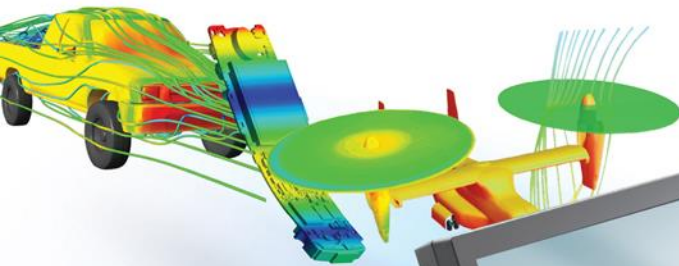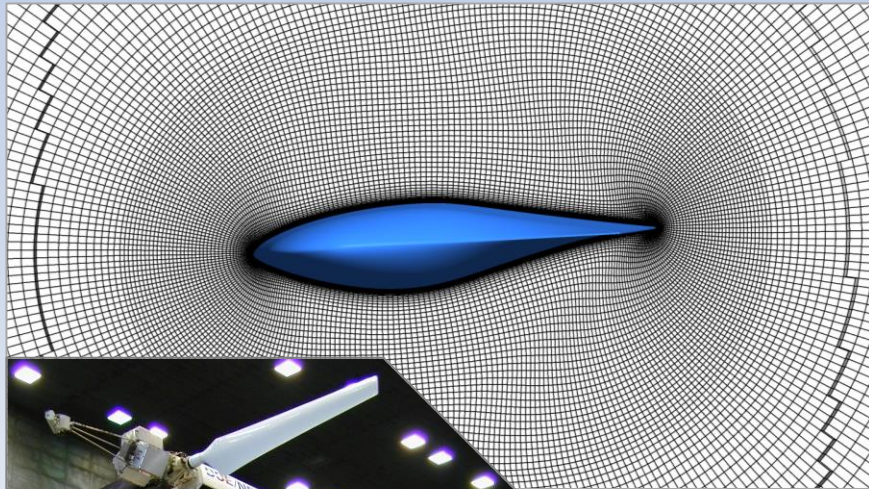# NREL Phase VI Wind turbine modeling using ANSYS CFD
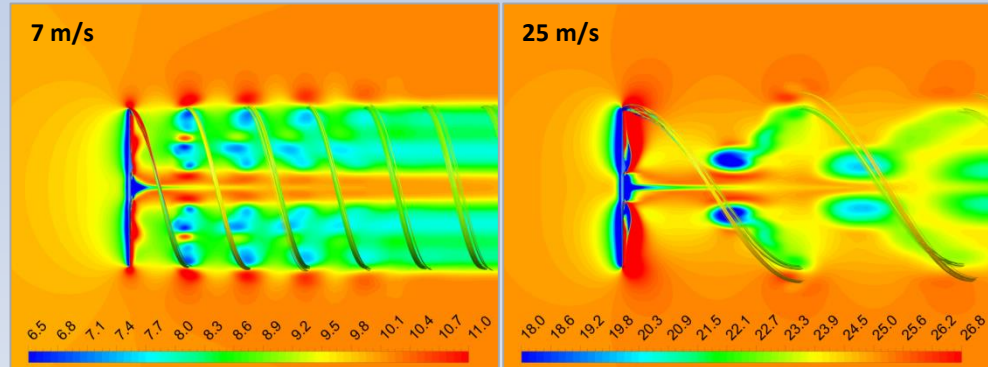
Dr.Ing. Răzvan MAHU
Prof.Dr.Ing. Florin POPESCU
Prof.Dr.Ing. Ion Ion

NREL Phase VI Wind Turbine
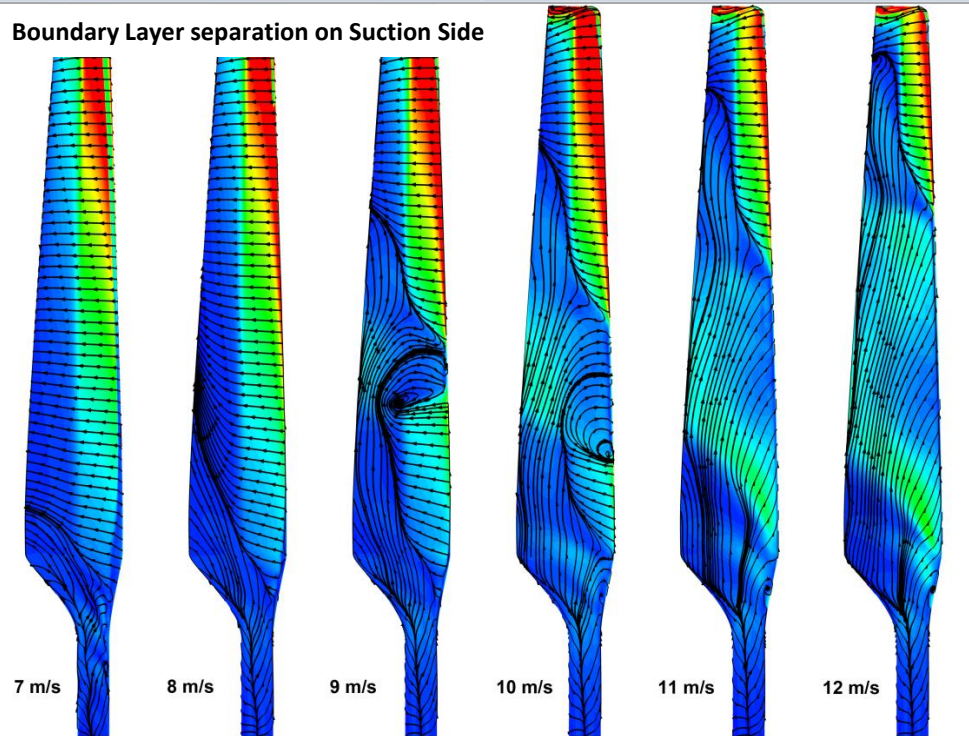

7 m/s

25 m/s

6.5 6.8 7.1 7.4 7.7 8.0 8.3 8.6 8.9 9.2 9.5 9.8 10.1 10.4 10.7 11.0

18.0 18.6 19.2 19.8 20.3 20.9 21.5 22.1 22.7 23.3 23.9 24.5 25.0 25.6 26.2 26.8

Boundary Layer separation on Suction Side

Rotor diam.: 10.058 m
Rot. speed: 71.63 RPM
Nom. power: 19.8 kW

7 m/s   8 m/s   9 m/s   10 m/s   11 m/s   12 m/s
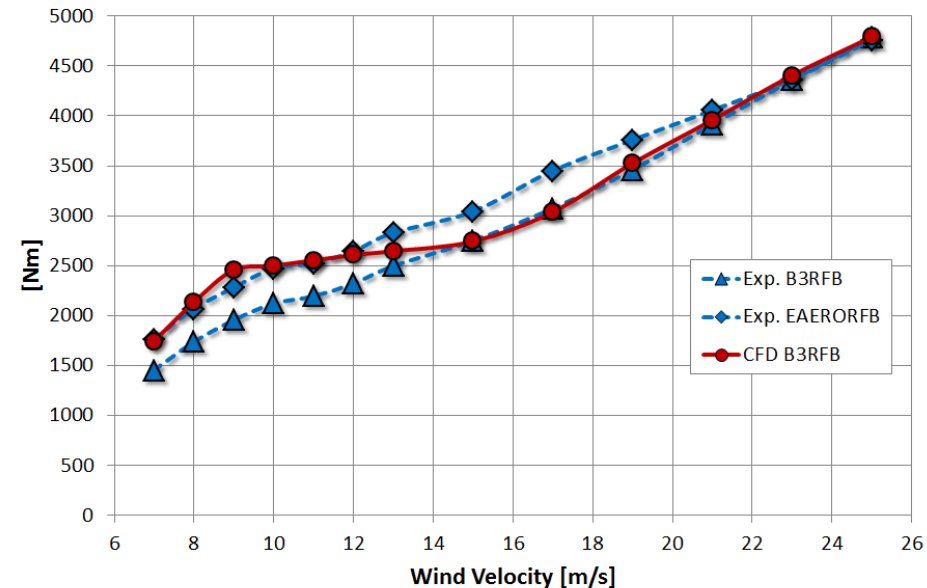
2

NREL Phase VI Wind Turbine (2)

CFD Results vs. Experimental Data : Rotor Torque
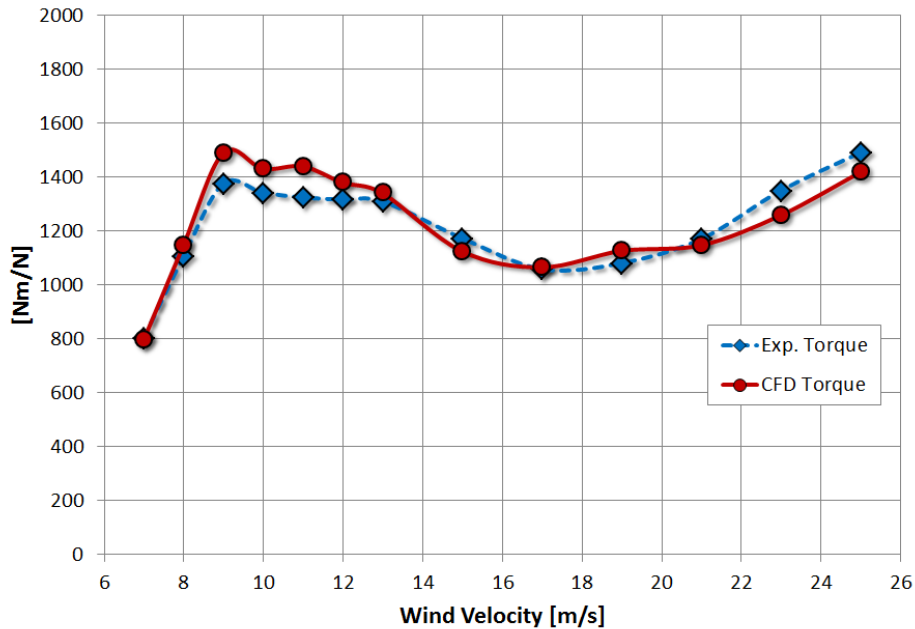
- **Very good assessment of Turbine Power and Blade Bending Load over entire Wind Speed range**
- **Excellent prediction of turbine passive control mechanism action (BL stall)**

CFD Results vs. Experimental Data : Blade Root Flap Bending Moment

Biomass-Fueled Boiler

- **Forced convection, batch-fueled two-stage small boiler, burning briquette-shaped biomass mixtures**
- **A highly complex, UDF implemented biomass thermal decomposition model converts biomass components into char, tar and gases used as input for the CFD combustion model**