ENDGAME
ECONOMICS

Analysis of changes to the Relevant Level Method

Presentation for the RCP Workshop

10.05.2021

Purpose and structure of this presentation

- Endgame has been engaged by Alinta to assist in analysing the proposed changes to the Relevant Level Method (RLM).

- The Rule Change Panel (RCP) has proposed the use of a new method, known as the Delta Method, to calculate the capacity credits allocated to individual intermittent generation facilities in the SWIS.

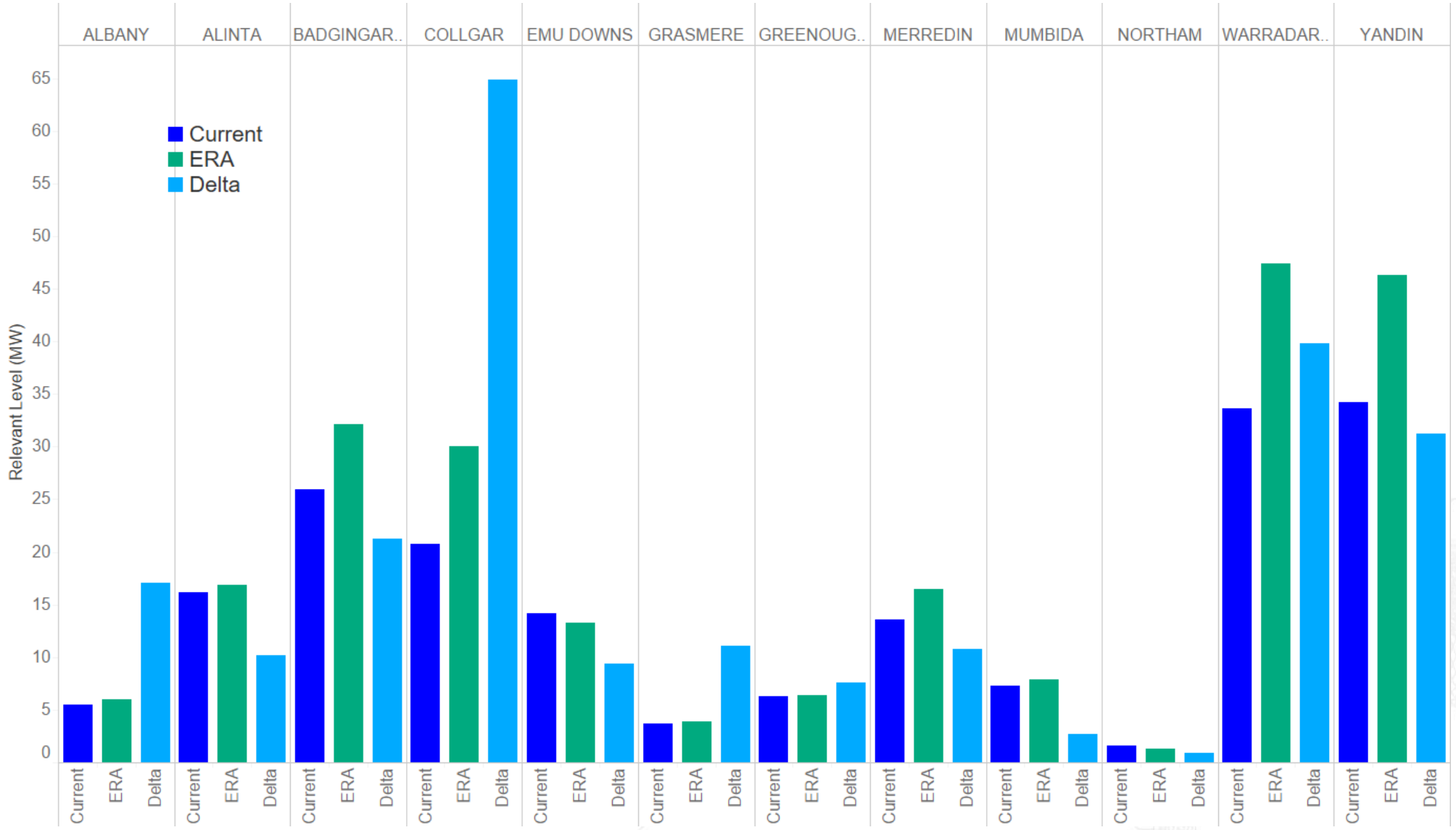
- The purpose of this presentation is to set out the findings from our preliminary analysis of the Delta method, as compared to the previous method proposed by the Economic Regulation Authority (ERA).

- The remainder of this presentation is structured as follows:
  - Descriptive analysis
  - Understanding the results
  - Conclusion

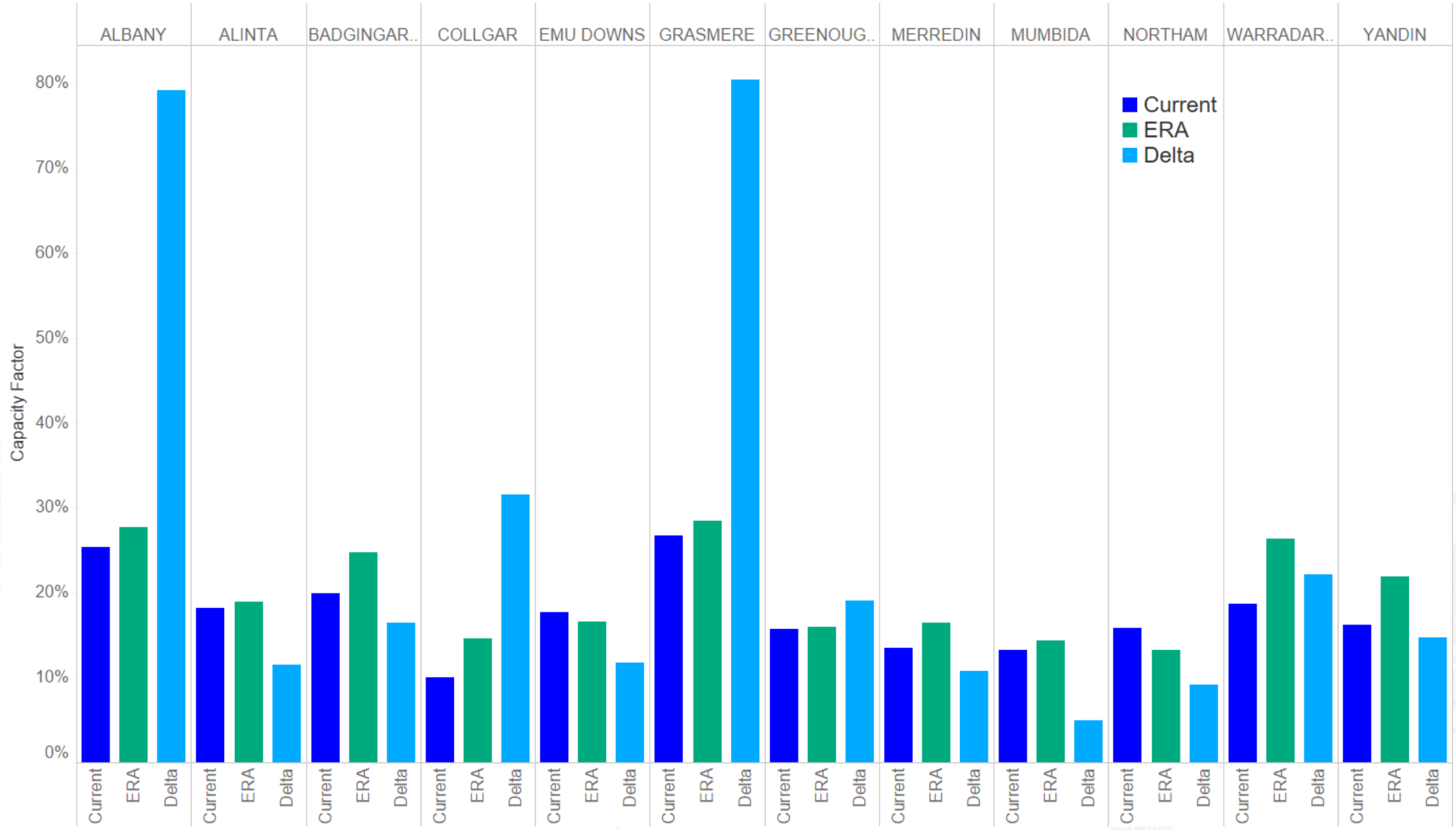
ENDGAME
ECONOMICS

Descriptive analysis

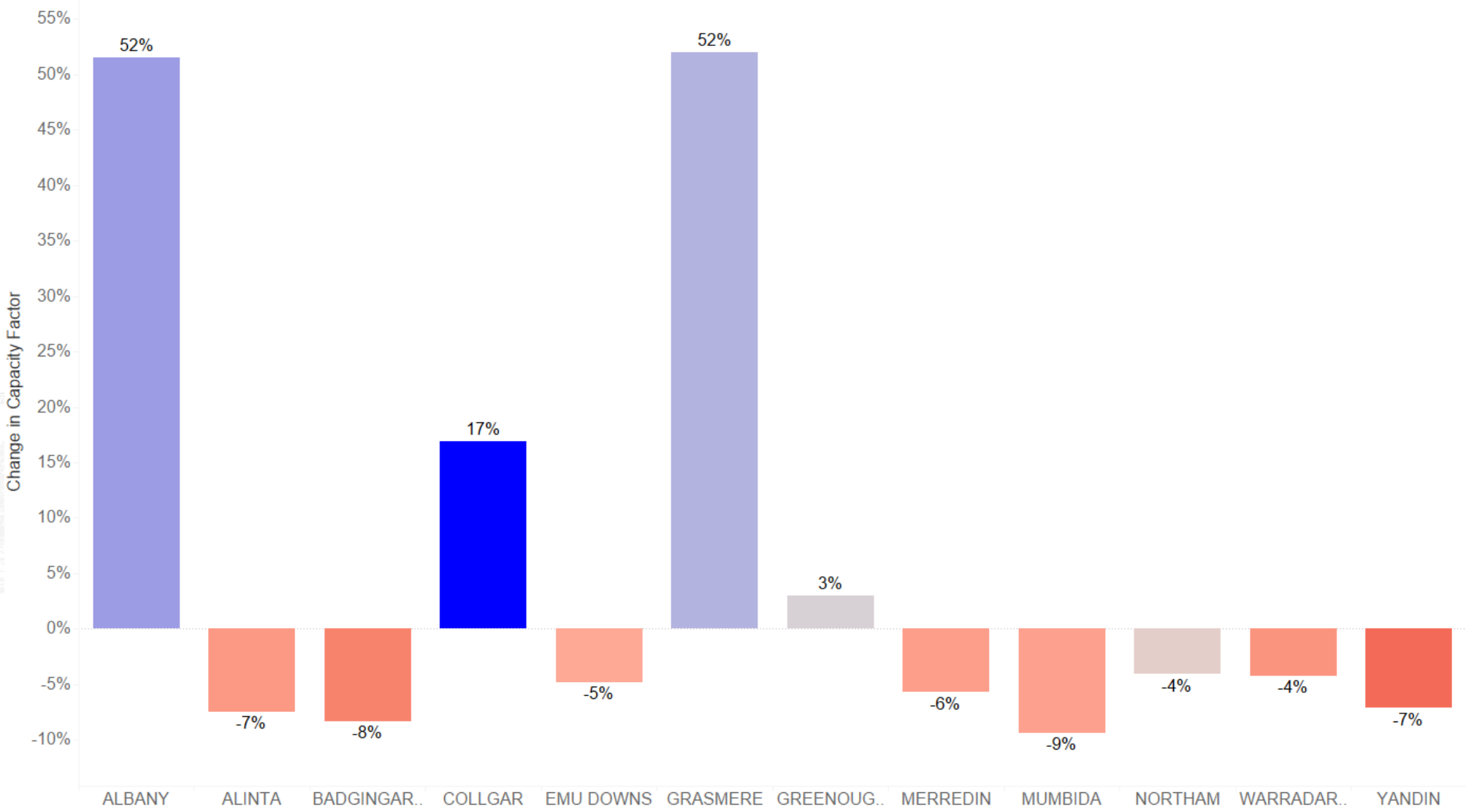
Allocations to individual facilities – Comparison of methods



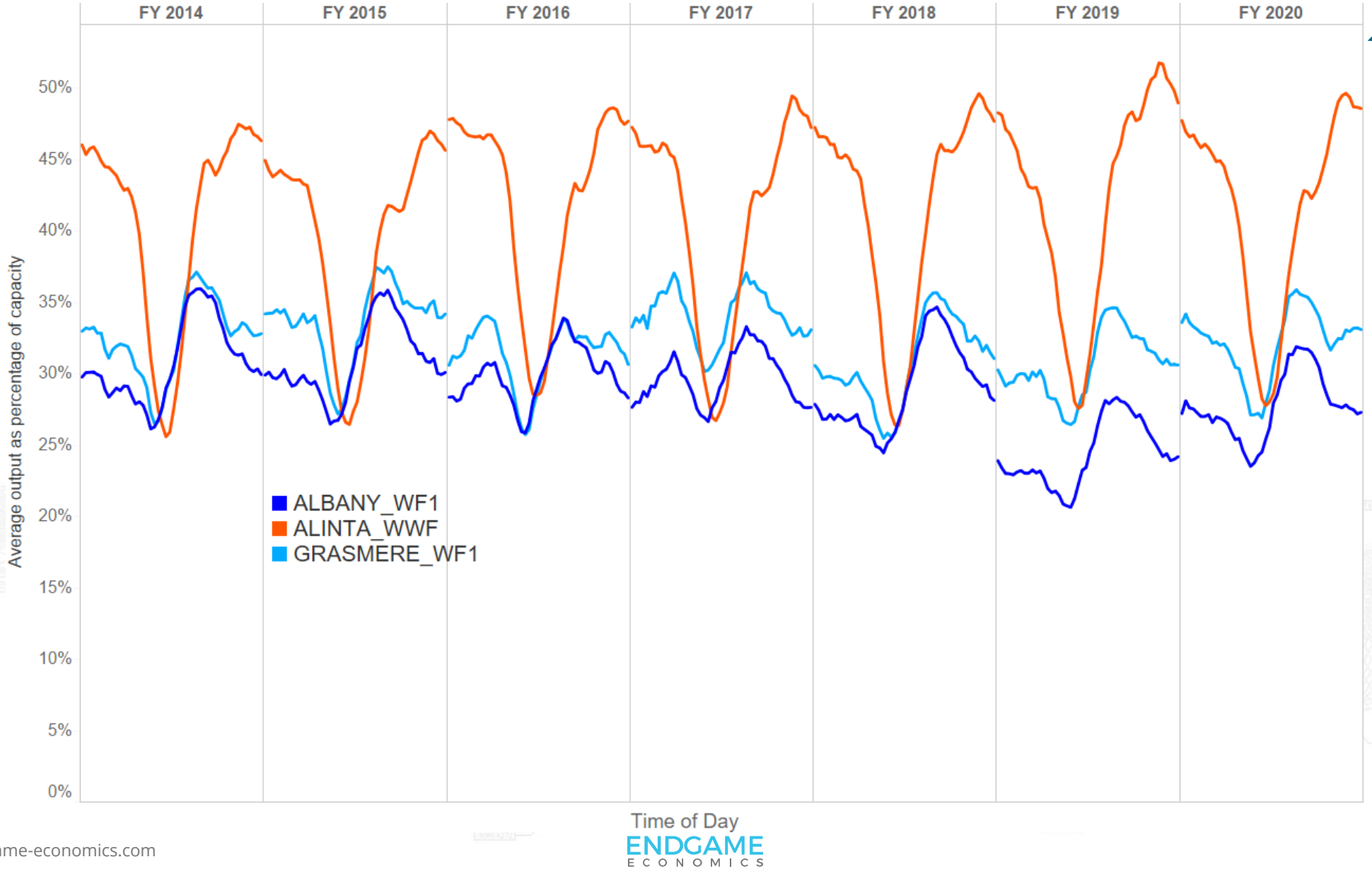
Allocations to individual facilities – Capacity Factor



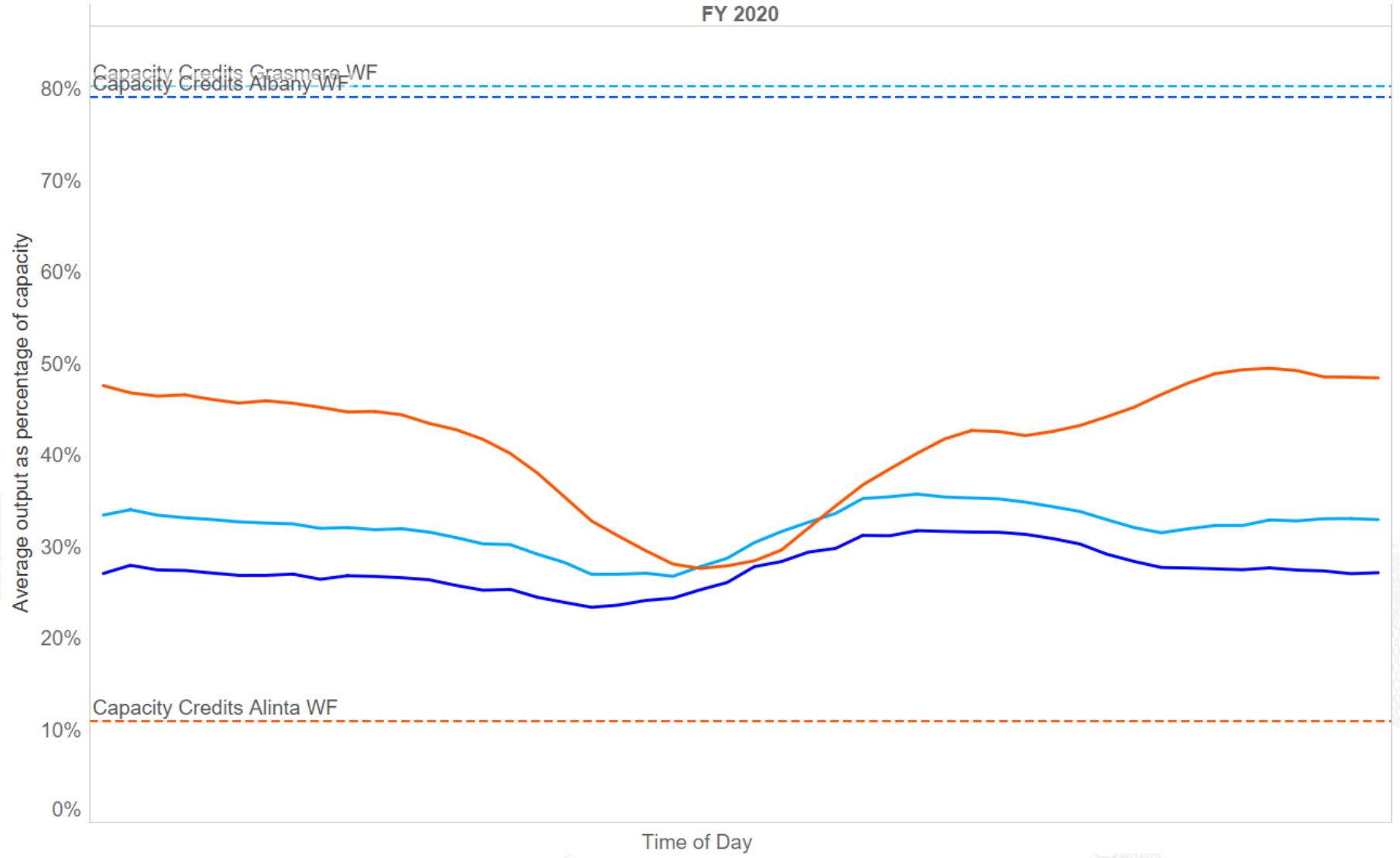
Allocations to individual facilities – Change by capacity factor



Comparison of Albany and Grasmere with Walkaway WF



Albany and Grasmere versus Walkaway WF, capacity via Delta Method (2019-20)



Allocations to individual facilities – Observations

- **Shifting to the Delta method has enormous consequences:** changes brought about by the Delta Method are substantial in MW terms and enormous when viewed in terms of capacity factors.
- **Anomalous results:** Under the Delta method there are a number of results that warrant further investigation:
  - Capacity factors of ~80 % for Albany and Grasmere seem implausible. This would suggest that these wind farms are almost firm resources.
  - Under the Delta method, Grasmere wind farm (13.8 MW) receives credits comparable to Walkaway Wind Farm (89.1 MW) despite being 1/6th the size.
  - Results seem vastly different from what average profiles of output suggest.
- **Significant shift from current RLM:** the Delta method yields results that are far from current levels – effectively a completely new system for how intermittent generation earns capacity credits.

How can we understand what is driving these results?

ENDGAME
ECONOMICS

Understanding the results

Allocations to individual facilities – ERA

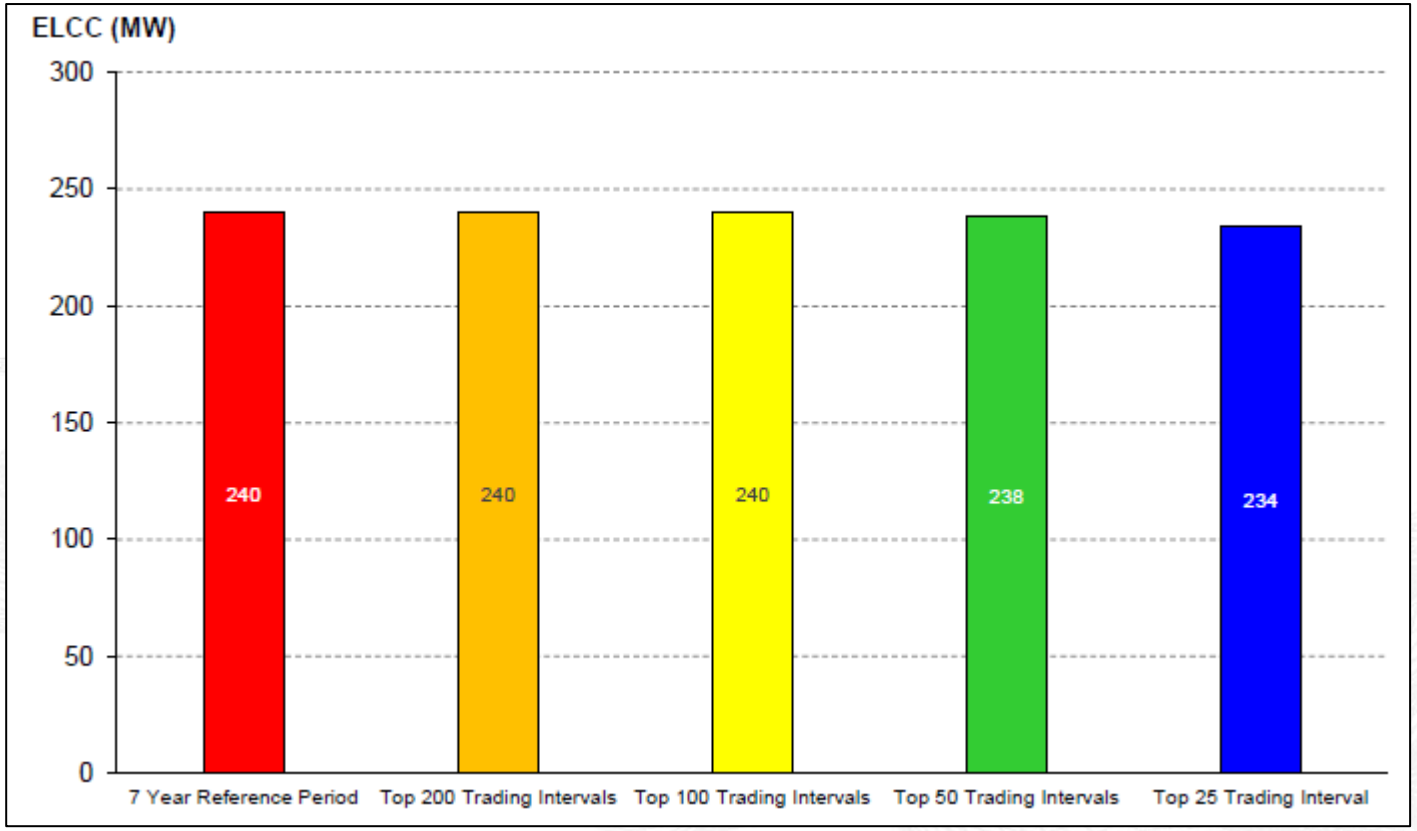
'The technology class capacity values can be distributed to individual facilities in that technology class using the average capacity factor of facilities during two sets of trading intervals:

- *The **top 12 trading intervals with the highest demand from separate days** in each year in the past five years.*
- *The **top 12 trading intervals with the highest demand net of the output of the intermittent generation fleet, estimated for separate days**, in each year in the past five years.'**

**Relevant level method review 2018 capacity valuation for intermittent generators – Final Report, 31 March 2019, ERA*

Allocations to individual facilities – RCP

*'Figure 1 [below] indicates that the ELCC of the 7 year reference period is driven by the Trading Intervals with the highest system stress (ie, the highest system demand).**



- We have not been able to replicate the method used to calculate the ELCC for the fleet or individual generators in the time available.
- But if the ELCC for the entire fleet is driven by the top 25 demand intervals, it suggests that so will the ELCCs for generators via the Delta method.
- We have examined how the results compare with capacity factors calculated for various numbers of relevant periods.

* Draft Rule Change Report: Method used for the assignment of Certified Reserve Capacity to Intermittent Generators (RC_2019_03), *20 April 2021, RCP*

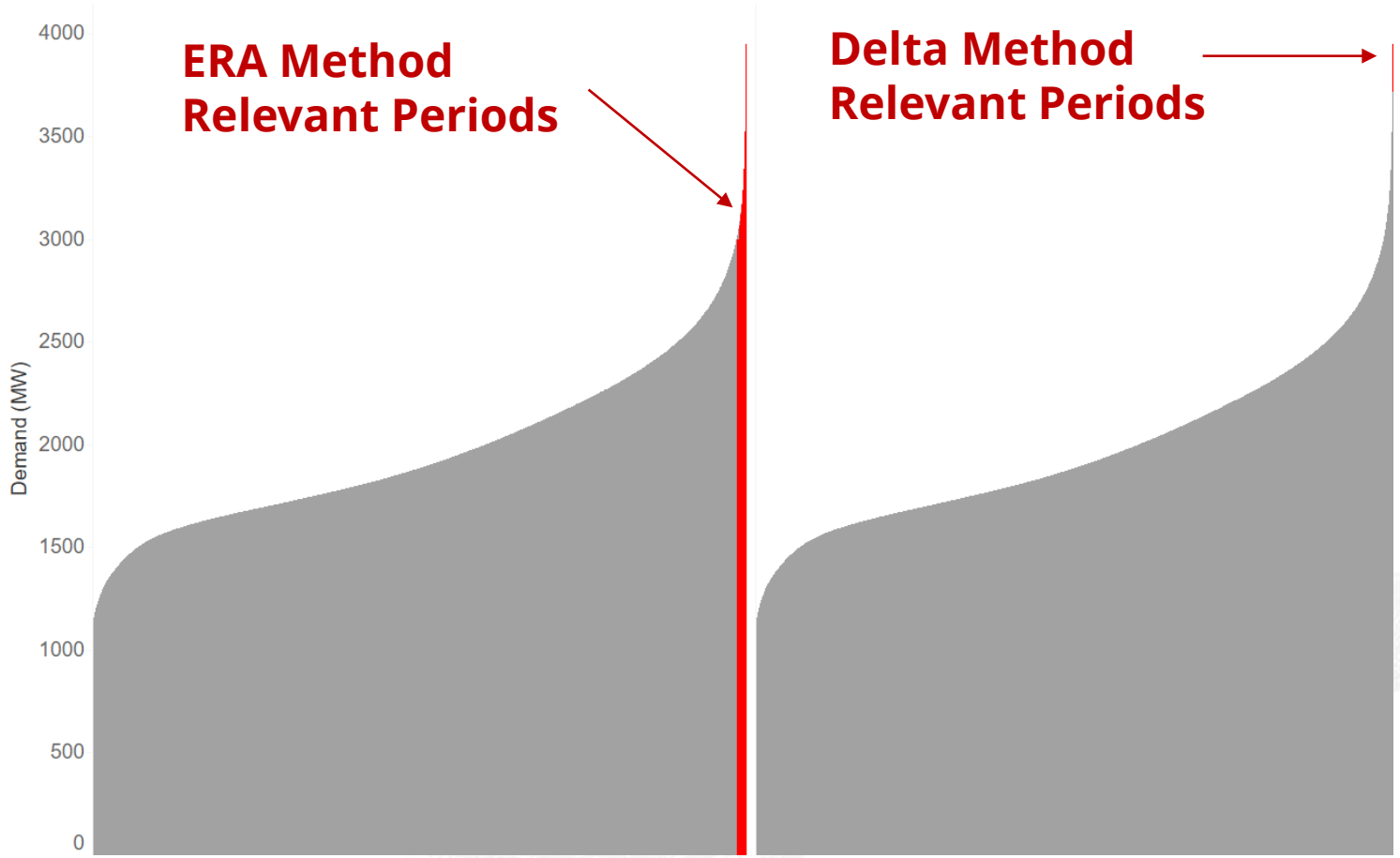
Which periods matter to the RLM?

ERA Method

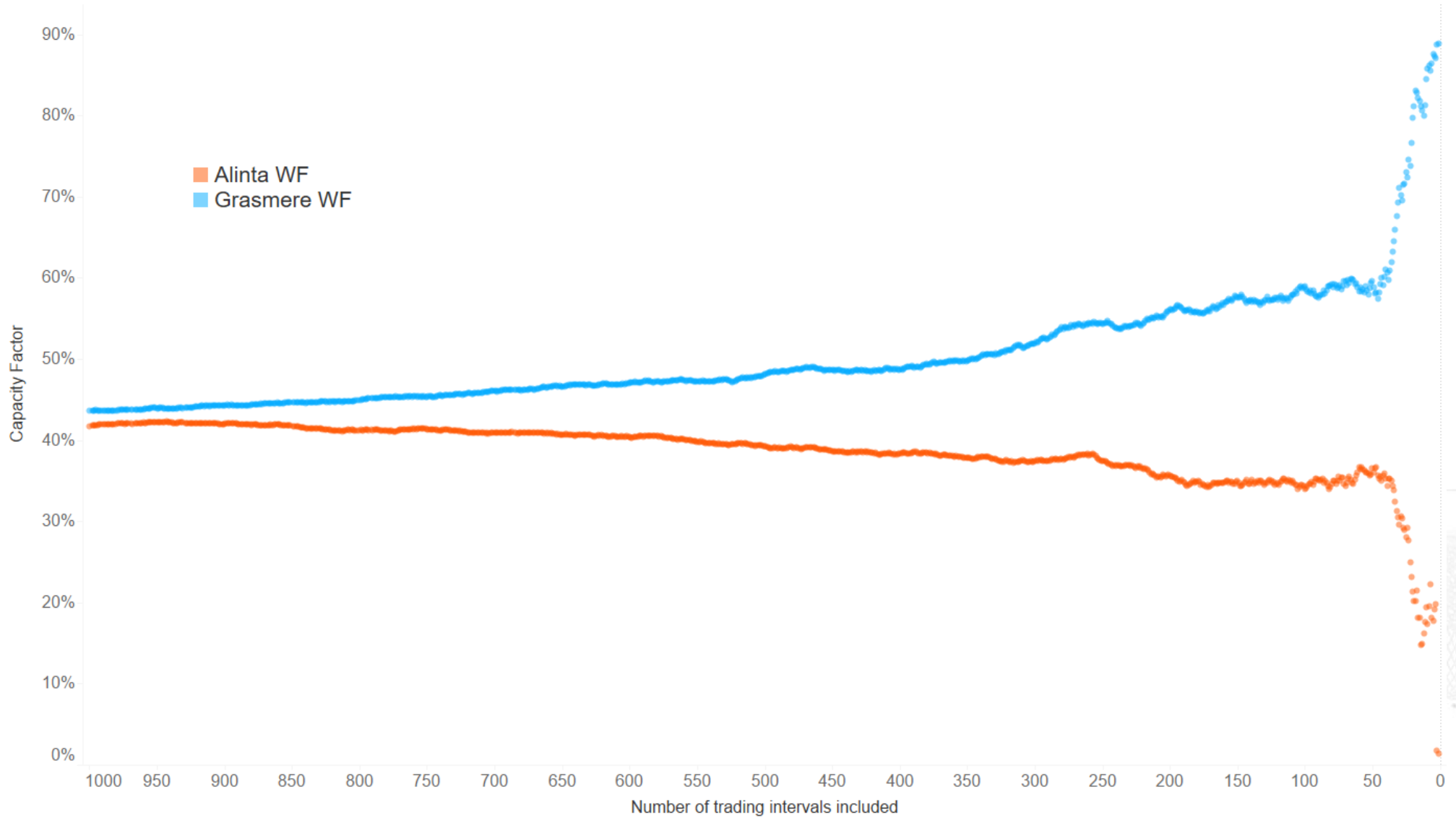
Uses many periods to determine capacity value.

Delta Method

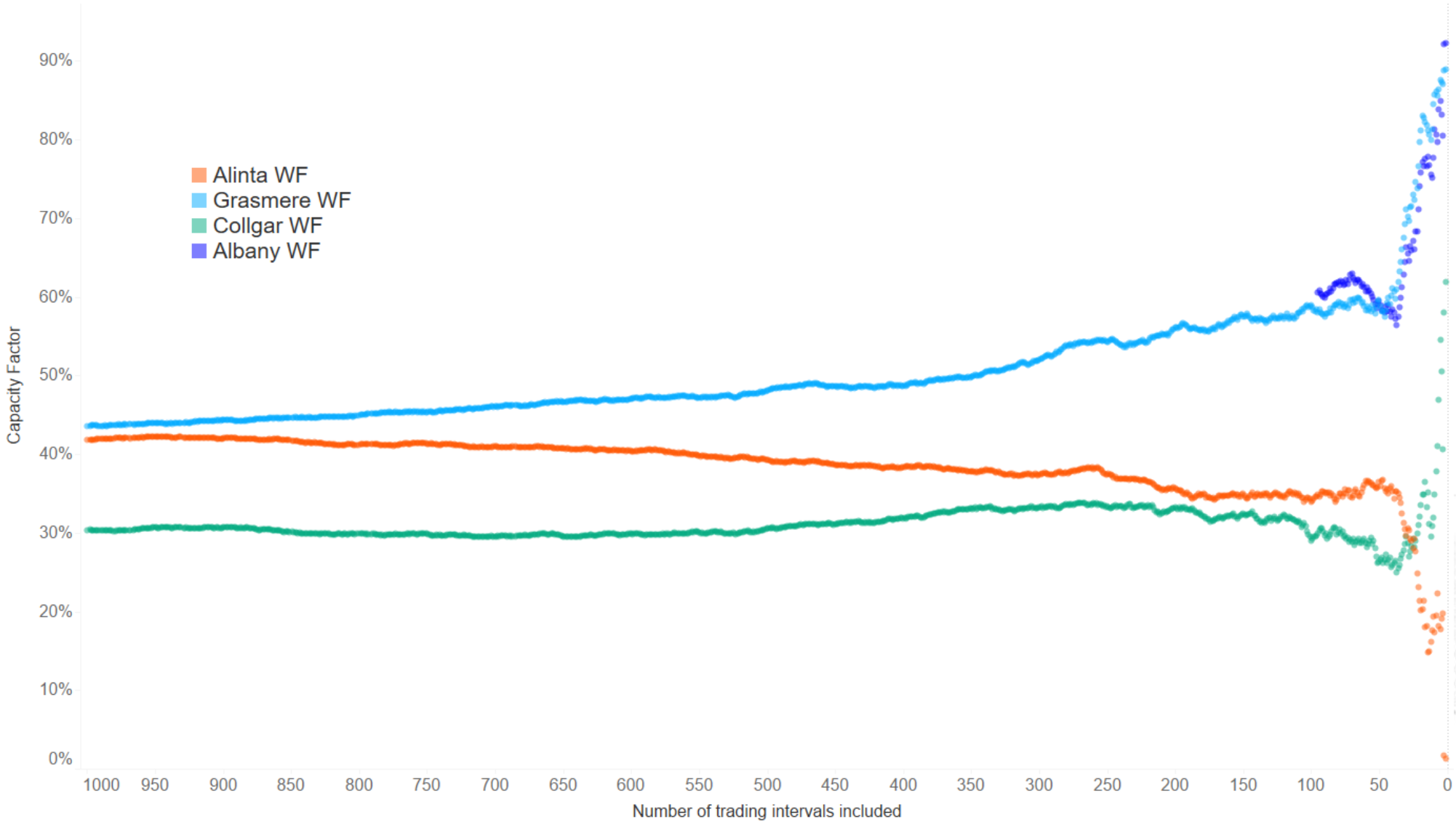
Driven by very few (here shown as top 25) periods.



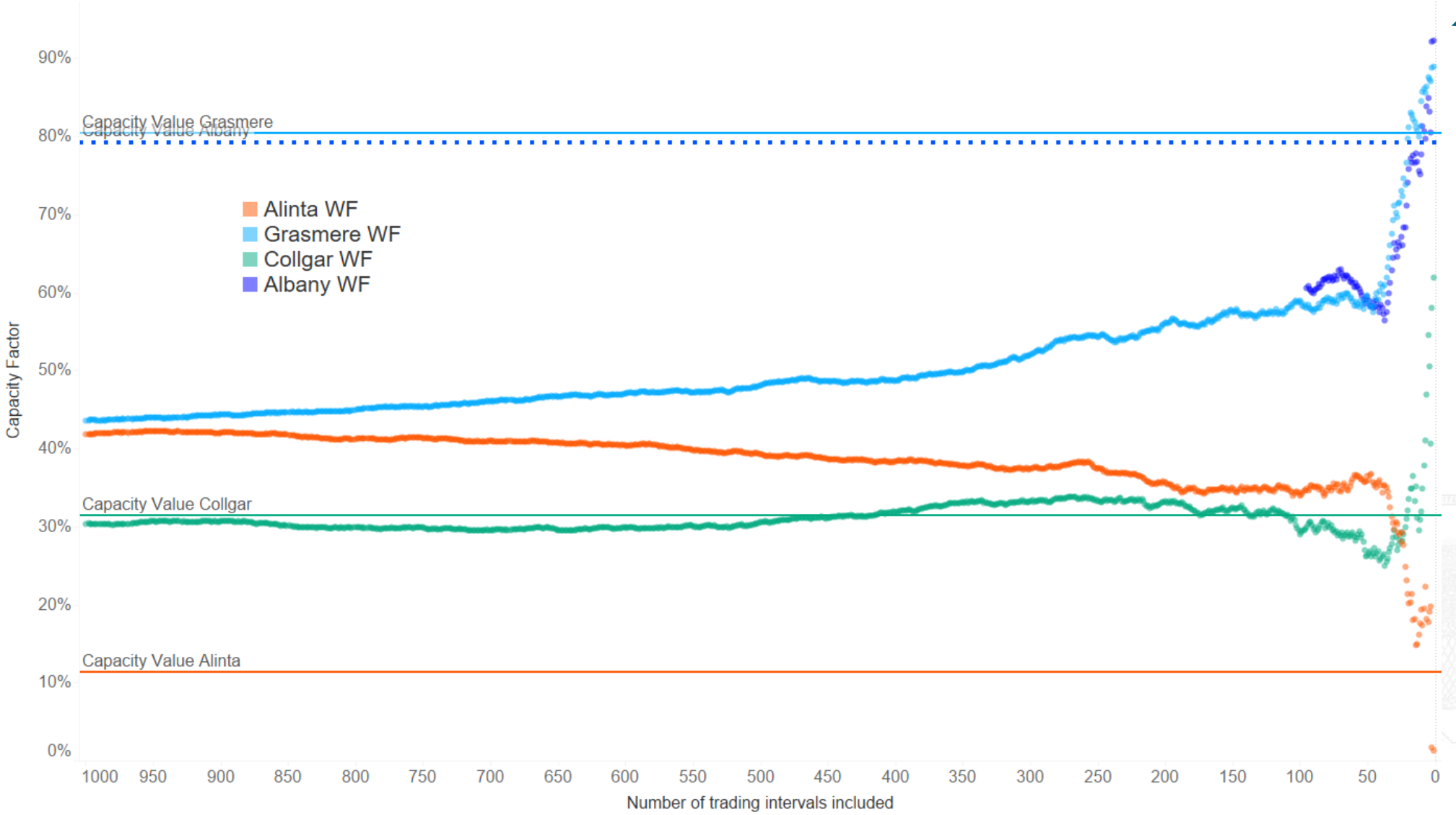
Grasmere Alinta WF, capacity factor vs number of periods



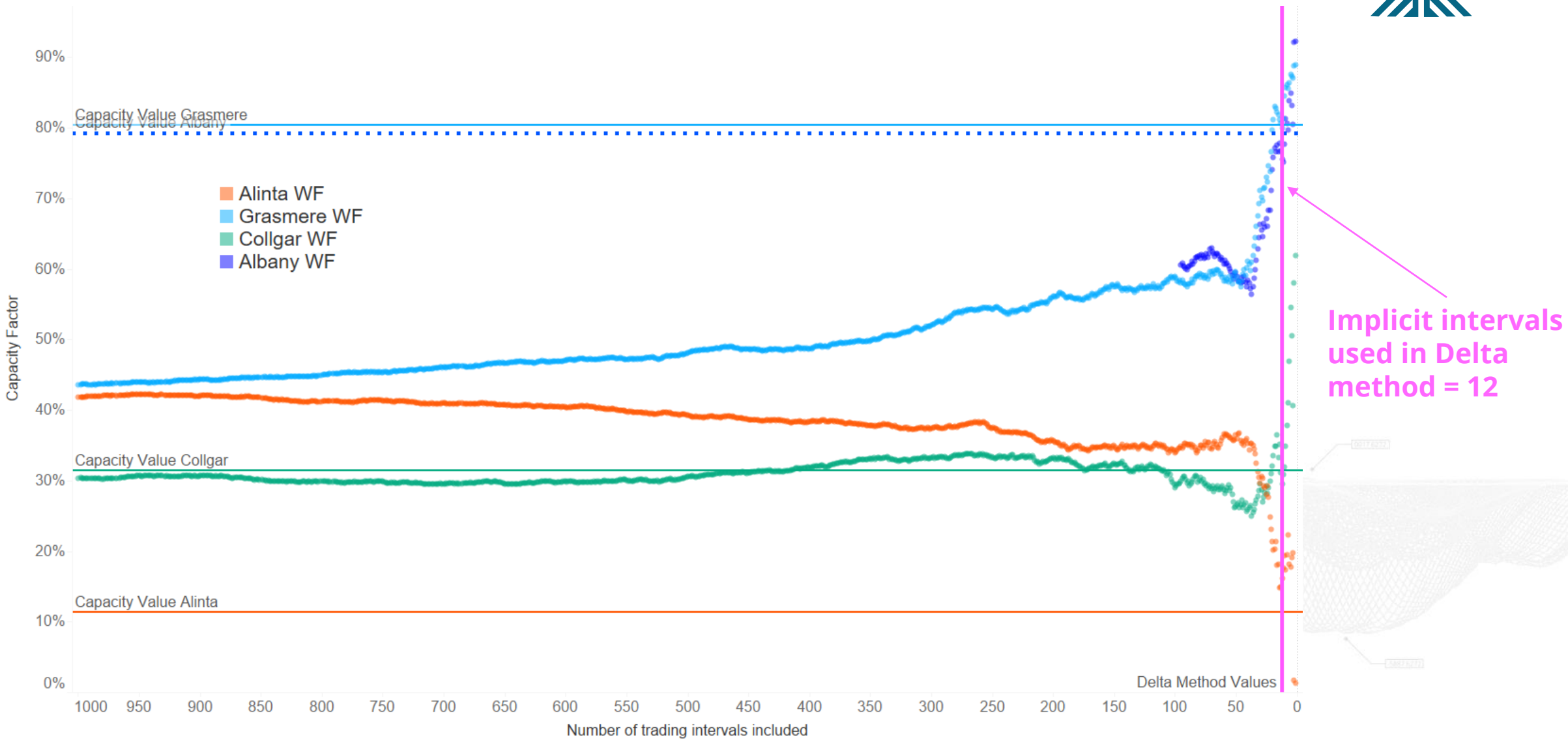
Four wind farms, capacity factor vs number of periods



Four wind farms, capacity factor vs number of periods

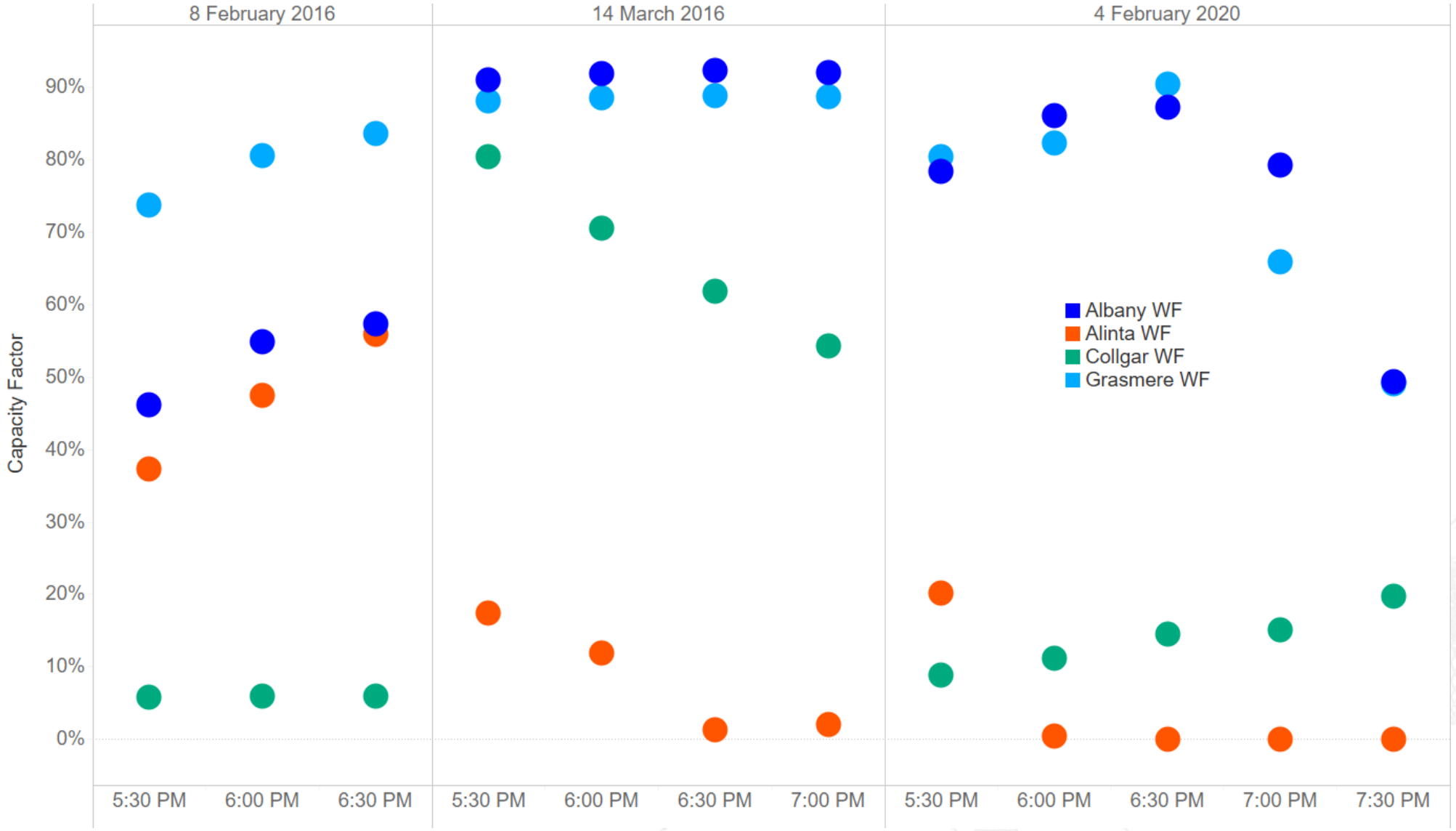


Four wind farms, capacity factor vs number of periods

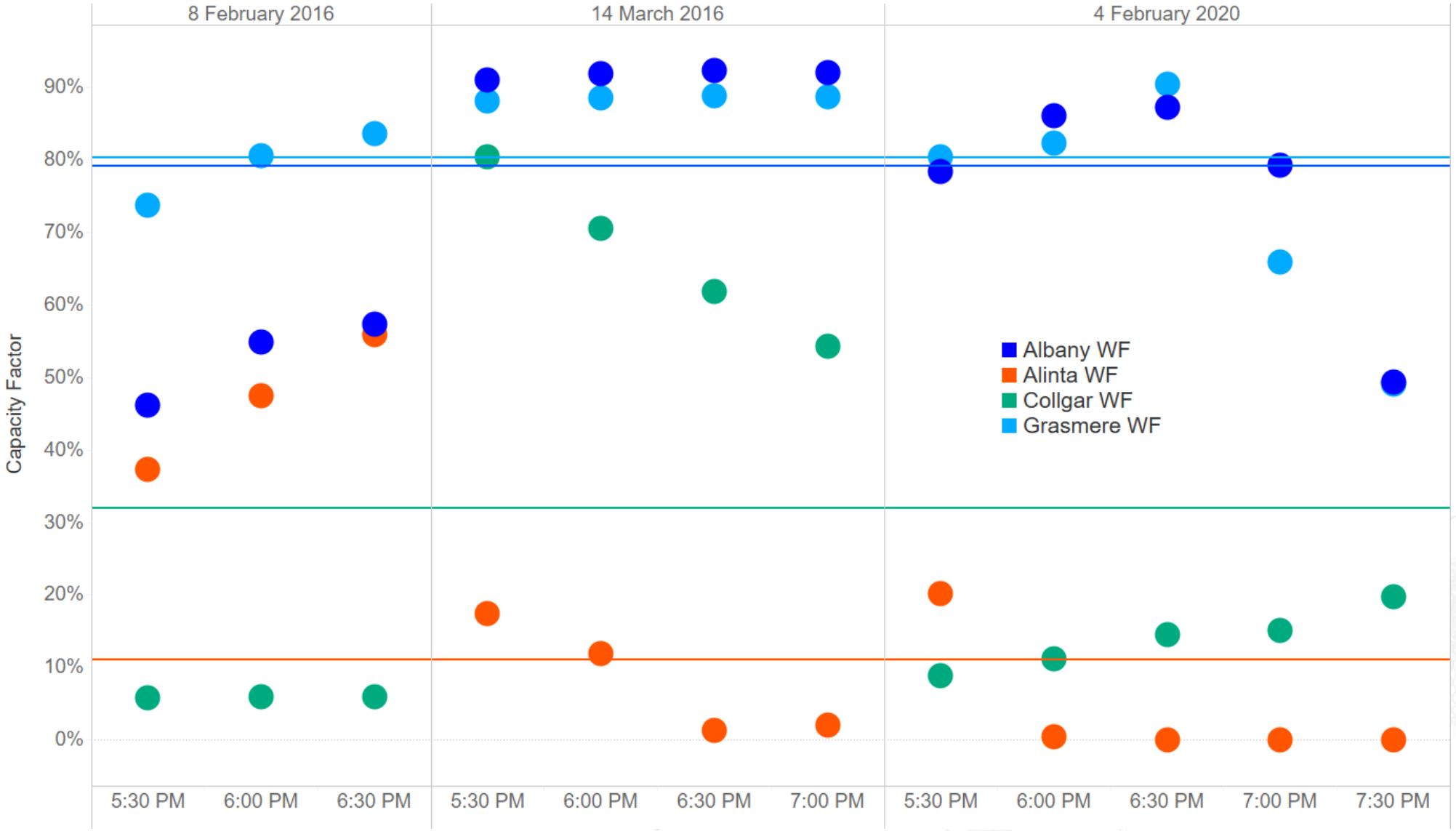


Implicit intervals used in Delta method = 12

Four wind farms, capacity factor for top 12 demand periods



Four wind farms, capacity factor for top 12 demand periods



Observations and conclusion

- **Delta method appears to be driven heavily by outcomes during high demand periods:** despite the complex nature of the Delta method, it really appears to be driven by something simple – ie, how much are intermittent generators outputting during very high demand periods.

- **Results are driven by a mere three observations:** given the strong autocorrelation that exists for wind farm output, in effect there are only three observations. This is too small a sample set and will not result in robust outcomes.

- **Results will always be prone to drastic changes:** a single high demand day, or heatwave, could lead to drastic revisions to the capacity values of plant. Such a heat wave could occur tomorrow, with entirely different outcomes for all wind farms.

Conclusion: Delta method is not fit-for-purpose

ENDGAME
ECONOMICS

Expert in the design, development
and application of mathematical models.

www.endgame-economics.com

T: +61 2 8218 2174
M: +61 425 204 793

Upper Ground, 55 Brisbane Street,
Surry Hills NSW 2010

Oliver.Nunn@endgame-economics.com