Experimental evaluation of further power augmentation possibilities of ducted wind turbines

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The focus of my PhD research at TU Delft will be on the aerodynamics of ducted wind turbines, based upon the Donqi® concept and explore possible ways of further power augmentation by using (asymmetric) vortex generators, multi-element aerofoils and their combination in multi-element ducts. I will become responsible for the experiment design, the experimental preparation and the experimental campaign of testing the basic duct configuration, and its follow-ups that will be developed in the course of the Duct4U project.

Aerodynamic research on favourable combinations to enhance the performance of ducted wind turbines will be performed without compromising structural integrity or manufacturing and installation cost-efficiency. The research will be performed in collaboration with an industrial consortium, and hence academic research will be combined effectively with experiments in controlled and real conditions, allowing validation of concepts under real outdoor conditions. In the course of the project, three sets of experimental turbines will be built, used for experiments in the OJF wind tunnel of the Faculty of Aerospace engineering, tested outdoors and subsequently installed in an outdoor infrastructural test environment. It would involve working closely together with the other aerodynamics PhDs in the Wind Energy Research group as well as PhD at the Process and Energy group of the Faculty of Materials, Mechanical, and Maritime Engineering.

 