



Case study

onshore wind

performance optimization

curtailment



# How Windunie Recovered 126 MWh for Swifterwint Op Land with Canopy

## Challenge: Unseen Losses

Wind farm operators like Windunie face a critical challenge: subtle performance issues that go undetected by traditional monitoring systems. After scheduled maintenance, two of their Vestas V162 turbines began consistently under-performing at mid-wind speeds. The issue, which was effectively invisible to other systems, led to continuous production losses and left the customer's team in the dark.

## Solution: Clarity in the Data Jungle

Jungle's platform, **Canopy**, provided the solution. With no additional hardware required, Canopy uses its machine learning models to learn the "normal" behavior of each turbine. By continuously comparing real-time data against this learned baseline, Canopy's curtailment detector quickly flagged the abnormal pitch behavior as a high-severity issue in the home view. This allowed the customer to inform their unaware O&M who could then resolve the problem.

## Customer feedback

"Thanks to Canopy, we can now proactively identify potential issues ahead of our daily operation management tools, preventing downtime that would have otherwise grown increasingly under the surface. Both Jungle's monitoring and technical team support are dedicated for consistently maximizing our wind farm's output."

**Jesper van Vliet**  
Technical Asset Manager  
Windunie

## Highlights

Area	Renewables
Sector	Onshore wind energy
Location	Netherlands
Turbine capacity	5.6 MW
Farm Capacity	207 MW
Root cause	Misconfigured pitch control
Value Recovered	At least 126 MWh



## Canopy in action

Canopy's curtailment detectors & advanced analytics tools



Figure 1 - Curtailment detectors firing with high severity and informing about relevant anomalies



Figure 2 - Normality charts for the grid active powers and the average blades pitch, showing clear deviation from the expected and healthy behaviors

Canopy's Performance Curves module was crucial to identify the root cause of the issue.

By plotting and comparing the pitch curves of the affected assets with the one of a neighboring turbines, there is a net difference of behavior at mid wind speeds. The same difference appears when comparing the pitch curves of the same asset before and after the day when the issue started.

This analysis revealed that the under-performances were consequence of a faulty pitch control logic.

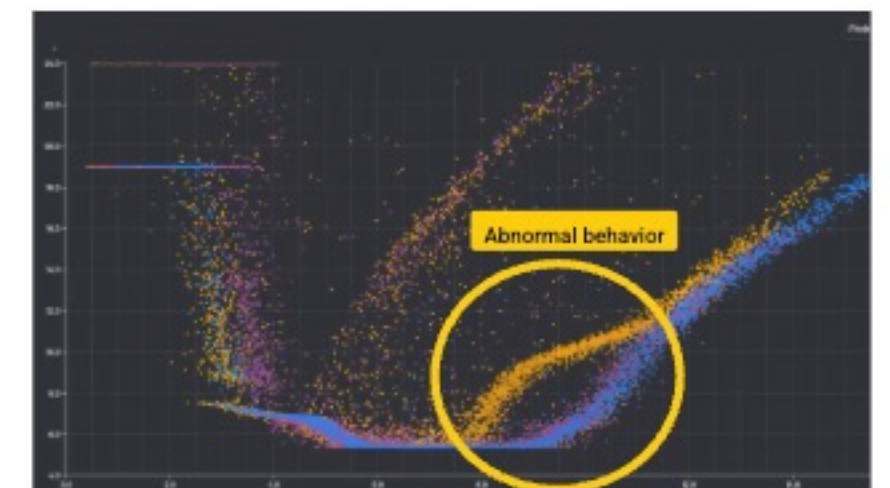


Figure 3 - Different pitch curves in Canopy's Performance Curves. The under-performing asset in yellow, in purple a neighbor turbine and in blue the same under-performing asset but in a period of time prior the issue started.