

## Assignment

### Living Lab EnTranCe

**How to combine Wind Power and other sustainable energy sources with Hydrogen generation and storage**

**Client: Professorship Wind Energy together with PUMSWindT companies WP3 (TWE / Right Connection / Green Trust/ / OmniWind / Hochschule Emden Leer / NoordenWind)**



#### **Problem:**

How can small and medium wind turbines, together with other forms of sustainable energy generation, sustainable energy storage, reduce the problem of overloading the electricity grid, and allow living communities and/or working units to function independently of the electricity network on a small scale? The problem is that there is not much experience yet with executing such combined energy projects as the costs and safety risks are expected to be high.

#### **Description of the assignment:**

At the test facilities of EnTranCe projects are executed in many fields of operation, such as in wind and solar, in hydrogen storage and hydrogen use as an energy source. These projects are only combined on a micro size scale. To be able to develop more knowledge on a level of households and or small industry, this should be further scaled up.

The student will investigate/research technical aspects of combining Wind, Solar and Hydrogen for small scale use. With the aim to come with a plan to build such system at EnTranCe. In successive assignments it is the intention to actually build a test set up. As an example here are a few technical aspects:

- What is the optimal capacity of each source?
- How to control a mixed system from different energy supply systems? What is the best available technology for that?
- What is the optimal operation strategy for each source. For example an electrolyser generally has the highest efficiency if operated on a constant level.
- Is there a possibility to store the energy in other ways than hydrogen (for instance heat storage)

#### **Suitable for students of the course(s):**

Bachelor: Werktuigbouwkunde / Mechanical Engineering / Elektrotechniek / Electrotechnical engineering / engineering students with an affinity for energy transition  
Master: EMRE

## **Assignment**

### **Living Lab EnTranCe**

#### **Type of assignment:**

Bachelor/Master - 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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