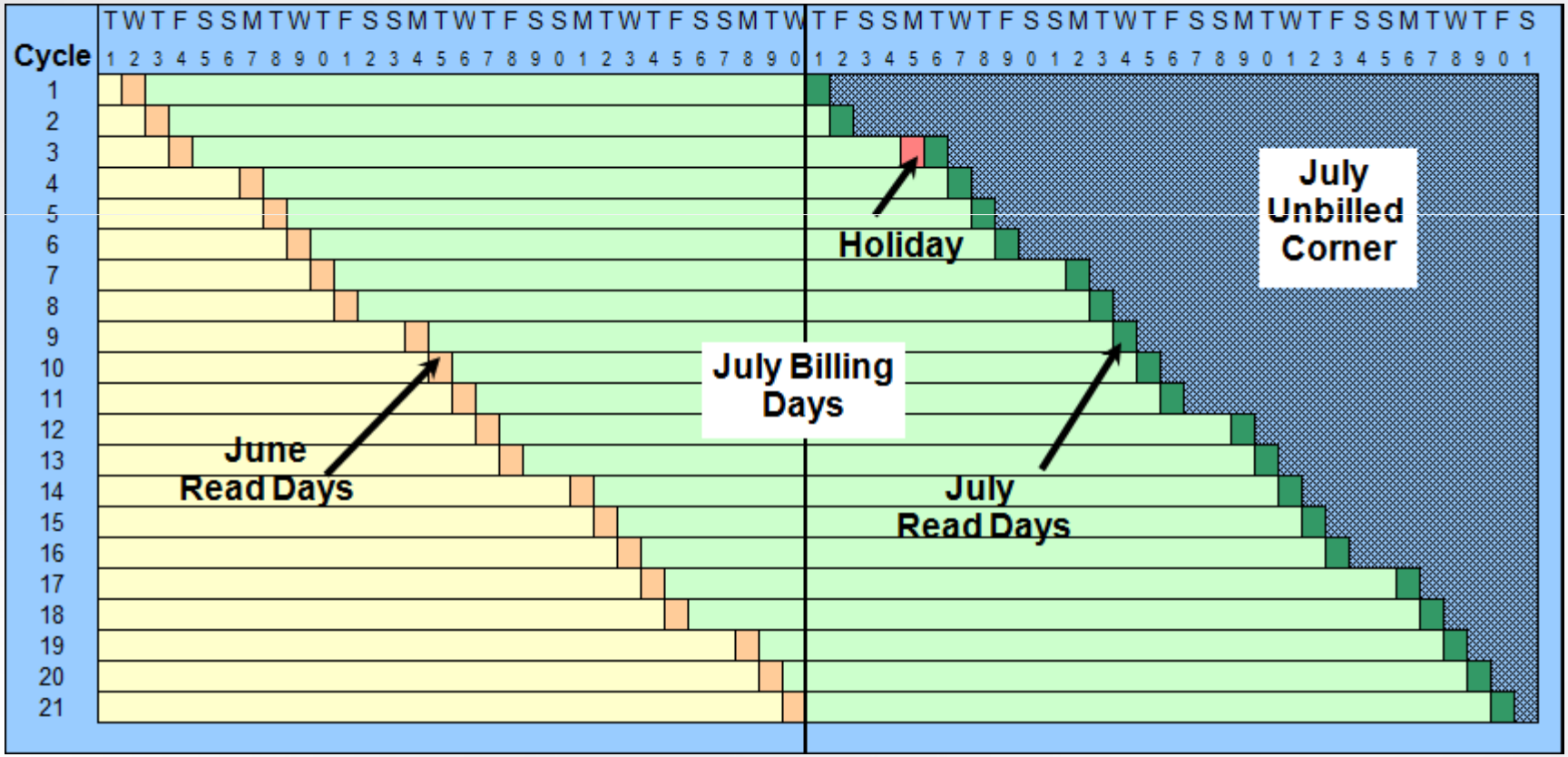
- Part 1: AMI Data and Financial Closing
- Part 2: AMI Data and Weather Response

FINANCIAL CLOSING

- Billing is by cycle.
- Financial reporting is by calendar month.
- Each month analysts must estimate:
  - Sales and revenue by class for the calendar month
  - Unbilled sales and revenue by class
    - Unbilled revenue is an asset on the balance sheet
    - Unbilled revenue is a large part of monthly revenue (35% to 65%)
- This can be a pain point, depending on the methods used
- AMI data allows replacement of estimates with direct measurement
- Partial AMI data can improve estimation process during deployment

THE ROLE OF BILLING CYCLES

- Most utilities use 20 or 21 billing cycles
- Some use 40 bimonthly cycles
- Not always a clean precise process with manual reads or AMR



WHY AMI DATA CLARIFIES THE PROCESS

- AMI data provides day-by-day usage for each customer
- AMI data is up to date for closing calculations
- AMI is the source of usage data for computing bills
- With AMI data
  - Calendar month energy can be calculated directly
  - Unbilled energy can be calculated directly
- Complicated estimation processes…

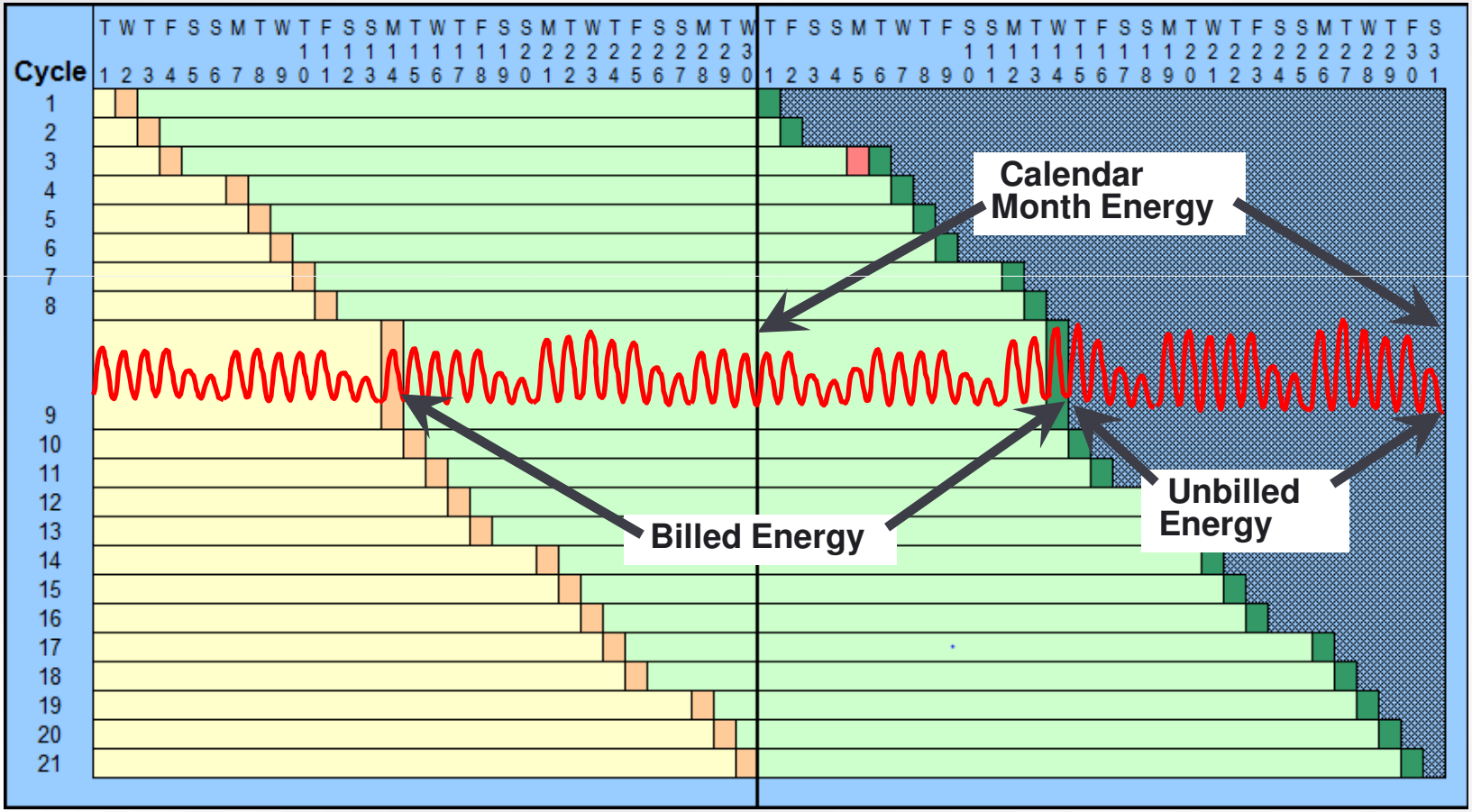
  can be replaced…

  by **direct calculations**

WHY AMI DATA CLARIFIES THE PROCESS

» Complicated estimation processes can be replaced by direct calculations

The Close



USING AMI DATA DURING DEPLOYMENT

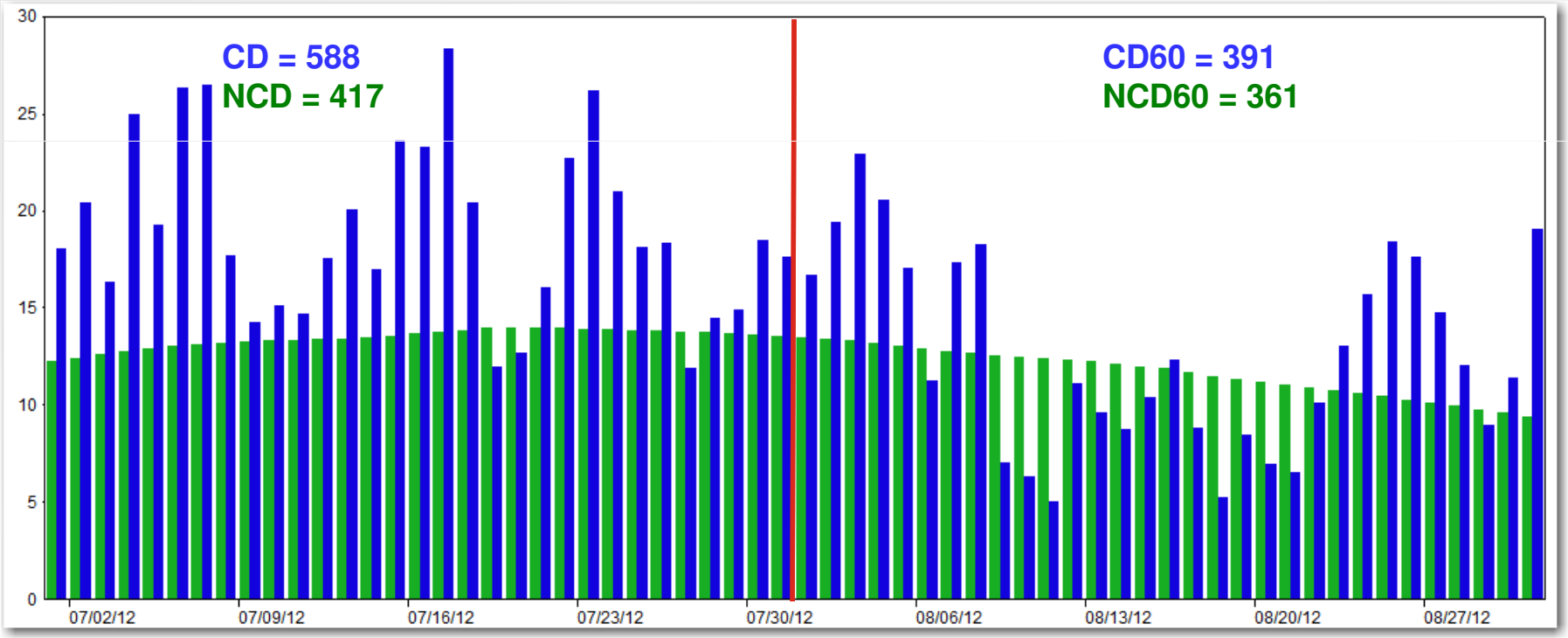
- There are three primary estimation methods
  - Aggregate using monthly billing totals
  - Aggregate using billing monthly billing by cycle
  - Detailed based on individual customer bills and read dates
- All methods use profiles or models to estimate ratios
  - Calendar month/billing month ratio
  - Unbilled/Calendar month ratio
- Partial AMI data can be used to generate profile data and to estimate ratios during deployment
- An example follows at the 30% deployment point.
  - Concern: Is partial AMI data representative

ESTIMATION PROCESSES

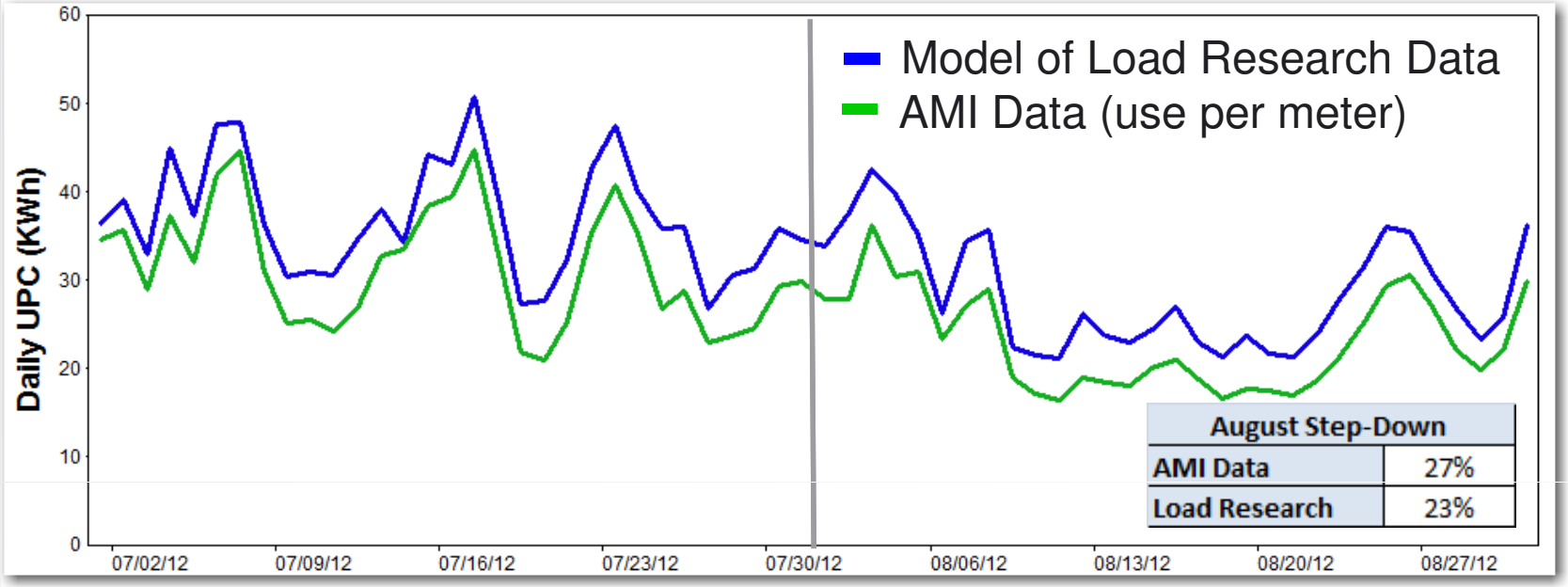
- Estimate calendar month energy for the close
  - Calculation on 3rd working day of the following month
- Estimate unbilled energy for the close
  - Calculation on 3rd working day of the following month
- Finalize calendar month energy (look-back analysis)
  - Calculation one month+ after the close
  - Example for September
    - Calculation performed in early November
    - Allocate September bills between August and September
    - Allocate October bills between September and October
    - Sum up the parts for September
- Partial AMI daily energy profiles can be used in these processes

BACKGROUND ON WEATHER

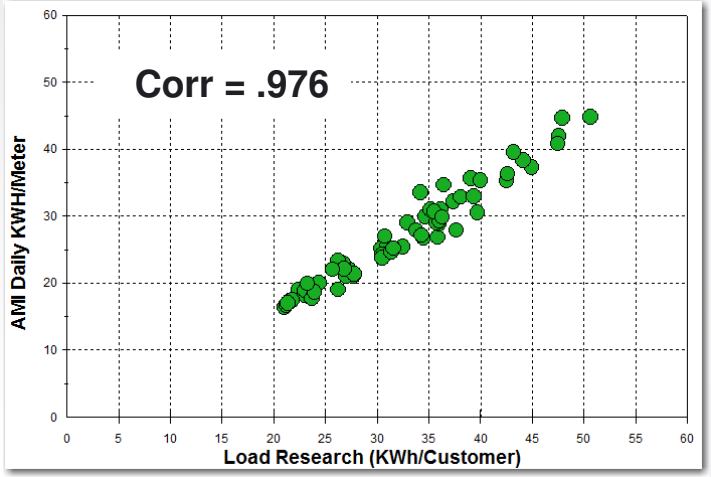
- In the example, July is hot.
- August is close to normal.
- Chart shows daily cooling degrees (CD) relative to 60º F.



RESIDENTIAL AMI PROFILES

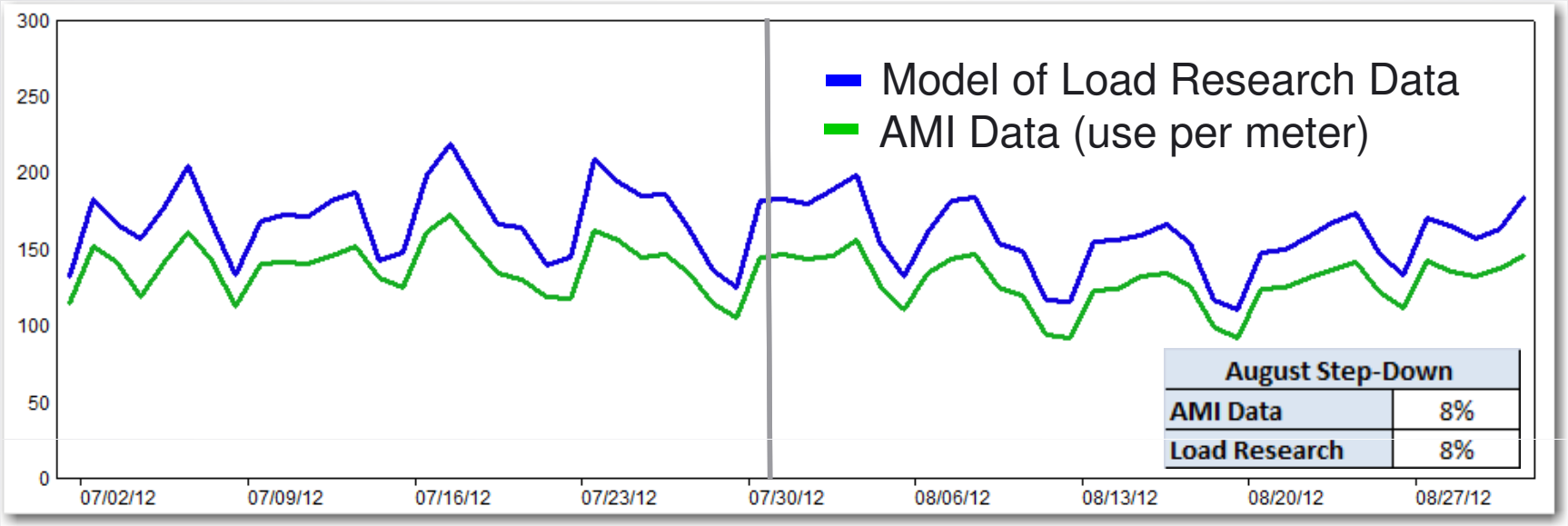


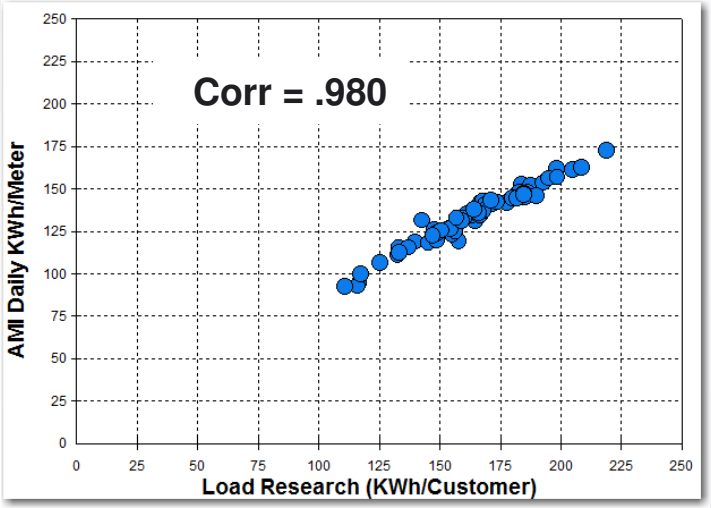
August Step-Down	
AMI Data	27%
Load Research	23%



» Daily variations in residential AMI data are consistent with data from statistical load research studies

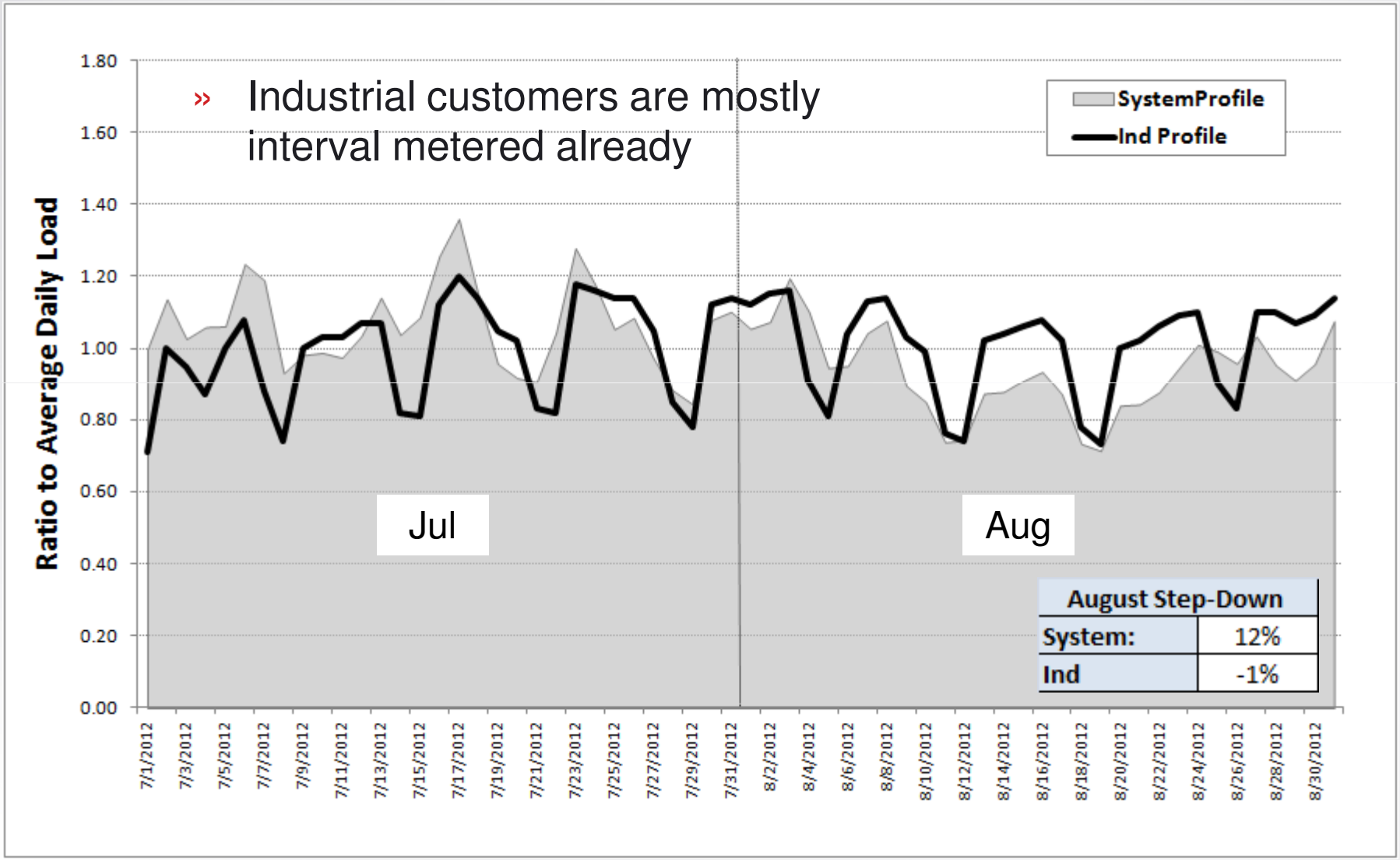
COMMERCIAL AMI PROFILES





» Daily variations in commercial AMI data are consistent with data from statistical load research studies

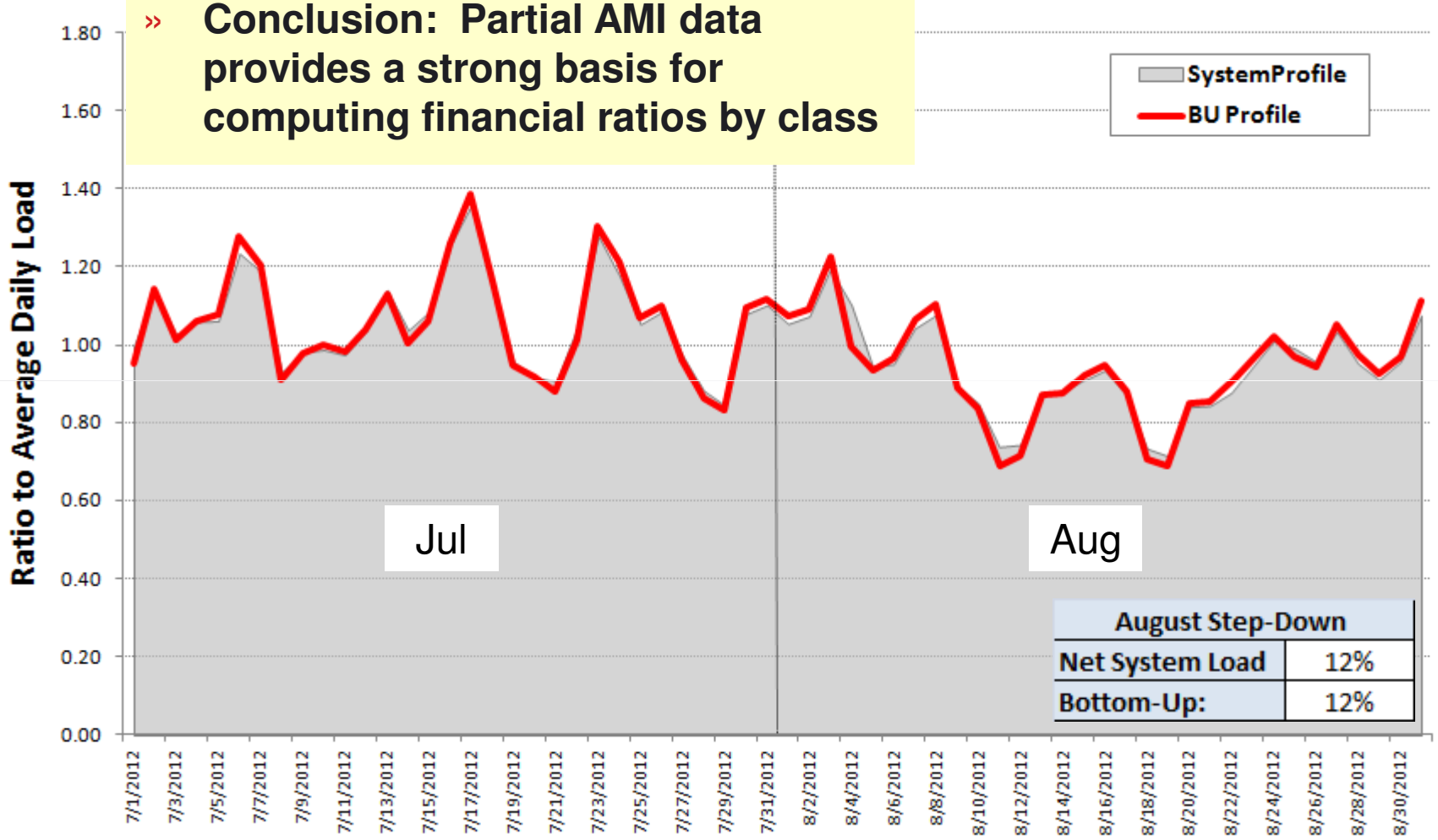
INDUSTRIAL AND SYSTEM RATIOS



August Step-Down	
System:	12%
Ind	-1%

BOTTOM-UP PROFILE AND RATIOS

» **Conclusion: Partial AMI data provides a strong basis for computing financial ratios by class**



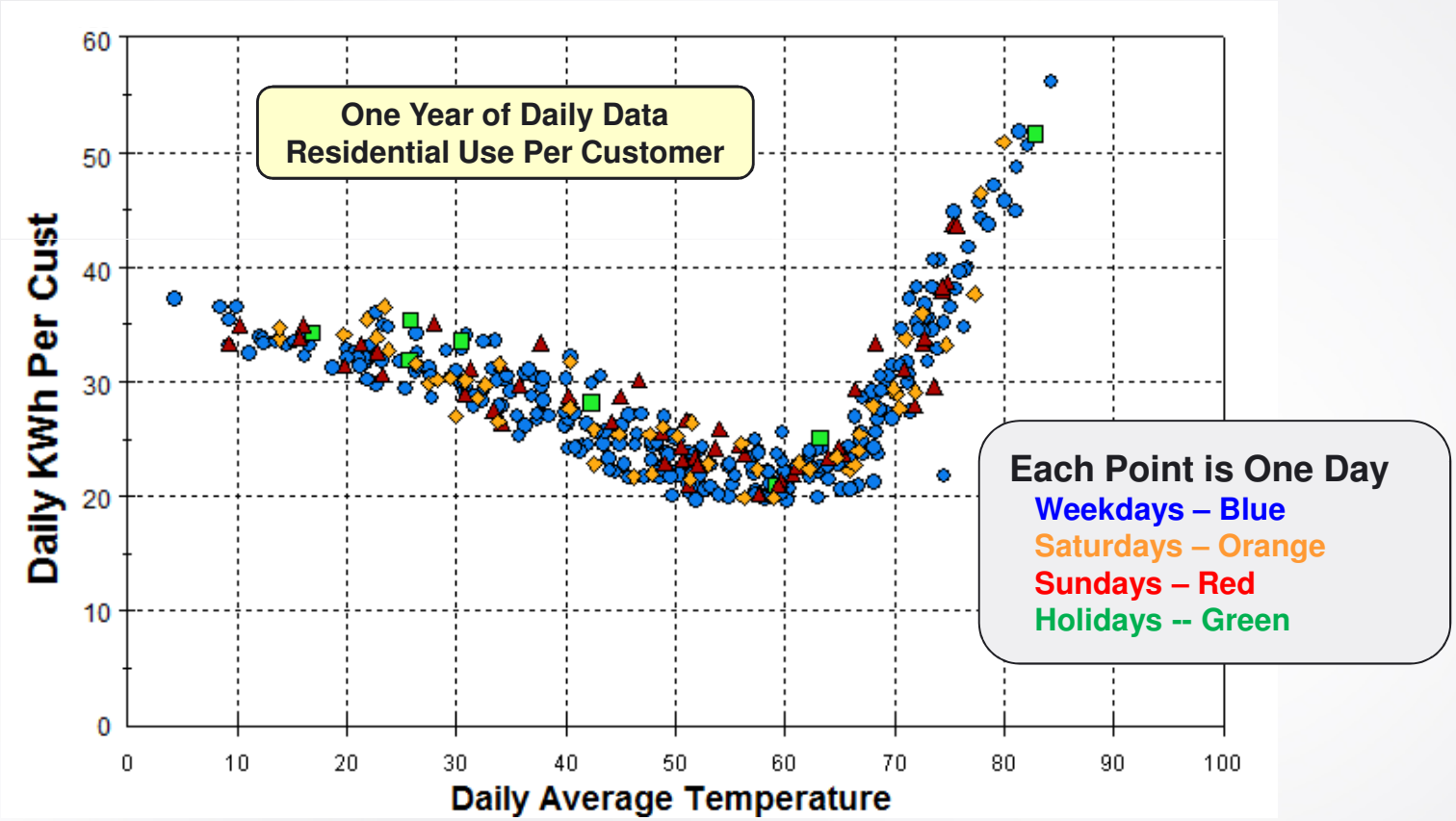
August Step-Down	
Net System Load	12%
Bottom-Up:	12%

UNDERSTANDING WEATHER RESPONSE

- Looking back at each month weather effects are quantified to:
  - Analyze variances from budget
  - Track actual values against the budget forecast.
- Weather effects are often modeled with monthly sales
- Use of daily AMI data can strengthen these models
- The result is:
  - Stronger, more robust models
  - More precise estimation of weather effects
  - Improved clarity about the business

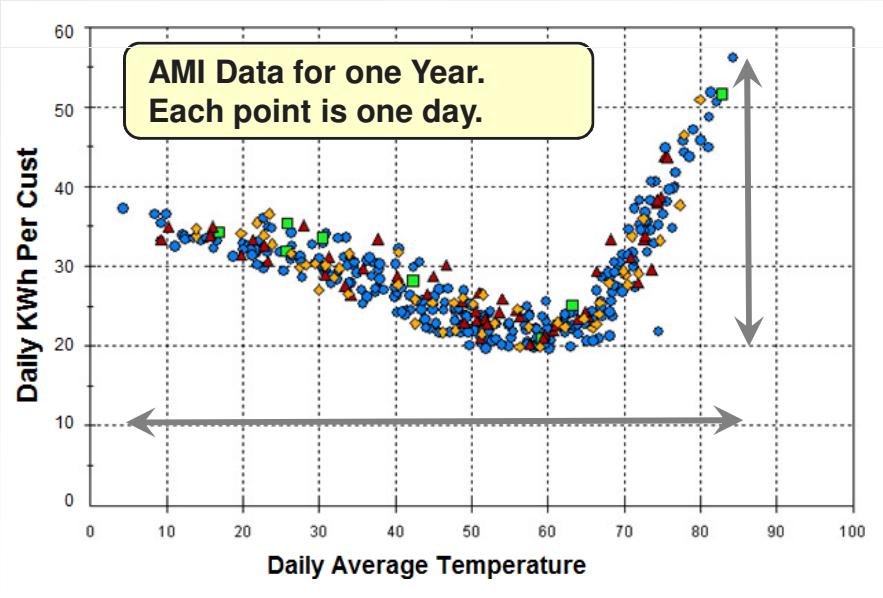
UNDERSTANDING WEATHER RESPONSE

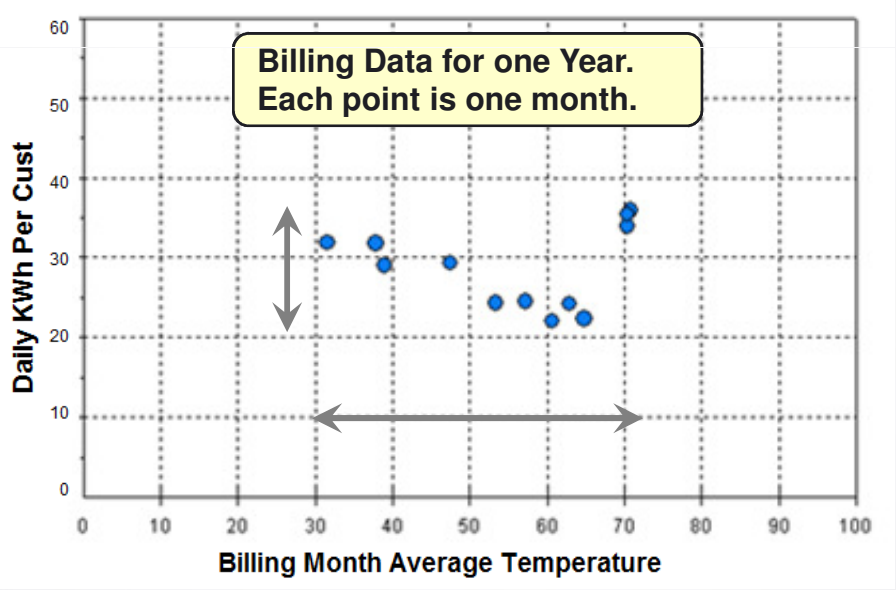
- AMI data is very powerful for understanding weather relationships.
- There are 365 points per year, a strong advantage over monthly data.
- AMI usage on a day can be matched cleanly with weather for that day.



WHY THIS IS IMPORTANT

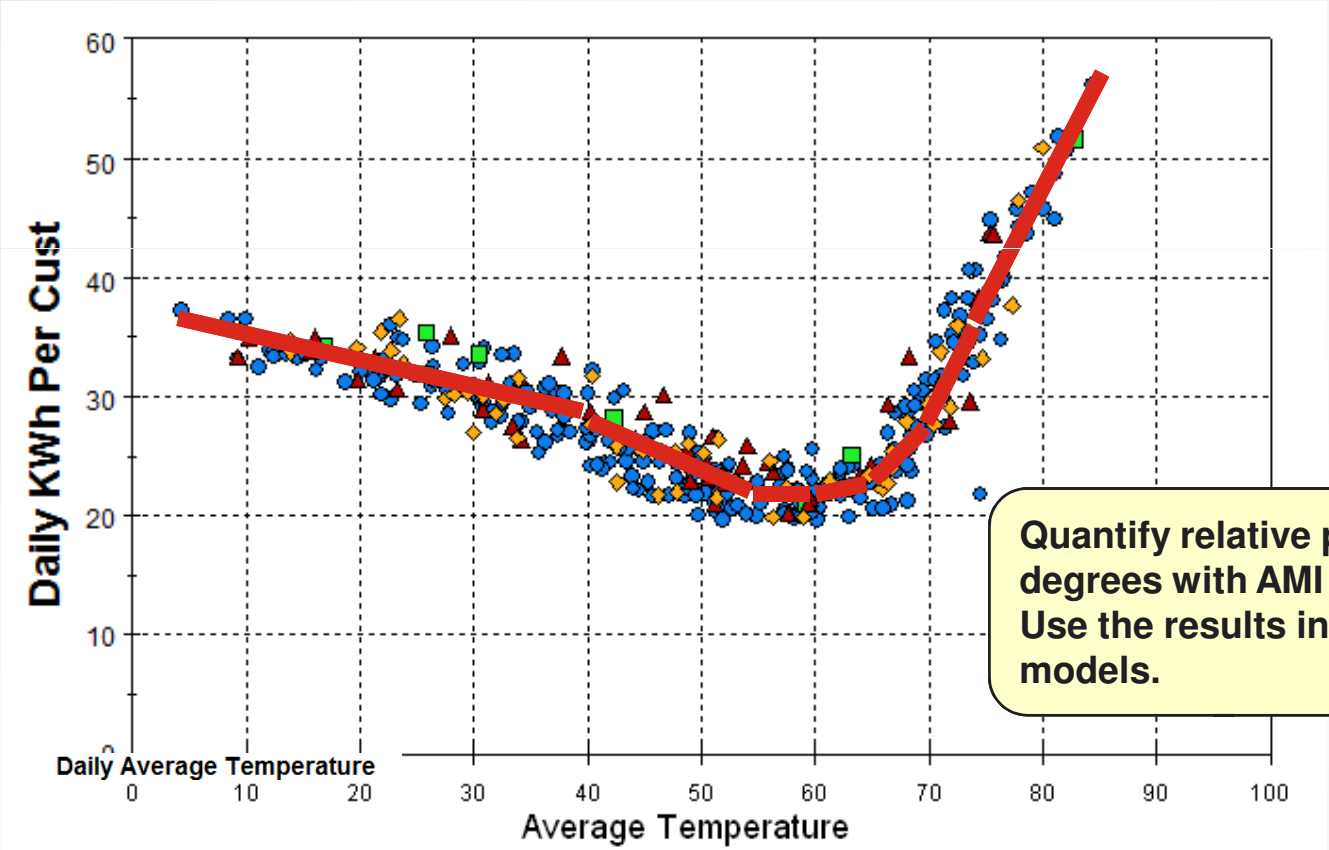
- Most analysis models are built with monthly data.
- Monthly sales data are from staggered billing cycles.
- Monthly data has less leverage (in X and Y directions).
- Daily data show how weather works.





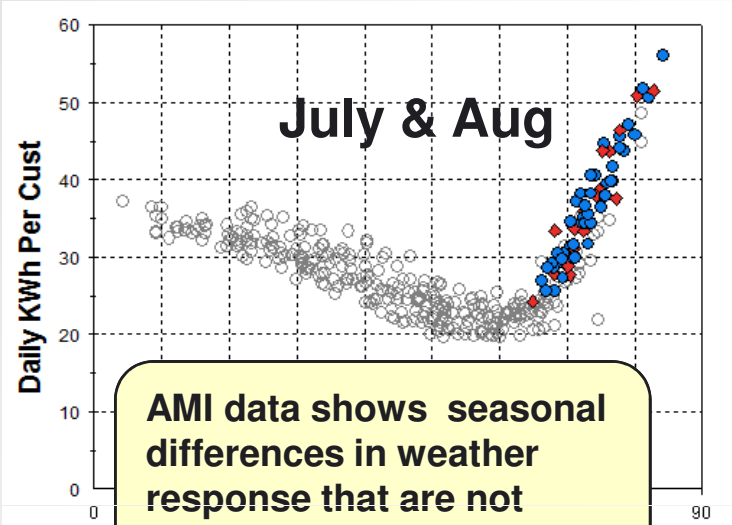
AMI DATA SUPPORTS RICHER MODELS

- AMI data shows us when weather starts to matter
- AMI identifies low, medium, and high powered degrees

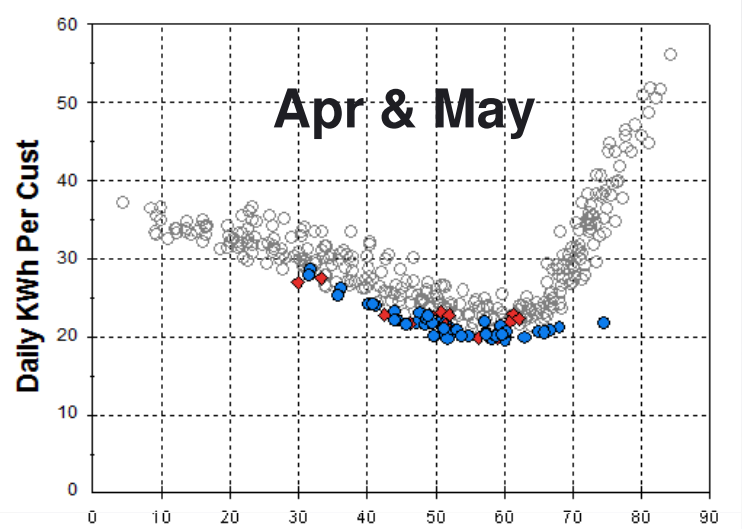


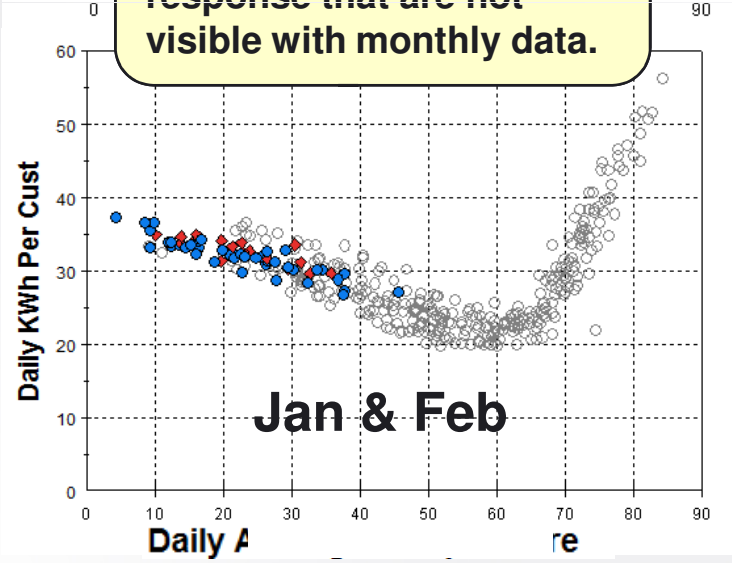
Quantify relative power of degrees with AMI data. Use the results in monthly models.

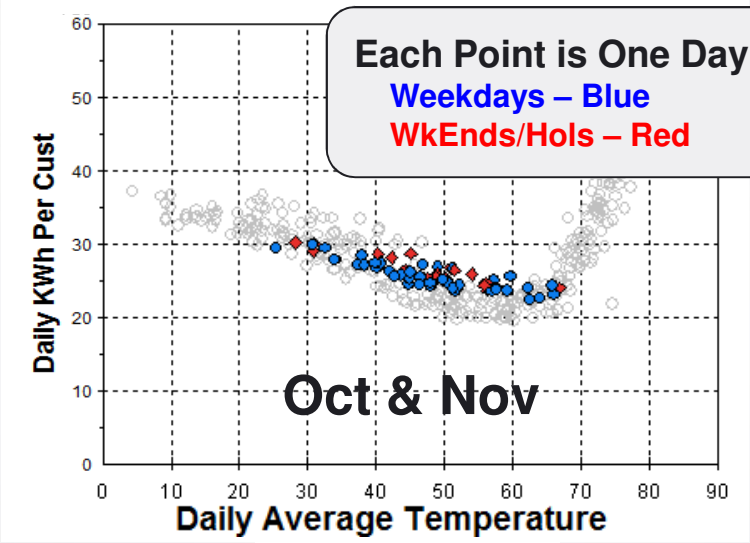
AMI DATA IDENTIFIES SEASONAL RESPONSE



AMI data shows seasonal differences in weather response that are not visible with monthly data.



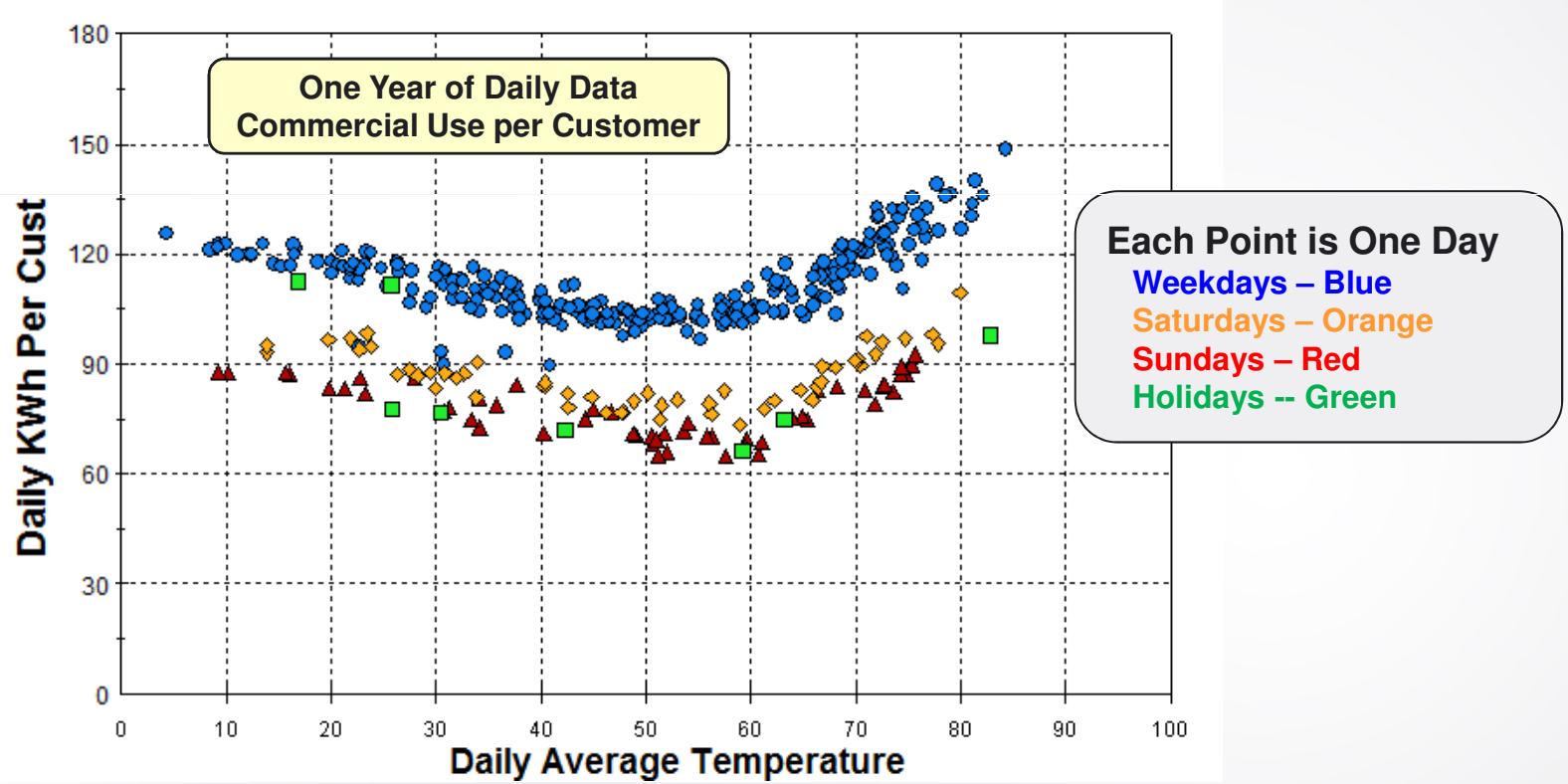




Each Point is One Day
Weekdays – Blue
WkEnds/Hols – Red

AMI DATA IDENTIFIES CALENDAR IMPACTS

- AMI data identifies weekend effects
- AMI data identifies the strength of holiday effects
- Understanding these effects creates additional clarity



SO WHAT?

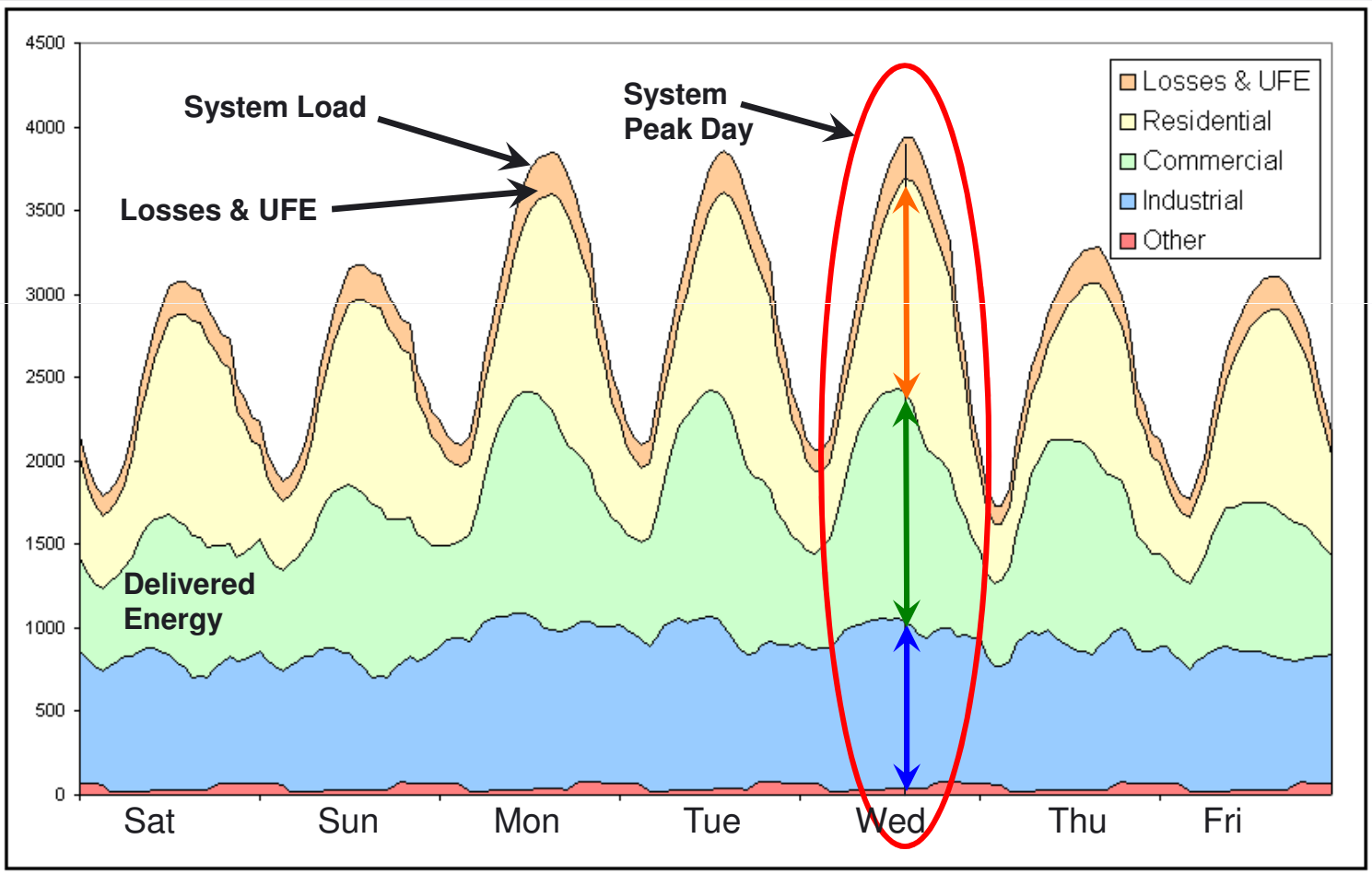
- You put it all together and new possibilities emerge
- Class sales can be adjusted for weather on a daily basis
- Class sales can be tracked against budget on a daily basis
- This is a major step forward in clarity and visibility
  - Upper management likes this
  - That's what

WHERE IS THE VALUE?

- It won't increase revenue
  - The bills are the bills
  - Cash flow is cash flow
- It won't decrease cost
  - You get what you pay for
- But…when management goes to the street
  - There will be no confusion about how the business sits
  - This will relieve a major pain point in many companies

THE BOTTOM LINE

» AMI data provides improved clarity about customer usage patterns and this supports stronger financial analytics.



WHAT THIS MEANS FOR FORECASTING

- Estimation of calendar month energy by class goes away.
- Estimation of unbilled energy by class goes away.
- Budget forecasting needs remain the same.
  - But models will be estimated using daily or calendar month data
  - Daily budget forecasts will be enabled
- Weather normalization processes will improve.
  - These processes will be applied at the daily level (tracking weather normalized daily energy by class against daily budget forecasts), providing improved clarity and visibility.
- Monthly variance analysis processes will improve.
  - Variance calculations by class will be based on actual calendar month usage instead of estimated calendar month usage.

WHAT ITRON IS DOING

- Smart Grid Analytics based on AMI and Grid data
  - Transformer load management
  - Power quality analytics
  - Revenue protection
  - Deposit administration
  - Financial analytics
  - Smart Grid forecasting