



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of Energy Engineering

at Vilnius College of Technologies and Design

Expert panel:

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Study Field Data

Title of the study programme	Renewable Energy	Energy Engineering
State code	653E33001	6531EX020
Type of studies	Higher Education College	Higher Education College
Cycle of studies	First	First
Mode of study and duration (in years)	FT/PT	FT/PT
Credit volume	180 ECTS	180 ECTS
Qualification degree and (or) professional qualification	Professional Bachelors	Professional Bachelors
Language of instruction	Lithuanian	Lithuanian
Minimum education required	Secondary Education	Secondary Education
Registration date of the study programme	06-04-2013	18-05-2012

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I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order [No. V-149](#).

The evaluation is intended to help higher education institutions to constantly improve their study process and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter – HEI); 2) site visit of the expert panel to the higher education institution; 3) production of the external evaluation report (EER) by the expert panel and its publication; 4) follow-up activities.*

On the basis of this external evaluation report of the study field SKVC takes a decision to accredit study field either for 7 years or for 3 years. If the field evaluation is negative then the study field is not accredited.

The study field and cycle are **accredited for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).

The study field and cycle are **accredited for 3 years** if one of the evaluation areas was evaluated as satisfactory (2 points).

The study field and cycle are **not accredited** if at least one of evaluation areas was evaluated as unsatisfactory (1 point).

1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure (hereinafter referred to as the Procedure) as approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 [Order No. V-149](#). The site visit to the HEI was conducted by the panel using video conferencing on 27 April, 2021.

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1.3. GENERAL INFORMATION

The documentation submitted by the HEI follows the outline recommended by SKVC. Along with the self-evaluation report and annexes, the following no additional documents have been provided by the HEI before, during and/or after the site visit.

1.4. BACKGROUND OF THE STUDY FIELD/STUDY FIELD POSITION/STATUS AND SIGNIFICANCE IN THE HEI

General information about the significance of the study field

Energy Engineering is an important engineering field in Lithuania. The energy transition requires highly skilled engineers to meet the demands of the job market as well as undertaking research and development projects. The changing energy market is a result of the following:

1. Lithuania has a long-term national strategy for energy independence by 2050, when imported electricity will be replaced by domestically produced electricity.
2. An interim target for 2025 is to have the country's electricity network operating reliably in synchronous mode with the with the European electricity system.
3. Power generation will rely on renewable resources, with wind making up most of the electricity generated. The plan is to produce 50% of electricity from wind by 2030, with the rest shared between other resources, primarily solar power, biofuels and hydroelectric power.
4. The Government's strategic plan prepared by the Ministry of Energy highlights the need to promote sustainable, competitive and efficient development of the energy sector.

Information about the role of the HEI

Vilnius College of Technologies and Design (VCTD) was established after reorganised Vilnius Technical College was merged with Vilnius Construction and Design College in September 2008. The College is a public legal entity operating as a public institution with autonomy combined with accountability to the public and encompassing academic, administrative, economic and finance management activities based on the principle of self-government, academic freedom and respect for human rights. The main field of activity of the College is education, and the main type of activity is higher college education. The activities of the College are based on the Law on Science and Studies of the Republic of Lithuania. Studies at Vilnius College of Technologies and Design are focused on the preparation for professional activity and aims to create conditions for a person to acquire qualification based on applied research and/or applied scientific activities.

Vilnius College of Technologies and Design offers 16 study programmes in 11 study fields. Two of these study field programmes are conducted at the Faculty of Design (Design; Media Art), three study field programmes are available at the Faculty of Civil Engineering (Civil Engineering; Measurement Engineering; Management) and six study field programmes (Computer Engineering; Mechanical Engineering; Energy Engineering; Electrical Engineering; Electronics Engineering and Transport Engineering) are conducted at the Technical Faculty. Studies from the field of engineering sciences dominate at Vilnius College of Technologies and Design. The College has a competitive advantage in the region of Vilnius among other colleges

of the city of Vilnius due to uniqueness of study programmes and synergy of engineering and design studies.

The study programme Energy Engineering is conducted in the study field of Energy Engineering, which is conducted at the Technical Faculty. This study programme was prepared in 2016 by combining three study programmes that were conducted before: Electrical Energetics, Renewable Energy, and Thermal Engineering. The newly developed Energy Engineering study programme was registered in the Register of Studies, Training Programmes, and Qualifications instead of Thermal Engineering study programme, which was registered on 18 May 2012. The study programme Energy Engineering was awarded the state code of the previously conducted study programme Thermal Engineering. The last class of graduates graduated from the study programme Renewable Energetics in June 2019. The last class of graduates graduated from the study programme Electrical Energetics in June 2020. The self-Evaluation of the study programmes Renewable Energetics and Electrical Energetics are not performed in this self-Evaluation report summary. The study programme of Energy Engineering has been conducted since 1 September 2017 and until 2019 the programme was conducted in full-time and part-time modes of studies. In 2019, this study programme was not popular among the applying students, so the first-year group was formed. Due to decrease in the number of students studying in the programme, as of 2020 the programme is conducted only in part-time mode of studies. Although energy engineering sector is one of the most strategically important sectors of the economy, the professions that it requires are not among the specialities that are most sought.

II. GENERAL ASSESSMENT

Energy engineering study field and first cycle at Vilnius College of Technologies and Design is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	3
2.	Links between science (art) and studies	3
3.	Student admission and support	3
4.	Teaching and learning, student performance and graduate employment	3
5.	Teaching staff	3
6.	Learning facilities and resources	3
7.	Study quality management and public information	3
	Total:	21

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field is being developed systematically, has distinctive features;

4 (very good) - the field is evaluated very well in the national and international context, without any deficiencies;

5 (excellent) - the field is exceptionally good in the national and international context/environment.

III. STUDY FIELD ANALYSIS

3.1. INTENDED AND ACHIEVED LEARNING OUTCOMES AND CURRICULUM

Study aims, outcomes and content shall be assessed in accordance with the following indicators:

3.1.1. Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions)

(1) Factual situation

The institution has joined three existing programmes in 2016: Electrical Energetics, Renewable Energy and Thermal engineering into the Energy Engineering programme under consideration. The study in this programme has been conducted since September 2017 in full time and part time. From 2019, the programme has been conducted part time as it proved not popular.

The stated outcome of the Energy Engineering study programme is the application of practically tested scientific knowledge and typical engineering solutions. It is stated that Lithuania is moving towards more energy independence by 2050 through utilisation of indigenous renewable energy resources and interconnection to the European electricity grid. Information from industry indicate that there is a strong need for qualified energy engineers to support the energy transition of the country. The programme aims at producing engineers that support achieving the energy policy of the country which aims at reduction of the use of fossil fuels, energy efficiency, energy security, development of the internal energy market and development and creation of research. Among other changes, there is an ongoing process of modernisation of inefficient household boilers, development of wind farms and biofuel power plants.

To meet the needs brought by digitilisation and the changing work environment, the outcomes of the study programme were reviewed and updated during the evaluation period to respond to market needs introducing relevant material in some topics such as alternative heat production, biogas and power engineering, the selection of biogas energy engineering systems and biomass combustion.

Specialists graduating from the programme are trained to work in electricity networks management and electricity network companies, electricity network design and operation, utilisation of renewable energy sources, heat sector and municipalities' energy facilities. They are also trained to peruse higher education.

(2) Expert judgement/indicator analysis

The SER makes a case for the market need for energy specialists required to support the energy transition in Lithuania to meet the declared policy targets as well as to meet the market needs in the various sectors of energy including the transition to renewables and interconnections with the European electricity grid. The introduction of relevant topics during the evaluation period is commended as it supports the notion of continuous review of the programme to meet the changing needs of the market. Enhancement of topics such as heat production technologies, biomass combustion renewable energy system design and power electronics support this changing need.

While the merge of three existing programmes into one provides students with a broader perspective and may increase the range of jobs that they can apply for after graduation, it inevitably leads to reduction of in-depth knowledge as this must be sacrificed to allow the wider coverage within the same study credits. It is thus expected that graduates of this programme are more likely to work as energy managers or project managers rather than engineering specialists in specific areas. Hence it may be advisable to enhance specialist more relevant topics to this kind of jobs such as energy policy, energy and the environment, health and safety and ethics which do not seem to be sufficiently present in the programme.

3.1.2. Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI

(1) Factual situation

The stated mission of the college is the creation of sustainable society through training responsible specialists in the field of engineering and design and conducting research and technological development that is accessible and useful to the general public and business.

The Energy engineering programme is designed to prepare highly qualified specialists who are competitive in the labour market to meet the needs of the country.

The study field is focused on the needs of the fourth industrial revolution, digitalisation and sustainable development challenges and green energy development.

To achieve these objectives, the content of the programme has been updated to comply with the strategic documents of the relevant sectors and relevant aims of the UN sustainable development. Examples are given of subjects introduced such as Modern Electrical systems and Biomass Power Engineering

(2) Expert judgement/indicator analysis

The report has demonstrated that the field of study conforms with the aims and outcomes and the mission, objectives and strategy of the HEI through the development and modernisation of certain aspects of the programme.

It would be helpful however to emphasise in the programme education that leads to the training of socially responsible engineers.

3.1.3. Evaluation of the compliance of the field and cycle study programme with legal requirements

(1) Factual situation

The programme is run in full-time mode over three years and in part-time mode over 4 years. The total number of credits is 180 which is the same for both full-time and part-time modes. It is demonstrated that the structure of study field programme is compliant with the legal requirements through dedicating 15 credits to general college study subjects, 135 credits to study field subjects and 30 credits to special study subjects, which all match the legal requirements. In addition, 30 credits are dedicated to practice, 9 credits to optional course units and 12 credits for the thesis, all are equal to or greater than the minimum legal requirements.

The objectives and learning outcomes correspond to the legal requirements for the first cycle of college studies. Level of complexity of the study outcomes corresponds to the European Higher Education Area, the European Qualifications Framework and the Lithuanian Qualifications Framework Level 6. The studies prepare students in applied research or applied science activity.

The subjects are arranged in 6 semesters for the full-time study, 2=30 credits each and 8 semesters for part-time study with 22-23 credits in each semester. The students' weekly and termly workload is distributed evenly.

The specialised subjects are focused on acquiring and applying knowledge while the general subjects develop students' social and personal skills. Additionally, there is provision to develop ability to conduct research to develop personal skills.

The hours that make up the credit include the student's contact and independent work hours. Contact work hours are the student's study time for lectures, performance of laboratory works, seminars, consultations, and evaluation.

Study outcomes are reviewed annually by the Study Programme Committee and changes are made when found necessary to meet the needs of the society and market.

(2) Expert judgement/indicator analysis

The description shows overall compliance of the field of study to the legal requirements in terms of the credit structure, distribution of credits to the required types of study/subjects and the nature of the subjects.

It is useful to note that both full-time and part-time students undertake exactly the same studies and achieve the same learning outcomes. The work load is distributed evenly throughout the study periods.

3.1.4. Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes

(1) Factual situation

The study outcomes of each subject studied are formulated taking into account the outcomes of the study programme and are mutually coordinated. The study outcome of a specific subject provides necessary knowledge and skills required to achieve a certain result of the study programme. These have been mapped in annex which generally shows compatibility.

(2) Expert judgement/indicator analysis

The assignment of the aims to the programmes is appropriate. The aims of the study programmes are in line with the expected learning outcomes.

3.1.5. Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students

(1) Factual situation

The study field is composed of general study subjects, study field subjects and special study subjects, each set serving a defined set of provisions. The general study subjects provide fundamental knowledge on social sciences, and provide students with social responsibility knowledge, sustainable development and decision-making skills.

Study field subjects represent the largest part of the programme and include fundamental knowledge and skills in the areas of Mathematics, Physics, Electrical and Mechanical Engineering Software, Social sciences and other specialised energy engineering topics.

Special study subjects provide additional specialised knowledge, many of which are optional courses including science workshop project and interdisciplinary project in addition to the final thesis.

The programme includes practical content to develop skills of applying theoretical knowledge practically. This is included in the final year thesis where analysis of activities of a company takes place. The thesis also includes elements of research training.

(2) Expert judgement/indicator analysis

The combination of subjects in the study field allows students to develop the subject area skills, the general (soft skills) as well as the specialised skills that would develop a complete and socially responsible professional. As described, this is in line with the requirements of such a study programme.

The main issue is the wide range of subject area topics that is likely to reduce the ability to understand the subjects in sufficient depth as mentioned earlier.

3.1.6. Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes

(1) Factual situation

The study field allows students to select among a number of options in every year of the three full-time years of study or the equivalent in the part time study. The choices in the first year are from the general college study subjects. In the second and third years, choices are among optional topics from the study field subjects and the special study subjects.

The study programme Energy Engineering provides three specialisations. There is a possibility to individualise studies by choosing one of the following specialisations: Electrical Energetics, Renewable Energy and Thermal Energy

(2) Expert judgement/indicator analysis

There are sufficient choices for students to personalise the structure of field study programmes as described. Experts however consider making choices in the first year from

topics such as Sociology, Psychology and Sustainable development to be undesirable as students may miss out on important relevant aspects such as Sustainable Development.

3.1.7. Evaluation of compliance of final theses with the field and cycle requirements

(1) Factual situation

Theses are conducted in collaboration on a subject related to a company, and they follow the company procedures and guidance to undertake the required work. Relevant topics are selected that take into account latest developments in the field. Students choose the thesis topic in consultation with a supervisor where each academic supervises a maximum of eight theses.

A rigorous process is implemented in the assessment of the theses where a commission of five examiners is used that include social partners. Representing half of the commission. The commission can also include lecturers from other subject areas.

(2) Expert judgement/indicator analysis

The selection of the theses topic, the conduct of the process of supervision and the involvement of social partners in both the undertaking of the work leading to the theses and the assessment are considered valuable to this important part of the study and in essence comply with the evaluation of compliance and final theses requirements for the study cycle.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Broader topics leading to wider knowledge of graduates.
2. Involvement of social partners in the study programme.
3. Regular review of the study field content and improvements to meet the changing market requirements.

(2) Weaknesses:

1. The breadth leads inevitably to loss of in-depth learning of some key topics and achieving an adequate balance could be challenging.
2. Poor recruitment of students despite the declaration that there is a strong need to energy engineers in the country reflects lack of coherent approach by the College to improve students' recruitment.

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDIES

Links between science (art) and study activities shall be assessed in accordance with the following indicators:

3.2.1. Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study

(1) Factual situation

According to the SER, the College, in the course of commissioned applied research, experimental development work, consulting and artistic activities, performed commissioned works: in 2017 for EUR 39,106, in 2018 for EUR 59,488, in 2019 for EUR 55,694. Every year, based on the results of

the research, experimental development, and artistic activities conducted by the College, the College receives funding for research, experimental development, and the development of artistic activities. In 2017–2019, the College was allocated a total of EUR 27 900 for research, experimental development, and the development of artistic activities. In preparing experimental development projects, students implement their innovative ideas and develop creative thinking. During the evaluation period, EUR 150 000 were allocated for the promotion of the College lecturers performing applied research and experimental development works.

During the interviews, it was confirmed that the university administration created the conditions for the scientific activities, also the staff and students participate in research work, projects. Their research reflects the results obtained during the implementation of projects, the topics of which are closely related to the study subjects.

(2) Expert judgement/indicator analysis

The teaching staff are highly motivated, have sufficient competence levels. There is a sufficient level of scientific work and the College creates the conditions to conduct research at the required level.

The conditions created for staff in forming the pedagogical load are within the requirement of the HEI in order to achieve the learning outcomes.

3.2.2. Evaluation of the link between the content of studies and the latest developments in science, art and technology

(1) Factual situation

According to the SER, the content of the programme of the study field of Energy Engineering is systematically updated taking into account the recommendations of social partners and conform to the latest scientific and technological achievements in the sector of energy. In order to ensure relevance of the content of the programmes of the study field of Energy Engineering, the achievements of the latest research and technologies are constantly integrated into the study subjects. Lecturers learn about the latest technologies used in energy by participating in scientific conferences and professional development courses. Consequently, lecturers constantly update their knowledge and pass it on to students.

During the interviews, most statements made in the SER were confirmed.

(2) Expert judgement/indicator analysis

Taking into account the application of new technologies in the engineering sector, a rapid growth of renewable energy technologies and the implementation of innovative systems, new subjects are included in the study process, such as: Modern Electric Power Systems. The curriculum also includes alternative energy sources based on smart materials, their application in autonomous systems of electronics, Internet of Things and wireless sensors.

The study program is constantly updated with innovations. However, the College could focus more on applied research to address the challenges of the energy sector related to renewable energy and sustainable development. This can be done through closer cooperation with the social partners through various forms of cooperation.

3.2.3. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle

(1) Factual situation

The SER states that students perform research, present research outcomes at conferences, prepare articles for scientific publications, carry out experimental development works. Students individually or together with lecturers conducted various researches and presented their results in 5 scientific presentations at various student scientific practical conferences. Every year, the Technical Faculty organises student scientific practical conferences: “Innovations in Technologies and Management”, “Exact Sciences – the Basis for the Studies of a Qualified Engineer”, where students present their research and discuss a variety of research-related issues. During period 2017-2019, 12.4%, 15.7% and 21.4% of students participated in research activities accordingly.

During the visit, the expert panel found that the final thesis is either related to research topics or issues relevant to the social partners. Some students confirmed being involved in project activities. The social partners are involved in the Study Committee for the purpose of improving the study program.

(2) Expert judgement/indicator analysis

The Final Thesis is related to either research topics or issues relevant to the social partners. Some students confirmed being involved in project activities. To disseminate the research results, the teachers of the study program organise international scientific conferences, which provide opportunities to share their research experience, and students have the opportunity to participate with presentation or get familiar with the latest research achievements. The social partners are involved in the Study Committee for the purpose of improving the study program.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Suitable conditions are created for teachers and students to perform scientific work.

(2) Weaknesses:

1. During the period 2017-2019, the average number of students involved in scientific research was 16.5%. Students could be more involved in research activities.
2. Social partners could be more involved as well.
3. There is low level of involvement in international R&D projects that could attract additional funding and additional staff training.

3.3. STUDENT ADMISSION AND SUPPORT

Student admission and support shall be evaluated according to the following indicators:

3.3.1. Evaluation of the suitability and publicity of student selection and admission criteria and process

(1) Factual situation

The college follows regulations of the government regarding the minimum requirements of state-funded studies, which should ensure that majority of the admitted students are capable to successfully study and graduate. There is a developed system of additional points for entrants with related experience or achievements. Studies are publicized both in traditional and non-traditional ways. Studies are publicized on the College website and studies' journals as well as in popular local studies' exhibitions, which is sufficient when the study field has stable admission results. In addition, the College pays a lot of attention for field trips to schools, workshops and cooperation with business associations or HEIs in order to promote engineering studies and increase the popularity of Energy Engineering study programme in the long term. To make studies convenient for working students, the college established part-time studies, which were popular among admitted students in 2017 and 2018.

In 2017 and 2018, Energy engineering study field had reasonable numbers of admitted students, of 19 and 21 respectively. Most of them were admitted to state-funded places: 13 and 12 respectively, however, in 2019, when the minimum competitive score was raised, only 2 part-time students were admitted.

(2) Expert judgement/indicator analysis

By analysing the admission results in the period of 2017-2019, it is clear that the Energy Engineering programme does not attract capable students according to the new governmental requirements. When the minimum competitive score was increased from 2 in 2018 to 4.3 in 2019, the number of submitted applications as the 1st preference dropped from 23 to 2, and applications with all other preferences from 102 to 0. Competitive scores of admitted students in 2017-2018 reveal that average competitive scores of admitted students were below the newly adopted threshold of 4.3. Consequently, when the threshold was raised, the college had to direct the admission process to more capable students, but did not succeed in that, therefore admission of 2019 was not successful. Students stated that the programme may not be popular among school graduates because there is a lack of positive reviews/recommendations in the public domain.

The promotion of energy engineering during field trips and communication with communities is useful and could give positive impact in the long-term. However, the college may need to take additional actions to attract students in the short-term. Moreover, the closure of previous programs on Energy engineering study field reveals that the admission problem has a long-term trend.

Student recruitment process needs to be reviewed in order to attract students with higher scores. This could include for example better publicity of the unique selling points of the programme.

According to students' opinion, more marketing is needed to increase awareness of the programme. By examining admission data of 2017-2018, it seems that flexible part-time studies for working students is one of the positive aspects, which gives a positive impact on students' recruitment.

3.3.2. Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application

(1) Factual situation

The college has a system of recognition of foreign qualifications, partial studies of non-formal/informal studies, which is described in "Procedure for the Evaluation of Non-Formal Study Achievements and the Recognition of Competencies". It is made in coordination with the accreditation system of the studies. During the evaluation period, there were 3 examples when students got their foreign part-time studies recognised based on their mobility programs. One student had practice in a foreign company, which was also recognised. During 2017-2019, there were no requests to recognise informal or non-formal studies. During the interviews, students could not mention any problems related to recognition of previous studies/qualifications. It is possible that not all students know about the possibility to recognise previous studies or qualifications.

(2) Expert judgement/indicator analysis

There were no information in the self-evaluation report or during the meetings with management of the college about concrete principles of previous studies, qualification and experience recognition. The requirement, limits should be clearly publicized.

Since there are low numbers of students in the field and accordingly only few cases of recognition requests in the period, it is not possible to evaluate the system of recognition. The college could pay more attention to communicating the possibility of recognition – that could lead to increase of the applications (to publicise the related documentation is not enough).

Based on sufficient documentation, successful examples of foreign studies recognition and no complaints from students, it could be stated that procedures of recognition of qualifications and studies work more adequately.

3.3.3. Evaluation of conditions for ensuring academic mobility of students.

(1) Factual situation

There is a sufficient amount of information sources to promote mobility programs. This is done in two ways: information is published on college website and live events/meetings are organised. Admission requirements, experience of previous participants and other guidance is provided on website. Meetings with previous year participants and interested students are held. Personal consultations by International Relations Coordinator are possible, ongoing students are guided in personal. Also, students state that they receive all the needed information about mobility programs. However, mobility results are somewhat low: only 4 students enrolled mobility programs during the period of evaluation. Also, there were no incoming students from abroad. The management states that the only reason of low students' mobility is high percentage of working students.

(2) Expert judgement/indicator analysis

The academic mobility is at low level; this problem is also acknowledged in self-evaluation report. There are still no incoming students and there is no information provided on what actions are taken by the College in order to attract students from abroad. In regards to outgoing students, a deeper analysis has to be conducted in order to find out the reasons of students' low mobility. Self-evaluation report states that mobility events are held at least twice per year and that there are interested students who come to hear more. However it does not lead to participants.

The support of information and counselling is sufficient, but there may be other problems related with outgoing mobility students. The college could identify the reasons and implement measures which could improve the situation. The Self-evaluation report does not provide data on students' feedback on the question of mobility. It may be possible to compare different study fields in regards of students' mobility and use the good experience on the Energy engineering.

Finally, student representatives could be included in the management of mobility programs in order to increase mobility.

3.3.4. Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field

(1) Factual situation

According to the self-evaluation report and students' opinion during the interviews, there is a strong academic support for each student through all cycles of the studies. Students are introduced to principles of studies during first weeks after admission. During module studies and exams, students feel that information support about academic processes is sufficient. Examinations' criteria are clear, there are no examples of misunderstandings due to lack of information. Communication with administration is good, academic issues are solved fluently. Timetables are flexible. Both student and management state, that feedback/consultations on examinations and theses are adequate. The process of academic debts' liquidation seems to be appropriate and adapted for students' needs. Finally, in the occasions when students struggle, the college is ready to help students to find their practise in cooperation with social partners.

The study field has a traditional structure of academic and social scholarships. In 2017-2019 a relatively large number of students received incentive scholarships – 24 in full-time studies. By the government regulations, students have access to state-supported study loans.

Students have a good opinion about their dormitories – all needed services are provided. 3 of 4 dormitories have been renovated or in renovation process. Students shared a positive recent experience, when in cooperation with administration, the menu of local cafeteria was improved.

Career-related events are organised periodically, where students are consulted on career opportunities, alumni share their work experience with students. One of them is *Career Days*, which are actively attended by local companies: in 2019, there were 21 companies. Students have a positive opinion on the college cooperation with local companies and social partners. The college is able to provide individual studies schedule (3 students used this opportunity in 2017-2019), for personal reasons, students have an option to make a studies' break. Both self-evaluation report and students state that there is an access to gyms and sport clubs.

(2) Expert judgement/indicator analysis

It is clear that students' support is one of strengths of this study field. In accordance with the self-evaluation report, it could be stated that the system of academic, financial and personal support for students is well-developed. Students' opinion is very positive in the regard of their support. They could not mention any example when there was a lack of academic information or the management did not help to solve any problematic situation. However, one drawback could be named: in the self-evaluation report, the management and students did not mention

any means which are used to encourage students to take a part in the scientific research during their study years. Therefore, this HEI should pay more attention to this area.

3.3.5 Evaluation of the sufficiency of study information and student counselling

(1) Factual situation

Based on the self-evaluation report and students' opinion, the study field has a good system of information spread in respect to studying. It is mainly based on email communication and study events organisation. First year students receive introductory lectures about studies in the college – students find them useful and appropriate. Student representatives confirmed that the counselling during thesis writing period is sufficient, consultation timetables are flexible. However, it seems that students are not aware about internal processes of study programme management. They could not provide details about their relationship with study programme committee and they did not know about the possibility to cooperate in the preparation of the self-evaluation report. Finally, only 4 students attended the meeting with the committee, which is relatively a very low number.

(2) Expert judgement/indicator analysis

The study information spread and student counselling is appropriate in the view of study process. However, students are not informed about opportunities to contribute in the process of programme improvement and students interest representation in general. Therefore, adequate information to students should receive more attention from the College in order to support students' representation.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The academic, financial, social, and personal support provided to the students of the field is consistent, adequate and appreciated by students. The college provides a good infrastructure in the campus. There is a strong career counselling system, supported by the help of social partners.
2. Studies are flexible, adopted for working students (part-time studies, individual schedules).
3. The system of information spread is efficient; students receive it timely. There is a good communication between students and the administration in regard of problems solving.

(2) Weaknesses:

1. The study field has serious problems with students' recruitment. There does not seem to be a credible plan of action in order increase the general popularity of the program, emphasize its strengths and to successfully compete with other HEIs.
2. Students' academic mobility remains low, both in regard of outgoing and incoming students. The reasons of low mobility should be found out and concrete actions should be prepared.
3. The college does not provide clear information to students about recognition of studies or training abroad.

3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

3.4.1. Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes

(1) Factual situation

A combination of study methods is available to students (auditorium, remote, independent, and practical work). Lecture, exercises, seminars, simulation (when working with real or simulated devices and equipment), demonstration, discussion, case studies, trips to companies, lectures by business representatives, distance learning and project-based methods are available to students.

Six different evaluation methods are used to assess study achievements: examinations, project, tests, reports and presentations of individual work. Intermediate evaluations of study outcomes are carried out during the semester. Interim examinations are mandatory.

There is no clear description of the requirement for the different type of studying methods. The criteria for evaluating the achievements of students are linked to the study outcomes of the programme and are indicated in the description of each subject. Students' knowledge, understanding and skills are graded from 1 to 10. An individual cumulative index is used to assess the level of achievement of Study outcomes. During the examination/defence of the students' independent work, all study outcomes are evaluated: knowledge, understanding and skills acquired.

At the beginning of the studies, students are introduced to the organisation of independent work and its evaluation. Students are given independent work tasks that develop study, information processing and analysis skills.

College graduates can study at universities and gain a higher university education. The main universities involved are provided in the SER.

(2) Expert judgement/indicator analysis

Teaching and assessment methods are described in detail. Students are introduced to the study process and can choose different methods. After graduation, they can express their views on subjects and process.

After meetings with students, the Expert Panel realised that they choose this study program because of the option to enroll part-time, so teaching methods must be oriented to distance learning.

Up to 50 % of studies consist of individual work. For this reason, the study process must have its own key performance indicators, in particular students should be monitored throughout their study process.

3.4.2. Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs

(1) Factual situation

The facilities are suitable for students with special needs and students from socially vulnerable groups. The College provides opportunities for these students to study effectively.

However, the SER states that no students with special needs studied in the study field of Energy Engineering during the Evaluation period.

(2) Expert judgement/indicator analysis

The expert panel believes that the study program is available for the students with special needs and students from socially vulnerable groups. The description of procedures is provided.

3.4.3. Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress

(1) Factual situation

The students' knowledge and improvements are assessed throughout the semester and the final outcomes are evaluated during the examination session. The student receives the final grade of the subject only after having the grades of all interim evaluations. Students can see their personal progress and responsible member of the college contact student in order to provide additional consultations if necessary.

Description of the Procedure for the Evaluation of Study outcomes are in place.

Interviews with students showed that the majority are working and conduct their studies using distance learning. This also revealed that support to distance learning students requires improvements, particularly providing them with adequate information about available support.

(2) Expert judgement/indicator analysis

The procedures are described and assistance to students is offered by responsible member of the college. There is lack of evidence and examples on how the students are encouraged to use additional support and how it helps to improve their teaching process.

Many students learn at a distance, so more effective methods need to be implemented to involve them in their studies. More attention should be paid to monitoring the student's study process.

3.4.4. Evaluation of the feedback provided to students in the course of the studies to promote self-assessment and subsequent planning of study progress

(1) Factual situation

Feedback on study outcomes is provided to students after the publication of evaluation outcomes in a different form. It is a practice to interview students about the subject being taught. The results of the survey of the subject are presented to the lecturer, who taught the subject, during an individual interview with the dean of the faculty.

During the visit, the expert panel found that there is no specific guidance to teachers on how to provide feedback to students and that this is left to individual teachers. Talking to teachers and students, it is clear that there is a wide variation in the quality of feedback given to students.

(2) Expert judgement/indicator analysis

Individual feedback specifies specific errors in the student's work, suggestions for correction, and examples that help the students improve faster and easier. By discussing the completed student works in the group allows each student to compare their level of achievement with others, get acquainted with examples of good practice and achieve better outcomes.

The student receive feedback in a variety of forms. However, specific improvement plans, and their tracking are not identified, and this could be a good tool for students in their study process.

The expert panel noticed that feedback focuses on mistakes and errors, but does not praise or promote areas of good practice which should be an integral part of effective feedback.

A more consistent approach to provide feedback to students needs to be implemented.

3.4.5. Evaluation of employability of graduates and graduate career tracking in the study field.

(1) Factual situation

Information on employability of graduates is provided, graduate career tracking in the study field is not provided in the SER.

Study field programme surveys of employers are carried out in the study field of Energy Engineering. Employers participating in meetings and surveys confirmed that students are provided with necessary knowledge and practical skills. 93% of employers assess the preparation of graduates for professional activities and acquired theoretical and practical knowledge as excellent or very good.

Study programs have been improved in response to comments from employers and new subjects such as *Science Workshop Project* and *Interdisciplinary Project, Project Management* were introduced in the study field programmes.

(2) Expert judgement/indicator analysis

The report showed that there are contacts and cooperation with future employers and there are even several departments in the institution that take care of student plan career paths.

The conclusion that graduates start a professional career at a lower position due the business improper treatment of graduates is neither acceptable nor justified. The college, along with employers, could look for the real reasons. This conclusion of the college creates preconditions for insufficient cooperation with employers and understanding their expectations.

The visit revealed that employability skills of students (how to sell yourself, prepare a CV, career interviews) are not sufficiently developed during their studies.

3.4.6. Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination

(1) Factual situation

The principles and means to ensure academic integrity, tolerance and non-discrimination are described in the SER prepared by college. A list of documents is provided. The academic community (students, lecturers, administrative staff) is reminded of the principles of ethical behaviour in trainings and meetings.

The SER did not provide a summary of information on examined cases of violations of the principles of academic integrity, tolerance and non-discrimination and decisions made over the last 3 years of studies.

(2) Expert judgement/indicator analysis

The policy of academic integrity, tolerance and non-discrimination in the study field is described and to ensure academic integrity, students in the study field sign a declaration of integrity at the beginning of their studies, thus declaring honest performance of academic work.

During the visit, the Expert panel found that neither the students nor the teachers noticed that they were being discriminated against.

3.4.7. Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies

(1) Factual situation

The procedure for the appeals for the study process, grading of students' knowledge and procedural violations is described in the *Description of the Procedure for the Submission and Examination of Student Appeals Regarding the Evaluation of Knowledge and Procedural Violations*.

According to the procedure students have the right to file appeals against violations of knowledge evaluation grade and/or knowledge evaluation procedures.

During the analysed period, there were no appeals regarding the evaluation of students' knowledge and procedural violations in the study field.

(2) Expert judgement/indicator analysis

The lack of appeals may indicate that students and staff are not well informed about their rights and opportunities. A more effective method of informing staff should be implemented.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. An attractive opportunity for students is to study individually at a distance and come to an intensive study session.
2. Targeted visits to companies and lectures by company specialists are used in the study process.

(2) Weaknesses:

1. Insufficient development of students' employability skills
2. The involvement of graduates and the provision of feedback is very low.
3. Relatively low understanding of market needs and adaptation of studies to them.

3.5. TEACHING STAFF

Study field teaching staff shall be evaluated in accordance with the following indicators:

3.5.1. Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes

(1) Factual situation

According to Table 8 in the Self Evaluation Report, in 2019, the college had 23 lecturers in the study field (20 of them at least part-time). The number of lecturers was constant in the evaluation span time, but the lecturers themselves have changed due to different reasons (retirement, relocation, etc.).

In 2019, the programmes of the study programme of Energy Engineering were conducted by 20 lecturers (5 associate professors and 15 lecturers); 7 lecturers had a doctoral degree.

Lecturers have an experience in the pedagogical work from 5 years up to 44 years. From the professional point of view, lecturers are working also in the fields of law, engineering, management, and design. Few lecturers also carry out research in the topic.

The background of lecturers is architecture, electrical and electronic engineering, law, economics, mechanical engineering, maths, energy engineering, natural sciences, and social sciences.

During the visit, lecturers stated that they like to participate in this programme due to the good atmosphere and good motivation achieved.

It also became clear that there is a high rotation in the part-time lecturers, but the permanent staff participating in the programme is quite stable. There is a clear process to select the needed part-time staff.

Staff raise their qualifications when doing research and participating in projects.

(2) Expert judgement/indicator analysis

Due to the small group of students, the ratio of lecturers to students is very good, which should ensure very good lecturers' availability. A clear assessment on how to manage the correct number of lecturers with such low number of students is needed, especially considering the need to specialization in the lecturers and to ensure giving them enough time for other activities, such as research.

There is a higher number of electrical/electronic engineering vs. other fields more related to thermal engineering or demand side of energy engineering (buildings, energy systems in buildings/industry/transport).

The background of the teaching staff is adequate for the programme presented.

3.5.2. Evaluation of conditions for ensuring teaching staffs' academic mobility (not applicable to studies carried out by HEIs operating under the conditions of exile)

(1) Factual situation

According to the Self Evaluation Report, academic mobility of lecturers is in the form of participation in conferences, practices, seminars, business trips, and mobility programmes. The head of department approves any academic mobility. Business trips are fully covered by the department.

The Erasmus+ programme is fully used for academic mobility. There is a strong relationship with the University of Rennes (France) and contacts with other institutions from Canada or Spain.

During the visit, teaching staff expressed that there is a lot of support for them to carry out mobility activities; this motivation is both in form of funding and also non-funding support, such as support for publication of research work. Moreover, lecturers explain that they have the needed mobility opportunities available.

Most mobility activities developed during the period under evaluation were short-term visits (1 week, with 8 hours of teaching per day) to the University of Rennes.

At the College there is an opportunity to improve qualifications by various means and staff feels satisfied.

(2) Expert judgement/indicator analysis

It seems that lecturers do not need to find self-funding for their mobility actions, this is good in taking out stress from lecturers, but it also does not encourage looking for funding through other sources (like research projects).

The mobility carried out is linked to teaching exchanges and to conferences participation, there is a lack of mobility linked to research.

3.5.3. Evaluation of the conditions to improve the competences of the teaching staff

(1) Factual situation

The college has a procedure to ensure that lecturers can study and improve their qualifications and develop professionally. Such improvement is paid by the state budget. Improvement is carried out in courses, seminars, conferences, practices, and Erasmus+ and other international programmes.

The improvement of lecturer's qualification is planned between the head of department and the lecturer. Some activities are organised by the College; on this, seven lecturers on the field of study took a 40-hours course organised.

(2) Expert judgement/indicator analysis

The improvement of competences for the teaching staff is very well organised, with real active role both for the lecturer and for the head of department. It is not clear the success rate of such plans (how many lecturers use this opportunity at its full capacity and how many complete all the training plan).

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The qualification and competence of the teaching staff is adequate to achieve the learning outcomes.
2. There is support and motivation for lecturers to carry out mobility activities.
3. There is a clear procedure to ensure that lecturers can study and improve their qualifications and develop professionally.
4. At the College there is an opportunity to improve qualifications by various means and staff feels satisfied

(2) Weaknesses:

1. The relation lecturers/students is quite high due to the low number of students, which should be assessed by the management to ensure economic viability.
2. There is a lack of mobility related to research activities.
3. English language skills should be improved.

3.6. LEARNING FACILITIES AND RESOURCES

Study field learning facilities and resources should be evaluated according to the following criteria:

3.6.1. Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process

(1) Factual situation

According to the Self Evaluation Report, this study field takes place at the Technical Faculty with 16 lecture rooms and 16 laboratories, all recently renovated and following occupational safety and hygiene standards.

The details of the lecture rooms and laboratories show good equipment in all aspects (hardware and software for computers, sports equipment, etc. in lecture rooms and in laboratories, here also laboratory equipment is complete).

The video provided show very well-equipped laboratories based mostly on test stands for basic sciences (physics, electronic, electricity, etc.). A few test-stands for renewable energies are available.

Needs from personnel with special request (like mobility problems) have also been considered.

Professional practices are conducted in companies which have cooperation agreements with the College. Students choose practice places in coordination with practice supervisor.

The library is very complete in available resources, including open access ones. The video provided show good library space and organisation.

During the visit, the senior management explained that there is one assistant in each laboratory.

Students highlight the visits to energy sites that complement the work in the laboratories. The dormitories are recently renovated and offer the required services.

The library resources (books, e-books, access to data bases) are very good; about 50% of the material is electronic. There is enough material both in Lithuanian and English. For research, the library is subscribed to Taylor & Francis and to EBSCO Publishing data-bases. Connection to the library from KTU ensures access to required material.

Internet access and IT service are very good. Good connections with social partners and alumni allow to expand the number of internships.

(2) Expert judgement/indicator analysis

For laboratories, due to the recent upgrading, learning facilities are very good. Nevertheless, most laboratories are based on bench stands, there are no installations copying those that will be found in real buildings/industry/energy infrastructures. This is a drawback.

The library had the adequate material and services.

The upgrading of the infrastructure is linked to the funds available in the projects, assistance from the factory and the company, and still requires constant planning.

3.6.2. Evaluation of the planning and upgrading of resources needed to carry out the field studies

(1) Factual situation

According to the Self Evaluation Report, there is a strategic action plan in the College for resources required in the study field. The resources are constantly supplied and updated. For laboratories, there is an annual plan that ensures renovation and expansion of equipment.

Due to a joint project with Kaunas Technical College, in July 2021, 90,000 € will be spent in the laboratories of the study field.

During the visit, the panel found that there is an annual plan for renovation of equipment and that during the evaluated period was funded by the European Union. Lecturers feel that there is enough funding for maintenance and renovation of equipment.

The equipment maintenance is supervised by the lecturers. There is a clear plan for safety in laboratories for students. Participation in the project allows to purchase the necessary equipment.

(2) Expert judgement/indicator analysis

There is a plan for resource acquisition both for lecture rooms, computers (hardware, software, and laboratories). Details on such plan are not given, similarly to details of needs.

The maintenance of the laboratories is mostly done by lecturers, the College should study if the involvement of technicians is needed.

Up to now, most laboratories equipment has been funded by EU; the College should study how the upgrading will keep on going if this EU funding stops.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The laboratory for students in basic subjects is very good.
2. Staff are involved in projects and this is an additional source of funding for the purchase of equipment.

(2) Weaknesses:

1. There is a need for laboratory equipment as real installations.
2. There is a need of laboratory infrastructure related to renewable energies, if possible not as test stands.
3. There is a need for a better maintenance and renovation of infrastructure plan.
4. The upgrading of the infrastructure is linked to the budget available in the projects, but still requires constant planning.

3.7. STUDY QUALITY MANAGEMENT AND PUBLIC INFORMATION

Study quality management and publicity shall be evaluated according to the following indicators:

3.7.1. Evaluation of the effectiveness of the internal quality assurance system of the studies

(1) Factual situation

The study quality management and assurance process follow the College's Quality Assurance Policy and Procedure, available publicly, and implements an internal quality management system.

The management decisions of the study field are made by the Study Programme Committee. The college has set out a process for undertaking changes. Internal quality of studies is ensured through the control, analysis and evaluation of study field programmes, student achievements and progress, teaching and studying.

At the beginning of each study year, actions are planned to improve the quality of studies of the study field. A number of indicators are used for the analysis of study quality that include: study quality surveys, lecturer certification, graduate employment statistics, student evaluations, and analysis of study intensity. These topic employers provide feedback on the content of practices, students' preparation for practices; the representatives of employers are members of the qualification commission, reviewers of theses, and members of Study Programme Committees. The Study Programme Committees convenes to evaluate outcomes, relevance of theses topics, outcomes of surveys conducted during the study year, and other issues significant for the quality of studies discussed.

At the end of each study year, an evaluation of the activities of lecturers of the study field takes place, during which the professionalism of the lecturer's work during the study year is assessed. Students express their opinion about the study programmes of the study field, their implementation and updating through the representatives of the student representation in the Study Programme Committee, the faculty council, and the Academic Council.

The Dean of the Faculty is responsible for ensuring the implementation of the quality improvement measures of the field of study.

The college has formed a Programme Committee of Energy Engineering which is responsible for the supervision of the study programme. The committee membership is approved by the college director. The Study Programme Committee consists of five members: the head of the study programme; students; lecturers; the representatives of employers and graduates. The committee submits its recommendation report on improvements to the head of department and the dean of the faculty

(2) Expert judgement/indicator analysis

The college has put in place a rigorous process for evaluation and quality improvements which includes academics, employers, students and alumni. There is a process by which a specialised committee reviews all indicators and submit their recommendation to senior management who are responsible for implementation of these improvements.

3.7.2. Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance

(1) Factual situation

The college collects data from stakeholders in a variety of ways. Students provide their feedback at the end of each semester and the study practice survey is conducted at the end of the practice. Information from other stakeholders, such as graduates, employers and lecturers are collected through interviews roundtable discussions and 'other means'. However, the college did not clarify the nature of these other means.

The outcomes of the surveys are shared with stakeholders within two months from the time of collection including presentation of these outcomes on the website. Improvements to the study programmes are implemented based on the outcomes of the surveys.

There is however lack of clarity in the report on the details of how the interviews and roundtable discussions with stakeholders are conducted, what kind of data is collected and how it is analysed. It is not clear if there is a standard set of questions that are asked and whether quantitative or qualitative data is collected or both and how this data is analysed or benchmarked. Discussions with lecturers and social partners during the visit did not lead to sufficient clarification about this issue.

There were only 4 students available during the visit which limited the amount of information that could be provided about students' opinion. Generally, students were not forthcoming in answering questions about the study programme.

Social partners attending the meeting with the expert panel did not provide clear answers about the surveys conducted by the university.

(2) Expert judgement/indicator analysis

The SER stated that there is engagement of all stakeholders to provide feedback on the study programmes and critical analysis of this feedback is conducted to identify areas that require improvement. It also stated that improvements are implemented based on these outcomes.

However, it was difficult to verify this during the visit due to the small number of students involved. This is also due to social partners not providing information about the surveys mentioned in the SER.

It is recommended that a more systematic approach to collecting data from social partners is implemented to ensure quality and consistency of data and hence more robust action plan.

3.7.3. Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes

(1) Factual situation

The college uses their website to publish information for students, employers and other public bodies. This includes information about the study programmes and related details such as expected learning outcomes, qualifications and assessment processes.

Other information such as progress on improvement of the programmes are announced to students and stakeholders during internal meetings.

The college also prepares an annual report to present data such as student admissions, number of graduates, grades, employability data and significant students' achievements.

The college regularly collects data on their programmes and performs data analysis to decide on improvements that are regularly implemented and examples of such cases are given in the report.

(2) Expert judgement/indicator analysis

The Expert panel believes that the college uses a combination of methods for dissemination of information that are adequate for the purpose and the audience. Analysis of data to produce improvements plans is a useful approach and the examples given are convincing.

3.7.4. Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI

(1) Factual situation

Students feedback about the quality of studies is collected in accordance with the updated Description of the Procedure for Organising Opinion Polls of students, lecturers, employees, alumni and employers (social partners). Surveys are organised twice per year where questions are asked about teaching and professionalism of lecturers, quality of services provided, opportunities for personal development, and assessment of students' achievements. All students are asked to complete the survey and results are analysed in meetings of the faculty administration and in the SPC. Measures are adopted in the SPC for improvements.

The Study Programme Committees, organise additional surveys and round table discussions with students in order to have deep understanding of individual study programmes. A quantitative study was conducted by selecting students studying Electrical and Automation Engineering and Energy Engineering.

The outcomes of the student survey confirmed that the quality of studies is inseparable from the teaching and the professionalism of the lecturers. Analysis of the outcomes of student

surveys according to the study quality dimension Teaching and Lecturers revealed that students positively evaluate the preparation of lecturers for lectures, the study methods used and knowledge assessment methods. The study subjects meet the expectations of the students and are planned properly. The number of practical and theoretical classes is balanced, and the content of the subjects meets the needs of the labour market, as well as the expectations of students. The tasks of independent work are presented in an understandable way and their volume is optimal. Students are happy that professional lecturers work in the programmes of the study field.

(2) Expert judgement/indicator analysis

The expert panel believes that there is an adequate process for collecting and evaluating feedback from students. It would be helpful to provide clear metrics to ensure the consistency of the process and also allow for open questions at the end of the survey which is not clear from the information provided in the SER nor during the visit.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Engagement with stake holders in evaluating theses and providing feedback.

(2) Weaknesses:

1. The process of collecting data from students requires clarification.
2. There is no systematic approach of providing feedback to students
3. The range of industry partners involved as social partners does not cover a sufficient range of the renewable energy industry

IV. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	<p>It is recommended to review the curriculum to ensure that the merger of a number of study programmes does not lead to loss of in-depth study</p> <p>While the college emphasise that strong market needs specialists in Energy Engineering, this does not translate to matching student recruitment and hence the college needs to identify the reasons and make a plan of action, beyond stating that mathematics and science are not popular at schools.</p>
Links between science (art) and studies	<p>It is recommended that the college puts more focus on applied research to address the challenges in the Energy sector.</p> <p>It is recommended to encourage social partners to be involved in students' research projects</p> <p>Teaching staff should be encouraged to apply for externally funded research projects that in turn would underpin education</p>
Student admission and support	<p>It is recommended that the college takes a more systematic approach to students' admissions in the short term to improve the number and quality of students recruited to the programme</p> <p>The college should actively work on identifying the causes of low students' mobility and devise an action plan to increase that.</p> <p>The college should get students representatives more involved in improvements of various aspects of their study programme and mobility</p>
Teaching and learning, student performance and graduate employment	<p>The college needs to make more effort to better understand the market needs and adapt the study programmes accordingly.</p> <p>Itt is recommended to include specific study topics that improve students' employability skills.</p> <p>The college should improve the level of involvement of alumni in providing feedback on the programmes of study field.</p>
Teaching staff	<p>The high ratio of lecturers to students, due to low number of students need to be assessed to ensure economically viable programmes.</p> <p>It is recommended to improve staff mobility in relation to conducting research and to improve their English language skills</p> <p>English language skills of teaching staff require improvement</p>

<p>Learning facilities and resources</p>	<p>Improvement is required in the experimental facilities to meet the changing need of the energy market. In particular, there is a need to more laboratory equipment related to renewable energy.</p> <p>The college should have a clear plan and provide sufficient funds for regular maintenance and upgrade of laboratory equipment.</p> <p>It is also recommended to increase the proportion of library resources available electronically.</p>
<p>Study quality management and public information</p>	<p>The process of collecting feedback from students on the study programmes requires review and improvement.</p> <p>It is recommended to develop a more systematic and consistent approach to providing feedback to students.</p> <p>It is also recommended to consult with a wider range of renewable energy industry to improve the quality of teaching subjects.</p>

VI. SUMMARY

Generally, the aims and outcomes of the Renewable Energy and Energy Engineering Bachelor programmes are in conformity to the needs of the society and the labour market. They are also in conformity with the objectives and the mission of VTDK.

The study programme in Energy Engineering was formed in 2016 by combining three study programmes in electrical Energetics, Renewable Energy and Thermal Engineering to address issues of low student recruitment. Consequently, recommendations from the last evaluation report may not be of significant relevance and hence are not addressed.

The Bachelor of Renewable Energy and energy Engineering study programmes ensure consistent development of the competences of students. The range of general and specialised study skills are a good measure of supporting students to meet the requirements of the programme and the education required by the job market. Offering the study programme as part time where students could be working in a related field while studying is a positive measure that would improve experience of students and readiness for employment.

The low level and declining recruitment of students as well as reduction in minimum grades of students admitted is a matter of concern which needs immediate action. The experts suggest that more in-depth analysis of the causes of this reduction is undertaken and corrective measures are implemented. Although the college is working with school children to improve the long term prospects for studying engineering subjects, this is considered a long term plan and measures to improve recruitment in the short term are required.

The academic mobility is at low level. There are still no incoming students and there is no information provided on what actions are taken by the College in order to attract students from abroad. There is a lack of outgoing students as well. This development suggests that there might be a lack of suitable advertising for mobility among students.

Students' support is one of strengths of this study field. The system of academic, financial and personal support for students is well-developed. This is clearly acknowledged by students.

The college provides support to staff to get involved in research activities which helps their career development as well as the ability to feed their research into teaching. However, more needs to be done by staff in terms of involvement of international research projects.

There is a good level of involvement of social partners in supporting the research programmes and providing feedback for improvement of quality and relevance. However, as the renewable energy market is growing, there is a need to get involved with a wider range of renewable energy industries to ensure relevance of the study programme to the future needs of the country.

Expert panel chairperson signature:

Prof. Dr. Abdulnaser Sayma