PO.213

Results of a wind farm wide control strategy and a wake steering test on a commercial wind farm

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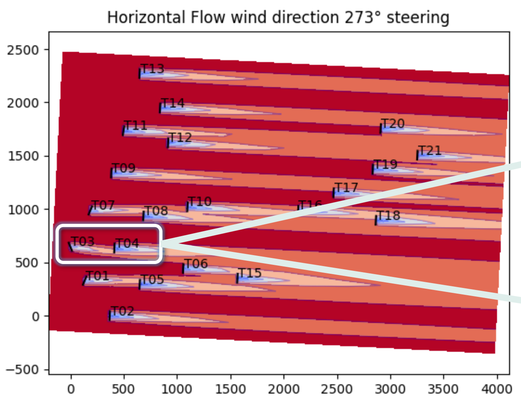
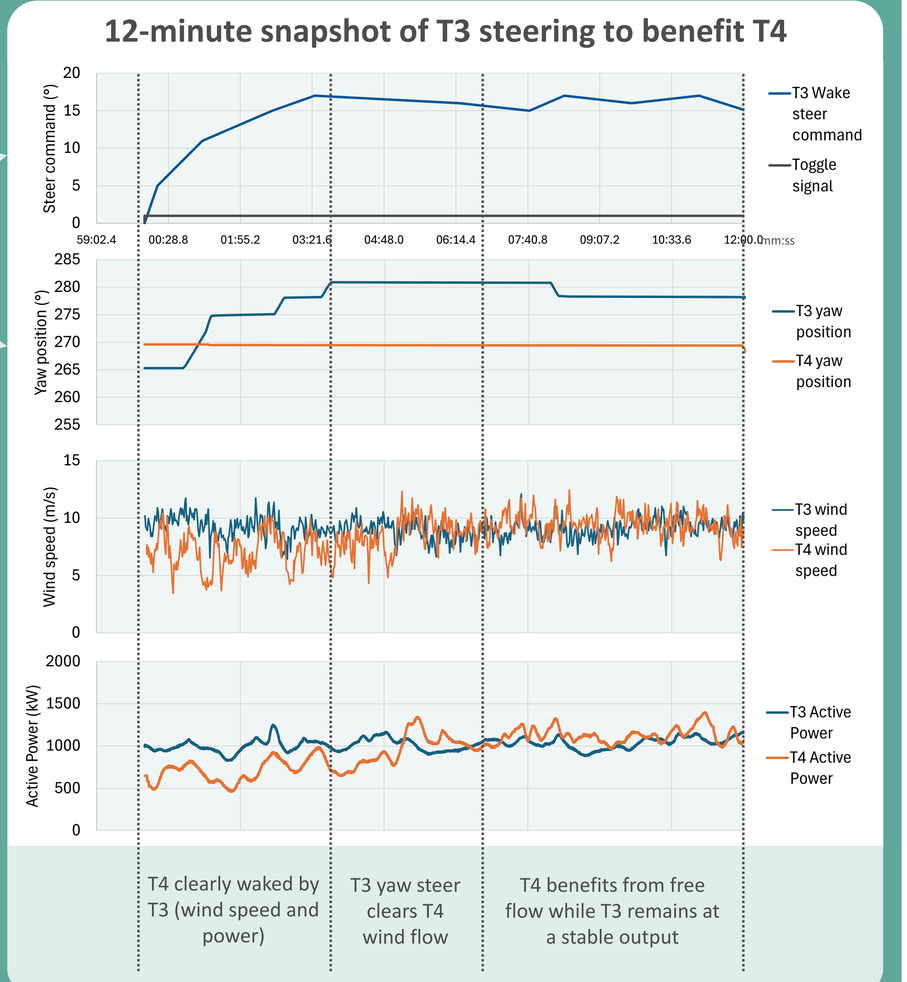
RES

From FLORIS modelling to site measurements





- RES has performed a full wake steering trial on a commercial wind farm
- Wake steering has been successfully deployed and demonstrated at scale
- Uplift values up to 2.5% have been measured on some turbine pairs
- Ongoing research and testing is required to validate collective control
- Join us at the WindEurope Workshop in June 2026 for the next phase of results

Why active wind farm control?

Wind farm wide control strategies like wake steering or consensus control have been discussed at length within the wind industry but very few information has been made public about trials and deployments on commercial wind farms.

The RES approach

RES deployed its Dynamic Yaw product on a 21-turbine site targeting a 1% AEP uplift

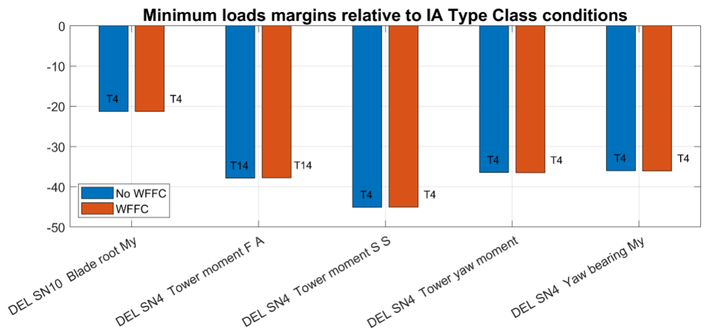
RES Dynamic Yaw

Yaw Misalignment Correction	Collective Control	Wake Steering
Small toggle-based yaw offsets	Reduce anemometer risk and increase AEP	Reduce loading and wake losses

More info on Dynamic Yaw and other RES Digital products here:

Managing loading risks

A detailed DFMEA was performed, which included aeroelastic simulations to define the maximum wake steering envelope and confirming minimal impact of the defined wake steer strategy on the wind farm loading:



When and where

Toggle On | Toggle Off | Toggle On | Toggle Off

100 min | 100 min

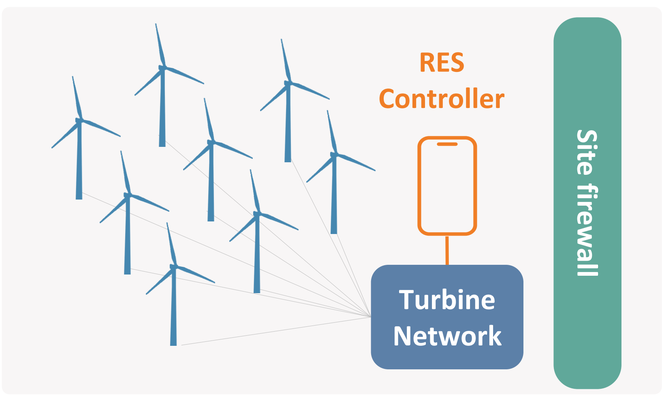
The test campaign started in late 2025 with the site favouring westerly winds for steering pairs.

A 50-minute toggle on / off schedule was deployed utilising the RES controller.

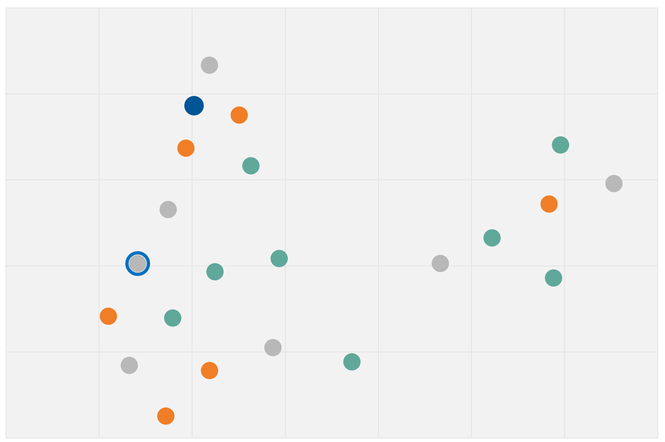
Safe and scalable technology without 3rd party or individual turbine hardware

All turbine commands were managed by a single RES developed controller sitting on the wind farm network, thus avoiding the need to equip every single turbine.

The controller leveraged **RES AnemoLive** technology to safely control all the toggle, wake steering and consensus control commands to all the turbines:

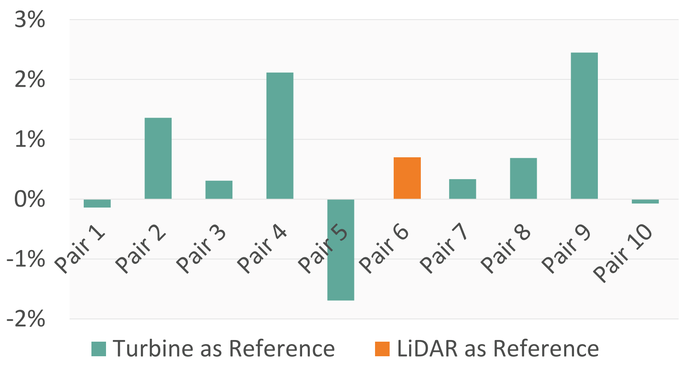


Site layout



Preliminary uplift of 0.6%

Turbine pair performance is validated with **RES WindUp methodology** using reference turbines and ground LiDAR:



References:

- res-group.com/digital
- https://github.com/resgroup/wind-up
- Hill of Towie wind farm open dataset

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Meet us at 9-E80

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