



Defining Resilience, Risks, and Readiness of Offshore Wind

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INTRO

There is not a large understanding of how an offshore wind farm will perform in an extreme condition such as a hurricane, cold spell, or heat spell compared to a non-renewable energy resource.

METHODS

A literature review was conducted to understand the concerns of what could affect a wind turbine in extreme conditions first. Starting with the Atlantic Shores area, an estimation was made for the output of a single turbine in a hurricane, a 10-day cold spell, and a 10-day heat spell. First data was collected from the NREL database at the same hub height of the V236 turbine used for the Atlantic Shores site. An estimation was made for the output solely based on the wind. This estimation was then adapted to reflect the output with the effect of temperature.

RESULTS

Preliminary results indicate that temperature affects the output performance of a turbine, however, with the current model the temperature has only derated the turbine to act at 77% of full capacity. There are also intervals in which the turbine is estimated not to operate because it is too cold.

DISCUSSION

Future work looks to evolve the estimation of the output model to incorporate the effect of conditions such as humidity and turbulence,

AUTHOR AFFILIATIONS

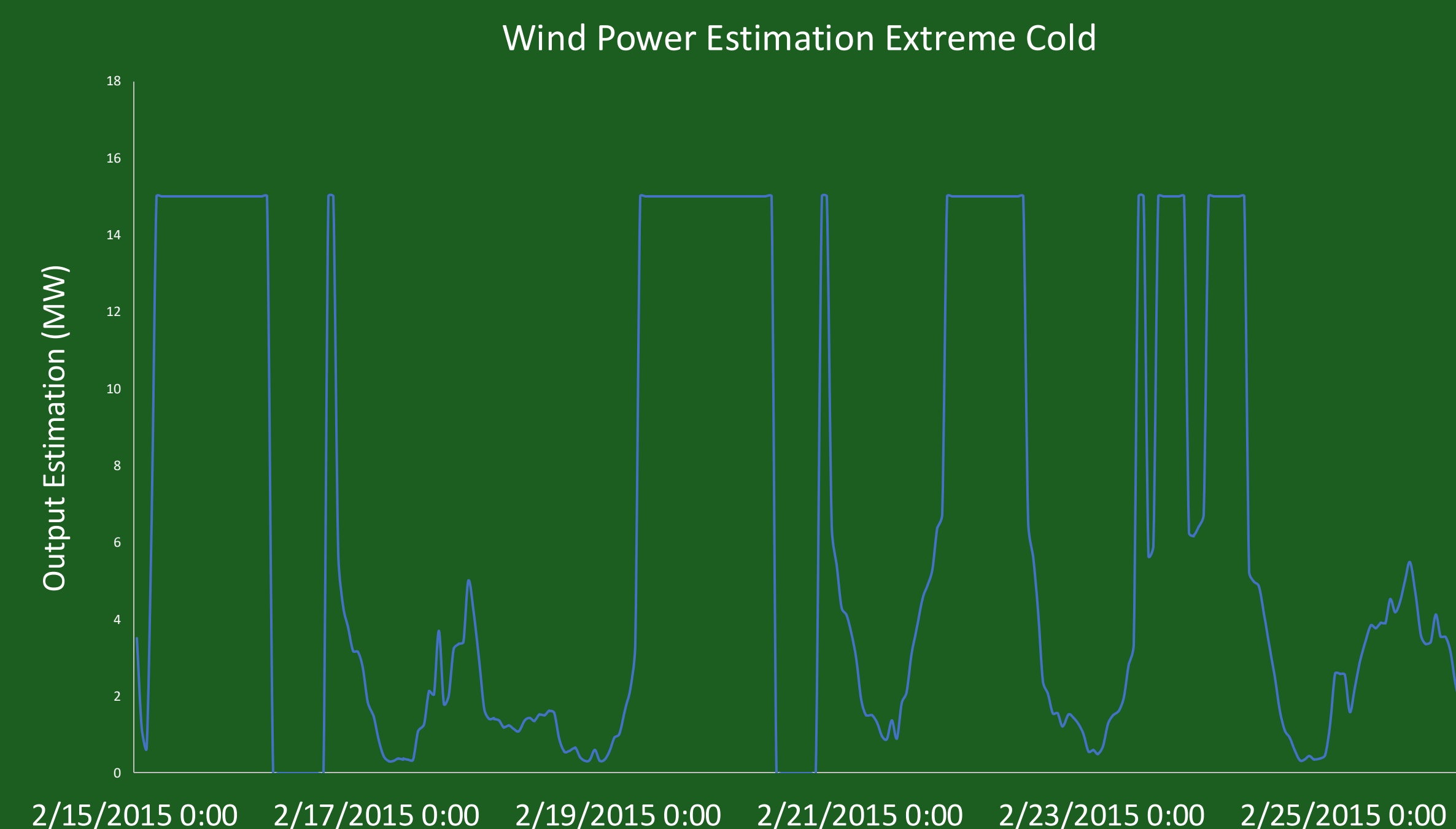
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Key Findings

A V236 turbine will not operate in a hurricane and will not survive in a category 3 hurricane.

A V236 turbine will operate in the hot temperature de-rating interval during the summer months.

A V236 turbine will have small intervals in extreme cold where it will need to shut off due to being below operating temperature.



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