

BRIAN PETERS, PRODUCT MANAGER – ENERGY AND MODELLING
100% RENEWABLES WORKSHOP – WELLINGTON, APRIL 2015

Forecasting – How Accurate in 2025/30?

Outline

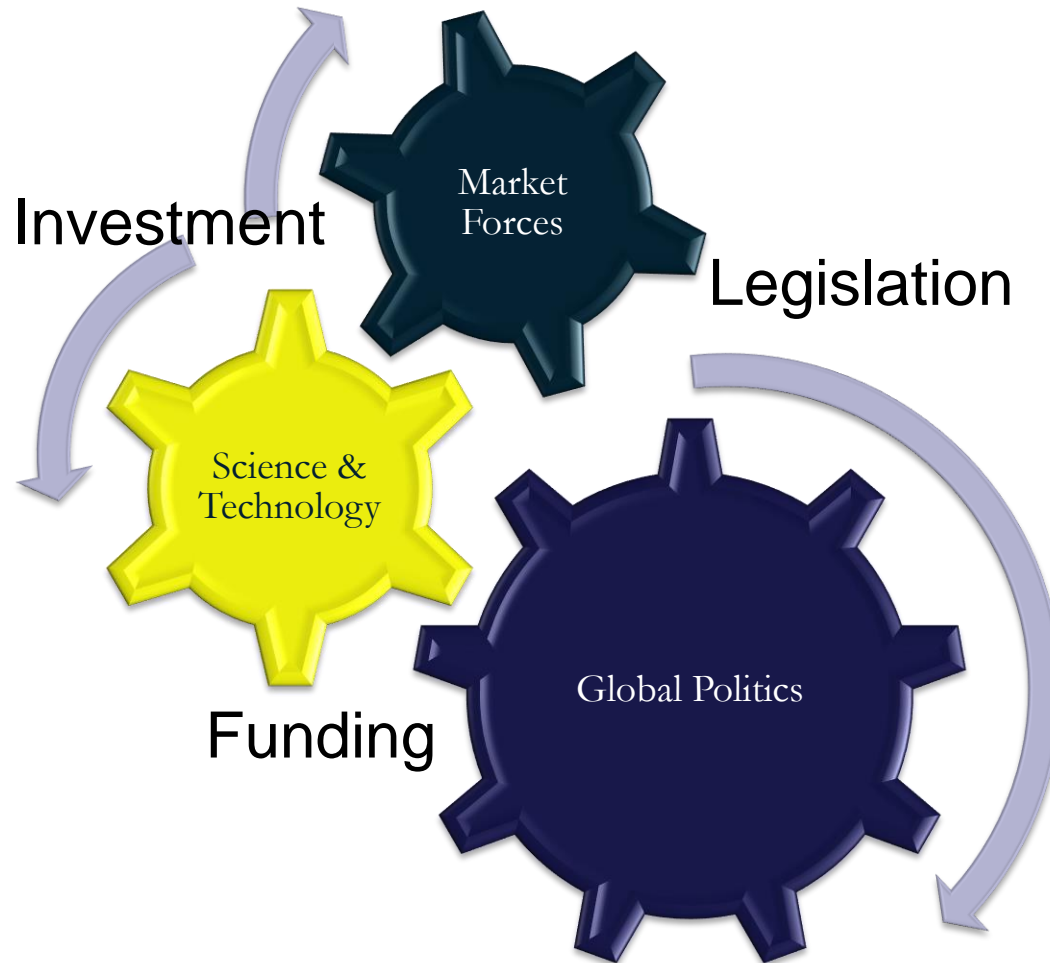
- Drivers of Accuracy Improvement
- What has happened from 2000 to 2015?
- Projecting forward to 2030 – Forecast of the Forecast

Diagnosis before Prognosis

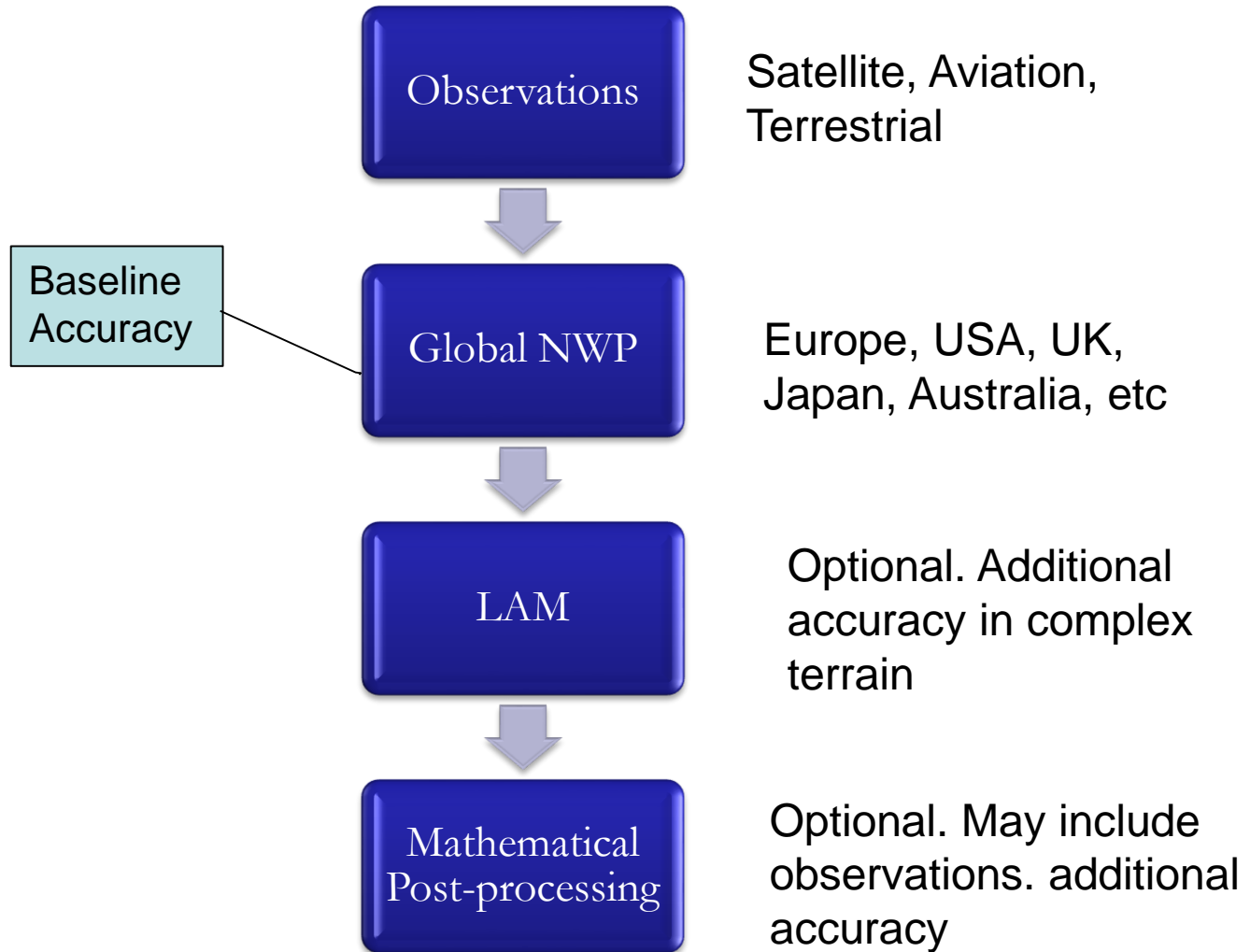
You must understand what is happening now before you can predict how things will develop.

The Past 15 Years

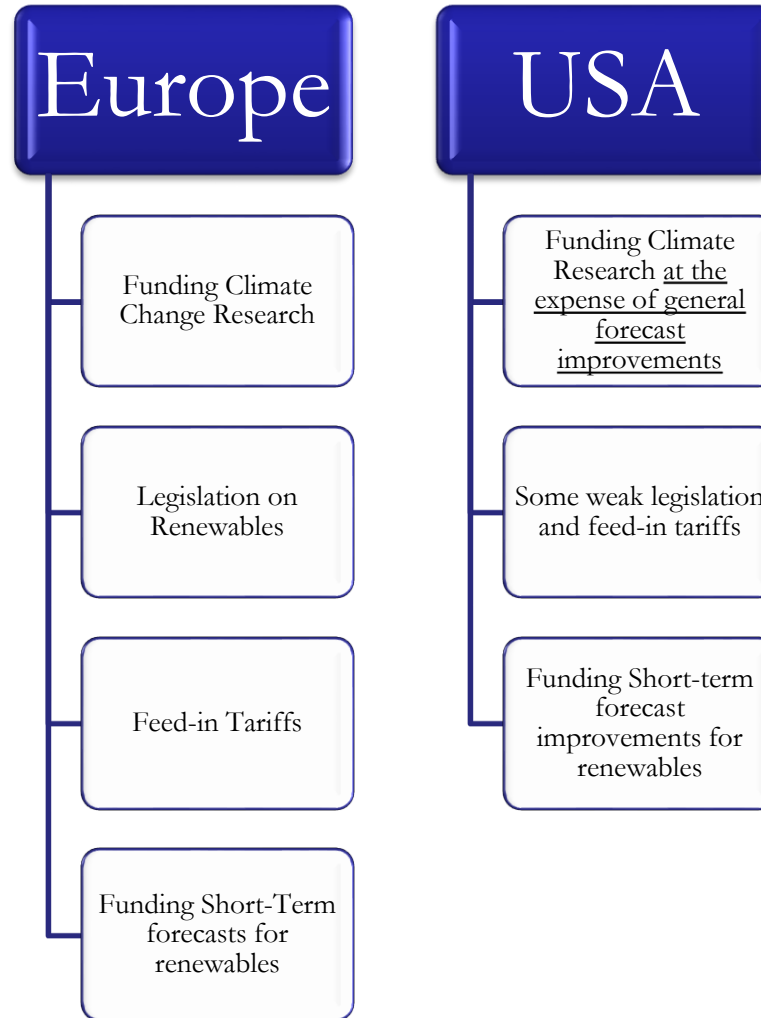
Big Picture Drivers of Forecast Accuracy



How the forecasts are created



Global Politics – Climate Change



Policy Impacts on Forecast Accuracy



USA Satellite programme delayed

Disruptive Events – Hurricane Sandy



European model forecast correct track 4 days before American model.

America was embarrassed

Funding for forecasting improvements reinstated.

USA currently playing catch-up

Market Forces – Drivers of Accuracy



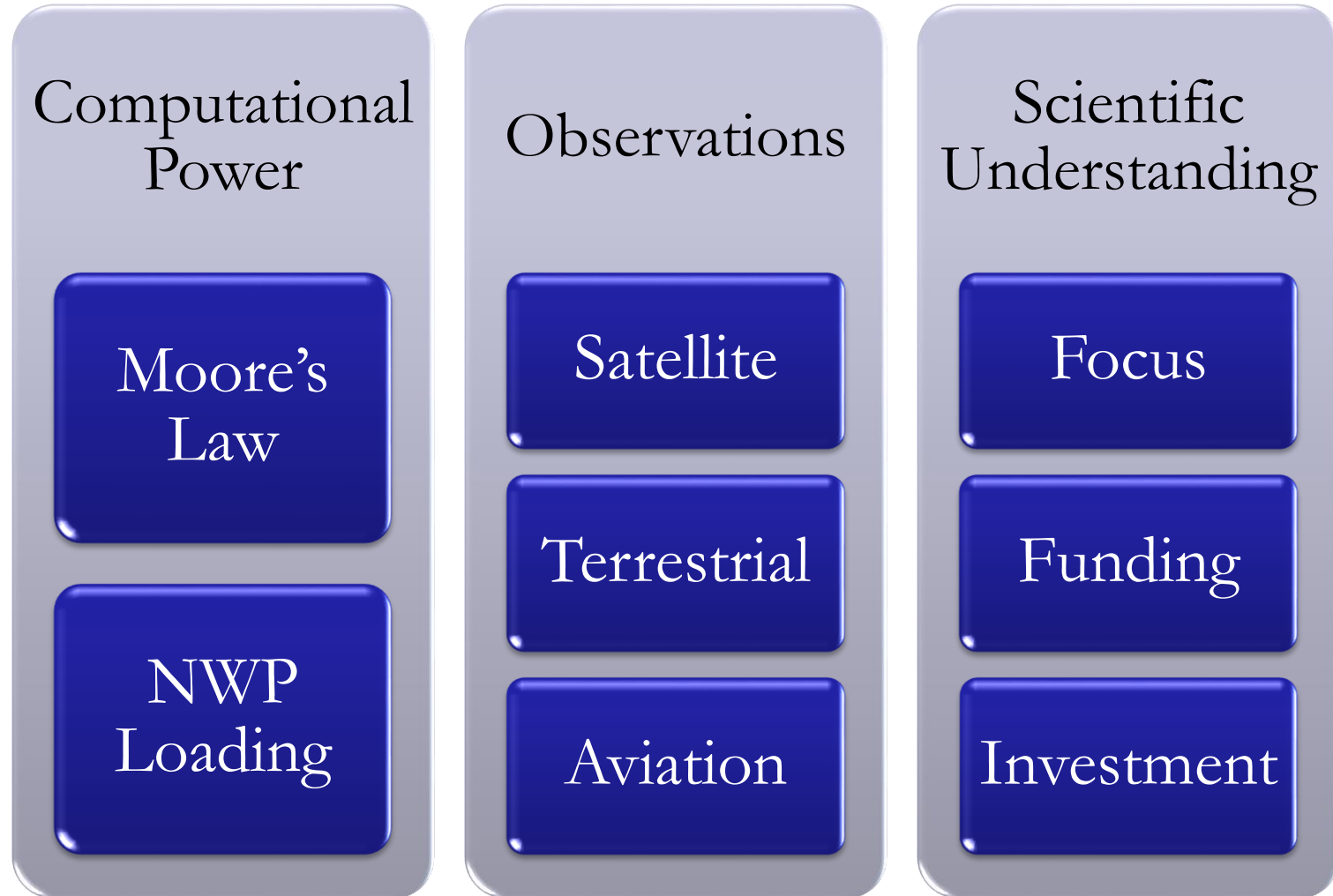
Market Forces

Over the past 15 years this has been centred on wind power.

Solar PV industry is roughly where wind power was 10-15 years ago

Predominantly for 0 to 3 Day forecast horizon

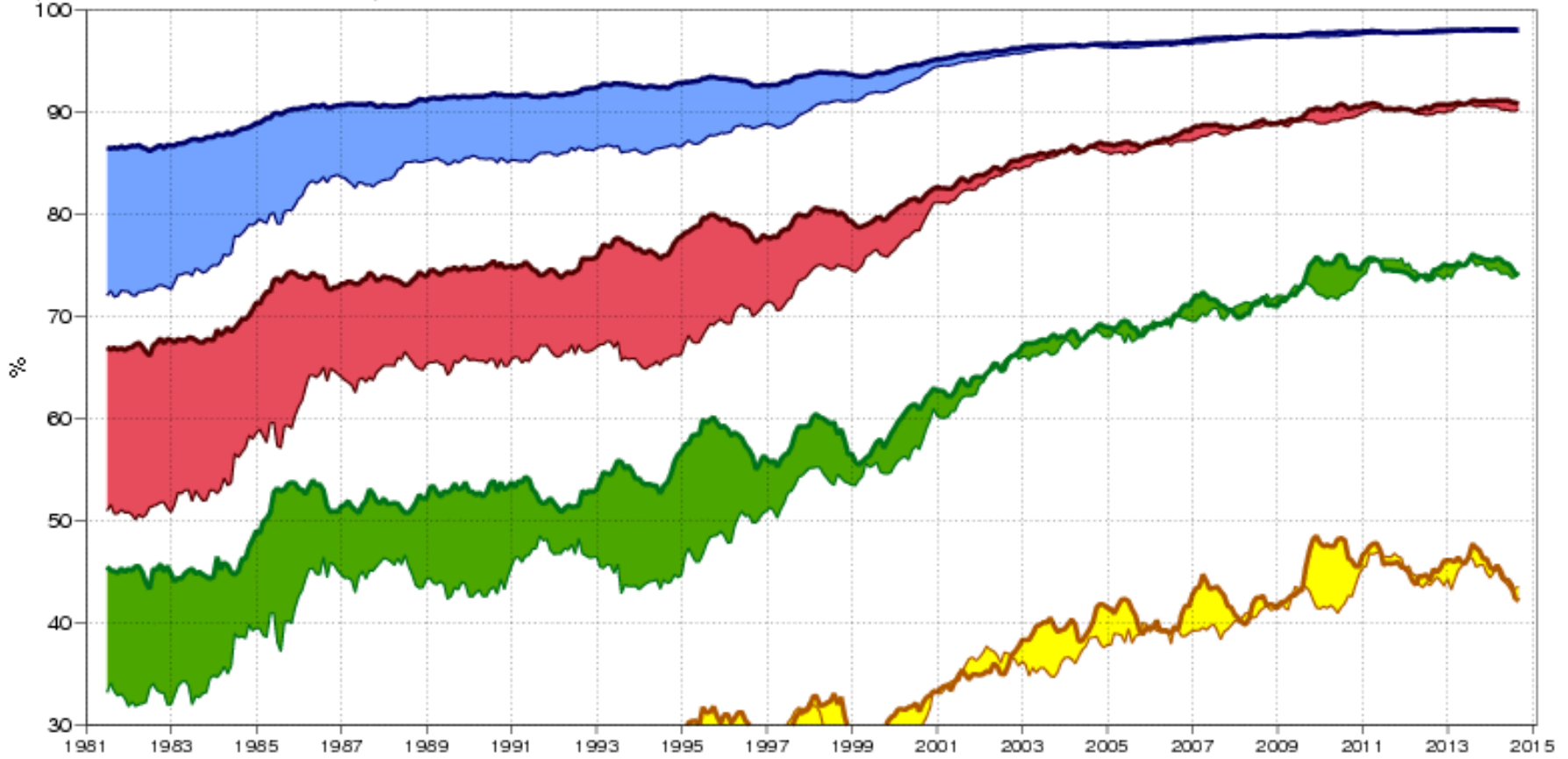
Science and Technology – Drivers of Accuracy



Mid-Atmosphere Accuracy

500hPa geopotential height
Anomaly correlation
12-month running mean
(centered on the middle of the window)

- Day 7 NHem
- Day 7 SHem
- Day 10 NHem
- Day 10 SHem
- Day 3 NHem
- Day 3 SHem
- Day 5 NHem
- Day 5 SHem



The Future

Political Drivers Over Next Decade (or so)

Climate Change

Renewables
(Wind,
Solar,
Hydro)

Seasonal
and sub-
seasonal

Science and Technology – Drivers of Accuracy

Computational Power

Moore's Law

NWP Loading

Cloud Computing

Big Data

Observations

Satellite
Himawari 8, etc

Terrestrial
Internet of
Things

Aviation

Scientific Understanding

Focus 1-9
months horizon

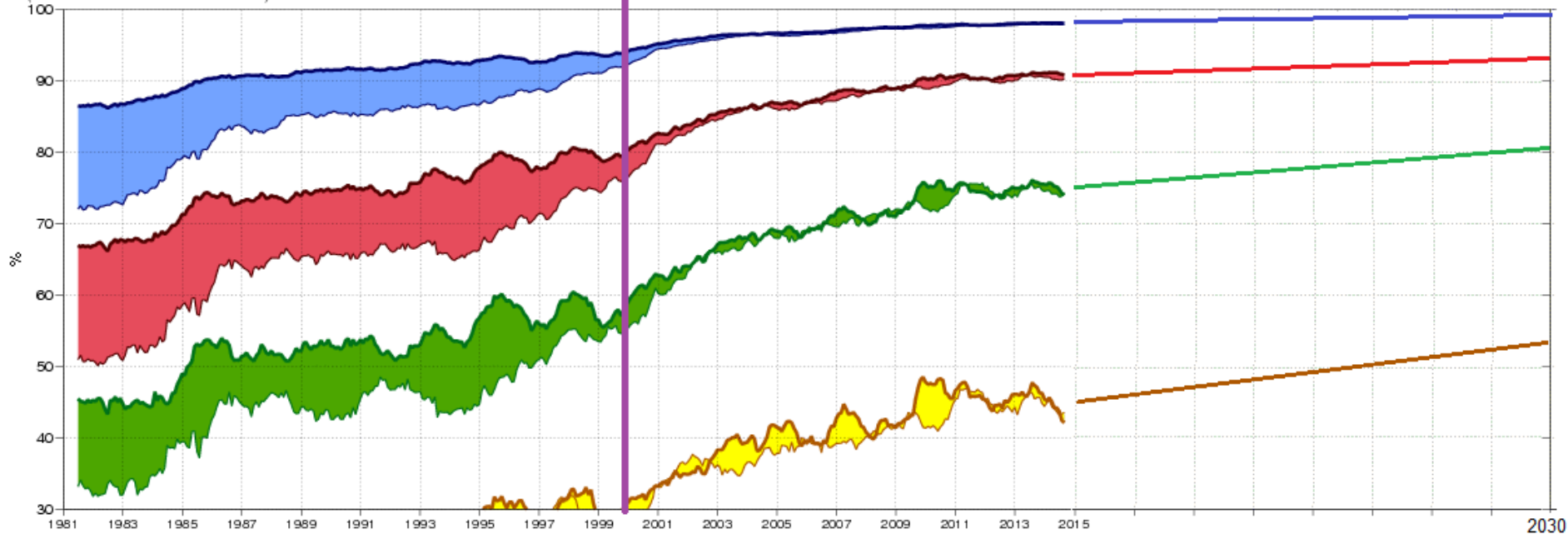
Funding
Climate Change

Investment
Solar PV

Projecting Forward

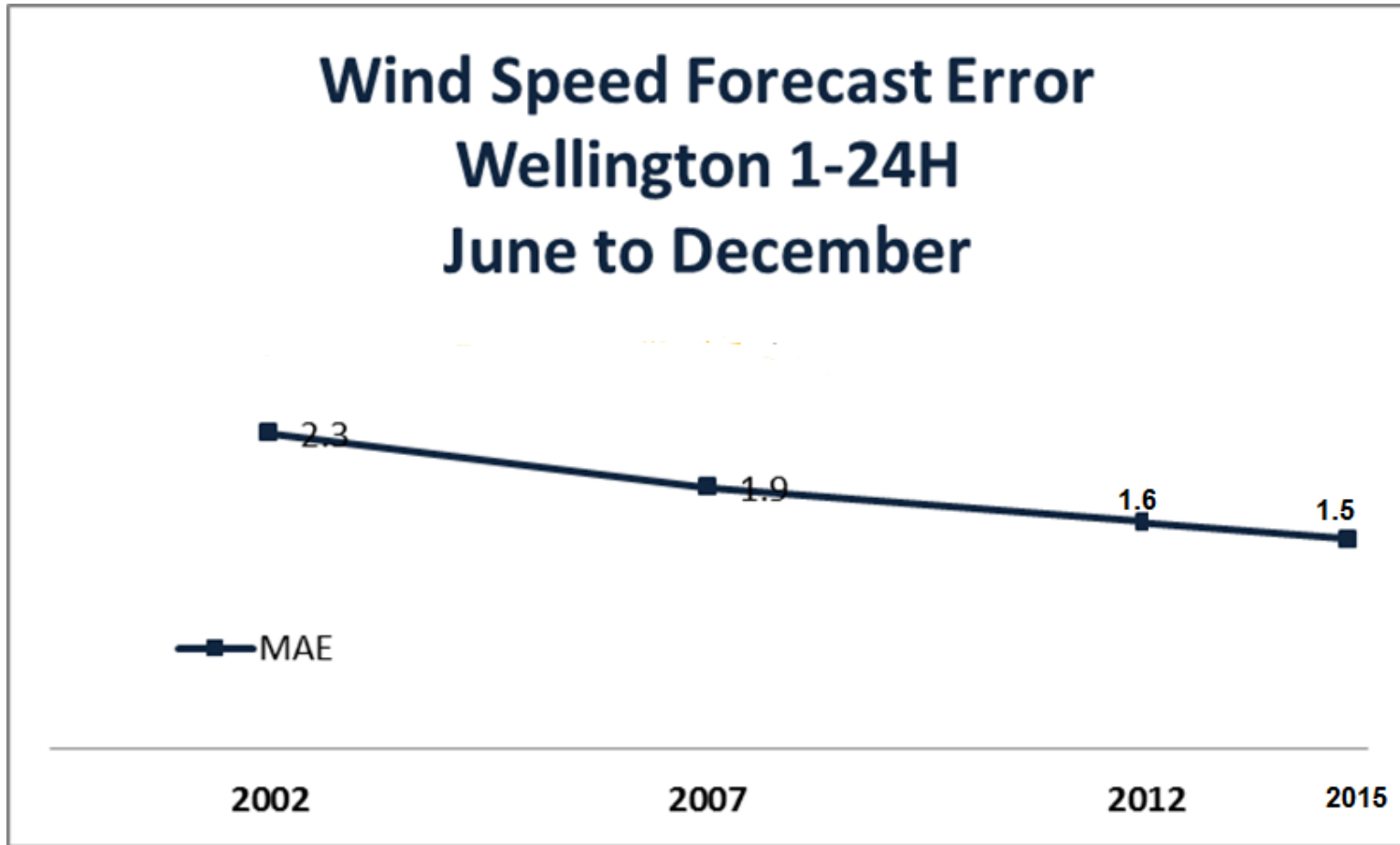
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Accuracy of 7 Day to 9 Month forecasts will increase fastest

Accuracy Improvements For Wind



~35% Error reduction since 2000 => ~1.0 m/s MAE by 2030*

* Assumes BAU with minimal NZ investment

Solar Forecast accuracy

The sun itself is relatively predictable. Individual Clouds...a little more difficult. Atmospheric aerosol content, contrails ... hmmmm.

Does not have long established global observation network and 100 years of forecasting experience & research to build on.

New techniques and approaches will be developed (rapidly I expect).

New technology will assist (e.g. Himawari 8, batteries, etc).

The key will be:

- Appropriate observation data
- not forecasting the sunshine directly - aggregated power output

Thank you....Questions?