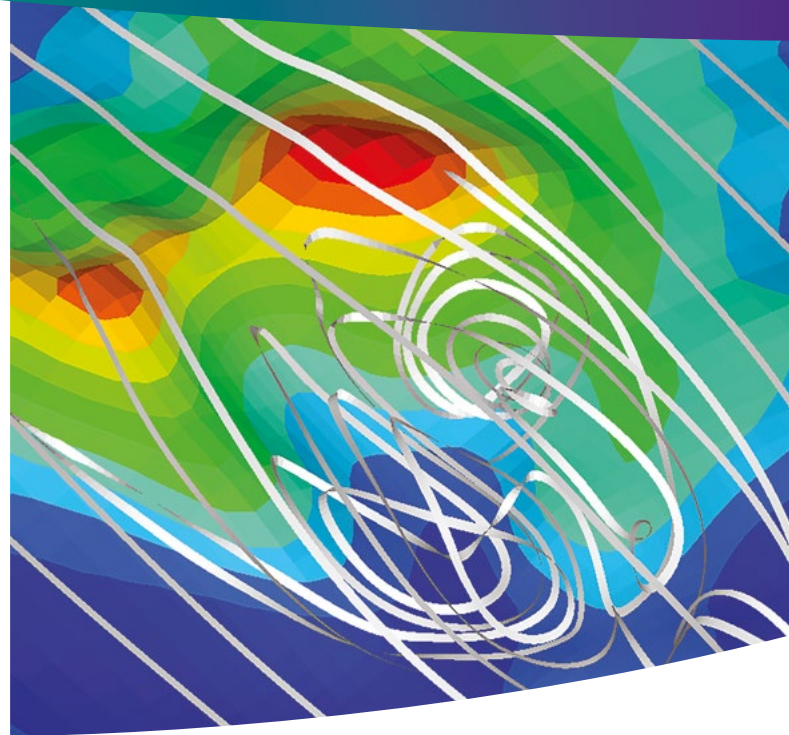


## WE CAN LOWER UNCERTAINTY ON YOUR ENERGY YIELD PREDICTIONS BY COMBINING THE BEST TECHNICAL TOOLS WITH THE RIGHT EXPERIENCE AND EXPERTISE



**Natural Power has high quality computational fluid dynamics (CFD) models designed to produce optimal wind flow modelling results at affordable prices.**

Our analysts use the VENTOS\* suite of scientifically-validated CFD codes, specifically designed to improve certainty of wind flow modelling. These outputs lead to improved certainty on energy yield predictions and feed into holistic operational performance analyses.

### MAIN FEATURES

- Our cutting-edge coupled CFD model tackles thermally-driven flows and outputs time series of wind flow variables
- 2D maps of wind flow features for turbine optimisation
- Wind resource grids, turbulence intensity, inflow angles and wind shear
- Up to 40% more reliable results when compared with standard industry models in complex terrain
- Turbine suitability modelling

### OUR CFD SERVICES INCLUDE:

- Site wind speed mapping and suitability assessments
- Resource assessment
- Wind farm layout design
- Turbine suitability verification
- Operational energy yields
- Investigation of impact of neighbouring wind farms on energy yield and turbine design life
- Energy reconciliation and budget re-forecasting
- Forensic operational asset analysis
- Operational optimisation



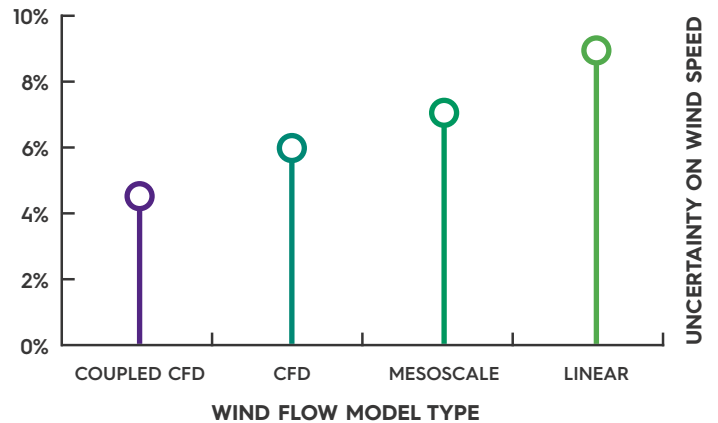
**// our clients demand an accurate picture of the likely energy output of wind farms so they can make informed decisions. The more accurate that energy calculation is, the more easily wind power can be integrated into the overall energy mix //**

CLAUDE ABIVEN SENIOR CFD ENGINEER

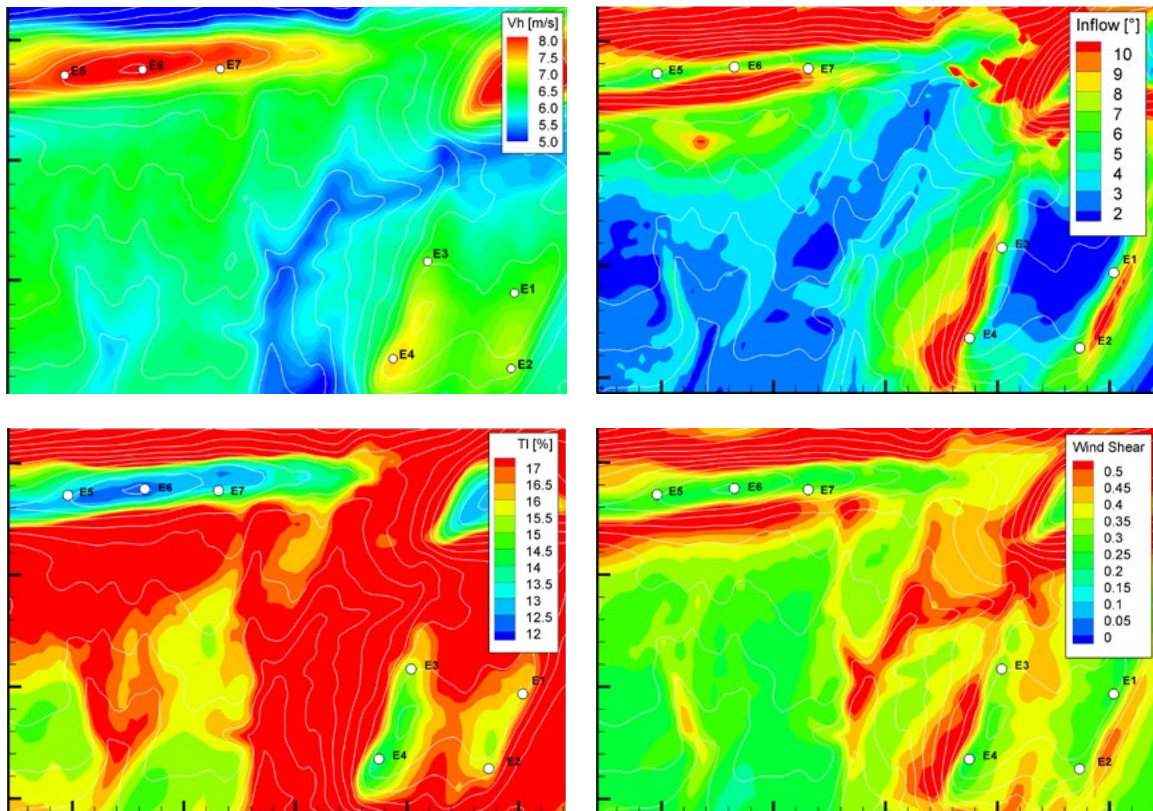
## PRACTICAL ADDED VALUE

- Increased certainty of energy yield predictions at development stage allows informed decision making
- Enhanced calculation certainty improves project value
- Detailed wind flow understanding explaining reasons for turbine under-performance
- Our computer cluster allows us to run our most advanced wind flow models and deliver analysis in commercially advantageous time-frames
- Turbulence and shear modelling ensure informed turbine choice and layout design during the development phase and efficient wind farm troubleshooting during operations.

## CFD WAS SHOWN TO REDUCE WIND FLOW UNCERTAINTY



## SAMPLE WIND SPEED, TURBULENCE, INFLOW ANGLE AND WIND SHEAR MAPS





[leanner@naturalpower.com](mailto:leanner@naturalpower.com)

**LEANNE RAMAGE**

HEAD OF PROJECTS