



**Development report  
Sustainable Energy Technology  
University of Twente**

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## Introduction

On 27 June 2023, the MSc Sustainable Energy Technology (SET) at the University of Twente was assessed by an independent peer review panel as part of the cluster assessment Sustainable Energy Technology. During the site visit, a development dialogue took place in the form of a thematic session during the site visit. This resulted in lively discussions amongst teachers, students, programme management, programme committee, Board of Examiners and the panel about several aspects of the programme. This development report was made based on this session.

## Topics discussed during the thematic session

### *Dealing with competition*

The MSc SET is experiencing a decrease in student numbers, even though the field of sustainable energy technology is increasing in importance. Panel and programme discussed various strategies to deal with this:

- Collaborating with the other two SET programmes to create attractive specialization options for students.
- Reaching out to universities across the border in Germany. The energy transition challenge in Germany is even larger than in the Netherlands, with a large socio-economic component. It might be fruitful to seek collaboration across the border on this issue.
- Increasing visibility and highlighting the strengths of the programme in external communication, such as the strong community of staff and students and inspiring atmosphere of the programme.
- Investigating whether SET can connect to the strengths of the UT in AI research. AI will be highly relevant in designing the energy grids of the future.
- Highlighting the strong focus on the socio-economic aspects of sustainable energy technologies as an asset of the programme. There is a high demand for SET engineers with a generalist outlook that can understand the economic, social and legal challenges associated with the energy transition.
- Discuss the unique selling points of the programme with external stakeholders, for instance from industry, This could be organized in the context of the (planned) SET Industrial Advisory Board.

### *Broadness vs depth*

The programme wants to offer specialization and flexible content without compromising the broadness and multidisciplinary character of SET. Ideas to achieve this are:

- 'Leading projects' working with several MSc programmes on a specific multidisciplinary challenge. Challenge-Based Learning is a move in this direction.
- There is a wide variety of electives right now: it might be advisable to provide more focus and design coherent packages to make specific profiles and specializations more attractive. Such packages could help build an energy technology profile.
- A point of attention: with 30-50 students, it is still possible to co-design individual specialization profiles with students. But if the programme were to grow in future it will be advisable to organize this beforehand, for instance through shortlists for specific profiles/directions with electives that help compose a coherent curriculum.

### *Multidisciplinary*

Programme and panel discussed several issues related to the multidisciplinary character of the programme.

- *Dealing with different levels of pre-knowledge.* Students seem to value the mechanisms that are already there: spending the first few lectures getting people up to speed, or providing a test to check whether students are up to level. Some further help could be offered digitally (video), or through offering extra reading materials or MOOCs/video materials from other universities. Another idea is to invest in student mentors (peer to peer mentoring), where students from a higher cohort help first-year students get acquainted with the programme and find their way to extra support opportunities.
- *Making the teacher team more aware of the SET principles and procedures, as they come from different faculties.* The panel understood that this is mainly relevant for the electives and individual course elements, as the teachers of the core courses are more closely related to the programme. The panel thinks that SET could take a stronger position in selecting electives: if you want to be a SET elective, you have to show that you adhere to the principles of SET. This ‘buying in’ could for instance mean attending the SET lecturer meetings, using a larger perspective with socio-economic links, connecting to SET or to what students need to know from a SET-perspective. The programme might lose some electives but end up with a stronger core package. Of course, students can still be allowed to follow other electives, where it is clear that they are a guest in another MSc.
- *Co-supervision of theses.* Multidisciplinarity in the graduation projects might be promoted through co-supervision of theses. Two supervisors with complementary backgrounds could help students pursue a fully multidisciplinary research project. An added benefit of this set-up is that there can be two examiners for the ‘Performance’ part of the thesis, further adding to the validity of this part.
- *Board of Examiners.* The panel learnt that the MSc has considered setting up a dedicated Board of Examiners for SET with members from each of the participating faculties in order to solidify a shared assessment approach for the interfaculty programme. In the end it judged the programme to be too small to set this up in a satisfactory way. The panel understands this reason and thinks that the strong community of teaching staff members currently suffices to communicate and enforce the SET assessment procedures. It recommends evaluating and monitoring whether this remains the case and taking measures when deemed necessary.

#### *Contacts with alumni & industry*

SET wants to expand its external contacts with alumni and industry. An idea to achieve this is organizing network events for industry, staff and students, to gain better insights into the working field of graduates. The panel thinks that the programme can benefit from collecting more information on the performance of graduates in practice. It can then better attune its curriculum to the requirements of the field, and help current students gain more insight in their future working field. An idea might be to couple students to an alumni mentor whom they meet once or twice per year and who helps them orient towards a future career. The planned set-up of an Industrial Advisory board could also strengthen the contact between the programme and industry and give ideas for further cooperation.

#### *3TU collaboration*

The MSc Sustainable Energy Technology was originally designed as a collaborative 3TU master, with specialization options at Eindhoven, Delft and Twente. Although students still have the opportunity to follow courses at Delft and Eindhoven, the fully collaborative character of SET never really took off. According to the programme, this can be mainly attributed to travel time between the three cities, in combination with the many options students already have at their own universities. The panel understands these limitations from a practical viewpoint, but still sees possibilities for the SET programmes to draw on each other’s strengths if the programmes want to do so. The educational portfolios of the three universities combined form a very strong combination of relevant topics in sustainable energy research. There are for instance obvious links between the energy research done at the Eindhoven and the new Heating & Cooling track that is introduced in Delft. The panel also sees several relevant connections to research done in Wageningen, such as the

impact of large-scale renewable energy generation on ecosystems, which might make it worthwhile to also get the fourth 4TU-member on board. The panel recommends investigating whether there are possibilities beyond the current sharing of electives to use each other's expertise. This could for instance take the form of exchanging teaching staff members on certain topics, or creating a portfolio of online courses or MOOCs. At the least, the management of the SET programmes could further benefit from each other's experiences and solutions in working in interdisciplinary and interdepartmental programmes and share best practices.