

Assignment 1: Elevator Pitch

ABSTRACT

The importance of computational mechanics for climate change

Carbon dioxide among other gases is one of the gases called Greenhouse Gases (G.E.I.). The greenhouse effect is a process that occurs when gases in Earth's atmosphere such as the excess of CO₂ trap the Sun's heat. This causes greater warming on the Earth. Therefore, the problem is accentuated when the greenhouse effect increases by the excessive emission of these gases.

A rise in the amount of CO₂ in the atmosphere has been detected in recent years. The increment has been from about 280 ppm in the preindustrial era to about 390 ppm in 2010. This contributes to climate change and global warming of the planet. The industry of energy production impacts on climate change directly.

Fossil fuels combustion signifies 50% of the total Spanish electricity production. Spain is the European country with the most kWh/m² average yearly of irradiance received with also an elevated wind resource. For this reason, the use and development of the renewable energy field would save an important amount of emissions.

This is where computational mechanics play a role in fighting climate change. For instance, it is put a considerable effort to develop wind energy technologies. The importance of renewable energy produces that wind energy industry invests in research to increase the current wind generation capability and to decrease the associated costs. This is why wind turbine aeroelasticity and aerodynamics simulations are performed.

Therefore, with the help of the Fluid-Structure Interaction simulation, the aeroelasticity and aerodynamics are optimized so that it is obtained more efficiency and energy. Finally, it is reduced the carbon footprint on the planet, and it is possible to reduce the effect of climate change.