Model Accuracy

Overview

- Model accuracy is the result of running the forecast model with up-to-date inputs, solving with actual weather and comparing to actual load.
- Each forecast run differs only in the estimation periods used to solve the sector and non-weather sensitive model, and final forecast model. Each run thus answers the question how well would the model have performed had we known what we do today for the forecast inputs.
  - For all runs, inputs are from Moody's Analytics September 2021 forecast vintage and the 2021 Itron end-use inputs (consistent with the EIA 2021 Annual Energy Outlook).

Overview

- Summary of runs:

	Estimation Period		
Forecast Vintage	Sector Models (Annual)	Non-Weather Sensitive Model	Final Forecast Model
2015	1998-2013	1/1/1998-8/31/2014	1/1/2005-8/31/2014
2016	1998-2014	1/1/1998-8/31/2015	1/1/2006-8/31/2015
2017	1998-2015	1/1/1998-8/31/2016	1/1/2007-8/31/2016
2018	1998-2016	1/1/1998-8/31/2017	1/1/2008-8/31/2017
2019	1998-2017	1/1/1998-8/31/2018	1/1/2009-8/31/2018
2020	1998-2018	1/1/1998-8/31/2019	1/1/2010-8/31/2019
2021	1998-2019	1/1/1998-8/31/2020	1/1/2011-8/31/2020

Terms

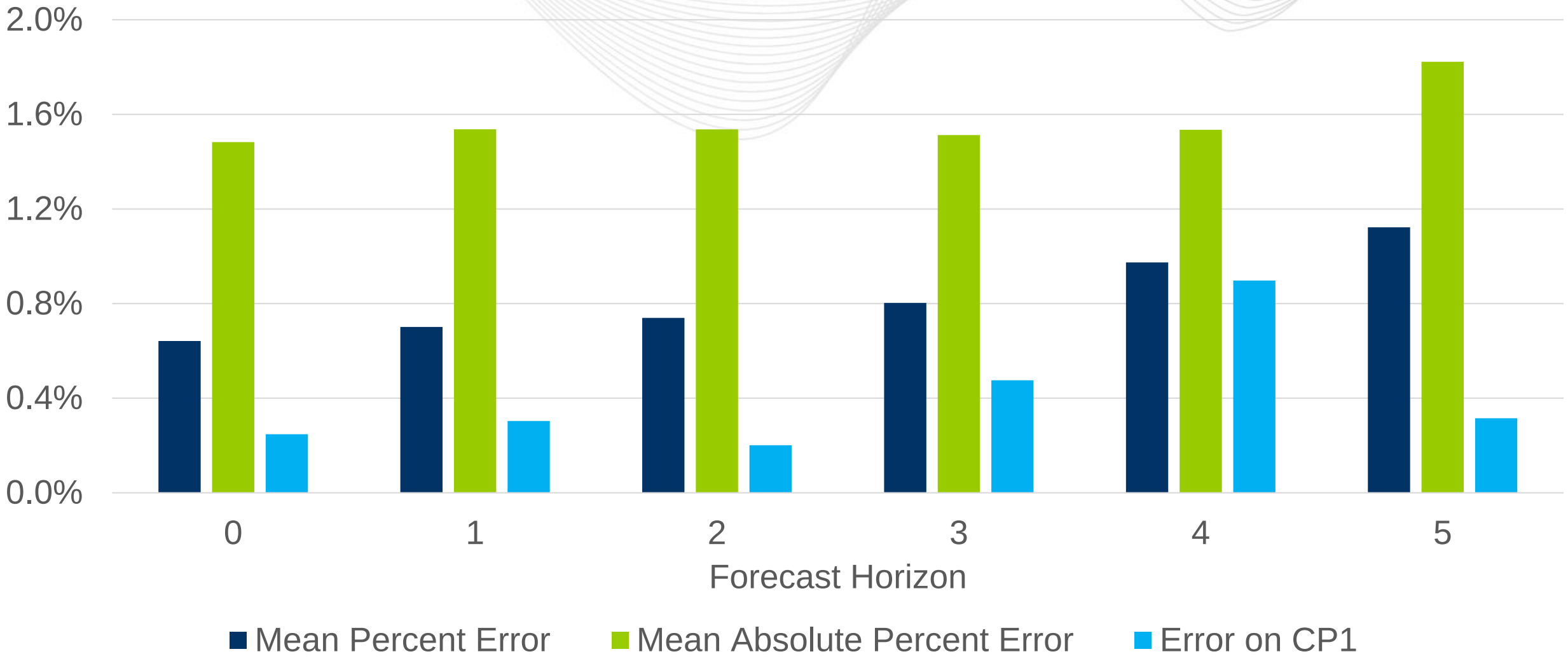
- Coincident Peak (or CP) – the peak(s) of the RTO, denoted here by CP1, CP2, etc with CP1 referring to the highest peak, CP2 the second highest peak, and so forth.

- Mean Percent Error (or MPE) – the average error across the CPs.

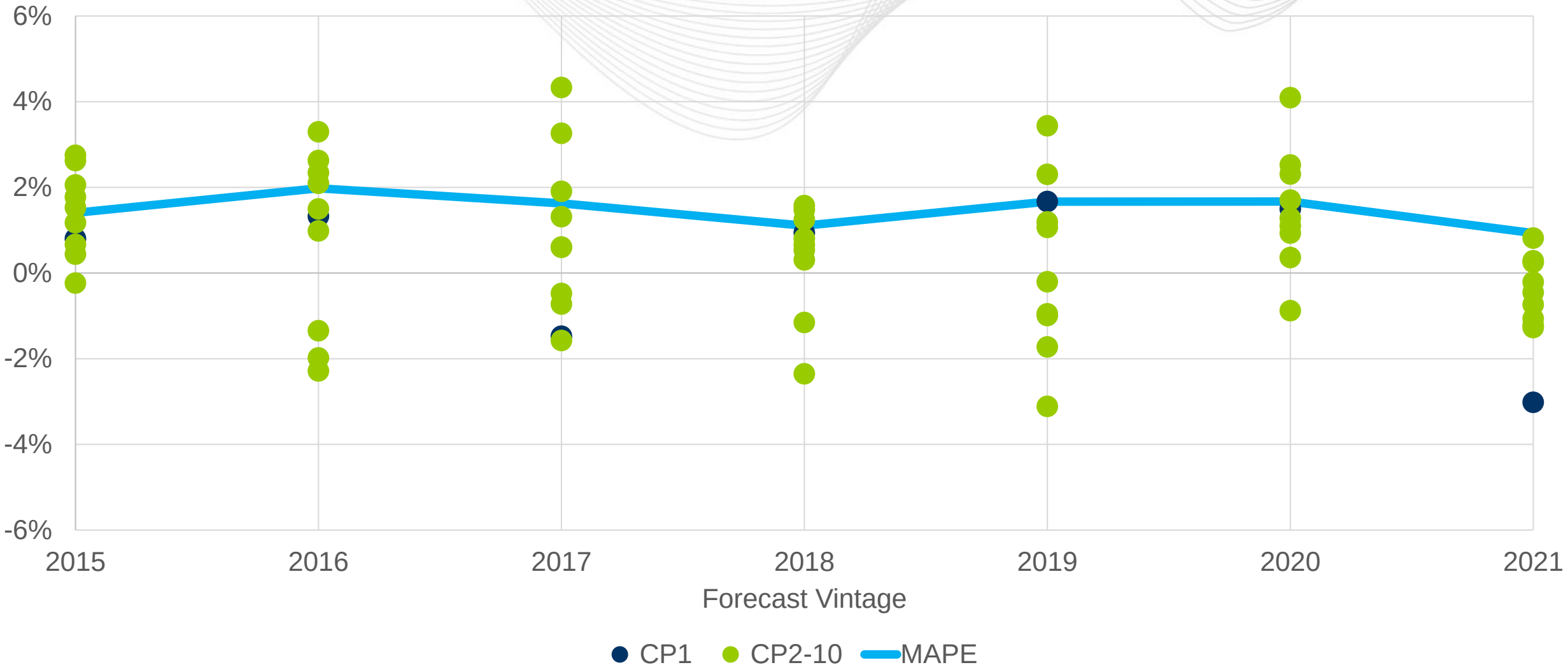
- Mean Absolute Percent Error (or MAPE) – the average of the absolute errors across the CPs.

Summer

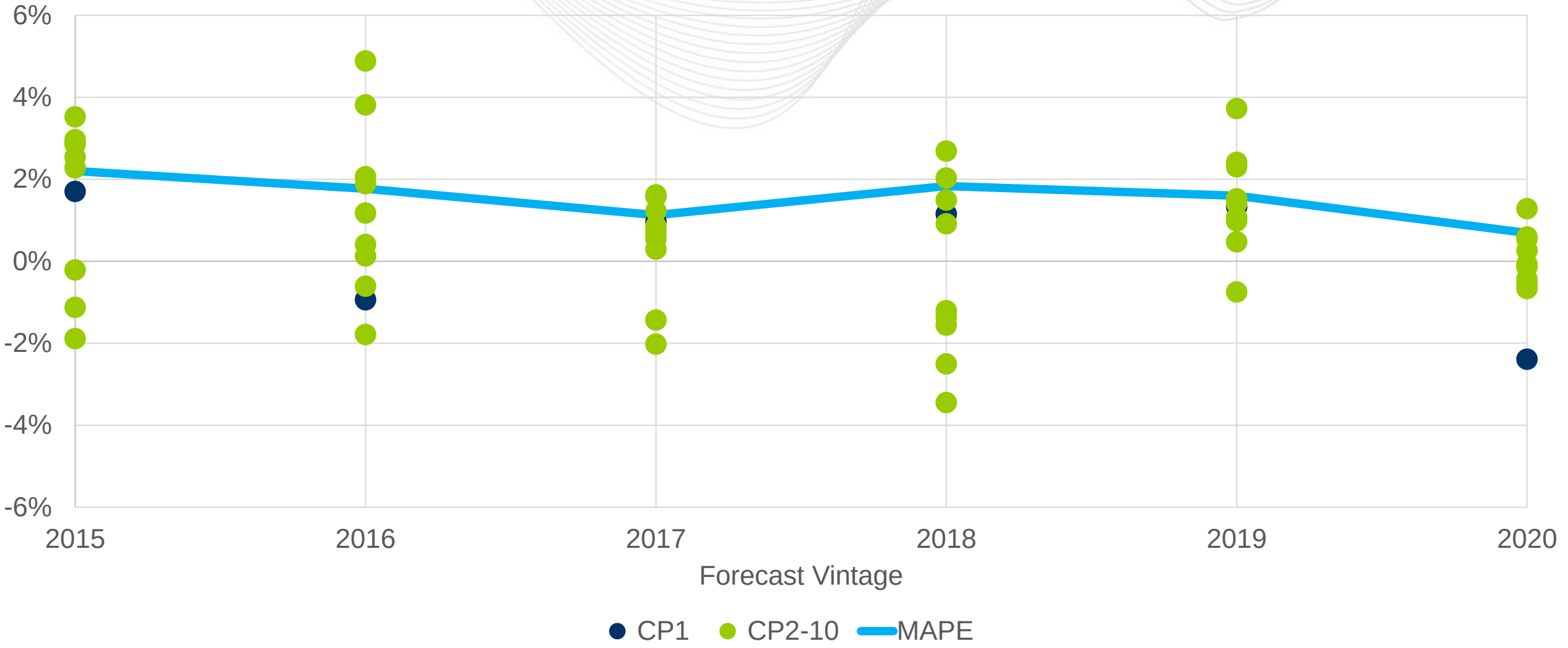
Summer Summary – Model Accuracy on 10 CPs



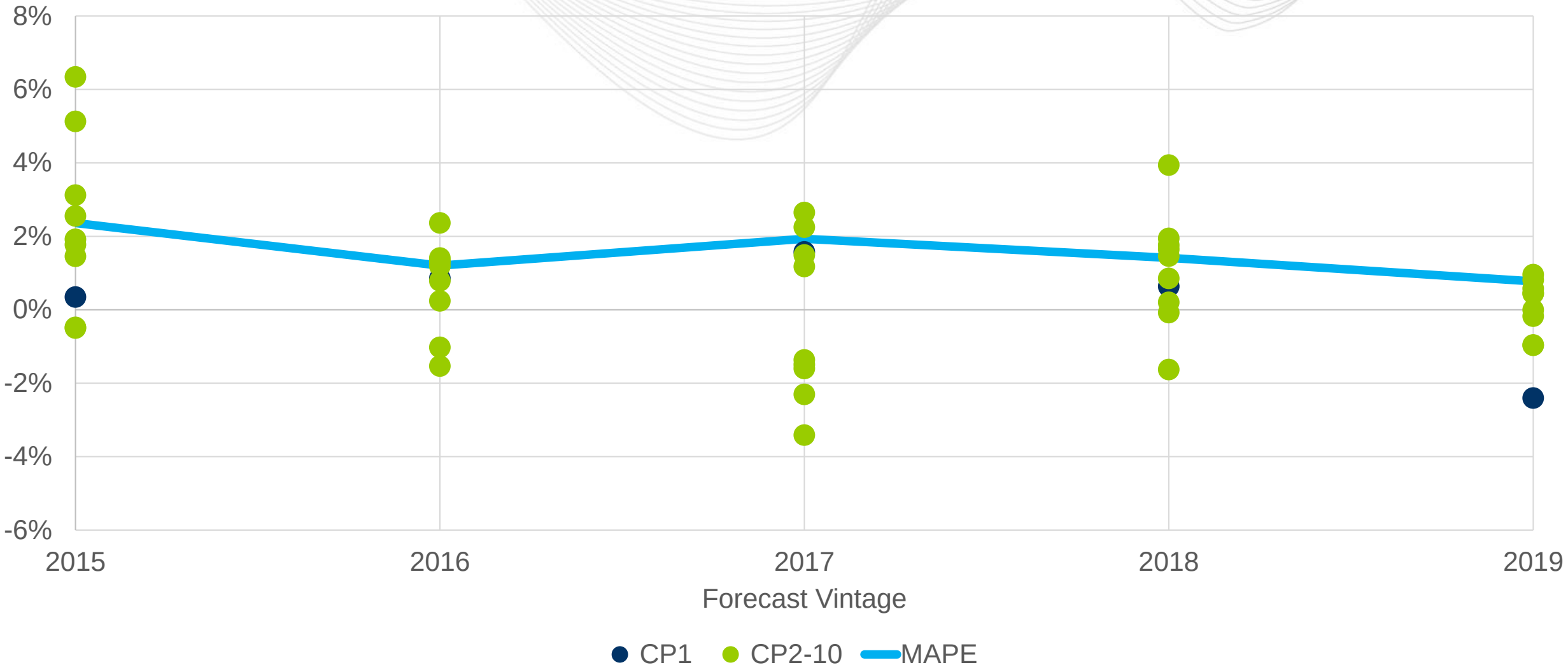
Summer – Zero Year Forecast Horizon



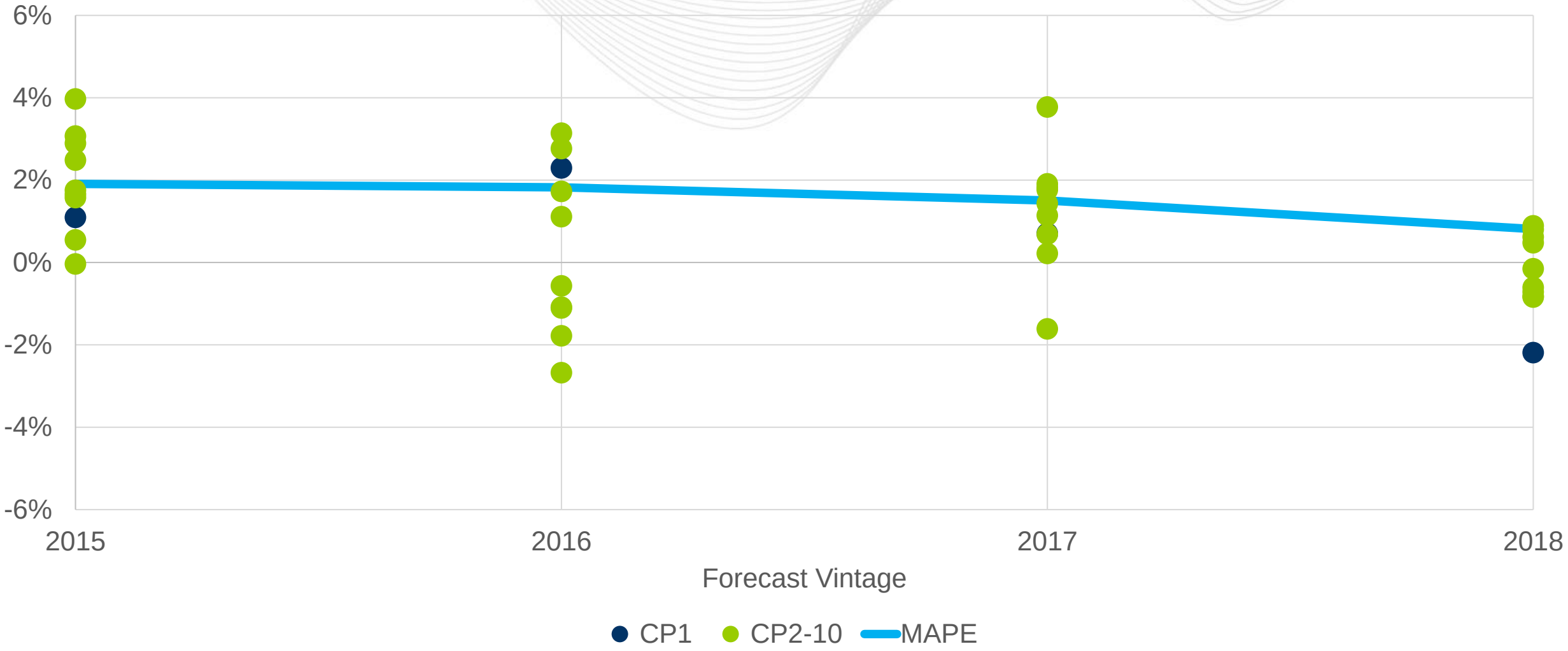
Summer – One Year Forecast Horizon



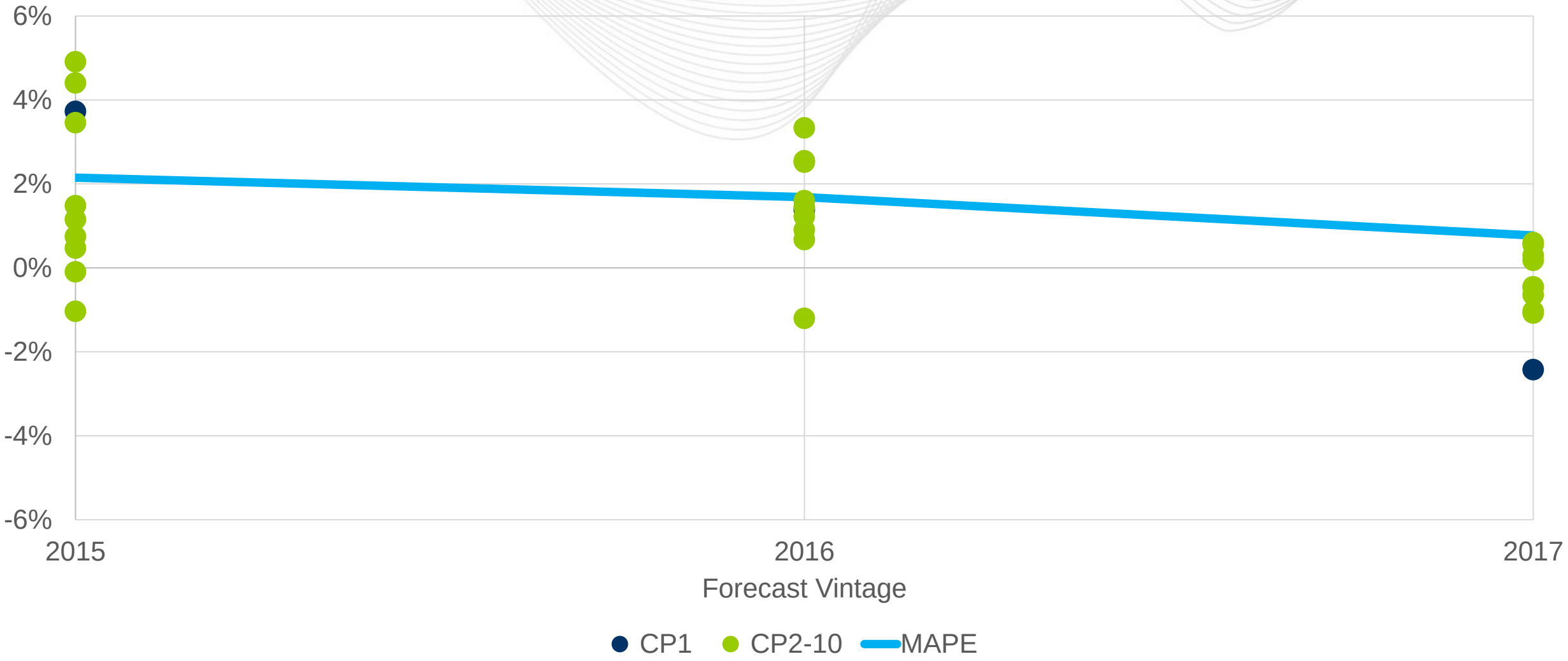
Summer – Two Year Forecast Horizon



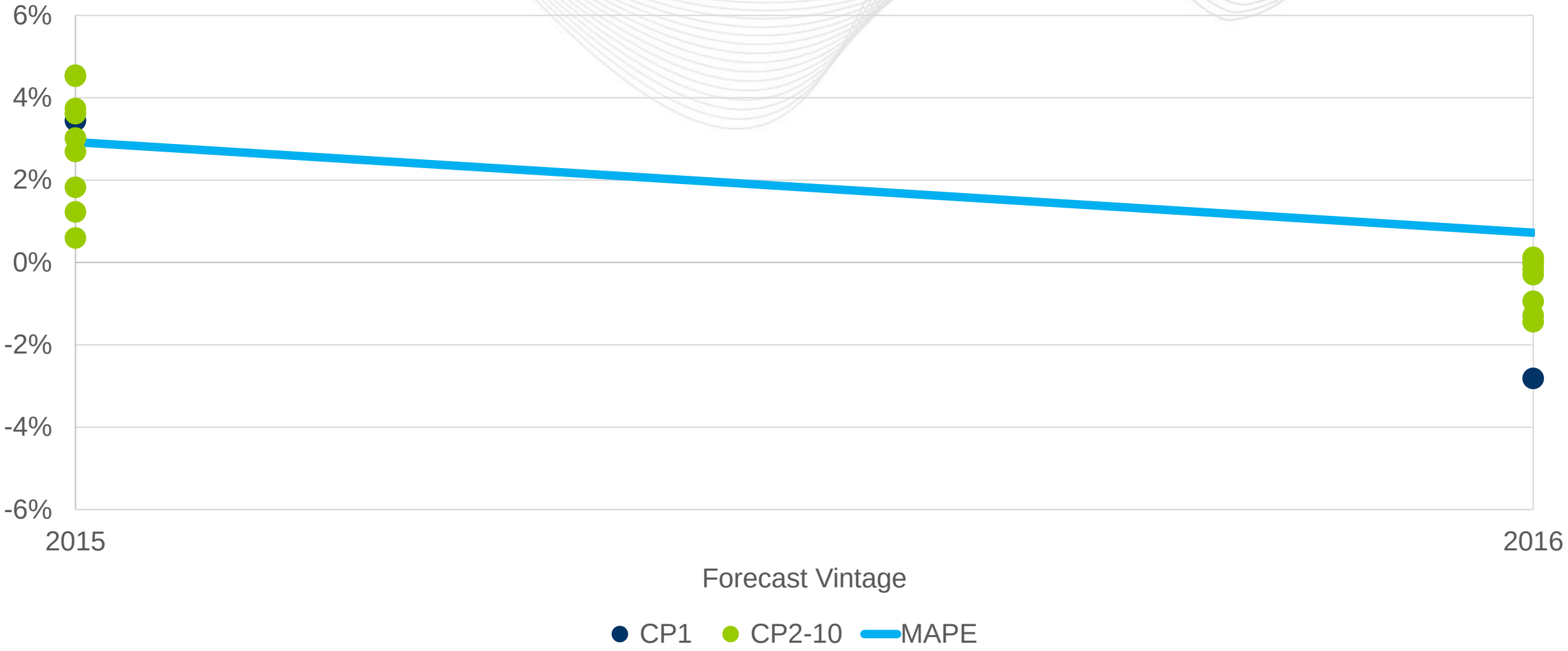
Summer – Three Year Forecast Horizon



Summer – Four Year Forecast Horizon

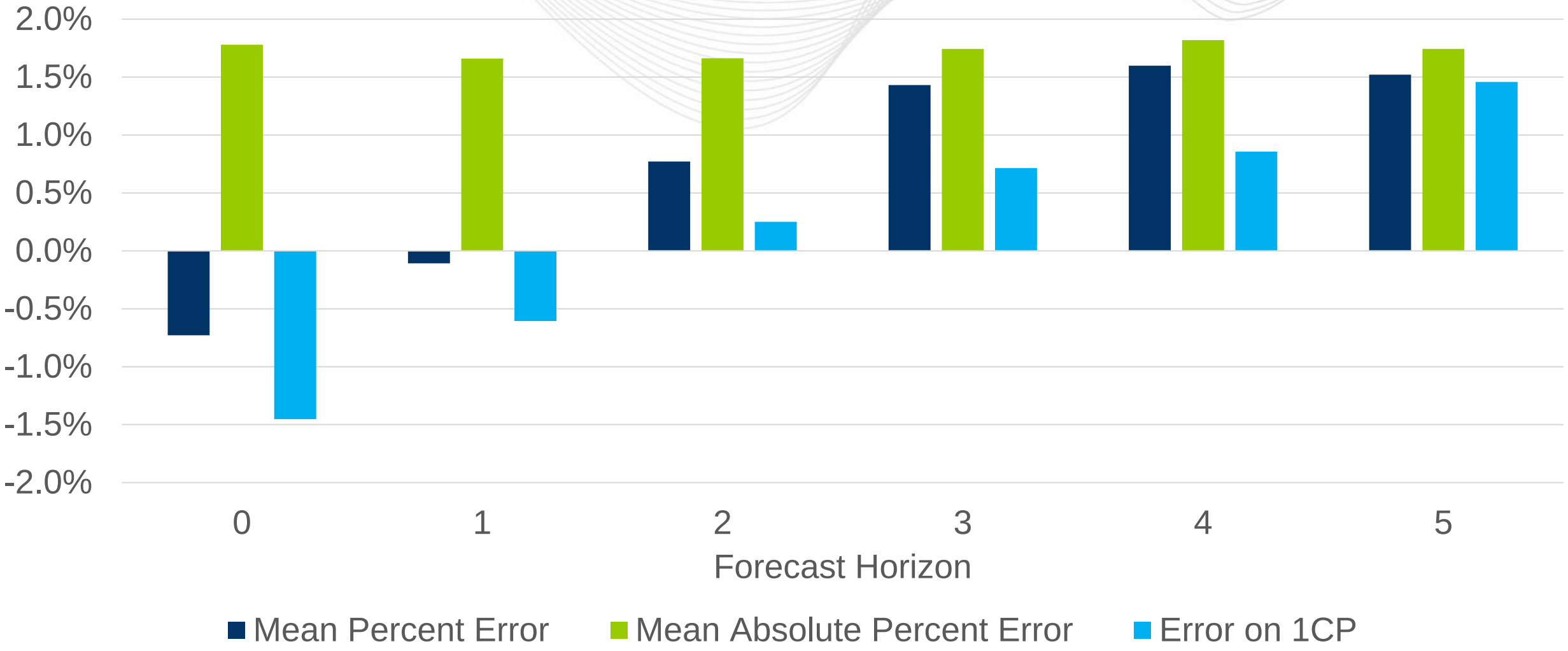


Summer – Five Year Forecast Horizon

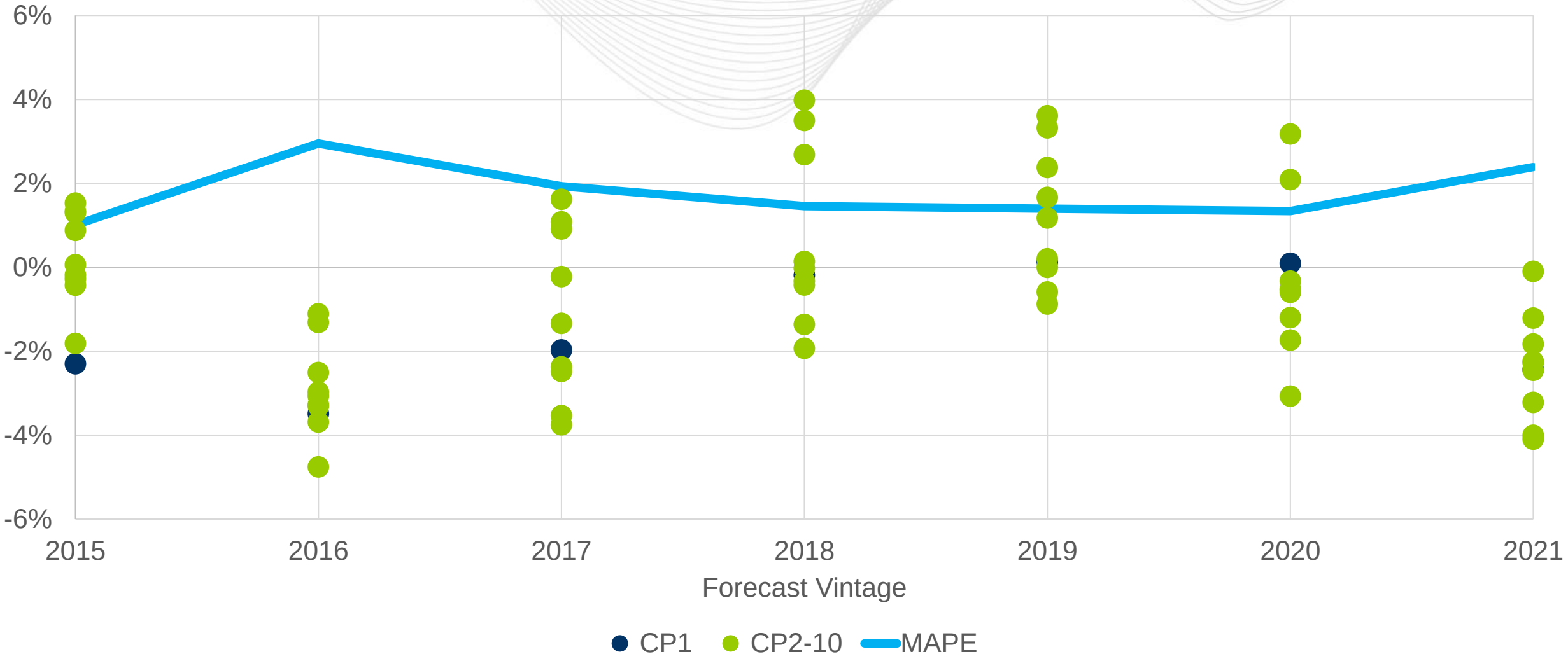


Winter

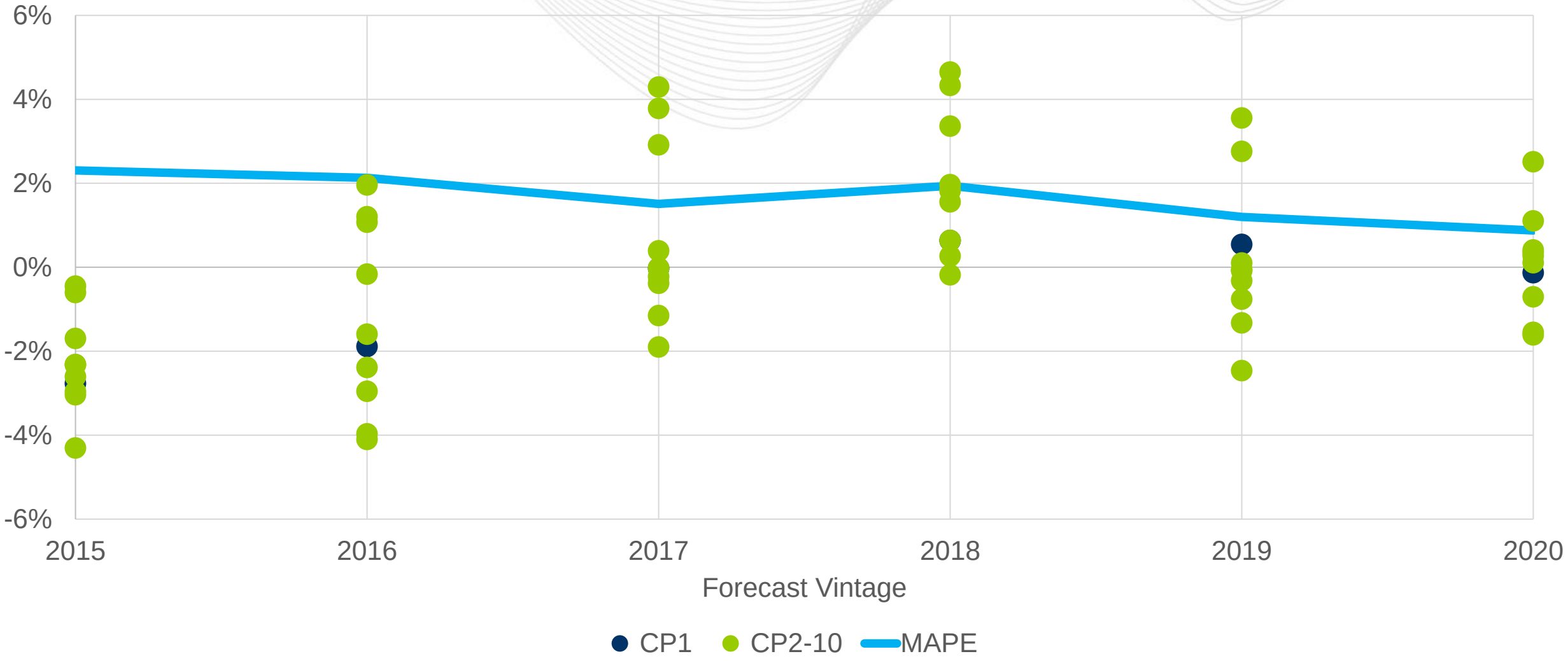
Winter Summary – Model Accuracy on 10 CPs



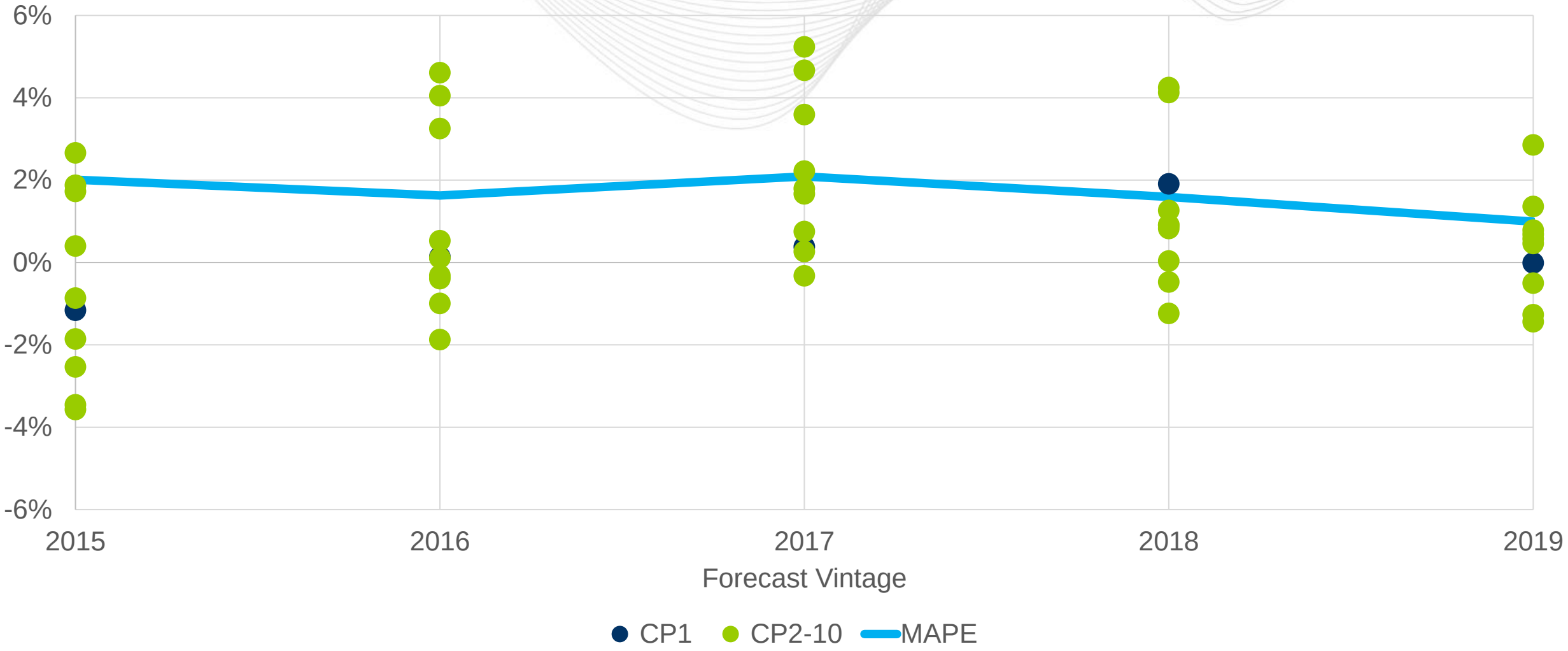
Winter – Zero Year Forecast Horizon



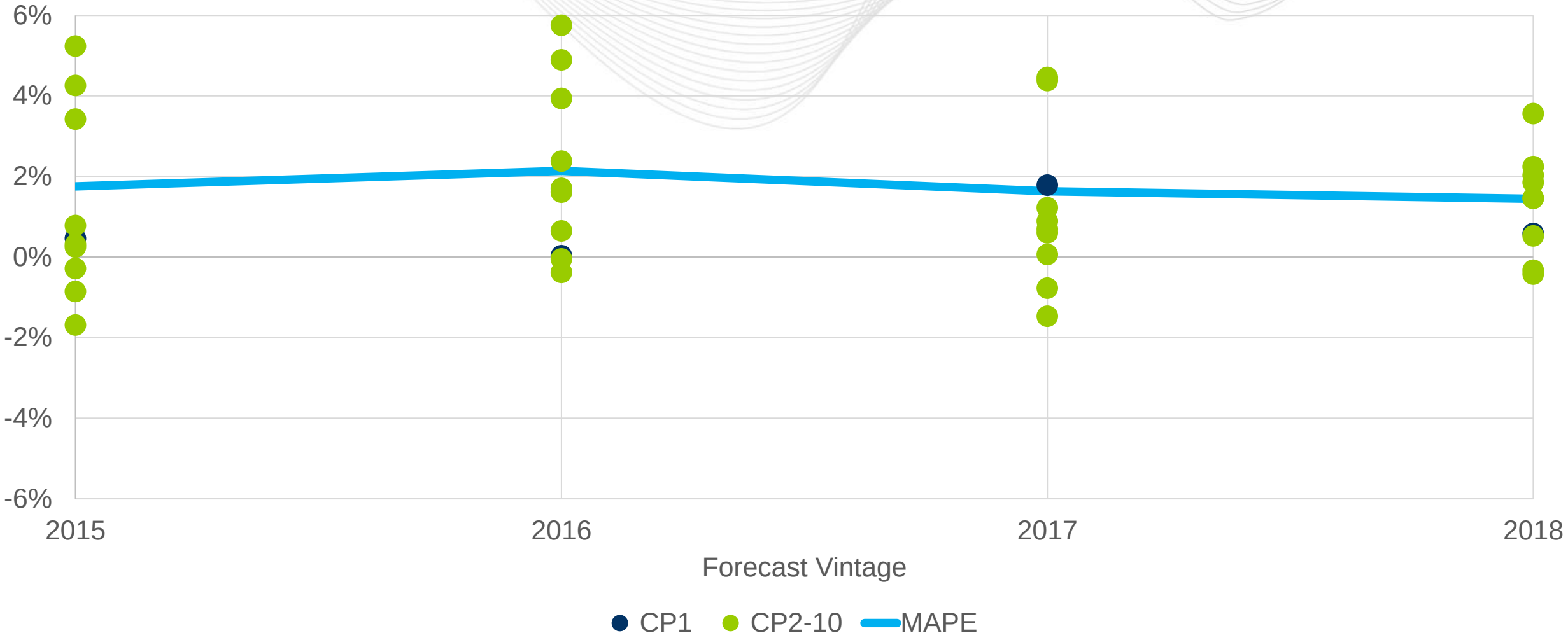
Winter – One Year Forecast Horizon



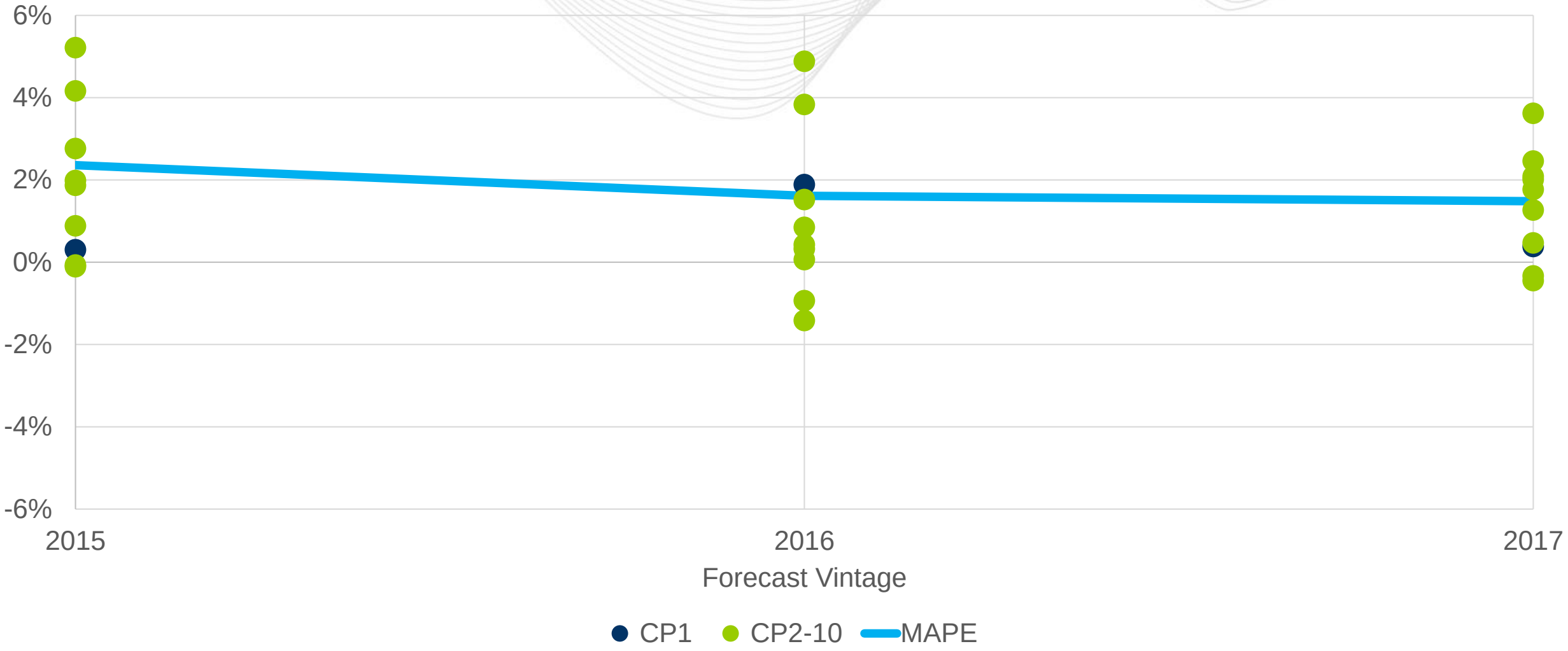
Winter – Two Year Forecast Horizon



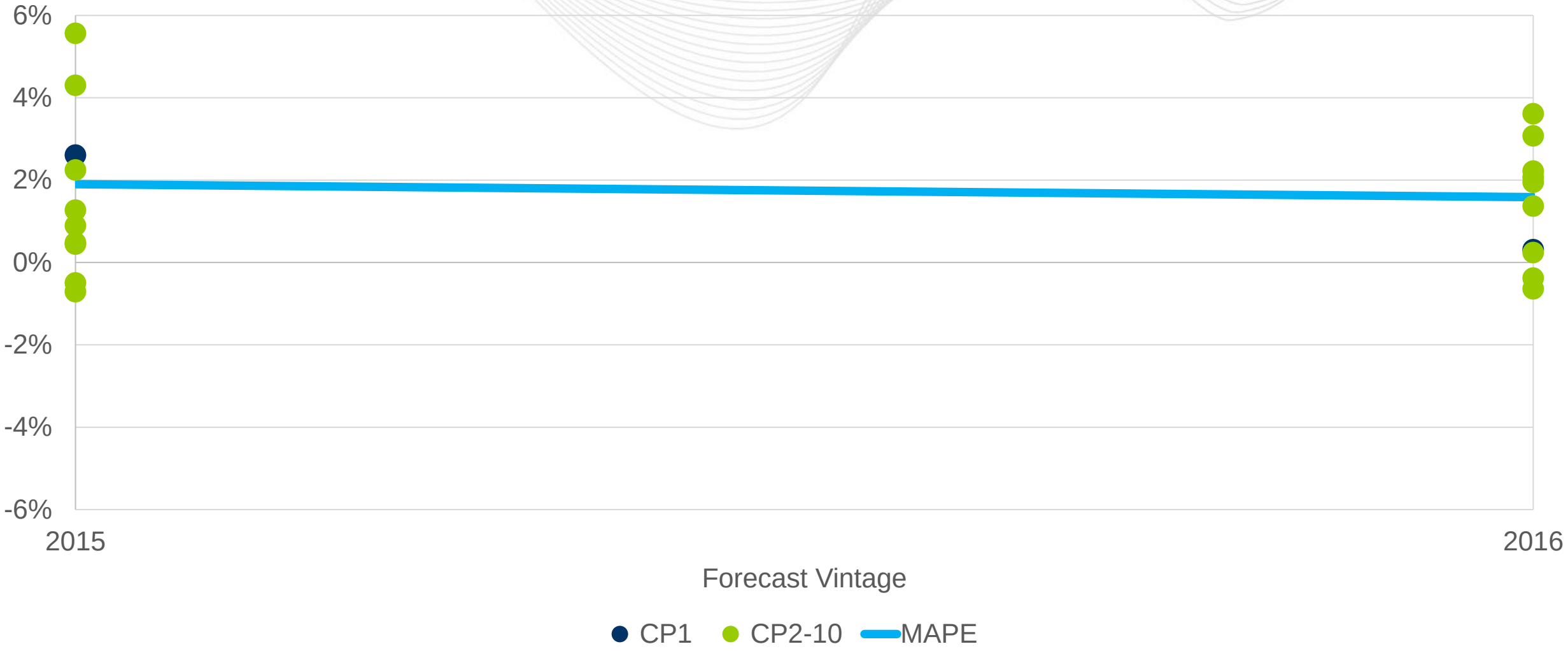
Winter – Three Year Forecast Horizon



Winter – Four Year Forecast Horizon



Winter – Five Year Forecast Horizon



Model Residuals

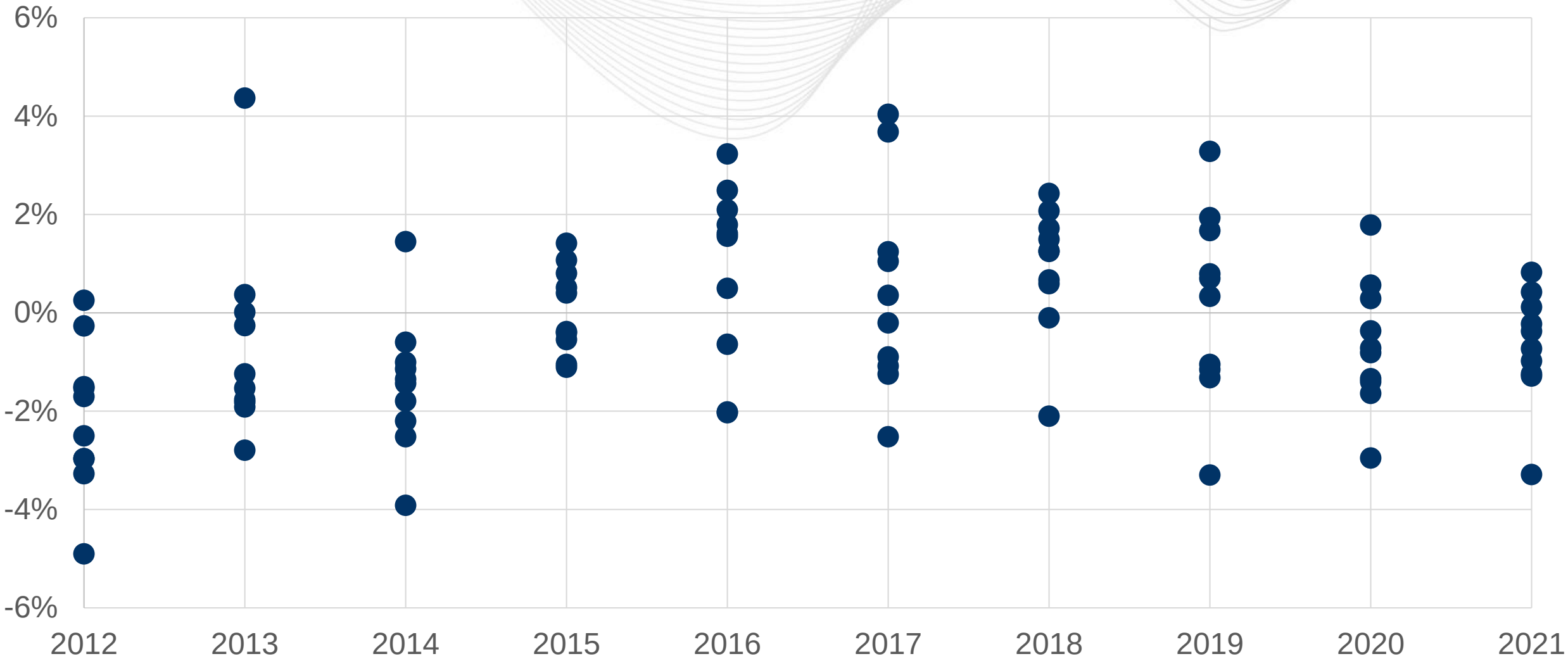
Overview

- The PJM Load Forecast is a regression model, which involves defining a relationship between a dependent variable (load) with independent variables (economics, weather, calendar, etc.). For each day in the estimation period, residuals can be computed by comparing the model fitted values with the actuals.

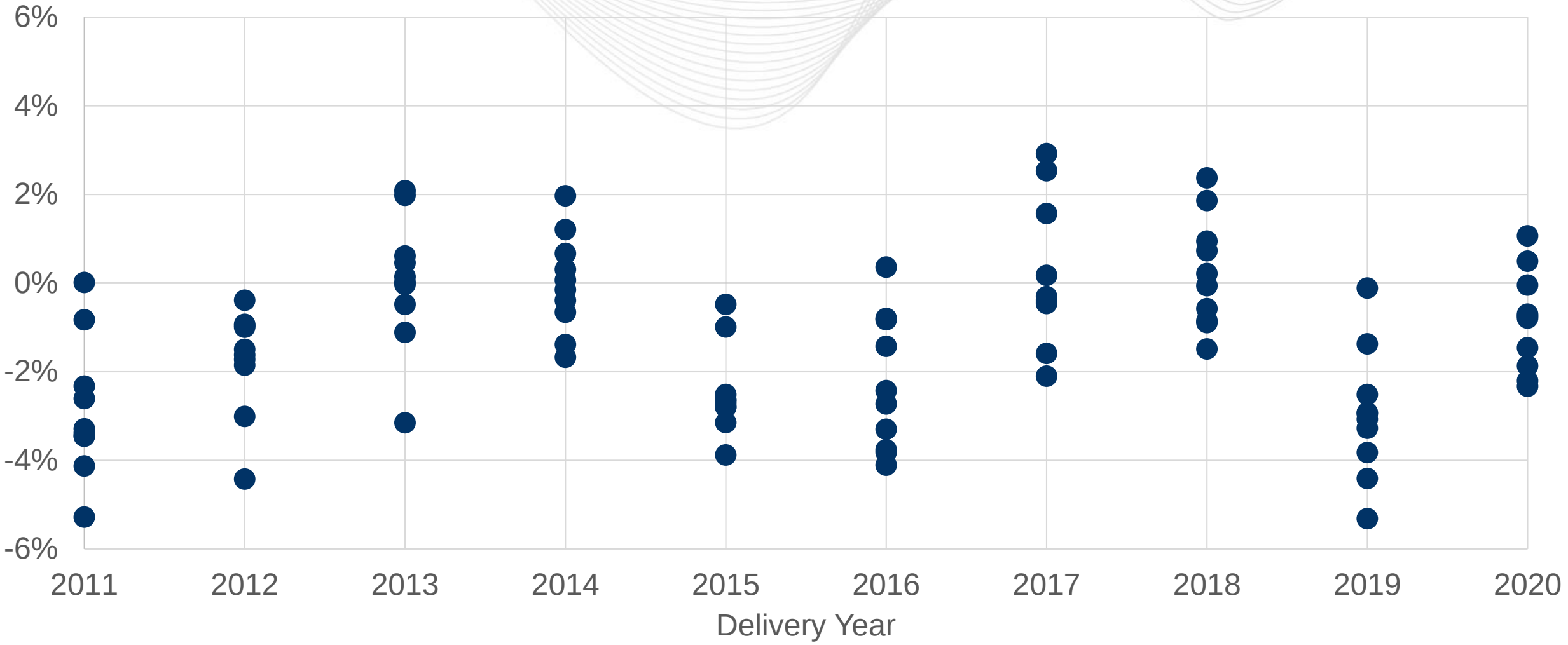
- Looking at residuals shows how much of the variance in the load is remaining after taking into account the independent variables.

- The following charts show residuals in the estimation period for the 2022 Load Forecast model for the 10 peak days for each of the Summer and Winter seasons.

Summer 10 CPs



Winter 10 CPs



Winter Observation

- Winter peaks tend to have significantly more variance than Summer. Some Winters have many cold peak type days (such as winters 2013/14, 2014/15, 2016/17, and 2017/18) whereas others have few to none (such as the two most recent winters 2018/19 and 2019/20).

- The next slide subsets the prior Winter 10CP slide, but only shows those days which exceeded 120,000 MW.

Winter 10 CPs (only days over 120,000 MW)