

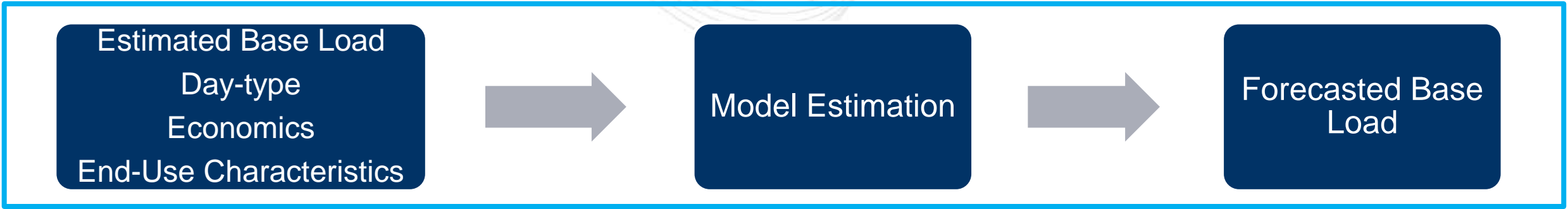


Load Forecast Model Development

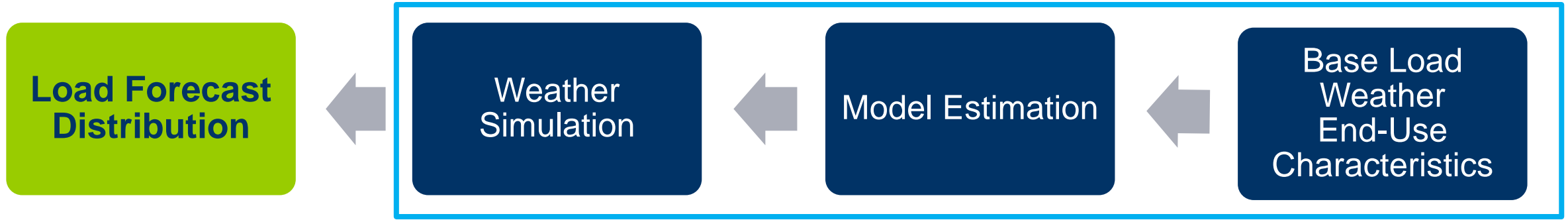
Load Analysis Subcommittee
June 20, 2018

- This is the current status of ongoing model development. The results are not final and are only indicative of what potential impacts on the forecast might be.

First Model

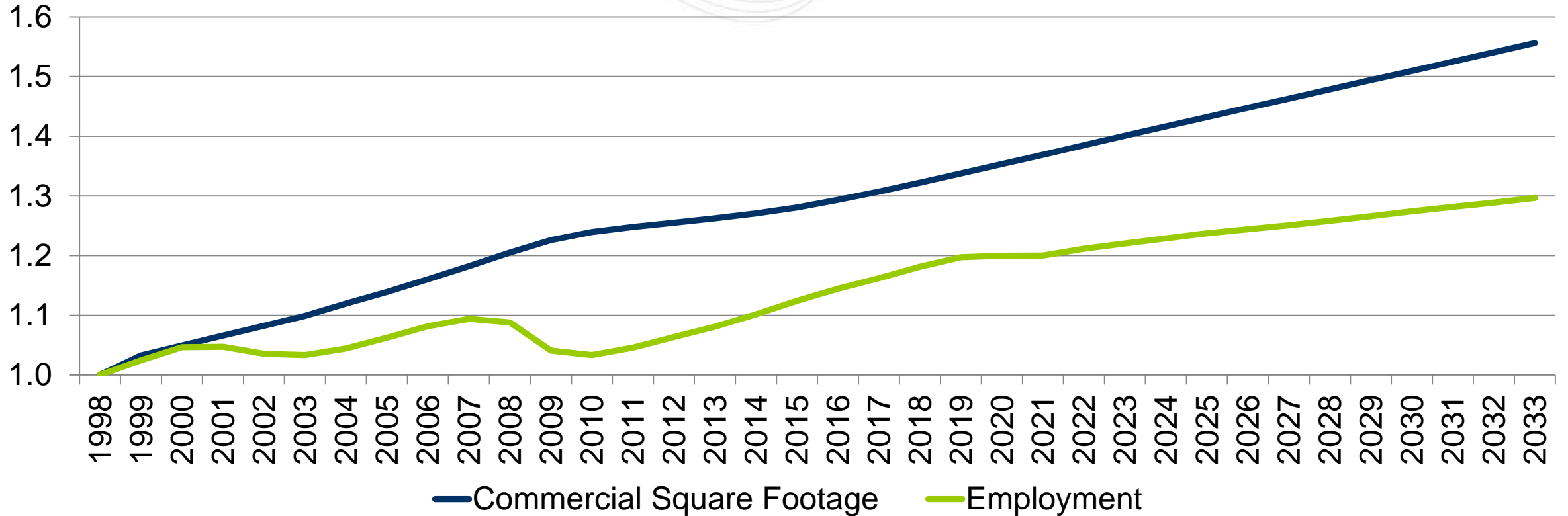


Second Model



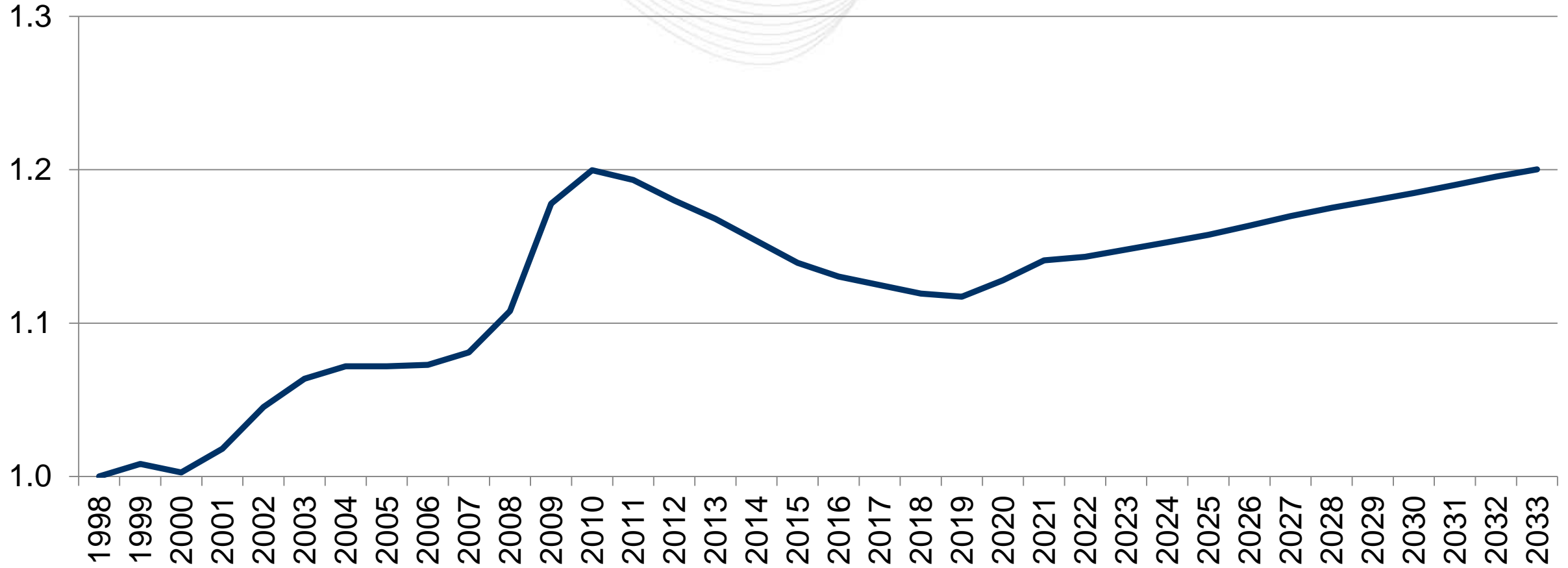
- Previously used a static weight to transform employment trends to square footage trends.
 - Stakeholder concern that this would miss the changing relationship over time.
- Looked at the relationship of U.S. square footage to U.S. employment
 - Commercial Equipment indexes are expressed in intensity per square foot (not per customer). Getting a proxy for square foot per customer, can establish intensity per customer.

U.S. Building Space and Employment Index, 1998 = 1.0



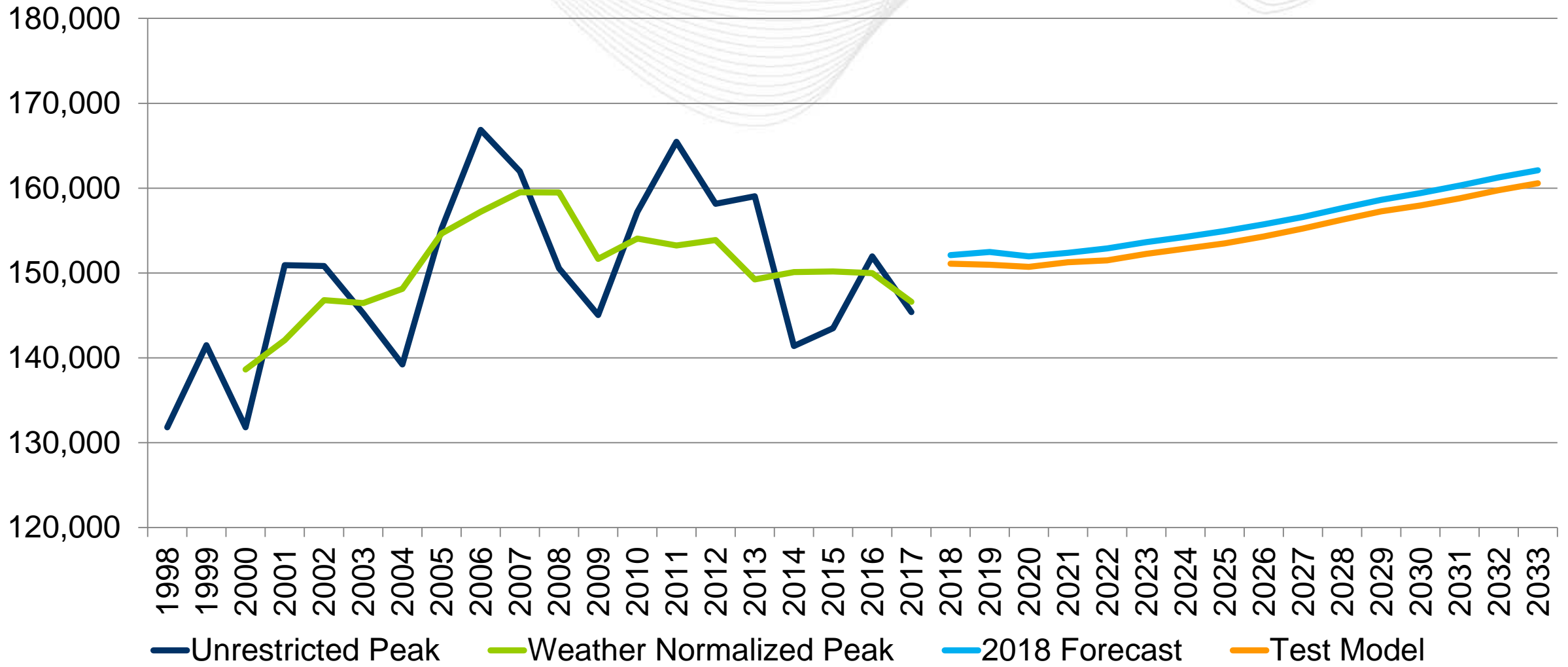
Sources: Itron, Moody's Analytics

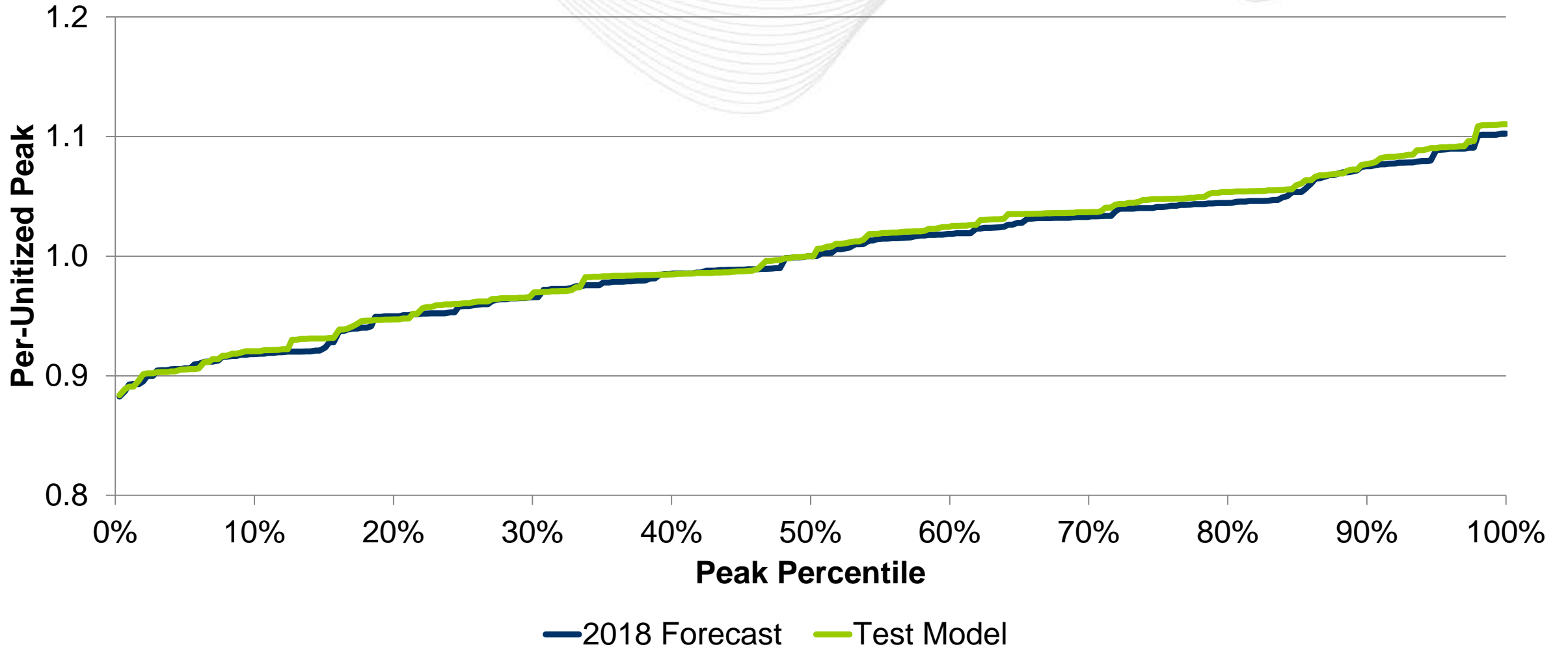
Ratio of Building Space to Employment



Sources: Itron, Moody's Analytics

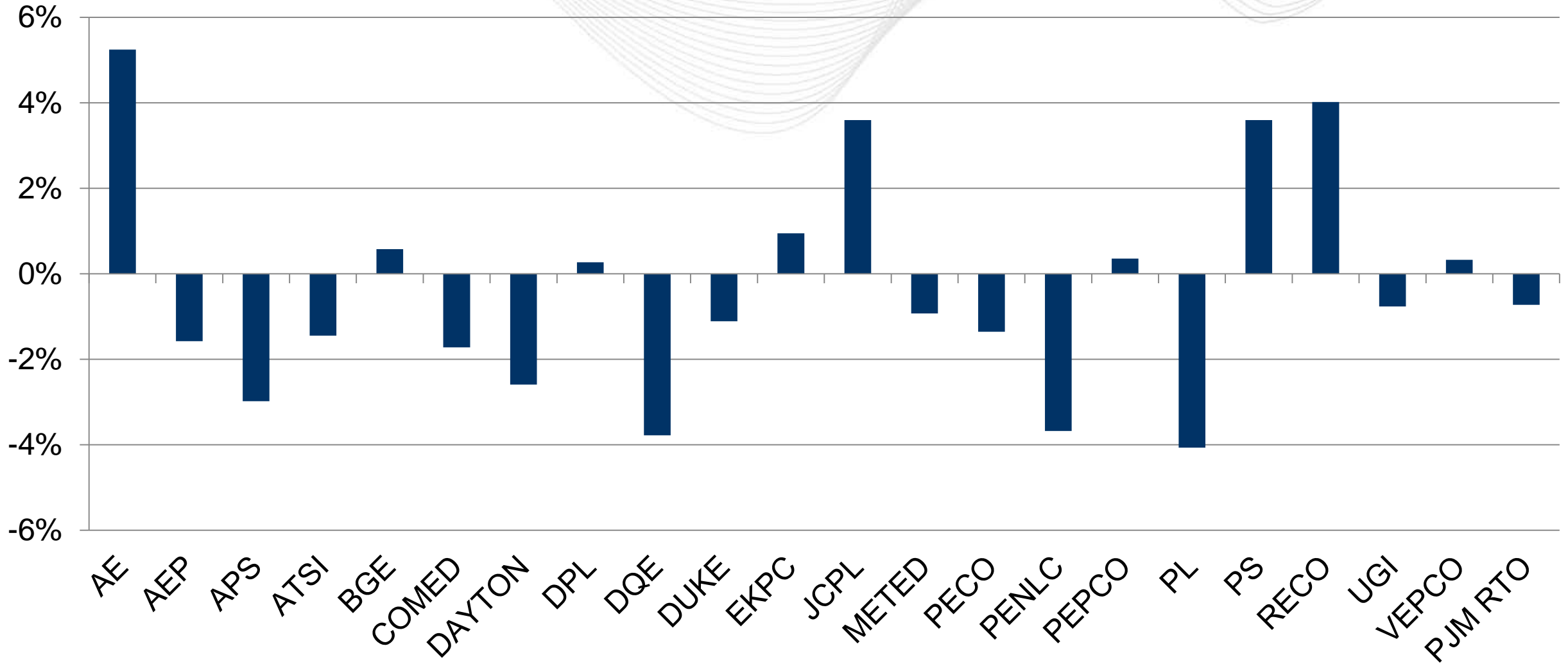
- Base
 - Contains base history and forecast values assumed in the model
- Coefficients
 - Model parameters from the “Second Model”
- Residuals
 - Model Estimates and Residuals





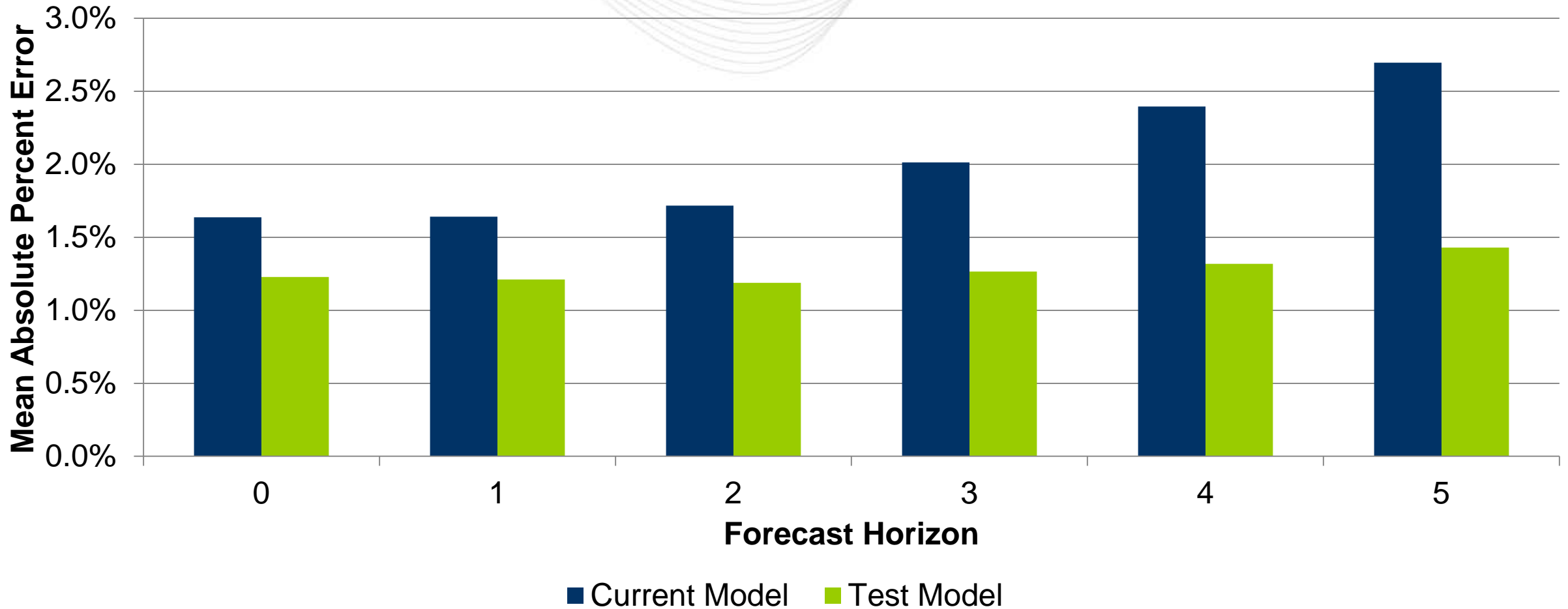


Summer Zonal CP Differences – Test Model vs 2018 Forecast For Delivery Year 2021/22

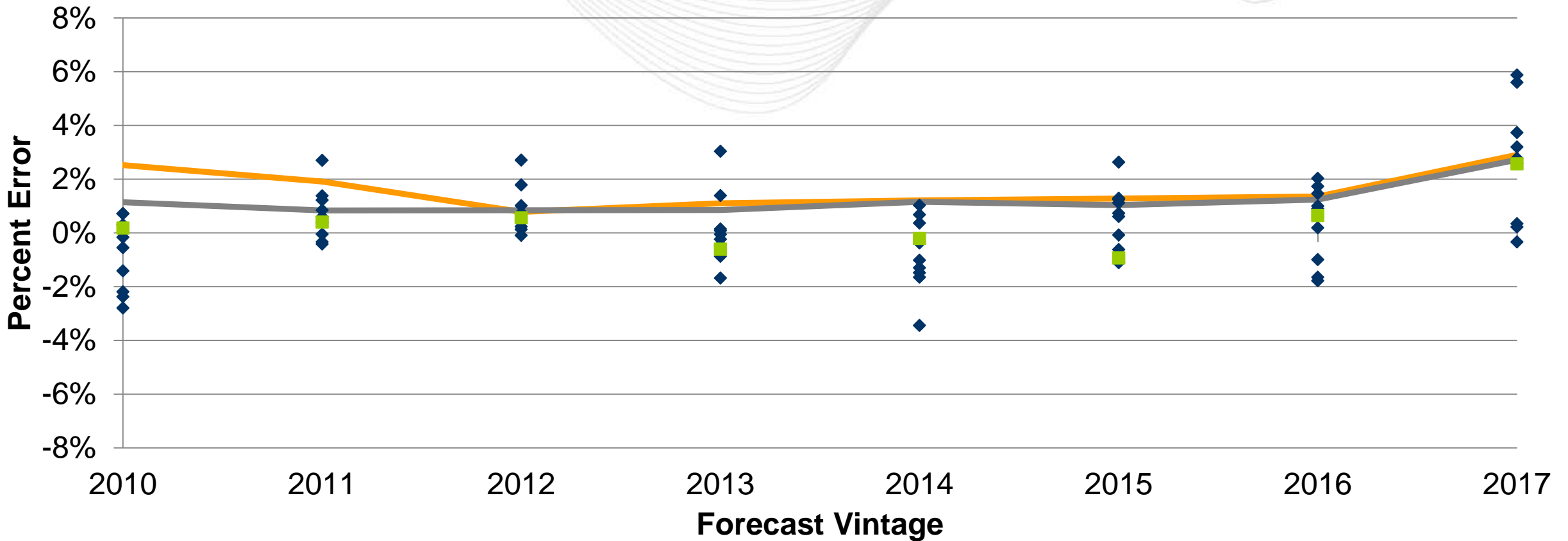


Summer Forecast Model Accuracy

Forecast Model Solved vs Top Ten Summer Days per Year



Summer Error – Zero Year Forecast Horizon

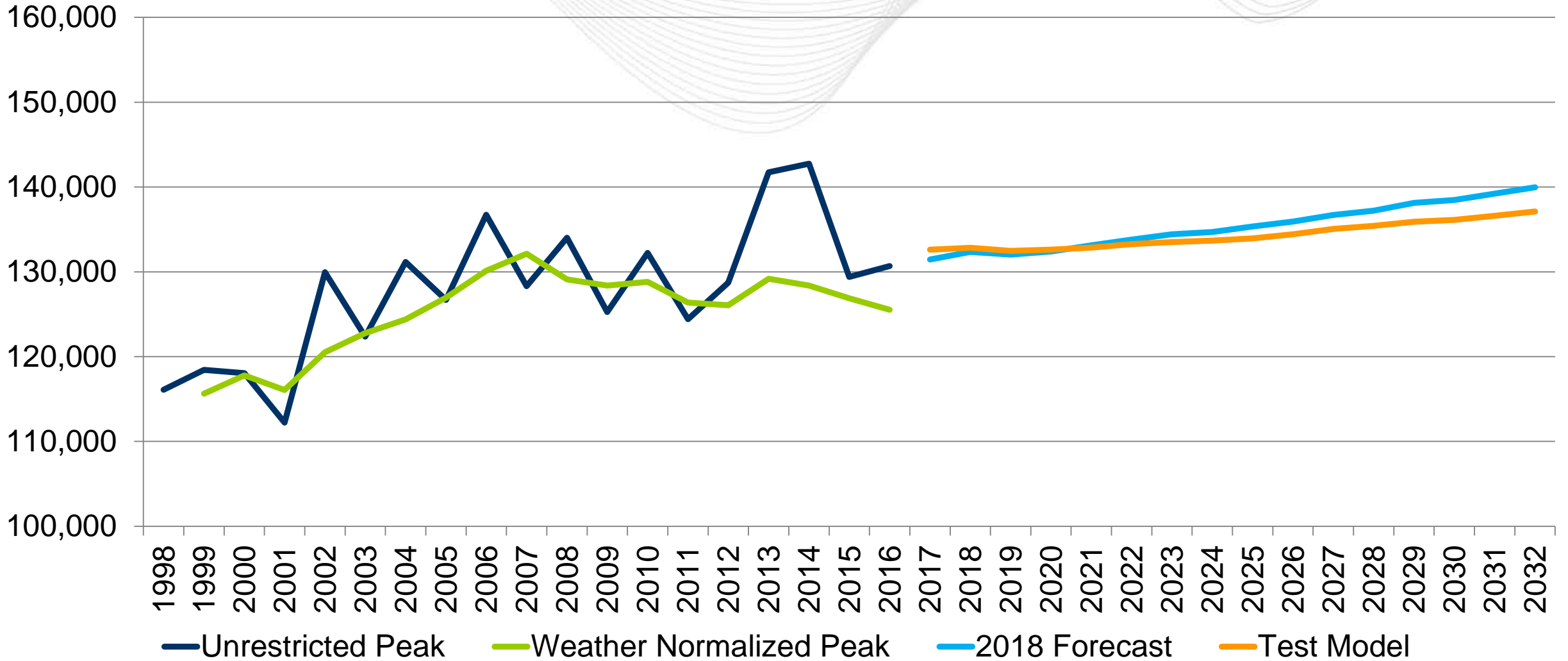


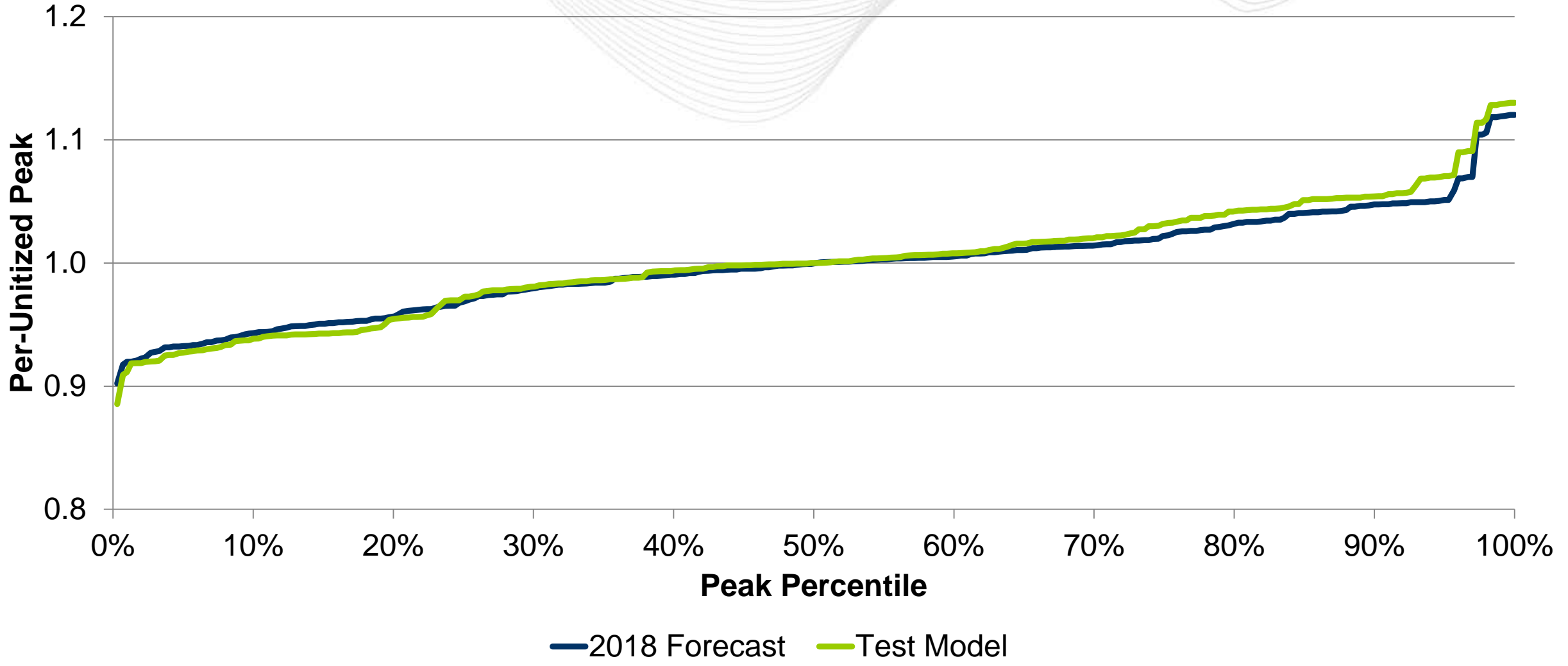
◆ Pct Err on Rank Day 2-10 ■ Pct Err on Rank Day 1
 — Current Model (Abs Pct Err) — Test Model (Abs Pct Err)

- Test Model has very similar growth pattern (0.3-0.4% growth) to 2018 forecast, though starts out about 0.7% lower
- Summer forecast distribution is a little bit more spread out, with generally slightly higher per-unitized values above the median.
- Zonal changes generally range between +/- 2%. Several zones in New Jersey have positive changes outside this range, while several Pennsylvania zones have negative changes outside this range.



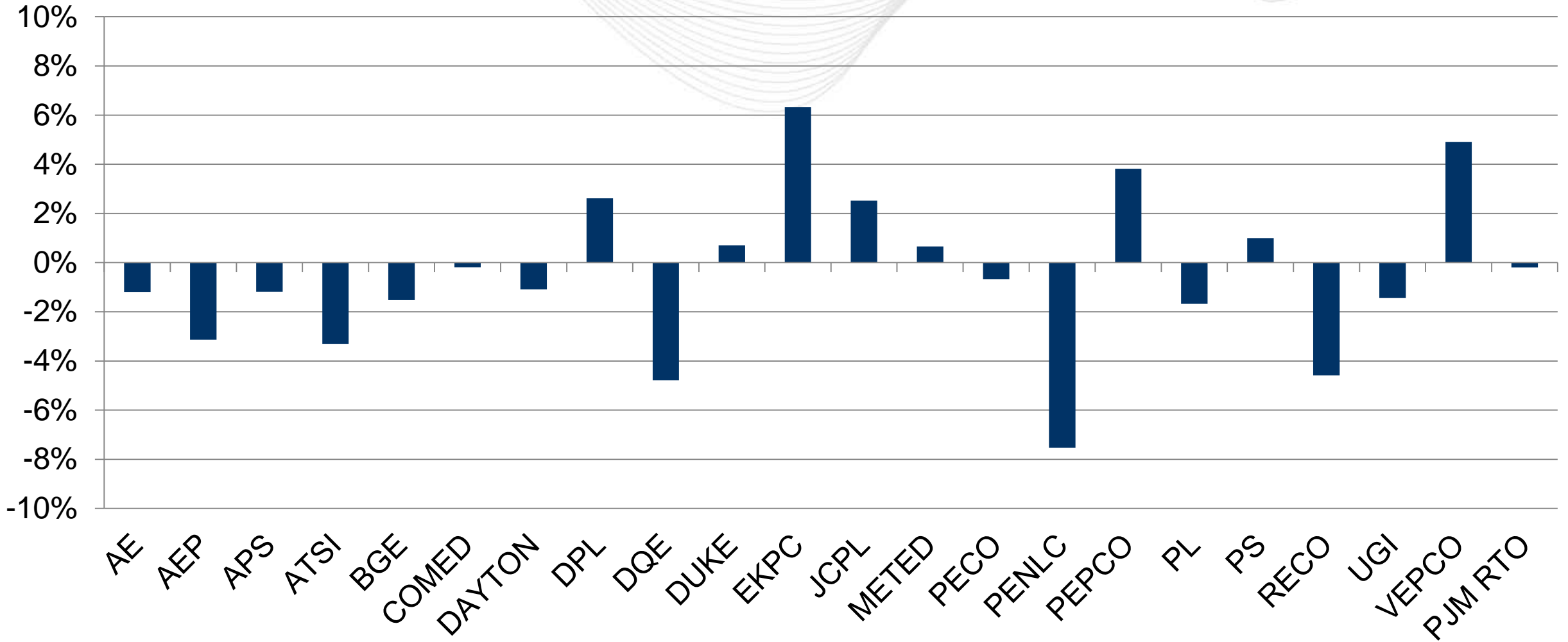
PJM RTO Winter Forecast





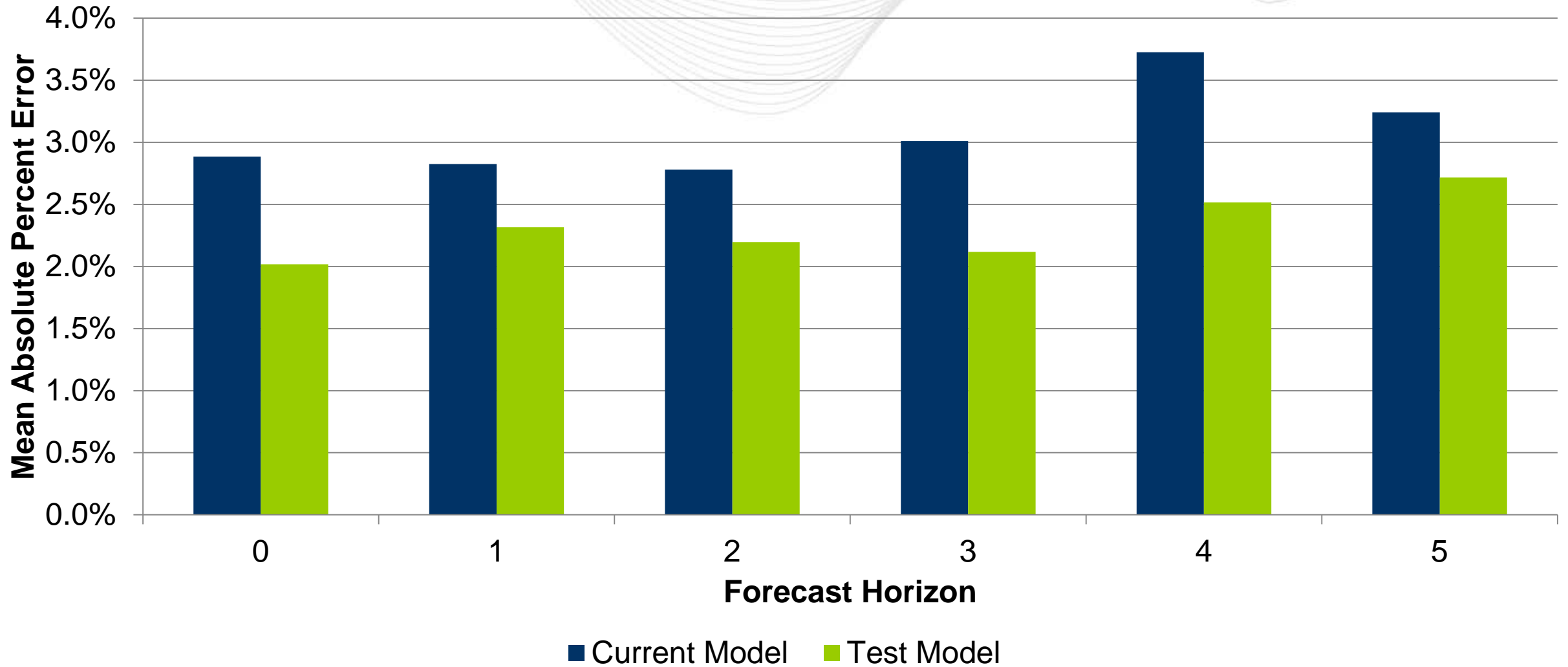


Winter Zonal CP Differences – Test Model vs 2018 Forecast For Delivery Year 2021/22

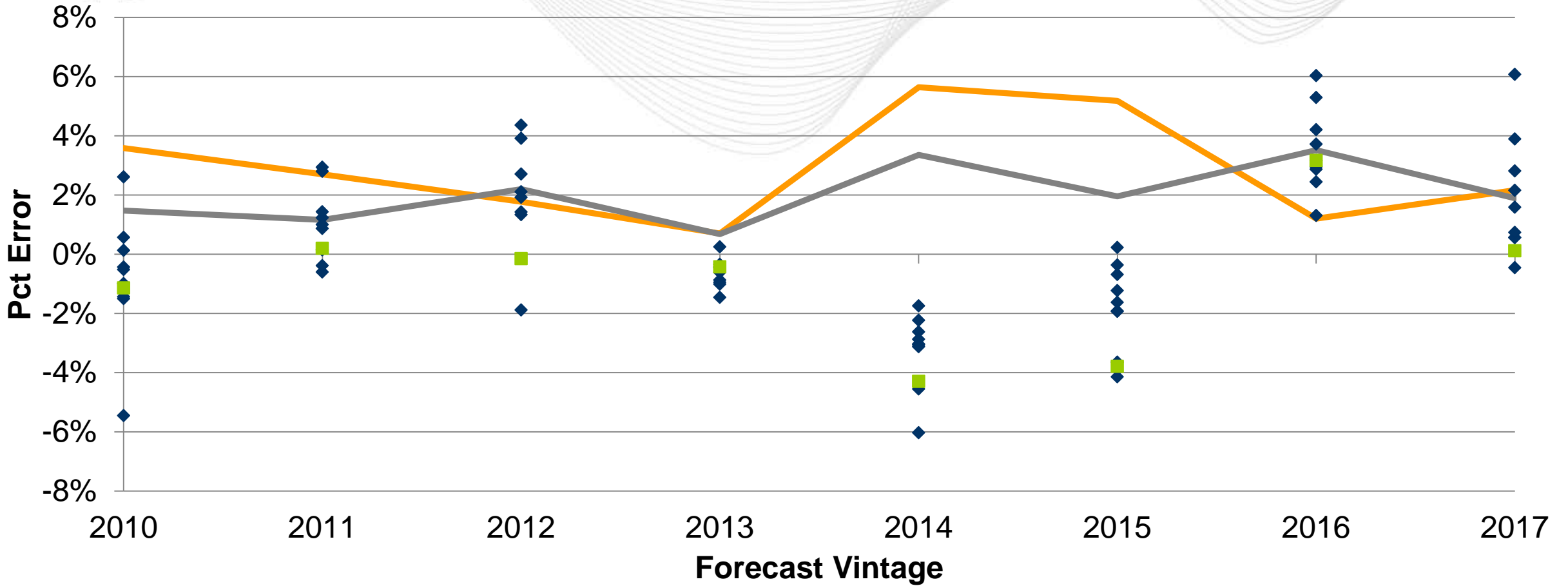


Winter Forecast Model Accuracy

Forecast Model Solved vs Top Ten Winter Days per Year



Winter Error – Zero Year Forecast Horizon



◆ Pct Error on Rank Day 2-10 ■ Pct Err on Rank Day 1
 — Current Model (Abs Pct Err) — Test Model (Abs Pct Err)

- While starting higher, Test Model has slower growth relative to 2018 forecast (0.2% vs 0.4%).
- More so than Summer, Winter forecast distribution is also spread out, with higher per-unitized values above the median.
- Zonal changes generally range between +/- 2%. PENLC, DQE, and RECO stood out as zones with negative changes outside this range. EKPC, PEPCO, and VEPCO stood out as zones with positive changes outside this range.

- Stakeholder Feedback
- Investigate additional refinements
- Develop Energy, Non-Coincident, and LDA CP models