Wind Resource Prediction in a Changing Climate

Johnathan Scofield
Senior Business Development Manager
120,000 Megawatts (MW) Assessed

- Assessed resource and energy for over half of all India wind projects in 2014.

- Consulted to half of all North American wind projects that came online in 2014, and 8 of the top 10 projects ranked by size.

43 GW

- We provide renewable energy forecasting services to over 43 gigawatts (GW) of capacity.

- Consulted to about a third of all Brazil wind projects that came online in 2014, and half of the top 5 projects ranked by size.

30+ Years of Experience

- 80+ Number of Countries Where We Worked

- 85% of our staff is comprised of engineers, meteorologists and environmental specialists.
Wind Speed Anomaly Map
First Quarter 2015

Anomaly maps derived from a custom combination of the CFSR, ERA-Interim, and MERRA reanalysis datasets. The anomalies are calculated as a percent deviation from the 1988 – 2014 mean speed at 100m above ground level for the calendar quarter.
Wind Resource Prediction in a Changing Climate

Wind Speed Anomaly Map
Second Quarter 2015
How does considering climate change impact wind resource prediction

- Current Independent Engineering assessment methods acknowledge climate change risk, but uncertainty has yet to impact project bankability
- Typical project finance engagement is 10 years (0.5% uncertainty)
- Higher risk when predicting out 20 – 25 years (up to 2% uncertainty)
Will climate change impact wind resource prediction in the future

• The application of a higher risk factor for climate change will only come after scientific determination of such risk

• It is possible that rising global temperatures will result in a decline in wind speeds in the mid-latitudes due to decreasing temperature gradients (equator / pole gradient)

• Long-term wind speeds typically not prone to prediction risk as “extreme events” have small to no impact on long-term averages

• Interannual variability (currently characterized by 4% uncertainty) may play a more pronounced role for project bankability if variation becomes more extreme

• While the current private capital market tolerates both interannual variability and the long-term uncertainty of climate change when entering ten year engagements, if either risk increases then alternative funding mechanisms may be required
Additional Questions:

• Contact AWS Truepower:
  Johnathan Scofield
  jscofield@awstruepower.com

• Consult: “Wind Resource Assessment: A Practical Guide to Developing a Wind Project”