

PDCWG Report to ROS

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June 26th meeting

- Open meeting to address ROS requests
- 14 attendees representing 9 companies, ERCOT, TRE, & PUC
- Fast Response Regulation Pilot
- NPRR 460 WGR ramp rate limitation
- Responsive Reserve supplied by Load Resources
- TRE request for feedback on San Diego event
- Canceled scheduled meeting July 3rd
- Next meeting August 8th

Fast Response Regulation Pilot Concerns

- Service to support system inertia
 - Desire clear problem statement
 - Desire clear deployment methodology
 - System inertia is currently not a market service/product
 - Mechanisms to supply inertia with current fleet
- Performance to DCS events
- Performance to events typically not measured
- Compliance impacts to units near FRRS equipment
- Dynamic impact
 - Oscillations, SSRI, etc.

Fast Response Regulation Pilot Concerns (cont.)

- Impact to ERCOT EMS & MMS systems
 - AS Capacity monitor
 - Regulation tuning required
 - Parallels with existing regulation (where do you draw the line between services)
- Pilot metrics
 - Success criteria
 - Performance to events and deployments
 - Compliance exemptions & requirements
 - Impact to compliance of other units
- Cost allocation & settlements
- Target resource supply
 - Capacity available to justify expense of pilot
- Full list posted

NPRR 460 WGR Ramp Rate Limitation

- Discussed and agreed with increase to 20% from 10%
- ERCOT proposed removing limitation and monitoring with GREDP metric
- Analysis is needed to determine impact & ability of WGRs to follow UDPB
- Suggest QMWG provide feedback of this proposal

RRS Supplied by Load Resources – Study Review

- Reviewed study scenarios and results
- Discussed study assumptions
 - Effects of Hydro
 - Benchmarking of models
 - Model validation

RRS Supplied by Load Resources – Study Review

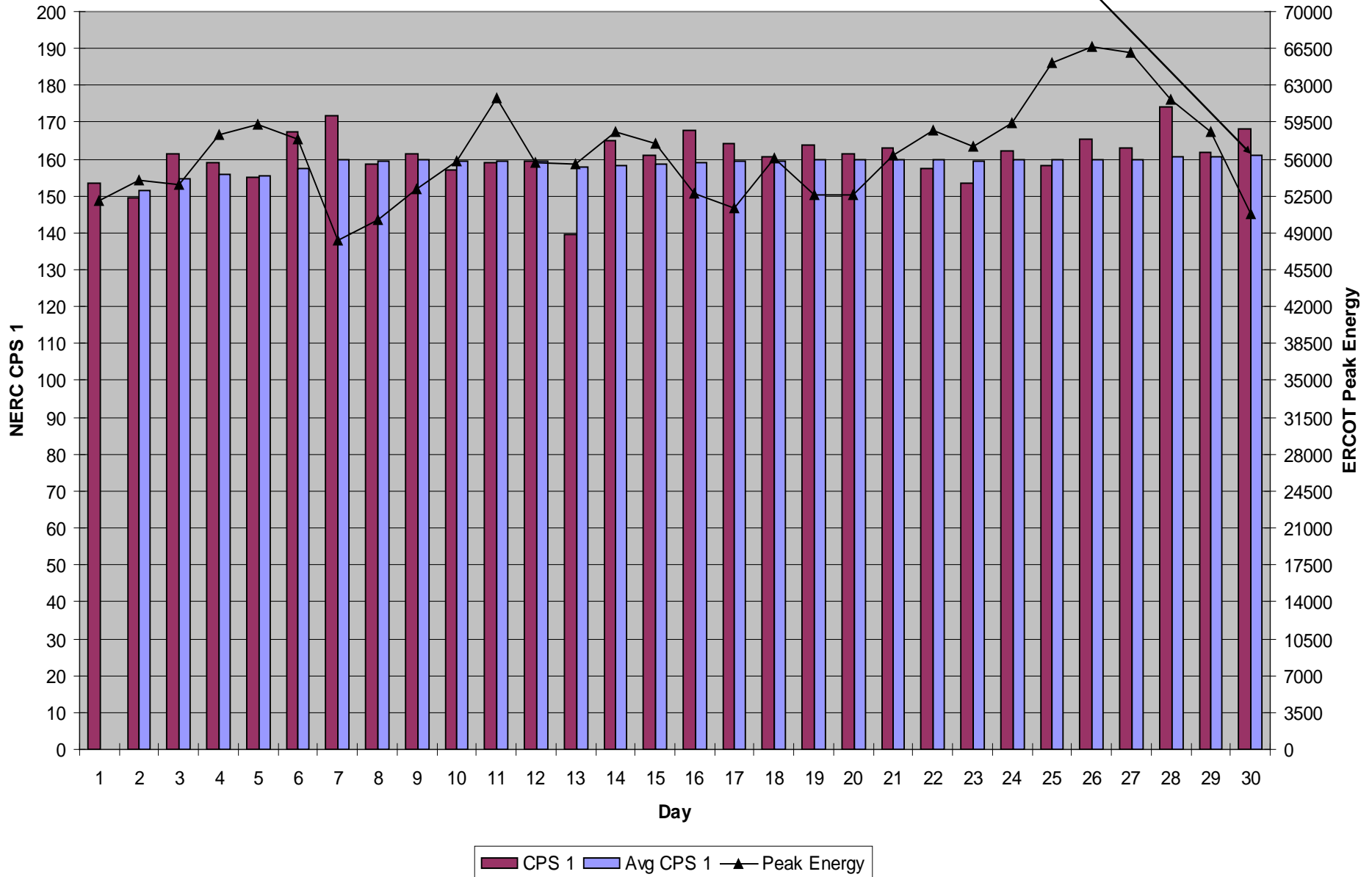
- Concerns
 - Models may not be up to date
 - Unaware of incentive or requirement to maintain generator models
 - Study period is up to 20 seconds
 - Concern over control(generator) instability caused by rapid changes
 - Response to low frequency is pulled back to respond to high frequency
 - Study is worst case scenario
 - Response is acceptable under worst case
 - Reduction in PFR is expected
 - Long term impact of reducing frequency responsive capacity
 - Impact to annual frequency response when evaluating to BAAL-003

San Diego Event – TRE discussion

- Finding 21 – Effect of SONGS Separation Scheme on SONGS Units (acceleration)
- Recommendation 21 – Fault protection should allow time for fault to be cleared by transmission protection devices
- Feedback: Speed sensors are an existing part of the plant distributed control system (DCS) and could trigger an overspeed trip to protect generator equipment. Control coordination is typically done during commissioning, and subsequently on an as needed basis. Current efforts of ERCOT compliance to provide feedback to GO/GOPs has resulted in a reduction of sympathetic unit trips.
- Recommendation: Periodic validation of DCS protection systems is encouraged and would partially address Recommendation 21.
- Risk: Adjusting DCS settings to withstand transient perturbations risks damage to the generator. This in turn could result in a long term (months) outage and shortage conditions.

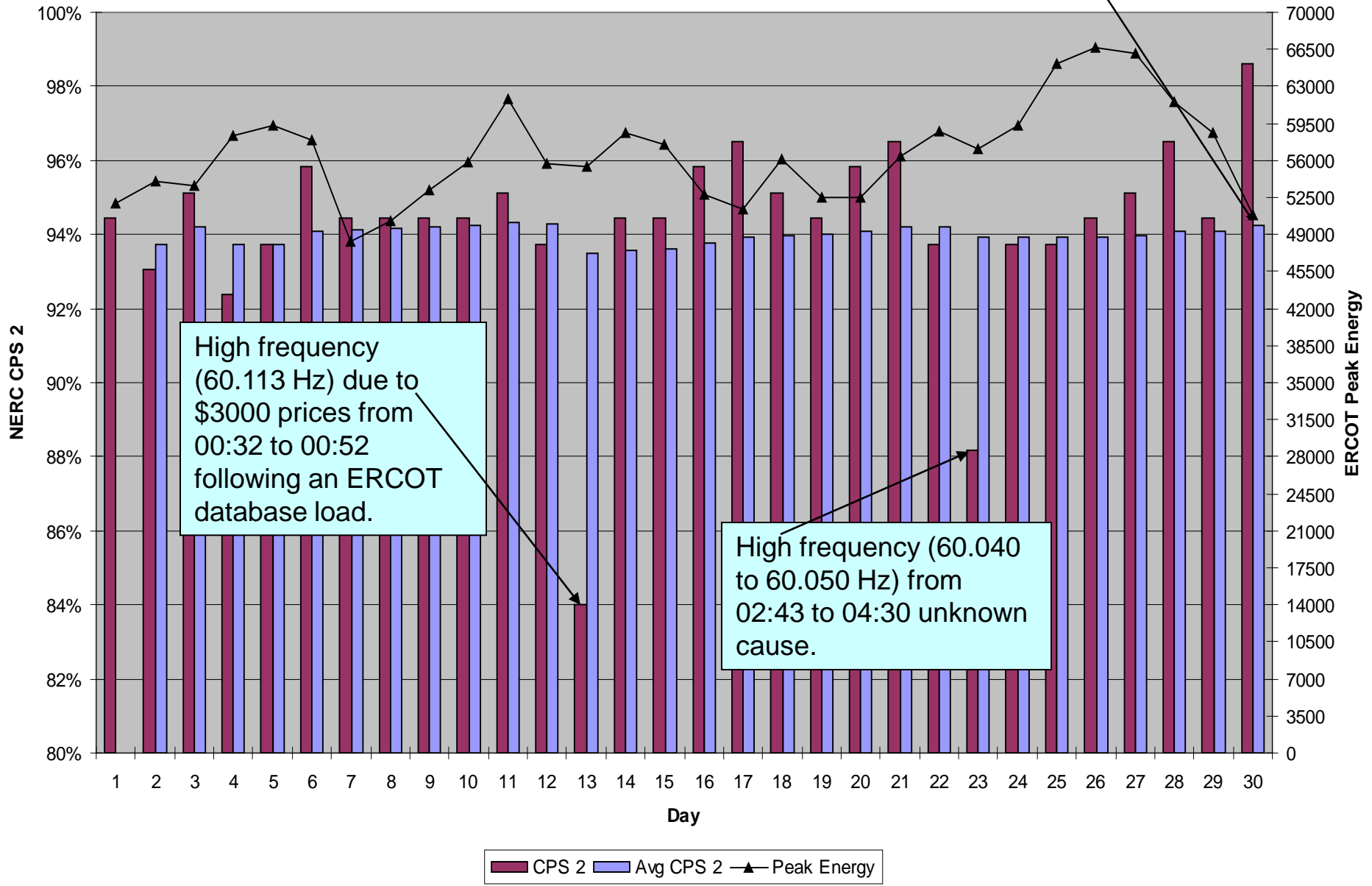
ERCOT CPS1 By Day - June-2012

ERCOT Monthly CPS1 = **160.82**



ERCOT CPS2 By Day - June-2012

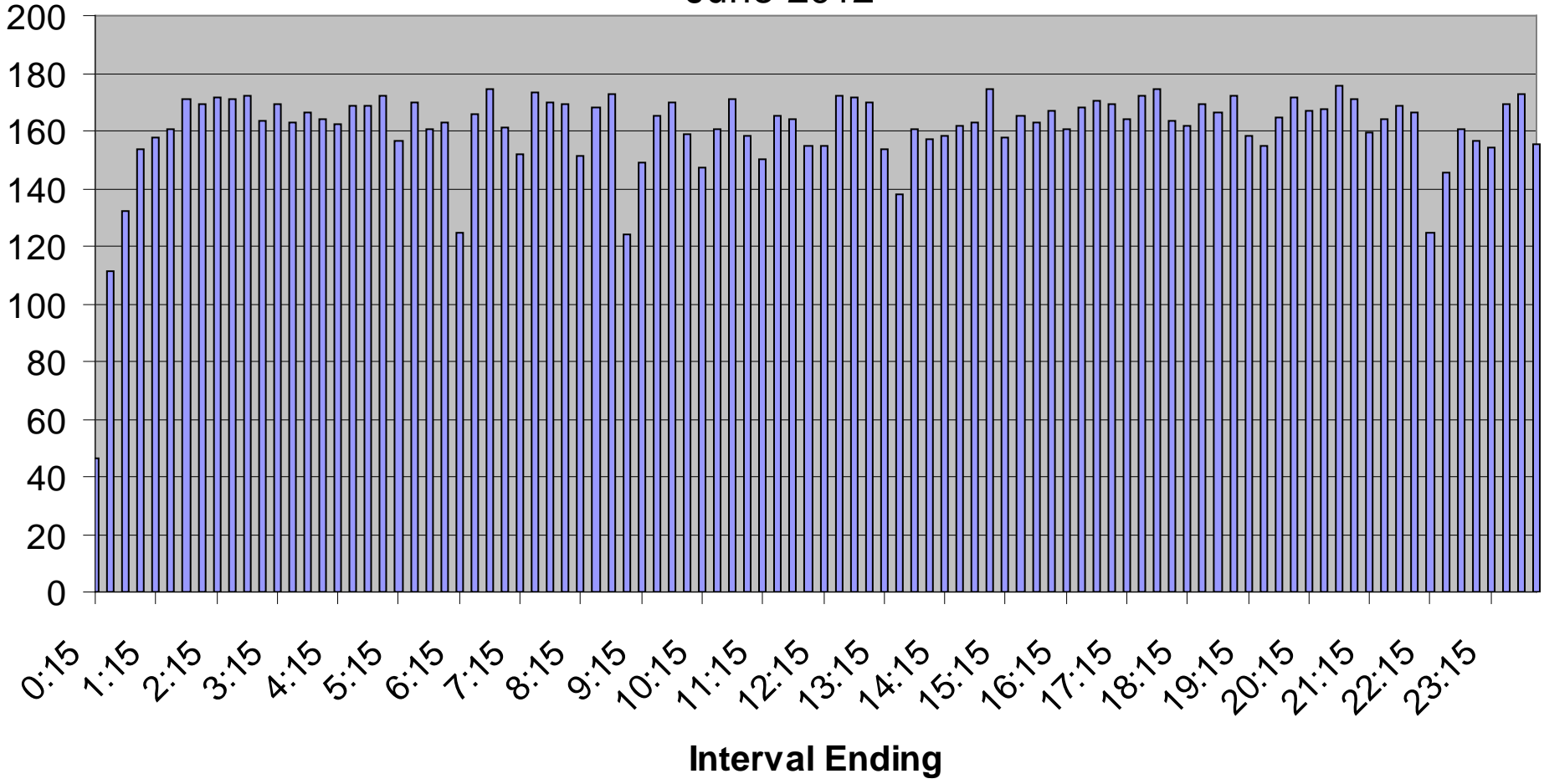
ERCOT Monthly CPS2 = 94.23



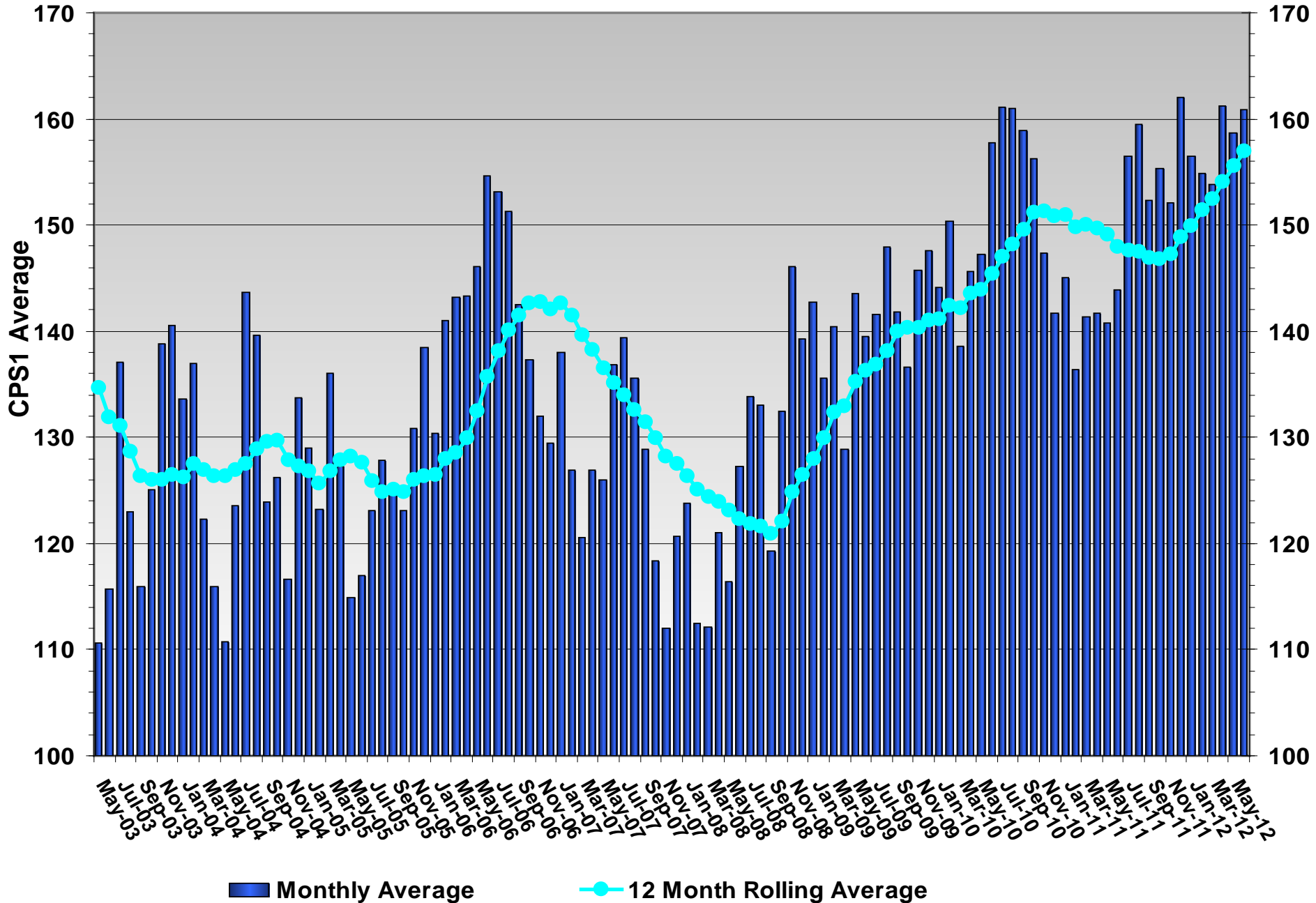
ERCOT CPS1 15 Minute Average - Monthly Score

June-2012

CPS 1 = 160.82

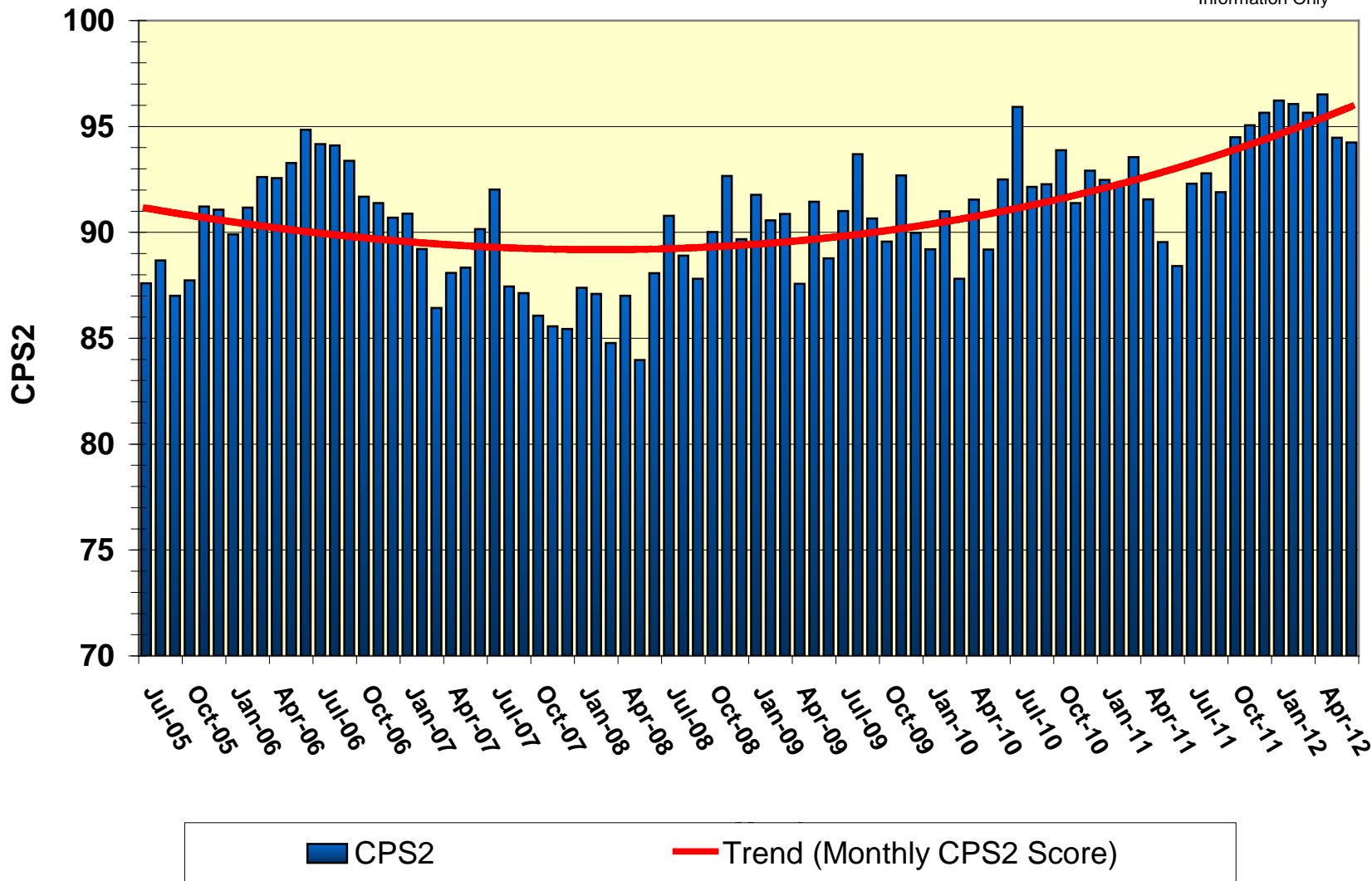


ERCOT CPS1

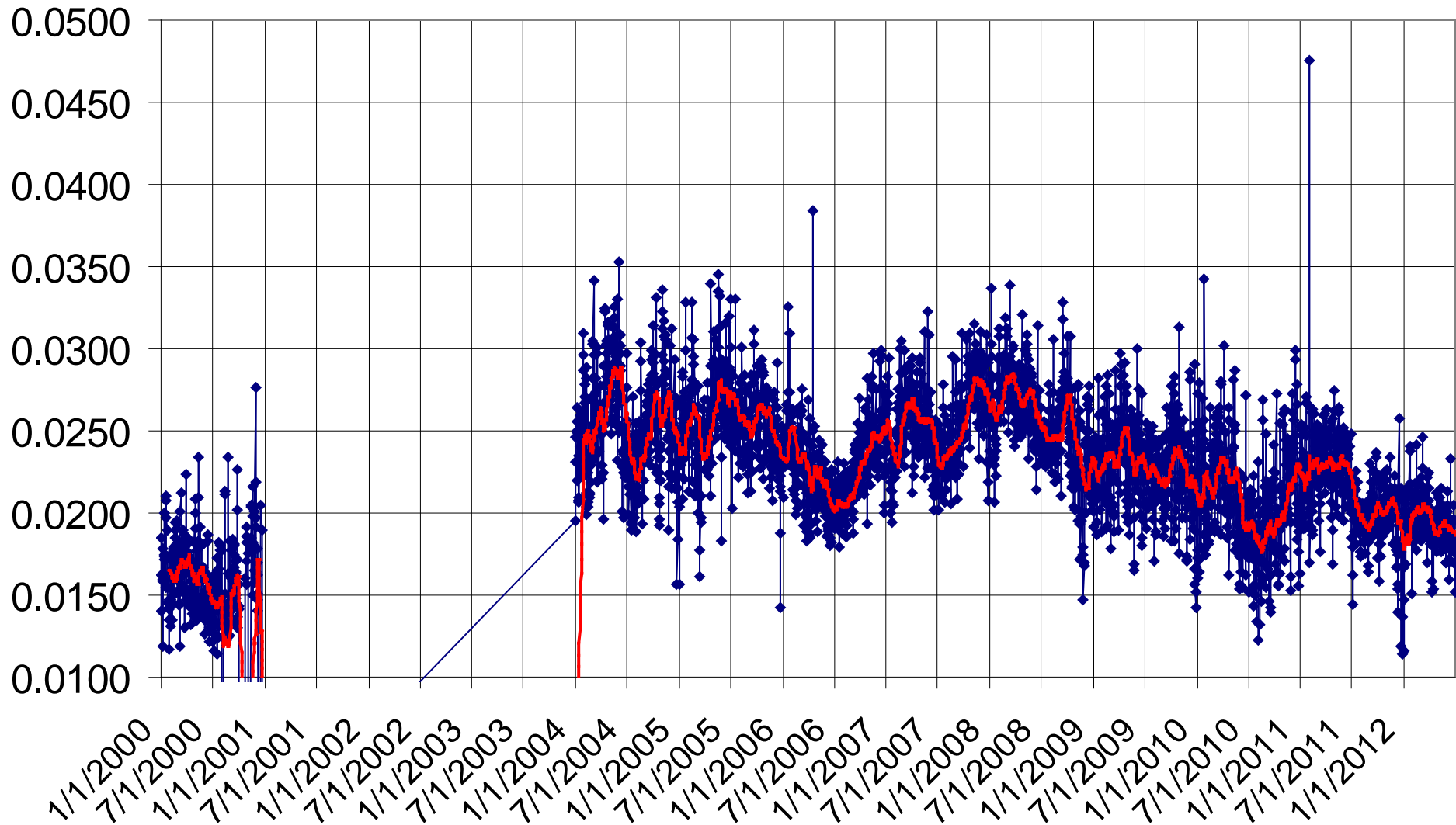


ERCOT CPS2 Score*

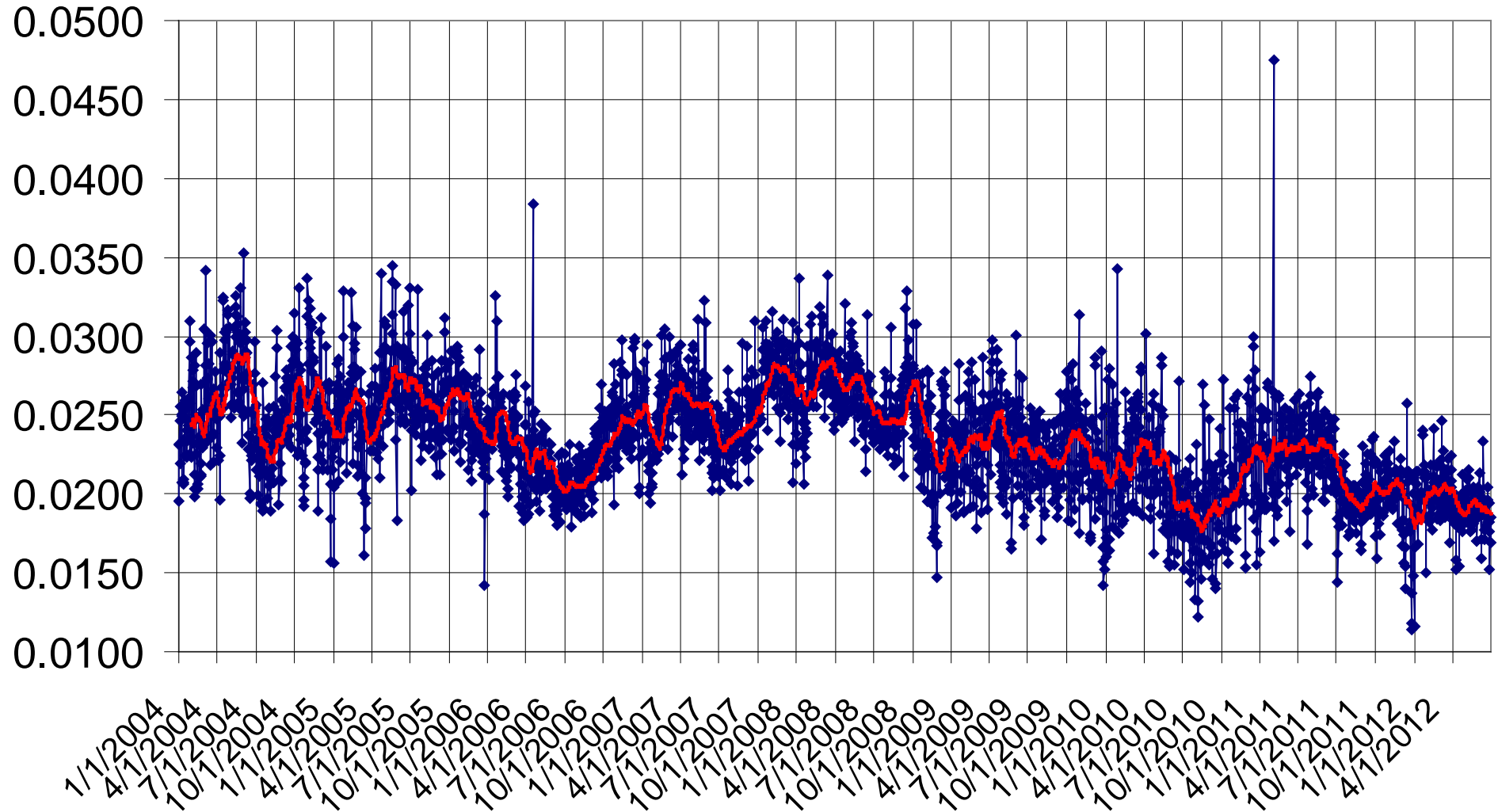
*ERCOT as a single control area is exempt from CPS2. These scores are For Information Only



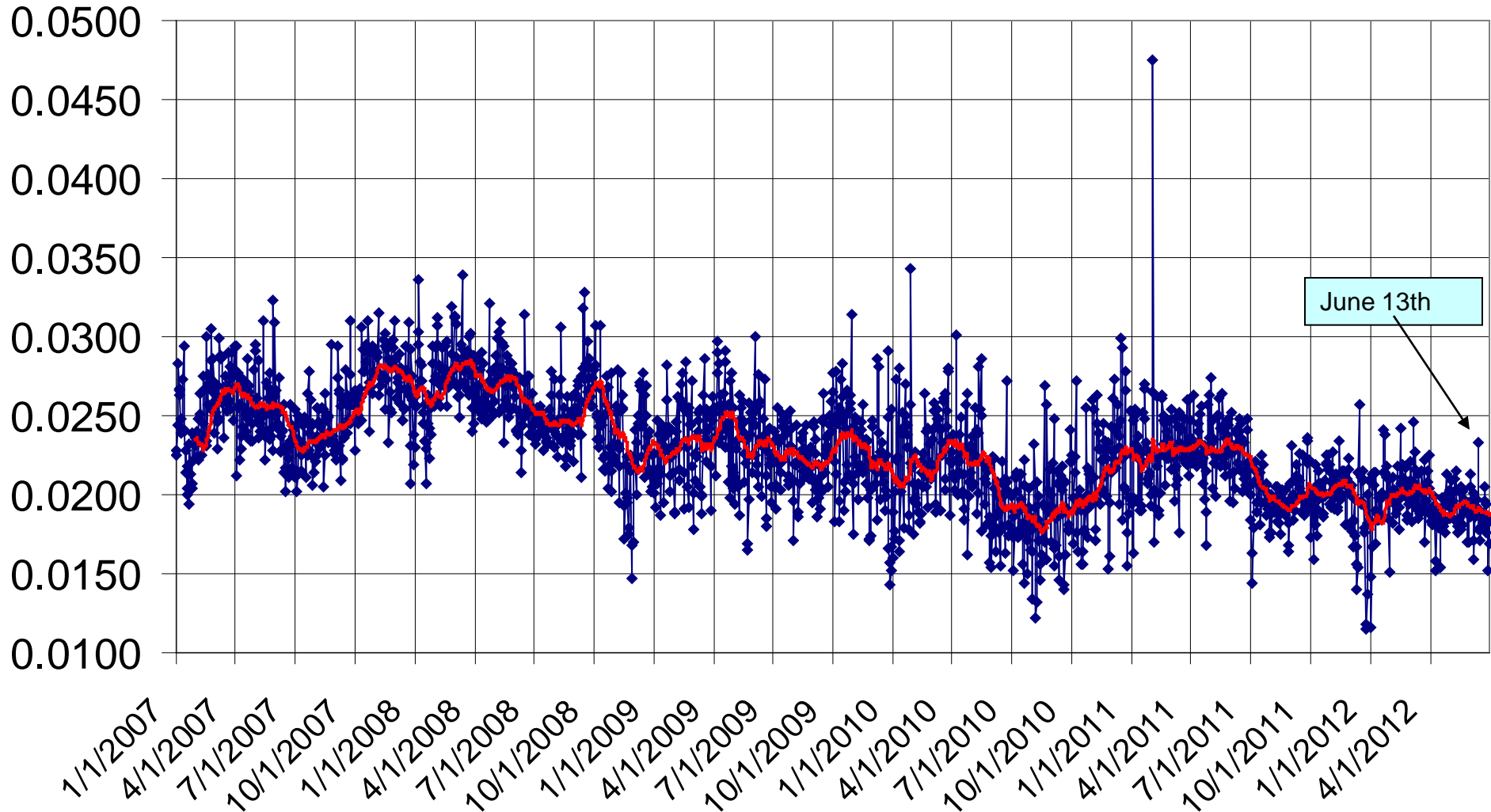
Daily RMS1 of ERCOT Frequency



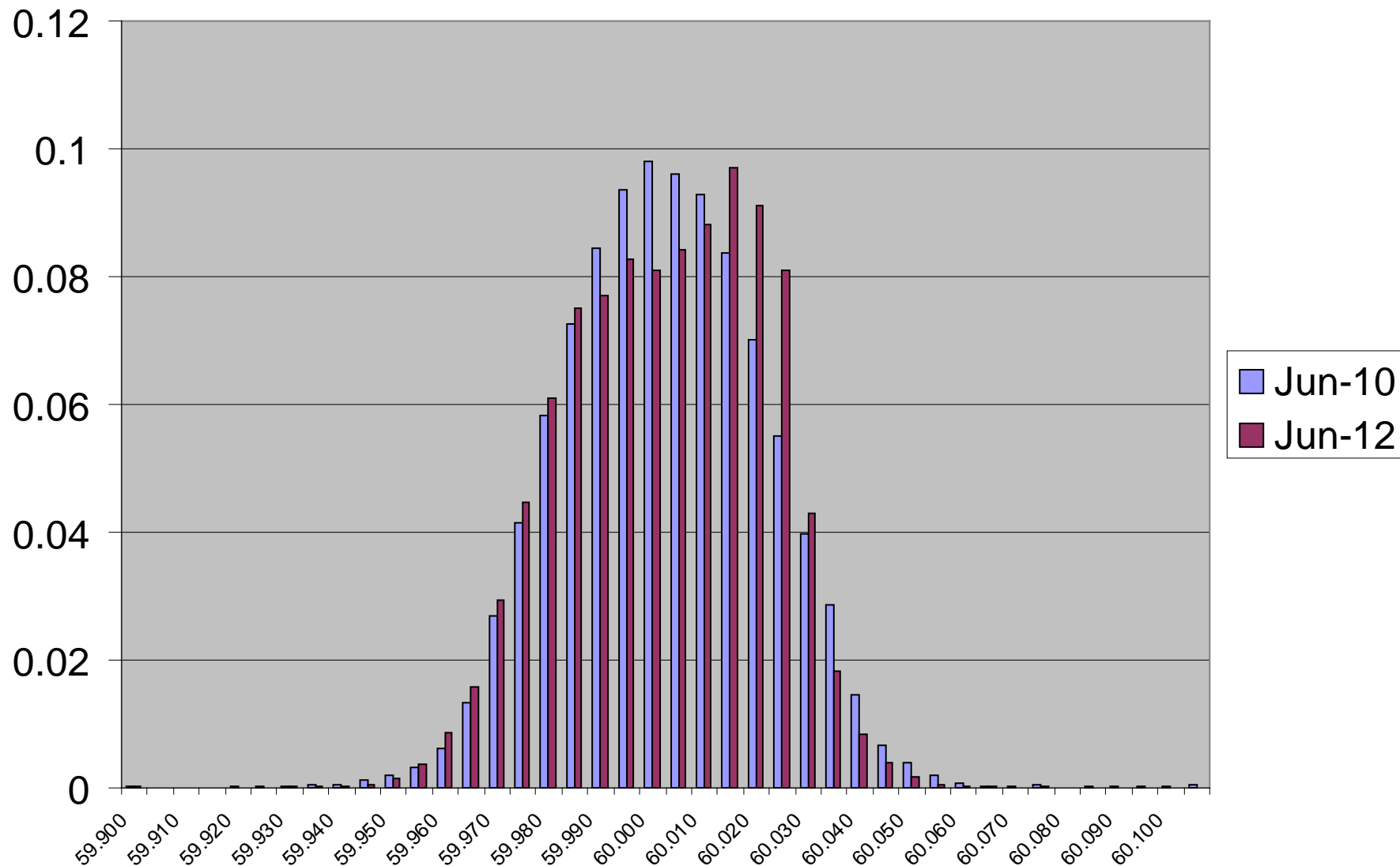
Daily RMS1 of ERCOT Frequency



Daily RMS1 of ERCOT Frequency

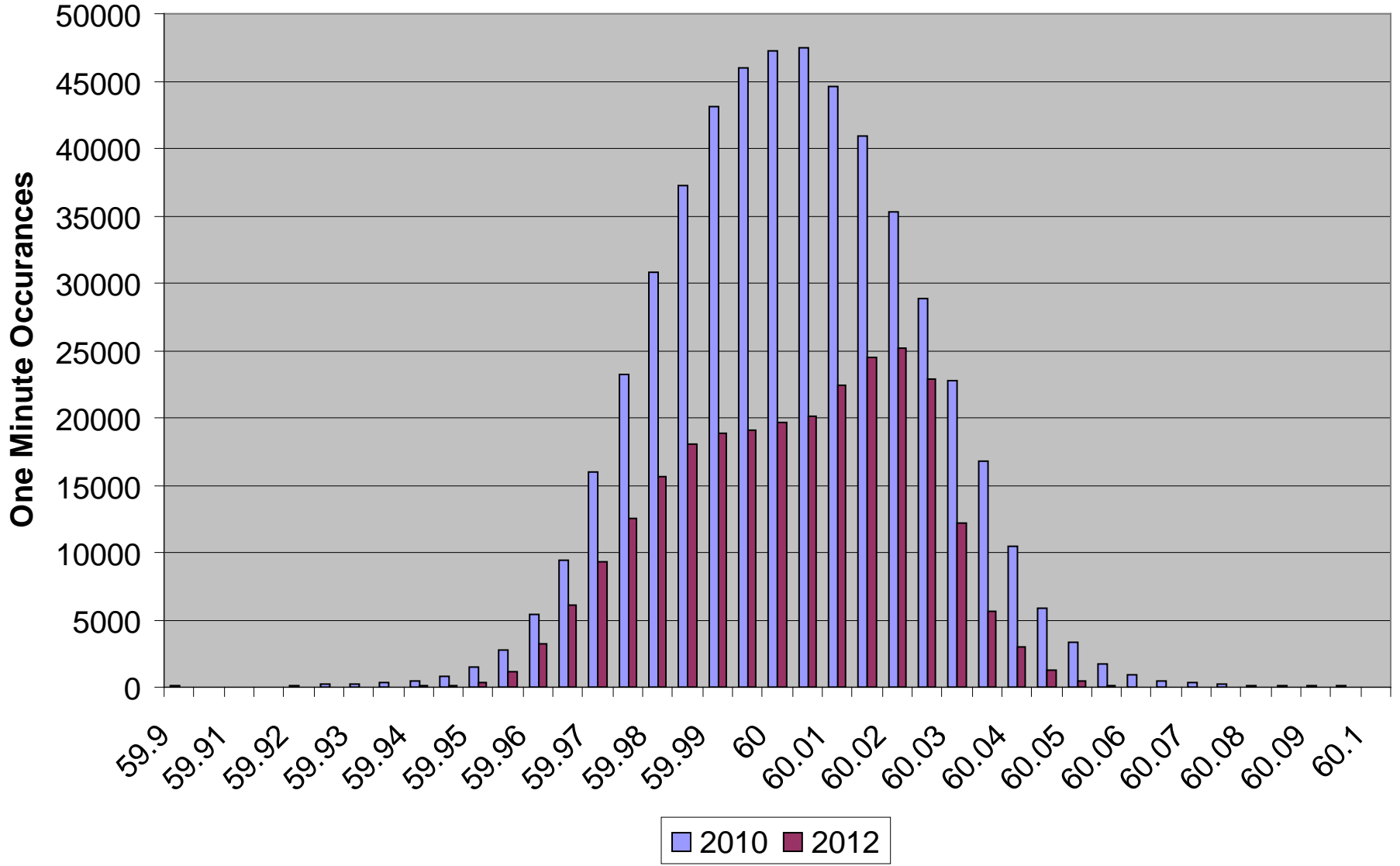


Comparing June 2010 vs June 2012 profile of frequency in 5 mHz bins

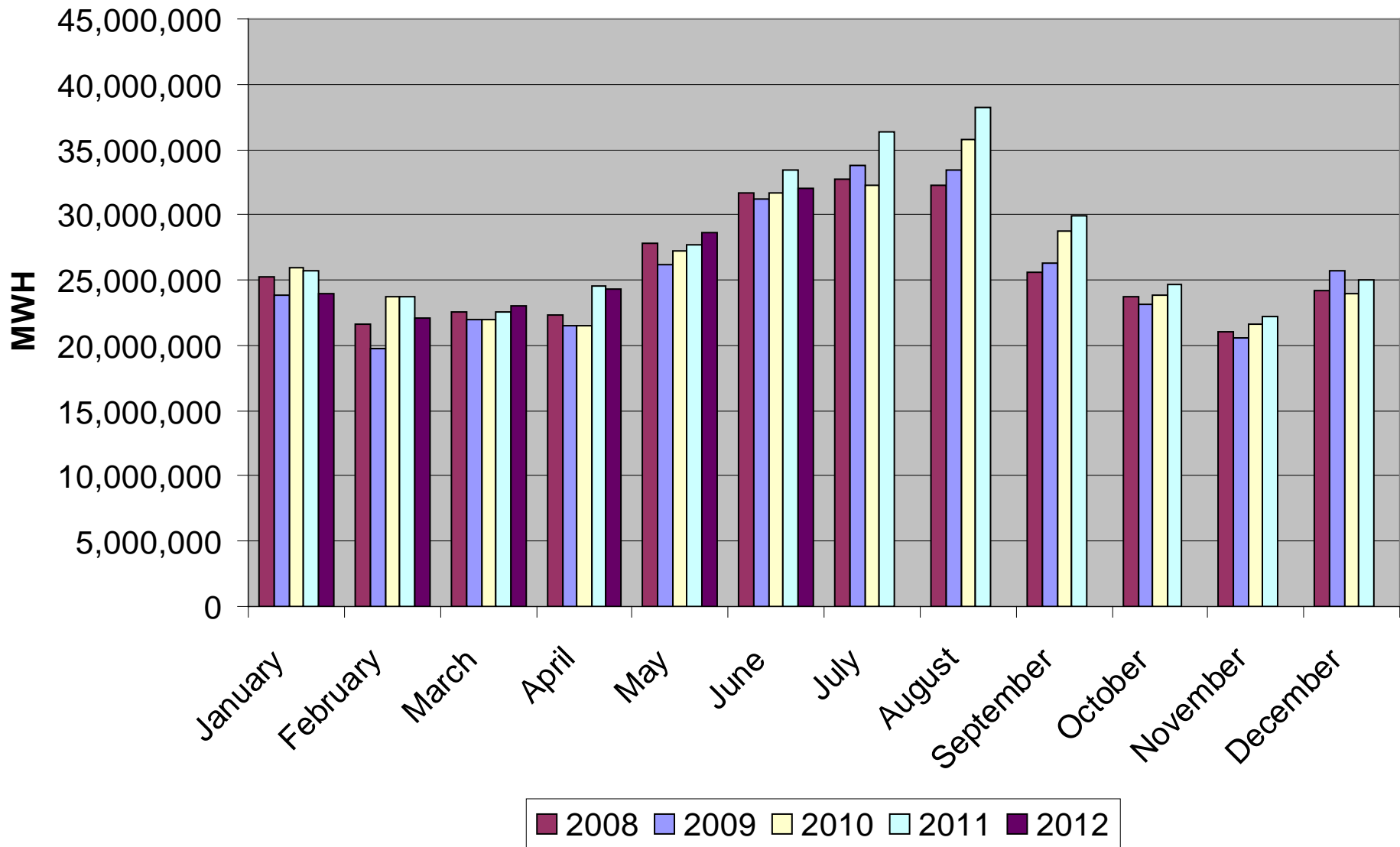


ERCOT Frequency Profile Comparison

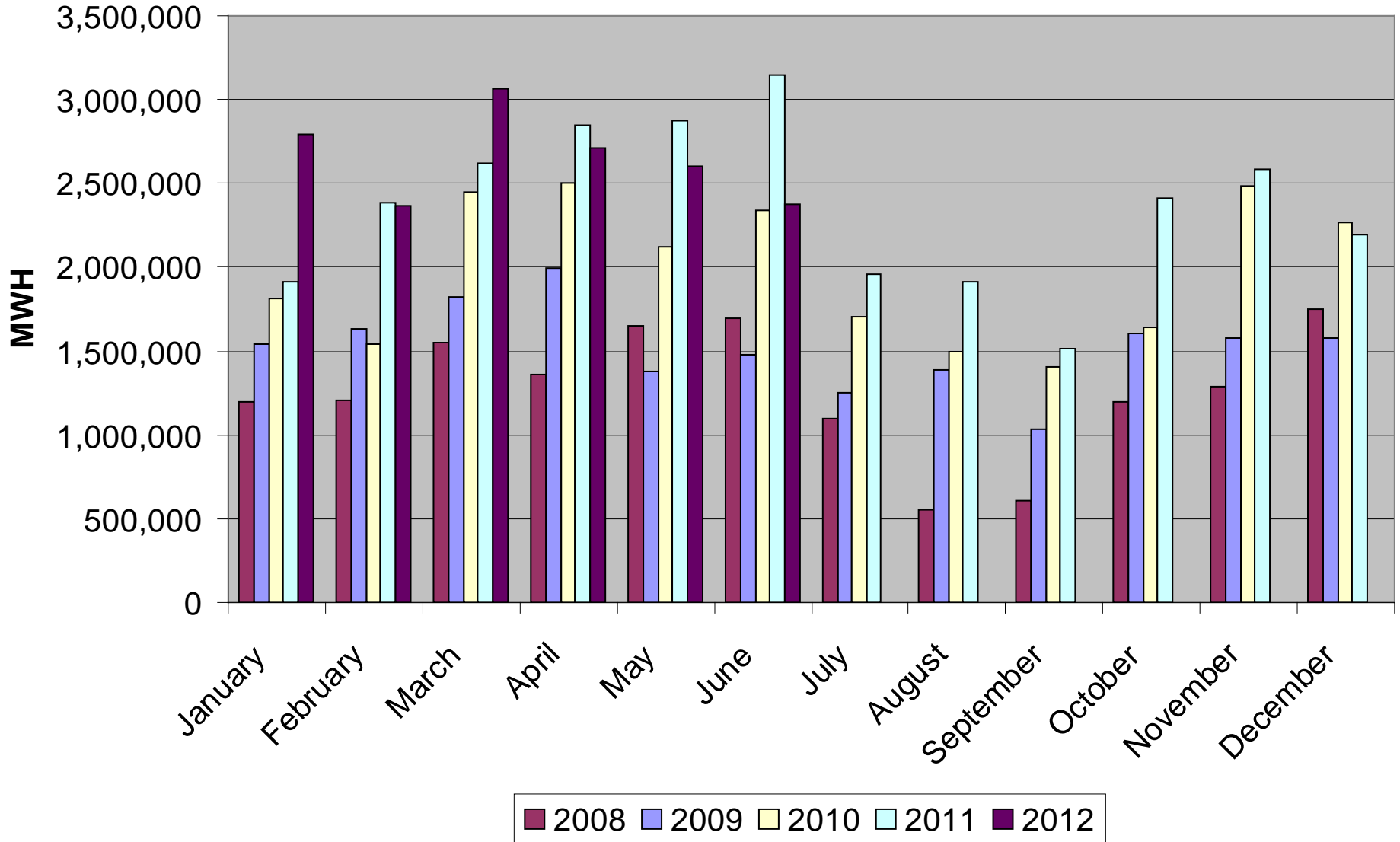
January through December of each Year



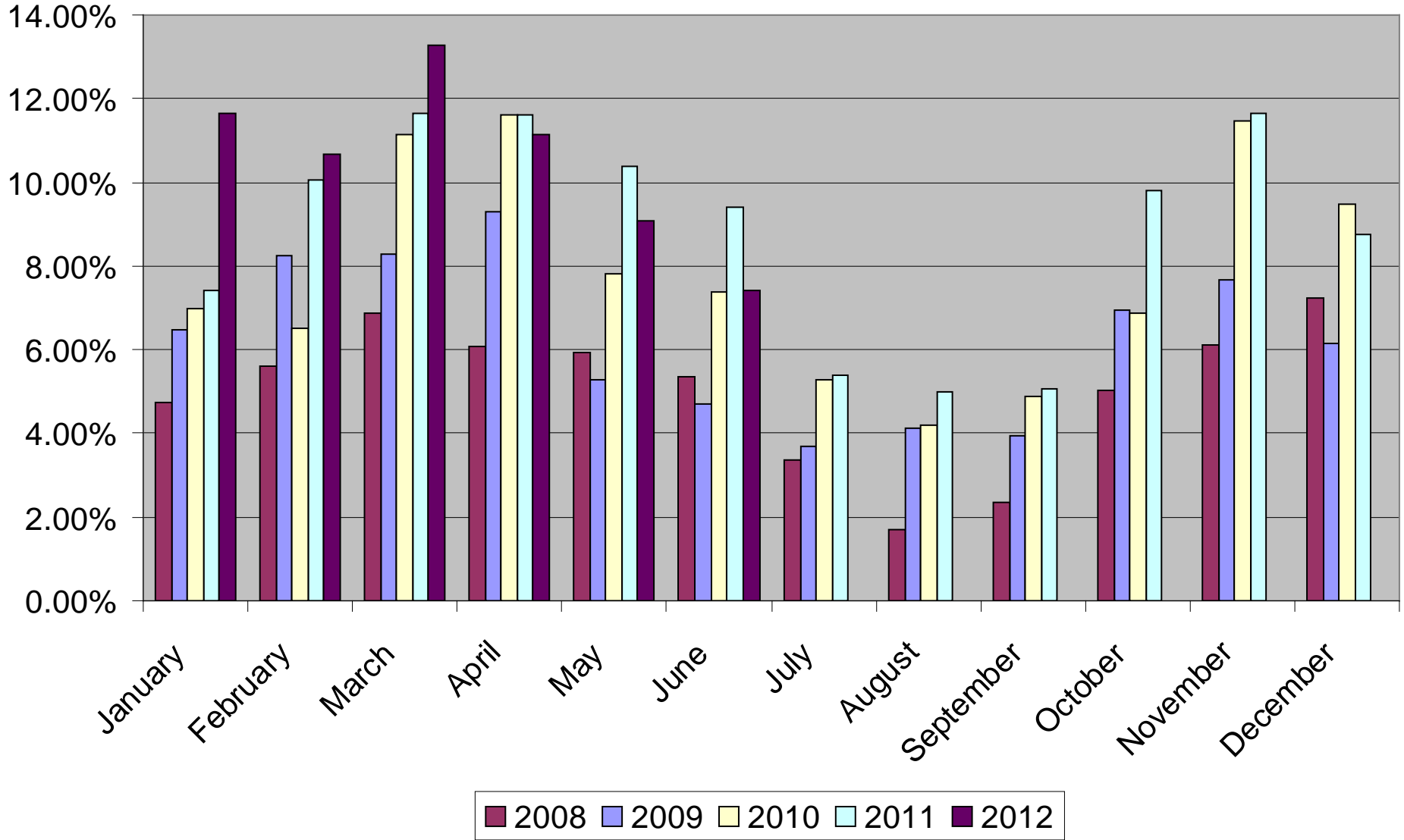
ERCOT Total Energy



ERCOT Total Energy from Wind Generation



ERCOT %Energy from Wind Generation



Questions?