

3TU.

3TU MSc in Sustainable Energy Technology

Creating the sustainable energy specialists of the future

TU Delft Delft University of Technology

TU/e Technische Universiteit Eindhoven University of Technology

UNIVERSITY OF TWENTE.



The challenge of Sustainable Energy Technology

The world is becoming acutely aware of the urgency of resolving the many issues associated with world energy consumption and the threat of climate change due to greenhouse gas emissions. Both are demanding fundamental innovations in the world's energy landscape. Sustainable generation of energy will need to play a key role in coping with these issues, especially when considering the West's determination to retain its standards of living, and the rest of the world's determination to adopt and hold on to those same standards.

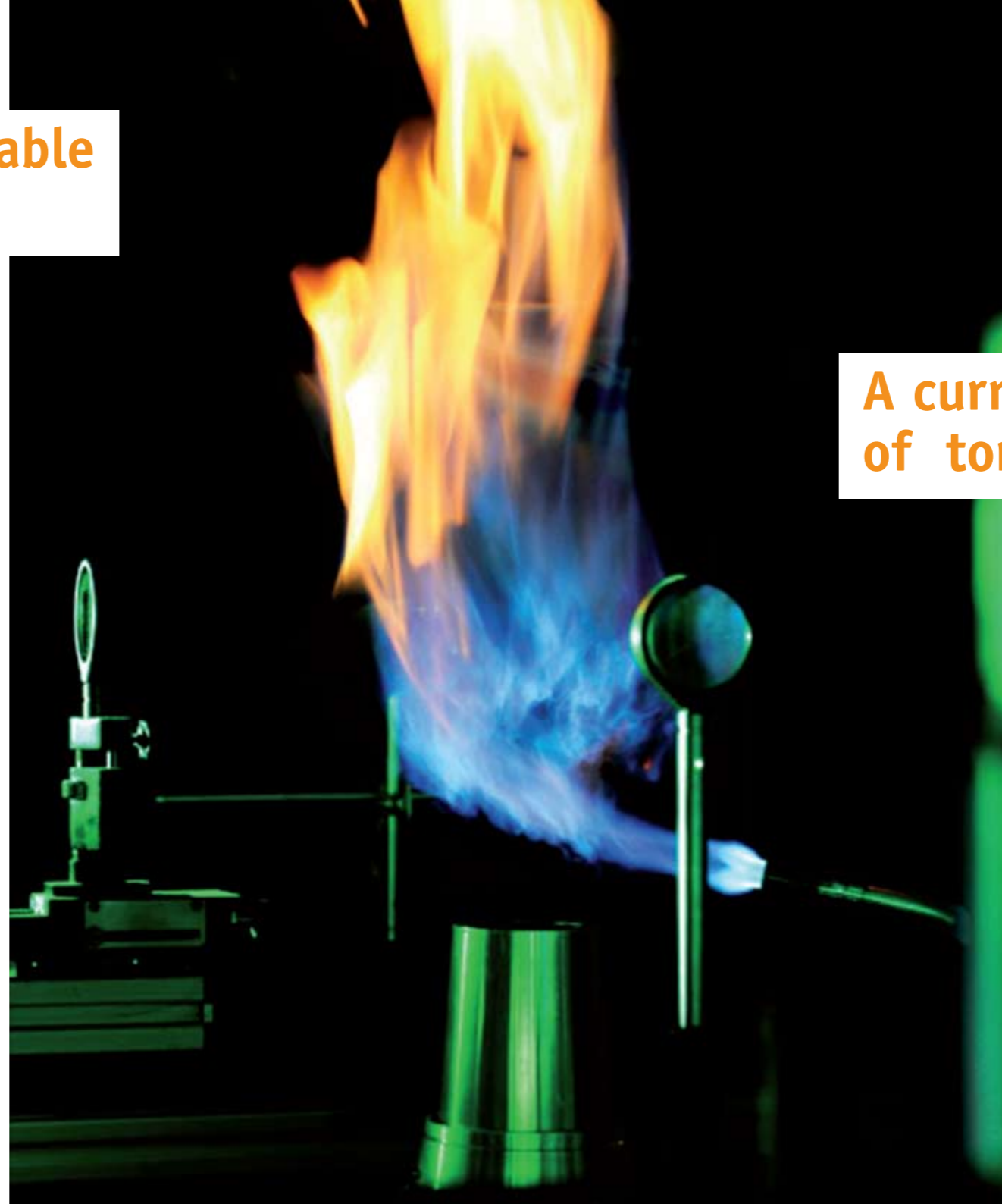
Realising this 'revolution' will demand a new generation of specialised engineers and researchers. Research is needed in order to technically develop, optimize and integrate sustainable energy sources. Important sources are for example solar power, wind, water and biomass. Additionally important are new energy carriers such as hydrogen and innovative batteries. New technologies need to be integrated into existing socio-technological networks. New forms of energy distribution must be investigated, as well as new energy market structures, and new means of intelligently satisfying the needs of a complex modern society. Sustainable Energy Technology graduates will achieve a standard of expertise in the world of energy that will stand them and their employers in good stead in the future.

A curriculum for the needs of tomorrow

The 3TU* MSc programme Sustainable Energy Technology (SET) offers a multidisciplinary technical programme with additional subjects from social sciences that anticipate the innovations' impacts. The multi-disciplinarity of the programme is reflected by involvement of departments like Mechanical Engineering, Electrical Engineering, Chemical Engineering, Applied Sciences and Technology Management. The main focus is on science and technology, but about one quarter of the course programme addresses societal and economical aspects of innovations in energy technology.

The programme provides engineers with broadly based energy technology competences. Graduates can apply their acquired knowledge and skills in projects involving a system-based and interdisciplinary approach. On programme completion, the engineer will be able to apply the fundamentals of SET to provide technical solutions for sustainable energy related problems, taking into account economic, social, environmental and ethical factors. The engineer will become an expert in at least one of the sub-areas of the field and be able to take part in the ongoing research in that area. The programme is largely identical at each of the three locations, with some subtle differences related to local specializations. The language of instruction is English.

* The three leading universities of technology in the Netherlands - Delft University of Technology, Eindhoven University of Technology and the University of Twente - have joined forces in the 3TU Federation (www.3tu.nl). This federation maximizes innovation by combining and concentrating the strengths of all three universities in research, education and knowledge transfer.



One programme - three flavours

The MSc programme in Sustainable Energy Technology lasts two years (120 European Credit points (EC)). To ensure a sound technological foundation, the programme starts with a number of basic courses such as physical transport phenomena and thermodynamics of energy systems. The fundamental knowledge in the Master is a primary requirement for students to evaluate the different technologies and to assess their feasibility and potential. Building on this is a series of specialized courses in fields such as 'energy from biomass', 'solar energy', 'wind energy', 'hydrogen as a sustainable energy carrier' and 'intelligent electrical networks'. These provide in-depth state-of-the-art coverage of many of the areas of interest to the application and development of sustainable energy and its users around the world. Courses in which technical innovations in society are a central element; societal factors, economic mechanisms and consumer behaviour are also part of the programme. During the first year an integrating, multi-disciplinary group project takes place. The year is concluded by an individual research traineeship or internship. In the second year, courses deepening the knowledge of specializations are offered to prepare students for their final project, which comprises a major part of the year. Students can choose their MSc assignment from one of the six specializations: energy from biomass, solar energy, wind energy, hydrogen technology, electrical power engineering, energy and society.

1st year 60 EC	Basic courses	Core courses on sustainable energy technology	Integration / research training / internship
2nd year 60 EC	Specialisation courses	Graduation project	

The three universities (Delft University of Technology, Eindhoven University of Technology and University of Twente) each offer a specialization, closely related to their strength in research. Detailed information can be found via the websites, but in general it applies that: Research on solar energy in Eindhoven focuses on the production of amorphous silicon and polymer solar cells, in Delft on nano-structured 3D and thin film solar cells and in Twente on the integration of solar energy into products. Research on energy from biomass in Twente emphasizes thermal and chemical conversion processes; in Eindhoven clean small scale conversion units, and in Delft on large scale power generation. Research on wind energy is mainly concentrated in Delft, with some small contributions from Eindhoven in the area of fluid-structure interaction and from Twente in computational fluid dynamics of wind turbines. Research on hydrogen technology in Twente focuses on the large-scale production of hydrogen, in Delft on the production using sustainable energy and on safe storage and in Eindhoven on the small-scale production. The field of Electrical Power Engineering and Network Integration is only subject of research in Delft and Eindhoven.

Picture yourself as ...

The significant increase in the world's demand for energy and the expected progression over the coming decades are evidence enough of the need for skilled engineers in this strategically important area. Sustainable energy engineers will be able to command positions across many areas of industry. Developments such as liberalization of energy markets, globalization of commerce and production, and the increasing pressures towards sustainability in the energy industry suggest the need for energy specialists with more than technical knowledge alone. People with a broad knowledge of sustainable energy will not only be needed in the energy industry and related sectors such as supply and transmission, but also in research for new renewable energy solutions in engineering, production, transport, infrastructure, consultancy and advisory areas, and government agencies.

Investigation by the national Foundation for Collaboration on Sustainable Energy (SDE) has confirmed significant interest from numerous leading organizations.

Admission requirements

Dutch students

Check www.3tudoorstroommatrix.nl whether your bachelor's degree is sufficient, or whether you need to follow a pre-master programme. HBO-bachelors, when admissible always follow a pre-master programme, university bachelors only if essential knowledge is lacking.

International students

In order for your application to be considered, you should possess a Bachelor's degree in one of the engineering disciplines such as Electrical Engineering, Mechanical Engineering, Maritime Engineering, Aerospace Engineering, Chemical Engineering and Physics from an accredited university, with average marks of at least 75% or cumulative GPA of 75% of the scale maximum.

For detailed information on how to apply, please refer to the website of the university you are applying to.

TU Delft	www.tudelft.nl
TU Eindhoven	www.tue.nl
University of Twente	www.utwente.nl

What is the 3TU.Federation?

The three leading universities of technology in the Netherlands - Delft University of Technology, Eindhoven University of Technology and the University of Twente - have joined forces in the 3TU.Federation (www.3tu.nl). This federation maximizes innovation by combining and concentrating the strengths of all three universities in research, education and knowledge transfer.

Within the framework of this cooperation, five joint MSc programmes have been developed that address key issues in engineering and society. These five MSc programmes are:

- Construction Management and Engineering
- Embedded Systems
- Science Education and Communication
- Sustainable Energy Technology
- Systems and Control

The main advantages for students

The 3TU MSc programmes have been developed as exclusive programmes of outstanding academic quality that enable you to study at three of the top universities in the Netherlands. These programmes focus on areas of innovation developed with state-of-the-art engineering expertise. You will have the opportunity to acquire qualifications and competences that are in high demand. Upon graduation you will have obtained an outstanding qualification profile. The 3TU masters combine excellent subject-based competences, research skills, the capacity for independent analysis and synthesis and an advanced capability to apply knowledge in practice.

The core programmes of the 3TU masters are largely identical and can be followed at any of the three locations. The admission procedures, teaching and examination regulations and academic calendars at all three universities have been carefully matched. You will benefit from the special strengths of the three universities by choosing a specialization at any of the three locations. You will be registered at the location of your choice, but you will automatically be co-registered at the other two locations to ensure access to the facilities of all three.

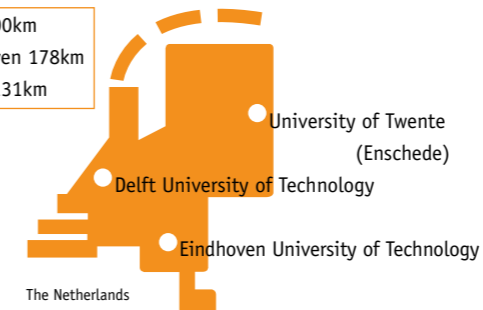


Universities of Technology in the Netherlands

Delft University of Technology (TU Delft)

TU Delft (www.tudelft.nl) is an enterprising university at the forefront of technological development. The university trains the engineers of tomorrow by means of its fundamental and applied research and educational programmes. With its broad knowledge base, worldwide reputation and successful alumni, TU Delft contributes significantly to the development of responsible solutions to urgent societal problems worldwide. The university offers 16 BSc and 39 MSc programmes. With approximately 16,500 students, TU Delft is the nation's largest university of technology with the most comprehensive range of engineering courses.

Delft <-> Enschede 200km
Enschede <-> Eindhoven 178km
Delft <-> Eindhoven 131km



Eindhoven University of Technology (TU/e)

Eindhoven University of Technology (www.tue.nl) is a modern and relatively young university. Students find the atmosphere open, informal and friendly. As an 'Eindhoven educated engineer', you are able to carry out complex analyses and develop solutions based on your findings. You are a problem solver with the ability to design new products, processes and systems. This means you can offer the community new opportunities for sustainability, safety, health, welfare and prosperity. You can look forward to a varied, challenging, lucrative and socially relevant career.

Compared to other universities TU/e has the highest scientific output in cooperation with industry. This position confirms the unique and close cooperation in R&D with the high-tech business sector in Brainport Eindhoven and the rest of the Netherlands.

University of Twente (UT)

Integrating social and engineering sciences. Developing high tech, with a human touch. This is what the University of Twente is committed to. Through teaching and research at the highest level. And through the innovations brought to the market place by over 700 spin-off companies. We offer degree programmes in fields ranging from the behavioural and management sciences to engineering and natural sciences. Research spearheads include nanotechnology, biomedical technology, information technology, governance studies, and learning and cognition.

The University of Twente is the only full-campus university in the Netherlands. 2,700 faculty and staff and 8,500 students and work and unwind in the beautiful green park grounds, supported by top facilities for research and teaching, as well as for sports and culture. It is home to events such as the world's largest annual student think-tank Create Tomorrow. All on less than 2 hours drive from Amsterdam. UT offers 23 BSc programmes and 33 MSc programmes.



How to apply

Admission is jointly coordinated. You are requested to apply only to the university of your preference, because admission and registration at one university automatically means admission and co-registration at the other two. If you have a specific interest in a certain research area or if you have specific preferences with respect to your graduation theme (wind energy, biomass etc.), please mention this when you apply, as we can advise you which university best suits your interests. This way we can ensure the availability of specialized courses and graduation projects at your study location. Note that you will receive an MSc certificate from the technical university you are actually registered at.

More information?

For more information visit www.3tu.nl

Additional information can be obtained from:

Delft: info-SET@tudelft.nl

Eindhoven: SET@TUE.nl

Twente: SET@utwente.nl