Aerodynamic assessment of

Weather Guard has commissioned independent wind energy consultants, Power Curve to conduct an aerodynamic impact assessment of StrikeTape.

StrikeTape is installed at the tip of wind turbine blade. Any change to the moulded shape of the blade surface (e.g. add-ons, dirt, leading edge erosion) can result in aerodynamic performance changes.

Due to the very low thickness of StrikeTape (<1mm), it will not significantly impact the boundary layer behaviour; however, depending on the exact installation position, it may trigger a premature transition of the boundary layer from laminar to turbulent flow.

To assess the potential impact of this transition, an industry-standard blade element momentum (BEM) model was constructed of the blades used on the GE1.6-100 wind turbine, and a baseline AEP calculated. A CFD simulation was then carried out of the aerofoil used at the tip of the blade in two conditions: perfectly clean, and with premature transition resulting from StrikeTape.

The CFD data was used to modify the BEM model to account for StrikeTape being installed on the outer 1m of the blade (this is conservative, StrikeTape typically covers <0.5m of blade span). The AEP was re-calculated with the modified aerodynamic data, and the potential loss was found to be only 0.05%. For reference, leading edge erosion on the outer 1m of blade span would result in an AEP loss of at least 0.1-0.2%.

In conclusion, StrikeTape has no significant impact on AEP and would be less than typical contamination or erosion impacts.