

Possible Internship projects

Biogas upgrading, finding the ultimate technology.

“Transforming waste into green gas”

The smallest Biological Biogas desulfurization system in the world.

“How to get rid of rotten eggs in the most efficient way”

Is there still a future for chemical desulfurization systems?

“Chemical warfare ”

Waste water reuse as solution to the world water problems

“How your toilet flush can be drinking water once again”

Biogas upgrading, finding the ultimate technology.

“Transforming waste into green gas”

Air treatment technologies without chemicals

“Making clean air cleaner”

New techniques for energy en water problems

“Developing the future”

Various projects

“You like the computer?”



For questions and or more information send an e-mail to [rlems@dm-et.nl](mailto:rlems@dm-<u>et</u>.nl)
For an application please send a motivation letter and CV possible with subject/ grade list. Do not forget to state period and time of the internship.

More information about an internships/ trainee positions (link to internships-benefits)

Biogas upgrading, finding the ultimate technology.

“Transforming waste into green gas”

CO₂ is warming up our planet. More and more renewable energy sources have to be implemented to prevent the earth from overheating. DMT has developed an installation to upgrade biogas to natural gas quality. The biogas comes from digesters or Landfill gas and contains about 40-50% CO₂ and 50-60% methane. The biogas is upgrade to 90% methane by absorbing the CO₂ at high pressure in water. The final “green” gas can be used in the national gas grid or as vehicle fuel.



DMT is looking for student who can optimize (parts) this system or expand the plant with systems for heat and/ or CO₂ recovery. We are also looking for **trainees** who want to help at engineering, start-up, operate and monitor an installation.

The next projects are available:

- CO₂ reuse: “Do(n’t) waste your coke”
- Starting the system: “Making plans come to reality”
- Field data evaluation: “Does it do what is has to do?”



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The smallest Biological Biogas desulfurization system in the world.

“How to get rid of rotten eggs in the most efficient way”

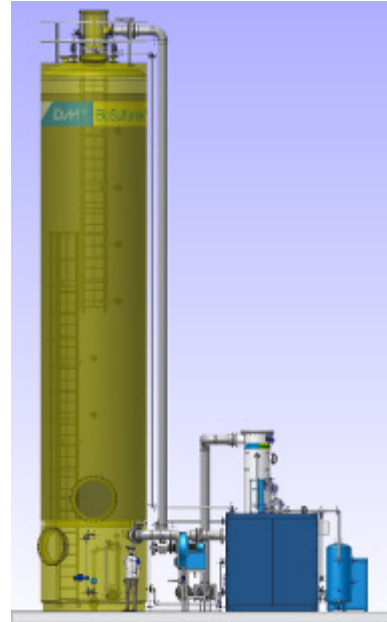
Biogas can not only be used by upgrading to natural gas but also directly at a heat and power unit. The methane is burned and converted to electricity and heat. For this application it is sufficient to only remove H₂S from the biogas. H₂S is an acidic component in biogas which smells like rotten eggs and is both toxic and corrosive.

The H₂S can biological converted to H₂SO₄ which can be dissolved in water. The main advantage of biological treatment is the absence use of chemicals. The disadvantage is the size of the needed bioreactor (typical a diameter of 4 meters and 14m height), the water consumption and possible fouling of the filter material.

DMT is developing a biological system which can be up to 20 times smaller than a conventional bioreactor, which at the same time converts the H₂S to sulphur, does not consume any water and is fouling free.

The next projects are available:

- **Minimizing water consumption and sulphur recovery: “Water 4 life and Sulphur 4 money”**
- **Field data evaluation: “Does it do what is has to do?”**



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Is there still a future for chemical desulfurization systems?

“Chemical warfare ”

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H₂S can be removed from biogas by a chemical scrubber with NaOH. Although biological systems are more and more in focus, the chemical systems still are more reliable due to direct control. If the chemical scrubber also wants to be a good option in the future, chemical use, water use and possible sulfur recovery have to be future improved/optimized. There is also the possibility of combining a biological and chemical system.



The next projects are available:

- **Field data evaluation: “Is there chemistry with the biological desulphurization?”**

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Waste water reuse as solution to the world water problems

“How your toilet flush can be drinking water once again”

Water is one of the most important basic needs for humans. It will only get more and more scarce in the future due to climate change and population growth. Therefore DMT has developed a Membrane BioReactor which can clean the water on a small footprint but with high effluent quality. The quality is high enough for reuse for swimming water, irrigation and/ or industrial applications. The next step will be transforming domestic waste water to drinking water.



The next project is available:

- **MBR: “Creating the Miniature BioReactor”**

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Air treatment technologies without chemicals

“Making clean air cleaner”

There are a lot of different air treatment technologies. DMT has developed a biological system based on 2 till 4 different stage with each it's own specific bacteria culture. The result is a slim column for treatment of different air streams. DMT is always looking for better removal efficiencies on an even smaller footprint.

The next project is available:

- **Odourex: “How to please bacteria”**

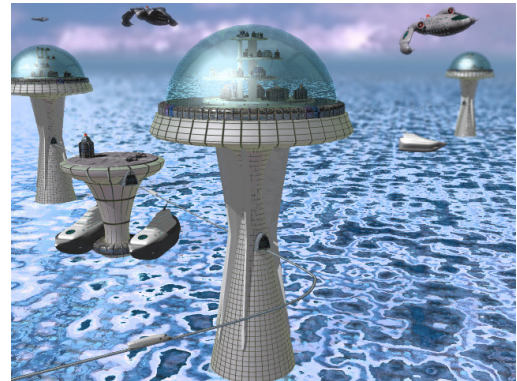


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New techniques for energy en water problems

“Developing the future”

Besides the future development of the current products, DMT is already looking to the next generation of products. The future needs new techniques to produce clean water and clean energy. DMT invites students to bring on new ideas and start the development of tomorrows products.



The next project is available:

- Turning waste water into energy: “ $H_2O \neq CO_2$ ”
- Biogas production optimization: “Gas \neq Gas
- Production of high energy gasses: “Energizing your waste”

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Various projects

“You like the computer?”

For people who like computers and programming, different projects are available that require these skills.



The next project is available:

- **Movie makers; making 3D promotional movies about our processes.**
- **Database build-up: Making a database for marketing and sales.**

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