

Development of a horizontal shaft rotor and verticalized power transmission system focused on downtime and maintenance cost reduction - Phase 1

## Motivation

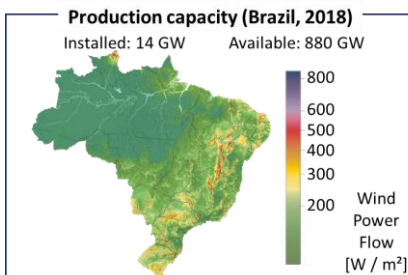
Wind turbines are exposed to very variable and severe weather and operating conditions, requiring more maintenance to extend their lifetime. In addition, with specific component failures and the need for unscheduled maintenance, there is a significant loss of revenue in power generation. One of the components of the wind turbine with the highest maintenance rate and which impacts on the increase in operating costs is the transmission box, mainly due to the logistical investment for carrying out the maintenance.

## Objective

Assessment of the technical feasibility of developing a horizontal shaft rotor wind turbine and verticalized power transmission. Through an innovative configuration, the repositioning of the nacelle carrying the main components to the base of the tower was investigated.

## Approach

The six phases of the IPD (Integrated Product Development) model were grouped in 4 development stages: conception of the problem, generation of alternative solutions, computational verification of the solution and indication of the solution limitations.



### 1.5 MW gearbox maintenance

- Logistic cost: **US\$ 250,000.00**
  - Approx. 40% of the turbine cost
  - Assembly + sea & ground transportation



Contact: +55 (12) 3947-6948

Praça Marechal-do-Ar Eduardo Gomes - Vila das Acácias  
 São José dos Campos - SP, 12228-900

Project Responsible: Prof. Dr. Anderson Vicente Borille