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Calculating site specific power curve loss estimates

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Overview

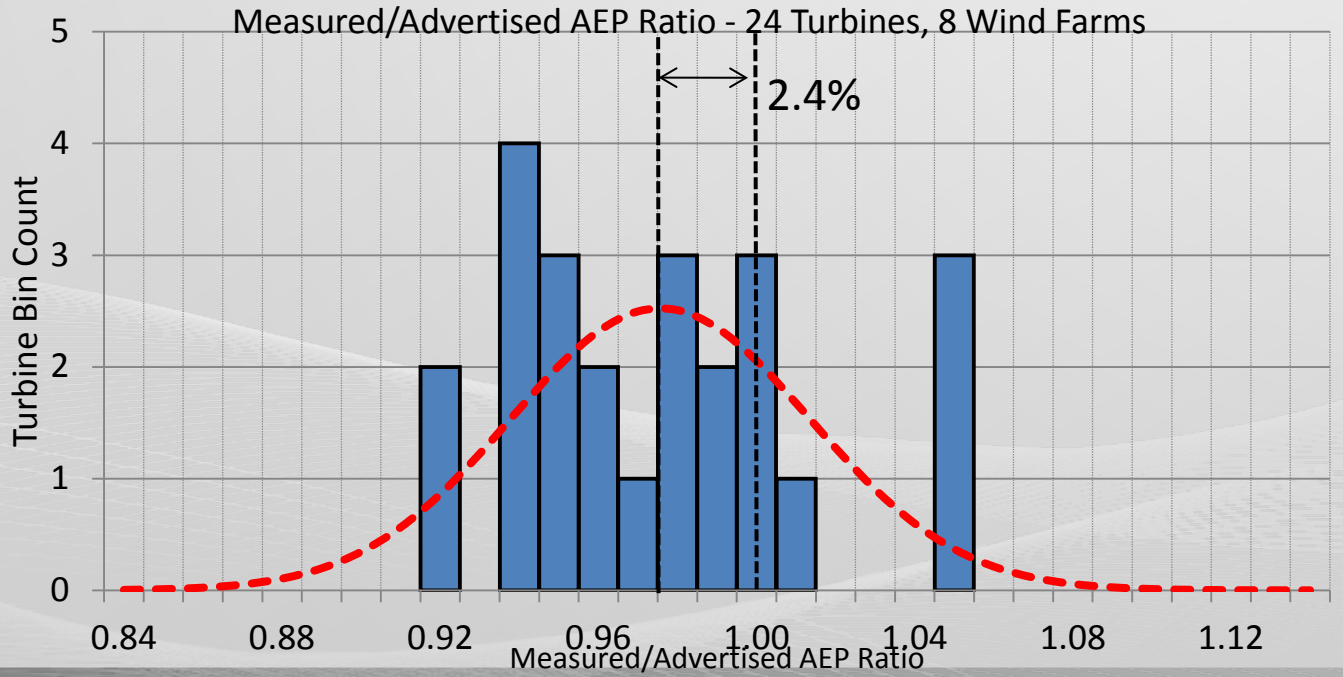
- The problem
- Standard treatment
- Current site specific treatment
- Immediate improvements
- Longer-term improvements

The Problem

- Observed turbine performance is often lower than expected at the site

Standard Treatment

- AWS Truepower applies a 2.4% power curve loss



Current Site Specific Treatment

- Measured power curves supplied by turbine manufacturer
- Select curves that represent shear and TI conditions at site

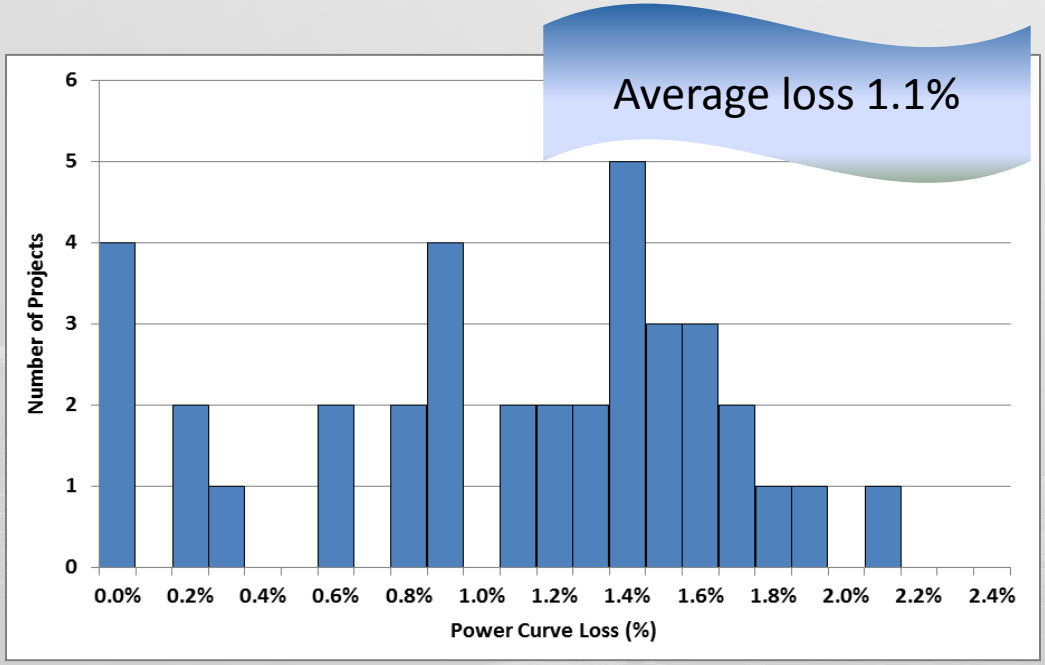
	TI	Shear
Low		
	0.10	0.15
Mid		
	0.15	0.25
High		

Current Site Specific Treatment

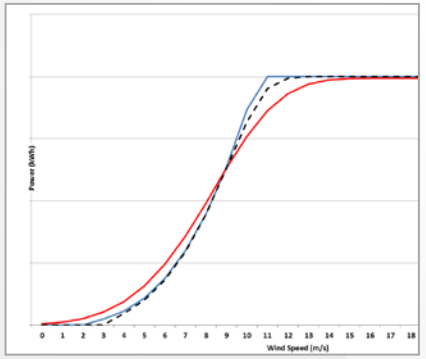
- Calculate AEP using site wind speed frequency distribution and both advertised and measured power curves
- Site-specific loss is determined from % AEP differential
- If data not available for turbine model or site conditions, use average of site-specific calculated loss and default power curve loss (2.4%)

Current Site Specific Treatment

- **To date, 37 projects have qualified for a site specific power curve loss adjustment, with an average loss applied of 1.1%.**

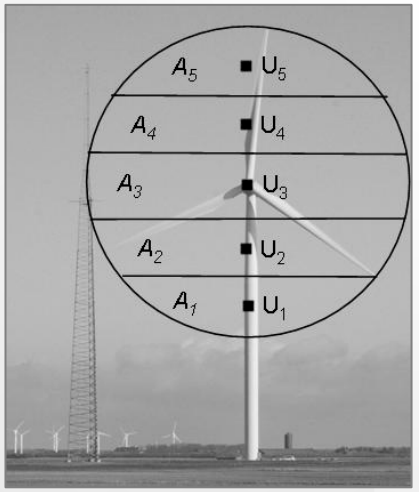


Immediate Improvements



- Use turbulence normalization to adjust measured curves to site conditions
- PCWG has shown general value of TN
- Additional validation underway by AWS to ensure broad applicability to range of sites

Longer-Term Improvements



- Rotor Equivalent Wind Speed
- Not classified as a loss by AWS since it affects energy BEFORE the turbine
- Implementation would require full year of data across the rotor disk

Summary and Conclusions

- AWS is incorporating data received and latest methods to give site-specific power curve loss estimates

- Turbulence normalization and rotor equivalent wind speed will allow more granular tailoring of site-specific estimates – but losses will likely remain near current levels

Thank you

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