

Assignment

Living Lab EnTranCe

Title assignment: Wind LCOE improvement by improving mechanical and/or electrotechnical systems of Mini and Small Wind Turbines.

Client: Professorship Wind Energy in cooperation with wind turbine companies of the PUMSWindT project WP2 (TWE / EAZ / Right Connection / Green Trust / OmniWind / Vdesign / TU Delft / Hochschule Emden Leer / Noordenwind / NWEA)

Problem:

The price-performance of Solar PV- and big wind turbine (BWT)-systems improved in the last decade but this is not true for the price performance of small wind turbines (SWT's). So the market position for the SWT marginalised, except for some niche markets, like rural stand alone farms. SWT manufacturers did and do not have the capabilities and capital of the BWT manufacturers, so they couldn't keep up with the latest scientific insights by which they lagged behind. This resulted in less optimal components, and control and data monitoring systems. The so-called Levelised Cost Of Energy for mini- and small wind turbines is therefore relatively high and must be decreased.

Description of the assignment:

The professorship Wind Energy has many project partners in the mini and small wind turbine market that look for opportunities to improve their wind turbine. Therefore we can offer the student several options, amongst them being following:

1. Use Aerodynamic properties of NACA44## profiles at low Reynolds values and optimal blade design.
2. Monitor, analyze and optimize the dynamic behavior of a wind turbine
3. Research lifespan of wood and influence factors
4. Analyze the self-rightness of the turbine (self-righting of the tailed turbine depends on the wind speed)
5. Cost optimization of turbine (design and manufacturing optimization)
6. Research on improving down-wind rotor blades (include developments in large wind turbines)
7. Optimizing and testing of charge controllers for wind turbines
8. Optimize generator designs for small wind turbines
9. ...

Students are invited to ask for more information on the subjects of their interest. For example for the design/optimization of a Generator for a SWT, data of such generator is vital. In the past a 5 [kWh] Fortis Wind Turbine Generator was tested in Germany, but the performance hardly improved not even after adding innovations. Other PUMSWindT Project Partners also search for improvements on their generator designs in combination with the electrotechnical control system. If you are interested in this or any of the other subjects, we will check with our partners in what way they would like you to do your graduation assignment.

Suitable for students of the course(s):

Assignment

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Institute of Engineering. Electrical and electronics engineering, mechanical engineering

Applicants should have affinity with renewable energy technologies and good analytical skills.

Type of assignment:

Master / Bachelor - Graduation

Period:

Semester 1 September - January

Semester 2 February - July

What are we, and where do you find us?

The Living Lab EnTranCe is the place where students work together with teachers, researchers, the business community, governments and/or civil society organisations on complex issues. We do this at the following locations:

- Location Proeftuin, Zernikelaan 17
- Location Energy Academy Europe, Nijenborgh 6.

What do we offer?

Interesting, topical and multidisciplinary research assignments in the field of energy transition.

Space for collaboration with lecturers, researchers, lecturers and the professional field.

Guidance within the innovation workshop by theme coordinators, project leaders or experts.

Are you interested?

Then please contact us:

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