

Adapting reanalysis data to develop monthly budgetary wind speeds for comparison with nacelle anemometry
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The Common Question

Was my wind resource above or below the long-term expectation last month?

The Issue

- Budgetary wind speeds are often extracted from pre-construction energy yield analyses.
- Cannot compare nacelle anemometry measured wind resource to these wind speeds once site is operational.
- Doing so can give a skewed perception of plant performance.

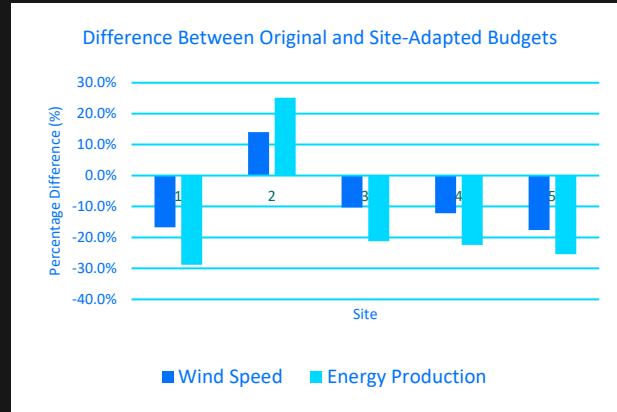
The Solution

Adapt reanalysis data (e.g. ERA-5 or MERRA2) using historical nacelle anemometry wind resource data.

The Complications

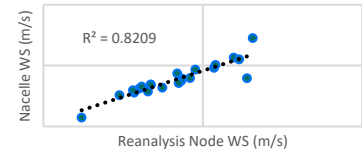
- Filtering historic nacelle anemometry data.
- Nacelle transfer function changes.
- Static rotor correction.
- Directional (i.e. changing wake) effects.

You could be attributing significant **underperformance to low wind resource** when, in fact, money is being left on the table!

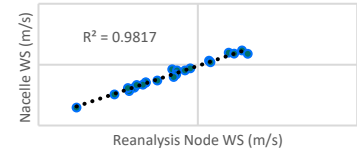


Reanalysis data can be adapted to develop budgetary wind speeds for ongoing comparison with nacelle anemometry measured wind resource.

Example Results



Before Filtering



After Filtering

Difference Between Original and Revised Wind Speed Budgets

Site	Monthly Range	Annual
1	-14.7% to -18.4%	-16.7%
2	12.6% to 16.4%	14.0%
3	-5.8% to -15.0%	-10.3%
4	-4.2% to -16.8%	-12.2%
5	10.8% to -30.0%	-17.6%

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Wind and Solar PV Operational Analysis