

Marco Belloli

Ph.D., Applied Mechanics

Full Professor of Applied Mechanics, Dipartimento di Meccanica, Politecnico di Milano

Main areas of interests are wind energy and wind engineering, more in details simulations of wind turbines, fluid-structure interaction of civil engineering structures (bridges, large roofing systems and high-rise buildings), large structure dynamics and sports aerodynamics.

Wind energy: Experimental and numerical studies on wind turbines to develop techniques to test scaled models in a boundary layer wind tunnel and in real environment; numerical modelling of the unsteady aerodynamic forces and reduced order models to evaluate control systems. He is a floating wind energy specialist and he has been involved in several H2020 projects on FOWTs

Wind Engineering: Marco has been involved in a very large number of experimental tests regarding base and applied research. Base research, in particular, focused on the definition of the pressure and the force field acting on a cylinder, when still, moving and also in bundle arrangements. Applied research's main focus is bridges and buildings. Some of the most relevant project Marco participated into are: Messina Bridge Project, First Bosphorus Bridge Revamping, Third Bosphorus Bridge, Forth Replacement Crossing Bridge, Swan River Bridge, Çanakkale 1915 Bridge. Marco also worked in complex projects on very high and slender buildings such as the building of Regione Piemonte in Turin, the Pelli Spire in Milan, the Aesthetic Arch and the Italia Building for the 2015 Expo in Milan; he was involved also in wind engineering for very large roofing system and stadium covering, Stavros Narchios Cultural Centre in Athens, Juventus Stadium, Braga Stadium, Al Whakrah Stadium, MBR Stadium, AEK Athens Stadium among the others. In the last years he is responsible of research projects with Pirelli Tyres for bike and car aerodynamics, with particular reference to tire flow interaction. The experience obtained from the extensive testing activity performed in the wind tunnel covers a wide selection of experimental arrangements: bridge deck sectional models (suspended and rigid); full aeroelastic models of bridges and towers; rigid models of buildings to define wind loads and pressure distributions; full aeroelastic model of buildings to define the wind induced dynamics.

Sports aerodynamics: Currently managing the research team on sports aerodynamics. Research activities are performed in the wind tunnel to help athletes to improve their aero performances by optimizing position and gear in Alpine Ski, Ski Jumping, Cycling and Hand-biking. The research involved notable professional athletes, such as the Italian National Ski Team, the Croatian National Ski Team, the INEOS Granadier and SKY Professional Bike Team, Sky Professional Bike Team, Alex Zanardi London Paralympics Gold Medalist, Elia Viviani Rio Olympics Gold Medalist, Filippo Ganna Time Trial World Champion.

He is the Scientific Director and a member of the Scientific Committee of GVPM Politecnico di Milano Wind Tunnel, he is a member of the Board of Directors Fondazione Politecnico di Milano, he is a member of the Board of Directors of SIDERA; member of the Faculty Board PhD in Mechanical Engineering, Politecnico di Milano; he is member of the ASPI Polimi JRC Steering Committee; he is a member of the EAWE Communication Committee

Competitive research grants

Step4Wind: Novel deSign, producTion and opEratiOn aPproaches for floating WIND turbine European Commission (Brussels), Financed, ID Project: 860737, Role: PI of Polimi Research unit, Training Coordinator and member of the Executive Board

CoreWind: COst REduction and increase performance of floating WIND technology, European Commission (Brussels), 2019-09-01 to 2023-02-28, Grant Number: 815083, Role: PI of Polimi Research unit

The Blue Growth Farm: Development and demonstration of an automated, modular and environmentally friendly multi-functional platform for open sea farm installations of the Blue Growth Industry, European Commission (Brussels), 2018-06-01 to 2021-09-3, Grant Number: 774426, Role: PI of Polimi Research unit

CL-WindCon: Closed Loop Wind Farm Control, European Commission (Brussels), 2016-11-01 to 2019-10-31, Grant Number: 727477 Role: Member of the Polimi Research unit

Lifes50+: Qualification of innovative floating substructures for 10MW wind turbines and water depths greater than 50m. European Commission (Brussels), 2015-06-01 to 2018-09-30, Grant Number: 640741, Role: PI of Polimi Research unit

Aeroroad: Structures for great power aerogenerators (> 2 MW) new technology on- and off- shore in Italy, MIUR (Roma), 2008-01-01 to 2010-01-01 Grant Number: 2008HBEMWC, Role: PI of Polimi Research unit