

Green Trust in cooperation with Hanze Wind Energy

Client	Green Trust in cooperation with Hanze Wind Energy
Related project	Performance Upgrading of Mini & Small Wind Turbines 2 PUMSWindT2
Start date	June or September 2024
Suitable for training course(s)	Bachelor/Master – graduation (EMRE, SESyM, Mechanical Engineering, Electrotechnical engineering, Mechatronics, ..)
Learning Community	Wind Energy @ ENTRANCE

Assignment description

Problem:

Green Trust is a shareholder of a solar farm of 9.5 MWp connected to a 6 MVA grid connection. Solar and wind energy aggregate well on the same connection since peak solar and wind production often do not coincide. However, at this particular solar farm large scale wind turbines are not an option due to zoning plan limitations, so Green Trust wants to investigate whether smaller wind turbines could be integrated within this solar farm to enhance the overall energy yield. The addition of wind energy also makes it more interesting to investigate the feasibility of a small electrolyser at this site. A higher capacity factor of wind should result into more operating hours and an improved payback time of the electrolyser.

Assignment

Green Trust is a consultant and developer of wind and solar. See <https://www.greentrust.nl/> for more information. The solar farm is called “Zonneweide De Blauwe Poort” and was constructed in 2023, it is in the municipality of Laarbeek between Eindhoven, Helmond and Veghel. We have plans to also install a 2 MW / 4 MWh battery at this location to provide balancing services to the grid operator.

We are looking for a student that will investigate all the technical and economic aspects of combining Wind, Solar and Hydrogen at the project site. As an example here are a few questions that should be answered:

- What is the most suitable small wind turbine for this site (looking at technical, financial, and legal/spatial aspects)?
- How much wind turbines could be installed at this site (looking at physical and electrical space)?
- Could the current infrastructure of the solar farm be repurposed to facilitate the integration of wind turbines, such as via DC connection prior to the inverters?
- Is there space for an electrolyser, both physical and electrical?
- What is the optimal operation strategy for the electrolyser?
- What will be the yield for both hydrogen and electricity, how much energy needs to be curtailed?

Currently, there are many different types and sizes of small wind turbines on the market, with large differences in efficiency, costs, and reliability. Green Trust is willing to install a larger number of small wind turbines, but they need to be profitable and reliable enough. The project will be executed under the flag of the subsidy Project PUMSWindT2 at ENTRANCE. We are looking for a student who has more insight in the opportunities and restrictions related to small wind turbines or who is eager to learn about this topic.

If the project has a positive outcome, there is a big probability that it will be implemented at Zonneweide de Blauwe Poort. See <https://www.zonneweidedeblauwepoort.nl/#nieuws> for more information about the project.

General information

Final Product	Graduation (advisory) report including technical documents
Location	ENTRANCE
Parties involved	Green Trust, professorship Wind Energy
Contact person	Arjen de Ruijter (Hanze Wind), Christian Holdert (Green Trust)
Guidance	Process guidance from the professorship Wind Energy, expertise guidance from company Green Trust
Details	To be further defined in good cooperation.

Photo and/or video

Green Trust: www.greentrust.nl

Zonneweide: <https://www.zonneweidedeblauwepoort.nl/#nieuws>

What are we and where can you find us?

ENTRANCE is a learning knowledge community, in which students and teacher researchers from various programmes work together with researchers, companies, governments and civil society organisations to accelerate the energy transition.

ENTRANCE is the place where, as a student, you work together with lecturers, researchers, businesses, 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?

ENTRANCE offers you a multidisciplinary, inspiring learning, working and research environment in which you can develop the competencies needed to shape and accelerate the energy transition. There is room for collaboration with professors, researchers, lecturers and the professional field. In addition, you will be supervised by professionals who are part of the ENTRANCE Learning Communities (ELC).

Contact us

Are you interested in the vacancy? Do you have questions or would you like to apply directly?

- Jacqueline Josse, Coordinator ENTRANCE Learning Communities.
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