

# PROJECT PROPOSAL FORM

Company	DMT environmental Technology	Website	www.dmt-et.com				
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Area of Traineeship (*)							
Mechanical Engineering	Industrial and Management Engineering	Electronic and Computers Engineering	Environmental Engineering	Chemical Engineering	BioEngineering	Metallurgical and Materials Engineering	Civil Engineering
x	x		x	x			
<b>Project's Short Description</b>							
<p>DMT Environmental Technology is a highly innovative engineering company operating on the cutting edge of green technology. DMT consists of a young dynamic team of approximately 80 employees, and is located in Joure (Northern part of the Netherlands). We are continuously developing and bringing to market technologies for (bio)gas upgrading, desulfurization and waste water treatment. Therefore, DMT is offering an internship position on the subject of:</p> <p><b>Developing a technological concept for the selective separation of N<sub>2</sub> and O<sub>2</sub> from biogas streams.</b></p> <p>a. <b>More and more landfill sites are starting to harvest the biogas that is produced by the rotting process of organic materials. This great example of turning waste into a valuable product does not come without challenges. As the landfill site is covered with plastic, a vacuum is used to suck out the gas. As most sites are not 100% sealed, also ambient air is sucked in, creating a mixture of methane gas with air. As the nitrogen and air content of the gas are too high to be utilized as natural gas replacement, additional upgrading of the gas is required. Therefore, DMT is looking for technology that is able to selectively remove nitrogen and oxygen from the gas. As potential solution route we are mainly focussing on adsorption based technology.</b></p> <p>For this project you will work at the Product Development department of DMT. But in order to reach your goal you have to collaborate with different other disciplines within the company like Sales, Marketing and Engineering. During the internship the student will convert a rough idea into a (pre-engineered) concept design. As part of your work you will create a design including a technical documentation package (consisting of: PFD, Concept P&amp;ID, Base of Design, Concept Equipment list, Mass &amp; Energy balance/design model, process description) as well as perform a technical-economic evaluation of the concept.</p>							
<b>Objectives and expected results</b>							
<p>The main goal of the internship project is to validate a concept-design for a PSA based Nitrogen &amp; Oxygen removal system and convert it to a more firm engineering package which includes a detailed design model for mass balances and energy consumption, equipment list incl. cost price estimates and a system boundary descriptions (based on the equipment selected and a sensitivity study performed with the design model).</p>							

Main objective: generate a technical design package (engineering documentation) for a PSA based Nitrogen & oxygen removal system.

**Workplan**

- Week 0-1: Get acquainted with DMT as a company and the product lines we commercialize.
- Week 1-3: Read into the subject and finalize internship project plan
  - Deliverable: final project plan
- Week 4-12: Create/improve system (Mass & Energy Balance) design tool
  - Deliverable: final design tool/model
- Week 8-11: Specify design premises
  - Deliverable: Functional feasibility analysis
  - Deliverable: System boundaries analysis
  - Deliverable: Sensitivity analysis on performance
- Week 11-12: Generate sales/marketing package:
  - Deliverable: product leaflet
- Week 8-20: Update engineering package:
  - Deliverable: Technical design package including:
    - PFD, P&ID, Proces description, Base of Design document, RFQ's for main equipment, Equipment list, 2D drawings (optional), system control narrative, concept Hazop study
    - System price estimate
- Week 5-20: Internship report:
  - Deliverable: Final report & presentation.

**Student's Profile**

Student has to be both team player as being capable to work individual. The student needs to have creative skills combined with engineering skilss in order to design the most suitable process. The student must have an entrepreneural mindset, as we work in Startup teams with the goal to commercialize the developed technology. Therefore student needs to be able to convert design into cost calculations based on equipment list and total cost of ownership calculations.

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**Additional information:**

(offer of accommodation, trips, meals; financial support, etc.)

DMT offers:

- Monthly financial compensation (375 euro)
- Office with computer
- (Optional) Housing (Shared apartment in the city center of Joure - The Netherlands)