

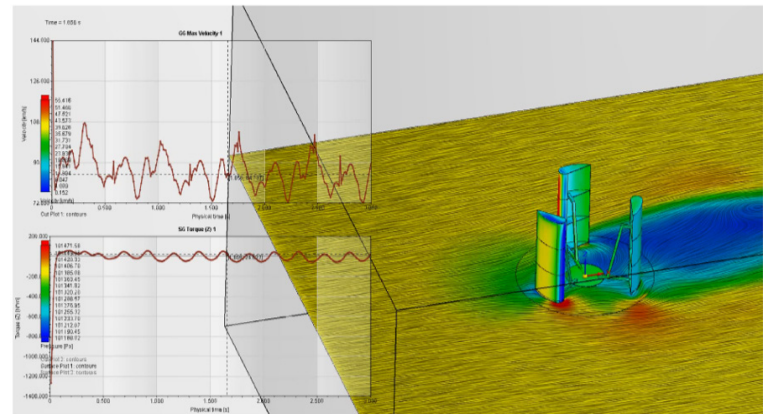
Performance Optimization of Vertical Axis Wind Turbines in the Prairies

The Opportunity

Kelso Energy LTD. manufactures vertical axis wind turbines (VAWT) that meet the electricity demands of cellphone towers, isolated communities, research centres, agricultural farms, cottages, ranches, and many other unique applications. Operational efficiency of the VAWT requires performance optimization, which is difficult to achieve by field-testing and trial & error approaches. Kelso also experiences significant fabrication problems including inconsistent product quality, longer fabrication times, and laborious design modifications due to lack of a standardized design blueprint.

The Approach

Performance optimization of VAWTs is a fluid flow problem, which is usually difficult to replicate using small-scale prototypes in laboratory environments. Kelso collaborated with TACAM on (1) the 3D CAD modeling to create a blueprint, and (2) analyzing various materials-design-fluid flow parameters for performance optimization of the VAWT, using computational fluid dynamics (CFD).



CFD Data and Flow Field

The Outcomes

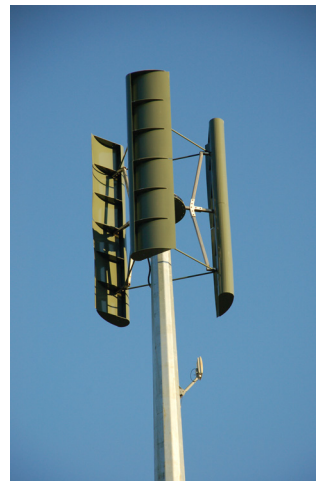
TACAM delivered a complete blueprint of the 5 kW VAWT to Kelso Energy in Fall 2017 and delivered final optimized design developed using results from CFD in January 2018. Kelso Energy is currently fabricating the VAWT based on the designs submitted as part of this project.

The Benefits

- Availability of standardized blueprint for product performance analysis and improvement
- Significant cost savings of product performance improvement

Testimonial

Kelso Energy was very pleased with the professionalism of the Technology Access Centre team. The CFD work and the completed blueprints helped in moving our company forward in performance and promotion of the turbines. Kelso realized a significant increase in the overall power output of the VAWT. This work provided Kelso with a uniform and easy-to-understand set of blueprints used for production and bidding process for components. We realized increased sales and ROI."



Installation of Kelso's Vertical Axis Wind Turbine



Collaborators:

