



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of Energy engineering

At Vilnius Gediminas Technical University

Expert panel:

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Study Field Data

Title of the study programme	Building Energetics	Building Energy Engineering
State code	6121EX053	6211EX059
Type of studies	University studies	University studies
Cycle of studies	First Cycle	Second Cycle
Mode of study and duration (in years)	Full-Time, 4 years	Full-Time, 2 years
Credit volume	240	120
Qualification degree and (or) professional qualification	Bachelor of Energy Engineering	Master of Energy Engineering
Language of instruction	Lithuanian and English	Lithuanian
Minimum education required	Secondary Education	Higher Education
Registration date of the study programme	19 May 1997	27 April 1999

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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 *29th April, 2021*.

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Mr. Henrikas Vaickus, *BSc graduate in Physics of Energy (Vilnius University) and MSc graduate in Financial Economics (ISM)*

1.3. GENERAL INFORMATION

The documentation submitted by the HEI follows the outline recommended by SKVC. Along with the self-evaluation report and annexes, no additional documents has been requested from the HEI before the 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. Together with all European Union countries, Lithuania aims for sustainable, reliable and competitive energetics. The EU Member States have agreed on measures to improve energy efficiency in society, which are defined in the following foremost directives: the Energy Efficiency Directive, the Energy Performance of Buildings Directive, the Eco-design Directive and the Energy Labelling Directive. Energy efficiency is defined as a key priority of the Clean Energy for all EU countries including Lithuania. As a part of the Package, the new amending Directive on Energy Efficiency includes a binding target of a 32.5% reduction in total primary energy consumption by 2030. As one of the measures, Member States are required to carry out a comprehensive assessment of the energy efficiency potential of the heating and cooling sector, taking into account climate environment, cost-effectiveness and technical feasibility. Specific energy efficiency objectives are solved in energy (thermal energy, electricity, gas) production and supply companies, companies that design, install and maintain building heating, ventilation, air conditioning and cooling systems, as well as factories and buildings that use the abovementioned systems.

The National Energy Independence Strategy (2018) asserts Lithuania's need to make a shift from a country importing energy technologies to the country creating and exporting energy technologies. Energy efficiency improvements by implementing building renovation programmes and ameliorating the efficiency of industrial enterprises' production, also renewable energy systems development create a large market for such services and an opportunity to expand employment opportunities and to develop innovative zero greenhouse gas and zero pollutant technologies and human resources' skills. In addition, the country's business development will be supported by promoting the experimental and industrial development of the most promising energy technologies and innovation incubators, green, distributed energy generation, and digital solutions in the field of energy research. The establishment of well-paid jobs and the increase of high value-added exports of energy technologies and knowledge is expected as a result of the implementation of changes in the energy sector and capacity building in Lithuania.

In order to meet the constantly changing needs of the labour market, the specialists in the field of energy engineering shall be able to effectively apply the advanced research knowledge for dynamic technological and economic market solutions.

Information about the role of the HEI

Vilnius Gediminas Technical University (VGTU) is a state higher education institution, established by the Seimas of the Republic of Lithuania. The university is a public legal entity,

operating as a public body. VGTU is one of the largest higher education institutions in Lithuania and the leading technical and engineering university in the Baltic states.

VGTU has two governing bodies, the Council and the Senate. The vision and mission of the university, principles of staff recruitment and assessment are approved by the Council. The Council controls and approves the university budget and strategic action direction. The Senate is the governing body for the university's academic affairs. Five permanent committees work under the Senate: Research Committee, Studies Committee, Students Committee, Development and Quality Committee, Legislation and Ethics Committee. University is managed by the Rector, who is in charge of the University performance and deliverables. Rector's orders and instructions are mandatory for all University staff and students. Rector delegates some of his functions to the Vice-Rectors and the Chancellor. Upon the Rector's recommendation, the number of Vice-Rectors and their functions are approved by the University Council. General University academic affairs are addressed by the Rectorate, which is led by the Rector. The Rectorate consists of Vice-Rectors, Deans of the Faculties and representatives of several other University units. Academic affairs are regularly discussed at the Rectorate in the presence of the Heads of Departments. The most important issues also may be brought for the discussion at the University Council, the Senate, Faculty Councils or Faculty Study Committees. The Rector approves the members of Faculty Study Committees, which are responsible for the study programmes quality. The abovementioned management structure supported by the existing interrelations is sufficient and appropriate for study programme implementation.

VGTU is a technical university with the majority of the study programmes belonging to the field of engineering. University operates in 29 study fields and the following groups of study fields: Engineering, Informatics, Mathematics, Technologies, Social Sciences, Business and Public Management, Humanities, and Arts.

Only two study programmes are implemented within the Energy Engineering field – one Bachelor's degree and one Master's degree. In total 270 students had graduated since the introduction of the first Bachelor's degree studies in the field of Energy Engineering in 2010. The field of Energy Engineering is closely related to the Energy and Thermal Engineering field of study; however, it is also linked with the fields of Mechanical Engineering and Civil Engineering, which is reflected in the research publications of the Department of Building Energetics staff.

II. GENERAL ASSESSMENT

Energy engineering study field and first cycle at Vilnius Gediminas Technical University 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	4
3.	Student admission and support	3
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	3
7.	Study quality management and public information	3
	Total:	24

*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.

Energy engineering study field and second cycle at Vilnius Gediminas Technical University 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	4
3.	Student admission and support	3
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	3
7.	Study quality management and public information	3
	Total:	24

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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

There is a need of graduates at both Bachelors and Masters levels to meet the demand in the energy market that is growing as a result of moving towards clean energy. This is of paramount importance as the country aims for sustainable reliable and competitive energy. This is also important as the county is required to meet the binding targes of 32.5% in total primary energy consumption by 2050.

The SER for the first and second cycle programmes provide the total number of people in the EU engaged in the energy sector with breakdown of numbers for each type of broad activity and speciality of the employees. Of importance is that around 5-10% are engaged in research and around 20-32% are engineers. In Lithuania 30,000 engineers were engaged in 2020 in the field of supply of heat, gas, electricity and energy for engineering structures. It is also stated the around 6000 energy engineering specialists with higher education are needed in Lithuania.

The SER however does not provide information about the size of the market in Lithuania nor the number of students available to enrol in this study field at VGTU and other competitors.

During the visit, it became clear that currently VGTU is the only university in Lithuania offering education in building energetics. Social partners provided further insight into the need for graduates from these programmes to the job sector in Lithuania and that they regularly find employment in the field.

(2) Expert judgement/indicator analysis

The aims and outcomes of the Bachelor of Building Energetics and Master in building energy engineering study programmes are in conformity with the needs of the society and the labour market.

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 university mission is to develop socially responsible, creative and competitive individuals receptive to science the latest technologies and cultural values to promote scientific progress, social and economic well-being; and to create value that ensures the development of both Lithuania and the region in a global context.

The building energetics Bachelors and building energy engineering Masters programmes aim to educate specialists who would be able to analyse and model energy conversion processes, identify, formulate and solve the engineering problems related to heat production, conversation, heat, gas supply, consumption as well as indoor air quality, design and use new and existing energy, thermal equipment and systems characterised by high efficiency, cost-effectiveness, quality, reliability, sustainable demand of resources and environmental impact

(2) Expert judgement/indicator analysis

Building Energetics and Building Energy Engineering programmes aims and outcomes are in the conformity with the mission of VGTU, which is to develop a publicly responsible, creative, competitive individual who is receptive to science, the latest technologies and cultural values; to promote scientific progress, social and economic well- being; and to create value that ensures the development of both Lithuania and the region in a global context.

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

(1) Factual situation

Tables given in the Self Evaluation Report show that the number of ECTs conforms with or exceeds the legal requirements for each category both for the Bachelors in Building Energetics and the Masters in Building Energy Engineering programmes. These are broken down as follows: Courses within the study field constitute 64% of the total programme volume, fundamental worldview, humanities or art study courses – around 6%, compulsory other study field courses – around 5%, specialisation courses – around 23%, electives – around 2% (6 credits).

The programme includes as many as three-level practice (traineeship): educational, training and career (18 credits in total). 15 credits are allocated for the preparation and defence of the final (graduation) thesis.

(2) Expert judgement/indicator analysis

Bachelor of Building Energetics and Master of Building Energy Engineering study programmes are in compliance with applicable legal requirements of the field and cycle study programmes.

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 aims of the study programmes are to provide knowledge in Energy Engineering, specifically in relation to building energetics, to develop the ability to find and apply new engineering solutions for buildings (first-cycle programme); to provide knowledge in building energy engineering (second-cycle programme).

The relation between study subjects teaching methods and the learning outcomes are clearly shown in the special matrix in Appendix 3 and Appendix 4. The matrix specifies the learning outcomes. They are in line with the provisions of the EUR-ACE Accreditation standard for engineering study programmes and cover six groups defined in the standards, in compliance with the parts provided for under the Description of Study Cycles.

Three key conventional study methods are employed for delivery of the theoretical materials: traditional lecture, consultation seminars, lecture by teacher-practitioner. A good share of the subjects (modules) include active learning methods, such as individual project, technological project, design-based thinking, creative workshop, etc. and support the subject (module) learning outcomes to be achieved.

(2) Expert judgement/indicator analysis

The Self Evaluation Report provides the overall aims and objectives of the study programmes in relation to knowledge related to the building energetic sector and ability to provide and apply new engineering solutions **for buildings depending**.

The learning outcomes, study and assessment methods conform with what is expected from both 1st and 2nd cycle programmes of study.

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 SER describes the distribution of various types of courses throughout the programme starting with general material and fundamental courses at the start, moving to specialised topics and finally project and research topics.

Students have the opportunity to study general and transferable skills topics at the early part of the programmes and focus more on specialised knowledge at the later parts.

By analysing subject/modules descriptions the experts have found that the list of literature sources is, to a reasonable extent, up to date. Staff are engaged in research and thus feed their research experience into their teaching. However, from talking to staff, it is clear that latest knowledge provided to students is related to topics of research at the University, while the wider latest knowledge is not adequately conveyed to students.

(2) Expert judgement/indicator analysis

The structure of the study (bachelor and master) programmes ensures consistent development of competences of students.

The team has been working improving the study programme subject and they should be encouraged to keep all the programme subjects' descriptions up-to-date, keeping pace with

the fast-changing energy sector, particularly from the wider body of recent research as opposed to teachers' research projects only to widen the perspective of students.

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 programme offers a limited number of electives in the fourth and sixth semesters for the 1st study cycles programme from general university level courses. It also offers electives for studying languages.

Students can also follow a study plan in terms of specialised courses that needs to be approved by the Dean.

(2) Expert judgement/indicator analysis

Students of Energy Engineering study programmes (bachelor and master) have good opportunities to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes. This was also confirmed from the interviews with the students and alumni.

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

(1) Factual situation

Students can choose a topic for the final thesis that is in the area of their interest. Topics can be proposed by lecturers or social partners representatives and students. Students can decide on the final topic by themselves or choose from a list of topics.

Essential requirements for the Bachelor's final thesis: the student shall apply the basic and special knowledge of the field of study, demonstrate the ability to independently collect and analyse data, evaluate and solve problems, develop technically, energetically and economically efficient engineering solutions that demonstrate a holistic approach taking into account costs, benefits, safety, quality, reliability and environmental impact aspects, provide alternative solutions for different types of buildings (premises), apply innovative energy system technologies to energy consumers.

The commission for assessing theses consists of five members, three of whom at least must have a science degree, one at least must be from another field of study.

(2) Expert judgement/indicator analysis

Bachelor and master final theses are in compliance with the field and cycle requirements. Involvement of social partners in proposing project topics and the commission assessing the final theses provide the necessary industrial relevance to the projects.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Both study programmes are unique in the country
2. There is a clear need for graduates from these programmes to the job market

(2) Weaknesses:

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

(Mostly it is the same for master and bachelor)

According to the Self Evaluation Report, the main field of research carried out by the Department of Building Energetics within the area of Technological Sciences is the Energetics and Thermal Engineering. The main research area is Environmental and energy technologies with the following topics: Efficient use of resources and energy; Building energetics; Renewable energy. Ongoing projects presented in Self Evaluation Report demonstrate the links between research, the field of study and the content of the programme. Regular cooperation with other HEIs and social partners has been held in the related field of studies traineeship. Teaching staff and researchers must conduct applied research, they shall dedicate one third of their working hours to research activities.

During the interviews, it was confirmed that the university administration created good 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. In addition, it was noted that the university organizes student scientific conferences and encourages students to present results at these events.

(2) Expert judgement/indicator analysis

Staff and students under its leadership are competent to successfully conduct research, participate in projects, conferences, present research results. There is a sufficient level of science, the university creates the conditions to do research at the required level. The conditions created for the staff in forming the pedagogical load are within the requirement of the HEI in order to achieve the learning outcomes and show good scientific results.

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 Self Evaluation Report, the study content is linked to the latest scientific and technological developments through the personal competence of teaching staff who is involved in research projects for technological development and innovation. Participation in international

programmes, international and national R&D projects is encouraged together with the development, patenting and commercialisation of new technologies. The research activity plan of the Department of Building Energetics 2020-2023 is presented in SER. The study programme seeks to balance students' interests and needs, the teaching staff requirements and partnerships with key university community stakeholders. Students express their interests and needs by choosing the topics of their course projects or final theses.

During the interviews, the most statements made in the self-analysis were confirmed.

(2) *Expert judgement/indicator analysis*

Students are involved in scientific activities through projects and customised research when working in laboratories. All Master's degree students carry out relevant national and global research in the scientific field of their studies. The initial study course on scientific research and innovation is the first stage for the students to start analysing research methods, work on problem formulation, scientific paper preparation. Postgraduates have the opportunity to focus more on experiments in their final work while working in laboratories.

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 Self Evaluations Report states that all students are actively involved in scientific and educational projects and exhibitions, such as "Researchers' Night", "Spaceship Earth". Practice for the second-year students involves an analysis of the actual energy consumption of buildings, students receive individual assignments during the career practice. Hereby, students learn how to complete specific tasks and are taught critical thinking and proper data analysis. Bachelor's theses also contribute to the development of analytical skills, where each student must perform an analysis of alternative design solutions. All these activities prepare students for further studies at the master's level.

Some Masters students are part-time recruited in the Department laboratory especially during the final thesis preparation stage. Students are encouraged to participate in conferences and prepare joint publications with the academics. In 2017, 2 Master's degree students were employed in the Department and two students - in 2018 one of each cycle; in 2019- 1 undergraduate student was employed, while the graduates with Master's degree continued their studies in PhD. Students are involved in scientific activities through projects and customised research when working in laboratories. All Master's degree students carry out relevant national and global research in the scientific field of their studies.

Interviews showed that the final thesis is related to either 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. Cooperation with social partners takes place more randomly as a result of good and close contacts.

(2) *Expert judgement/indicator analysis*

The students of the programme actively participate and present their reports annually at the conference "Science – the Future of Lithuania" "Building Energy" organised by the university, participate in scientific-educational projects and exhibitions. The results of the final works of students, together with the scientific papers of the staff of the Department are also published in

the periodical peer-reviewed scientific journal "Science – the Future of Lithuania", 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. There is the right link between science and study at the institution.
2. Excellent conditions are created for teachers and students to do scientific work.
3. Encouraging students to carry out scientific and applied research and present results at particular conferences.

(2) Weaknesses:

1. Cooperation with social partners in research takes place more randomly and as a result of good and close contacts.
2. Social partners could be involved in improving study programme regularly and in a planned manner.

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 student's admission process is organized according to the governmental regulations of Lithuania. During the last few years, the minimum competitive score for state-funded places was gradually increased and reached 5.4 in 2019. That ensures that only highly capable and motivated students are admitted to HEIs. Additional points are added for students with achievements in related spheres. There are part-time studies (2 year) of Building Energetics for those, who graduated in colleges, but want to increase their competence and obtain university diploma. There is an option to study the full-time program in English.

In case of Building Energetics, the admission results have a negative trend. During 2017-2019, there were accordingly 23, 25 and 11 students admitted. The average competitive score was accordingly 5.36, 5.64 and 7.02. The total number of applications were 116, 137 and 100. The admission to part-time studies remained more-less stable and in 2017-2019 there were admitted accordingly 13, 13 and 11 students.

In case of Building Energy Engineering, the requirements for applicants are quite strict: they are expected to have a bachelor's degree in a related engineering program and concrete numbers of credits in fundamental and specialised courses. The trend of admission results is negative: in 2017-2019 there were accordingly 15, 12 and 10 new students. The average competitive score in the period of evaluation was over 10 (due to extra points system used in admission process). The number of applications also significantly decreased in 2019: there were 20 applications, while in previous years it was over 30.

The management state that due to complicated situation with students' attraction, additional actions are done: more attention paid to job market analysis, there is some promotion at schools.

The admission requirements and the field itself are publicized in traditional ways: webpages, study fairs, social media, local study events.

(2) Expert judgement/indicator analysis

The increase of minimal competitive score in 2019 for state-funded studies had a negative impact on admission results, since until then a large part of enrolled students had a lower competitive score than a new threshold. As a result, numbers of enrolled students dropped. The study field and its promotion have to be reoriented for students with higher achievements, in other case admission problems may become critical. The number of students in master's programme is steady decreasing. The self-evaluation report state that only external reasons impact this trend. In general, Energy Engineering field has to have a concrete plan and a list of actions, which would allow to stabilize the situation with admitted students for the future. At this point it seems that there are no systematic actions to solve it.

Regarding the promotion of bachelor's studies, unique specifics of the studies could be developed further: double degree option, studies in English. By improving recruitment to the Bachelors degree, the Master's programme could secure a steady flow of new students.

To conclude, the situation with students' selection and admission was acceptable, but there may be serious issues in the future, if additional actions will not be taken.

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

In 2017-2020 there were 13 students, who received a double diploma (in cooperation with South-Eastern Finland University of Applied Sciences). In the same period, 28 students participated in academic mobility. Both groups of students got a recognition of their achievements abroad.

The information which was provided by the university during the evaluation is related to the recognition of foreign studies and qualifications. However, there is no attention for partial studies, non-formal and informal studies recognition. There was only a short comment that university is flexible regarding the studies/qualifications' recognition.

(2) Expert judgement/indicator analysis

It is clear that the study field has a lot of positive experience in recognition of foreign studies. There is no doubt, that procedures are adequate and correctly applied, since the university is running double-diploma programme, and it has enough experience with mobility programs. On the other hand, there are no description or examples for partial studies, non-formal and informal studies recognition – that is an area for improvement. Students have to be informed, that their previous experience and achievements can be recognised.

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

(1) Factual situation

The study field academic mobility focuses on Erasmus+ program and the double-degree diploma. There is a staff member who is responsible in mobility programs and students' consulting – the international coordinator. During the period of evaluation, 15 students of the bachelor's program participated in academic mobility programme. In the same period, there were 98 upcoming students from abroad.

In the case of master's programme, only 1 student took a part immobility program back in 2017. A high percentage of working students is the main argument.

(2) Expert judgement/indicator analysis

Despite the fact that there was not much data about students' encouragement and support, data of participants reveals that conditions for academic mobility are very good. Also, there is an outstanding achievement in case of incoming students. It is clear that the management created a good image for partners abroad. Therefore, the international studies on bachelor's level is a strength of the study field.

In case of master's programme, the situation is different – there is almost no students' mobility. It seems that a high percentage of working students is taken as a main argument. Well, the management could take a deeper look to the reasons of low mobility. It is possible to maintain at least small students' mobility, since surely not every student is employed. In cooperation of students, management and employees, even working students sometimes are able to take a part in mobility programs.

Another positive thing is popularity of internships: it seems that they are well-promoted and high-valued among students.

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

The academic support begins with "Introduction to Studies", where first-year students learn the main principles of studies. The study field has a developed system of mentors (senior students) and tutors (lectors), who help students to go through academic processes more smoothly. In addition, mentors are the intermediates between students and students' representation. Moodle is used as a main tool to provide students with required materials. Students feel encouraged to participate in scientific research, some of them have an experience of writing scientific articles and presenting findings at conferences. There is a culture to base the study process on scientific articles. Both students and lecturers state, that academic problems are solved quickly and in fluent ways.

On the negative side of academic support, there is evidence that academic dishonesty is partially tolerated. The meeting with students revealed that a big part of them had faced academic dishonesty during their studies. Moreover, after noticing academic misbehaviour, lecturers do not always make formal records, also, informal sanctions are used – students are able to have a retake on the same semester.

Regarding social support, students are provided with dormitories. A big part of them is in the process of renovation (or already renovated). There is an efficient system of social and academic scholarships. One-time scholarships are provided for the achievements in sport or

culture spheres. In addition, by the governmental regulations, students have access to state-supported study loans.

Students have access to psychological consultations and career counselling – but they are not very popular.

Based on the self-evaluation report and students' opinions, the students' representation is strong: it helps to satisfy both social and academic needs of students.

(2) Expert judgement/indicator analysis

In students' opinion, surveys ran too often, moreover, some often are too complicated (requires too much time). The main point is that giving opinion in surveys later do not result in better academic or social support (or it is not appropriately communicated).

The areas of academic, social and financial support seem to be appropriate.

3.3.5 Evaluation of the sufficiency of study information and student counselling

(1) Factual situation

First year students have "Introduction to Studies" events, which allow new students to adapt to university life. Students' opinion about introduction is positive. Each module has a number of hours dedicated for students counselling on academic subjects. Lecturers are reachable by email, telephone or in the office (by the schedule). During the Covid-19 pandemic period, consultations were successfully held online. Students are very satisfied with the quality of counselling and feedback on their assignments and assessments, the process of thesis writing is smooth due to good counselling. However, in the case of each new module, students feel that the provision of information is not perfect: sometimes a few lectures have to pass in order for students to catch up a study system.

(2) Expert judgement/indicator analysis

In the level of module, a unified system of students' information should be introduced. That means that each lecturer has to be prepared to clearly explain the structure of studying and requirements of assessments – it has to be done on the first lecture.

The introduction of first-year students to studies is sufficient, students' feedback is positive. The students' counselling and feedback on their assignments/assessments is done very well and makes studies process much easier.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Strong institution of students' representation.
2. High quality students counselling and feedback on their assignments.
3. Strong position in academic mobility of bachelor's students, outstanding results in attracting part-time students from abroad.

(2) Weaknesses:

1. In a long-term, Energy engineering field do not have a strong position in attracting students, since there are signs of decreasing popularity.

3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

Studying, student performance and graduate employment shall be evaluated according to the following indicators:

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

The study process of the programme is constructed of lectures, exercises, laboratory work and individual work. During the studies, students prepare the reports, complete the tasks provided in the course card - home assignment and course paper, coursework and complex projects.

The studies are organised in semesters consisting of a 16-week-long courses and 4 weeks of exam sessions.

The SER provides a clear description of the studies and assessment process within distribution in hours and the processes that VGTU follows to ensure quality.

The schedule of the courses is constructed by a staff member appointed by the Dean of the Faculty, and the approved schedule is published on the internal web pages. There is a clear process of informing students about the process and timing of assessments and exams.

The SER also provides description of the online teaching processes developed and implemented because of Covid-19 related restrictions.

Further opportunities for graduate studies are described.

(2) Expert judgement/indicator analysis

The study process and learning methods are clearly described and presented in the SER. The students are involved in the process throughout their studies and through interim assessments.

Where studies focus on the self-study process, more attention must be paid to consultation with students and monitoring of the 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 university applies a flexible schedule of assessments for students with a disability considering their needs and level of disability. In cases of severe disability, students are partially or completely exempt from tuition fees.

Special arrangements are put in place for students with mobility disabilities: sanitary facilities, elevator for the disabled, access the canteen, cloakroom on the ground floor as well as auditoriums on the second floor and laboratory building.

The University provide lectures to teaching staff about mental disability (identifying psychological difficulties and learning disabilities, effective communication, support and referral).

(2) Expert judgement/indicator analysis

From the information provided in the Self Evaluation Report, the university is adapted for students from socially vulnerable groups and students with special needs. Participation in additional projects strengthens and educates the institution and staff. However, proactive training and discussion are very relevant ways to educate the community and to get them to be prepared for potential challenges.

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

Systematic progress of the students in the field is monitored at the Committee level of the University, Faculty, and that of the Study Programme. Formal control of study results is carried out by the administration of the faculty based on study procedures approved by the University.

The process, responsibilities and monitored data are analysed and provided in the SER. Additional data are compared to data from other study programs.

(2) Expert judgement/indicator analysis

The progress of the students in the study field is monitored and the process is clear. The data of the evaluated study program are compared with other programs and this enables to monitor their level and students' achievements.

Comparison with other peers would provide a more complete picture and give ideas as to how the process could be improved.

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

The SER states that a survey methodology approved by the university is used to collect feedback about the study process. Results are available for all parties and are discussed at Rectorate, meetings of academic university units and Study Programme Committees as well as at meetings with students.

Since 2019, the survey results have become available to students via University intranet.

Members of the Study Programme Committees regularly attend their study programme lectures in order to share the best teaching practices with other academic University units.

(2) Expert judgement/indicator analysis

The report and the visit show that surveys are used to receive feedback. However, as indicated by the representatives of the university, the response rate is not very high, so it is necessary to explore other methods to gather feedback and information.

The visit revealed that there is no systematic approach and procedures for providing feedback for the students about their study process performances, it depends on each teacher's abilities.

One of the good practice examples is, that the members of the Study Programme Committees regularly attend their study programme lectures in order to share the best teaching practices.

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

(1) Factual situation

In the field of study, the employment and career of graduates are monitored, and information related to graduate career tracking is provided. The collection of feedback on employed graduates and graduates' feedback on completed study programs is provided.

The SER of the first study cycle program provides a comparison of employed graduates of this program with other educational institutions.

During the visit, employers expressed the view that students who have completed the study program are properly prepared to enter the market.

(2) Expert judgement/indicator analysis

Information on employability of graduates and graduate career tracking examples in the study field is provided.

The low level of involvement of graduates and employers in providing feedback suggests that other methods need to be explored to gather their feedback.

During the visit, students expressed a desire for the university to interact more with prospective employers.

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

(1) Factual situation

According to the SER, teaching staff and students must follow the principles of academic integrity defined in the Code of Academic Ethics, approved by the Resolution of university Senate. The procedure of the policy regulation is provided.

Upon enrolment, each student should sign the Declaration of Integrity of a Student, which is valid throughout the entire duration of the study contract.

(2) Expert judgement/indicator analysis

The principles and processes of the policy of ensuring academic integrity, tolerance and non-discrimination implementation is described comprehensively. The documents provided and rules enable the members of the university to know and act according to the established rules. However, a single acquaintance with the process may not always ensure full compliance. Re-introduction through tests and videos could improve everyone's understanding and adherence.

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 University has a description of the procedure for submitting and examining student appeals and complaints in place. The process of appeal or complaint is described in the SER.

In the SER it is mentioned that student representations regularly inform students that appeals, and complaints can be filed if a student encounters an injustice in the assessment or misconduct in the declaration of good faith.

Within the period of this self-evaluation, no written appeals or complaints regarding study programmes were submitted.

(2) Expert judgement/indicator analysis

The application of the procedures for the submission and examination of appeals and complaints regarding the study process is described. The involvement of student representations in addressing these potential issues is crucial.

To ensure their intervention, the process describing how student representation can provide appropriate assistance should be made clearer.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Deep analysis of students' achievements and comparison with other programs.

(2) Weaknesses:

1. Insufficient involvement and promotion in attracting potential students.

2. There is no clear and consistent process to give students feedback on their work and assessment results.

3. Low rate of feedback from graduates and employers can make it challenging to improve study programs.

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 the Self Evaluation Report, for Bachelor studies, there are 73 lecturers involved in the bachelors' studies, with 53% working in the Building Energetics programme. Most of them have more than 3 years of required experience, but with the majority having more than 10 years' experience. Their scientific interests are within the topic of the study field and with the wide topics related (maths, computer science, engineering). Moreover, 24% lecturers have practical experience in the field. Finally, more than 70% lecturers hold a PhD.

The lecturers-student ratio has increased from 0.39 in 17-18 to 0.61 in 19-20, due to the decrease of students. There is a process for the integration of young academics and the development of their career.

For Master studies, there are 13 lecturers involved in the masters' studies. Most of them have more than 3 years of required experience, but with the majority having more than 10 years' experience. Their scientific interests are within the topic of the study field and with the wide topics related (energy engineering). Lecturers have an average of around 1 paper per year per lecturer.

The lecturers-student ratio has increased from 0.48 in 17-18 to 0.61 in 19-20, due to the decrease of students (from 29 students to 23).

During the visit, lecturers show good enthusiasm about the study field and they have the right background to achieve the learning outcomes. About 50% of the lecturers involved in master studies are advising today a PhD student.

(2) Expert judgement/indicator analysis

For Bachelor studies, the number of lecturers and their scientific interests are adequate to the program, with enough experience in educational and scientific fields. It is excellent that there is a path for the development of young academics.

For Master studies, the number of lecturers and their scientific interests are adequate to the program. Their research outcome is within the worldwide average. Their involvement in supervising PhD is good.

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, for Bachelor studies, the University has a variable remuneration system that include up to 60 indicators and is aimed at motivating the staff to be active in different areas of academic and research activities. These indicators include the following activities: teaching visits to foreign universities, participation in studies-related seminars approved by a certificate. Delivering lectures/seminars abroad for at least 8 hours provides the teaching staff members with 0.8 (maximum 1) point per academic year. In this way, the participation of teachers in exchange programs is encouraged. Moreover, the Faculty has well set-up Erasmus+ exchanges.

Other than scientific conferences, an average of 20 lecturers per year went abroad in teaching courses, incoming lecturers were around 3 per year.

For Master studies, one of the most important forms of promoting the teaching staff mobility is the public communication. The mobility of staff is balanced between outgoing and incoming staff, with an average of 4 and 3 lecturers, respectively.

The main objectives of the academic staff mobility are to deliver lectures under Erasmus+ or other exchange programmes, discuss the project ideas, discuss the ideas for international scientific project applications, or join the ongoing project meetings, and/or participate in scientific conferences and internships.

Interviews during the visit showed that mobility initiatives are funded by the university central funding. The mobility is planned by the department every year and 100% funding is provided. Moreover, if ad-hoc activities arise, the department usually also provides the funding.

There is centralized project on cooperation university-industry that allows staff from international companies to give lectures or visits to VGTU and allows lecturers to go abroad on-site visits to those industries.

In the past, some foreign lecturers have been hired for several months by VGTU. Staff confirmed that academic mobility is ensured at the university.

(2) Expert judgement/indicator analysis

For Bachelor studies, the variable remuneration system encourages mobility in lecturers, which can be seen in the number of lecturers going abroad yearly, nevertheless, the number of incoming lecturers is much lower. Efforts on improving the attraction of lecturers working abroad should be carried out.

For Master studies, the number of exchanges means that around 25% lecturers carry one each year. The mobility of lecturers is quite low and short even with the good conditions of encouragement and funding availability, this is a weak point.

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

(1) Factual situation

According to the Self Evaluation Report, for Bachelor studies, the Group of Educational Competencies of the VGTU Academic Support Centre organises the seminars and courses for the training of teaching staff. Lecturers undertook a high number of courses and seminars in the period of evaluation, both internal (as explained before) and external.

By participating in projects, teachers improve their competence in the subjects they teach.

For Master studies, the teaching staff with the university employment duration of up to 10 years are recommended to improve their didactic qualification taking 40 hours of the education/didactic competence course during the period within the employment in the position, if the employment duration is over 10 years- 20- hour- course must be taken during the period of the employment in certain position. Moreover, the same comments as for bachelors' can be added here.

The number of educational competences shown in Annex 6.3 are high and within the study of field. By participating in project activities, teachers improve their competence in the subjects they teach.

The interviews during the visit showed that recently a lot of training has been carried out on e-training. Lecturers can also attend e-training from other institutions or universities. The Centre does not include training on research aspects.

The real work of the study committee in improving the study programs and making decisions is not completely clear. During the meeting the lecturers said that they do not vote for decisions in the study program committee, which would show that they cannot make proper decisions and prepare correct minutes without voting.

(2) Expert judgement/indicator analysis

For Bachelor studies, the number of courses, their scope and the number of lecturers undertaking them are good.

The real work of Study Committee in improving study was not given to a satisfactory detail in the self-evaluation report or from interviews during the visit.

For Master studies, the number of course, their scope and the number of lecturers undertaking them are good. Nevertheless, such training is focussed on educational skills, there is a lack of training offers related to research aspects (i.e. how to write a scientific paper for young researchers, how to write a research proposal, IPR and patents).

The real work of Study Committee in improving study program is not very clear.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Good level of training to staff and with the right background to achieve the learning outcomes
2. It is excellent that there is a path for the development of young academics.
3. The Group of Educational Competencies of the VGTU Academic Support Centre organises the seminars and courses for the training of teaching staff. Lecturers undertook a high number of courses and seminars in the period of evaluation.
4. Staff are actively involved in various projects and thus improve their competence.

(2) Weaknesses:

1. The mobility of the staff at master level is quite low. Moreover, incoming lecturers and researchers are very low.
2. There is a lack of training opportunities in research related topics.
3. The real work of the study committee in improving the study programs and making decisions is not completely clear. The lecturers mentioned that they do not vote for decisions in the study program committee, which would show that they cannot make proper decisions and prepare correct minutes without voting. The regulation requires voting.
4. When subject theory and labs are led by two different faculty members students notice that faculty members do not always agree on requirements.

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, for Bachelor studies the studies are carried out in auditoriums, laboratories and computer classes (no number of each is provided, but m²). The faculty is upgrading facilities for students' individual work. Hardware, software and internet connexion is provided widely. Highlighter software is MATLAB/SIMULINK and AUTOCAD-REVIT with licenses for students. There is an extensive number of laboratories covering all topics of the study field.

The University is fully adapted for the students with disabilities.

The Department is cooperating with around 60 companies that offer traineeship opportunities to students.

The library resources are extensive and covering all required needs for training and research. The videos provided show extensive and complete laboratories.

For Master studies, the information given is exactly the same as in the bachelors' studies.

During the visit, interviews showed that lecturers have assistants for the laboratories. Safety training for students work in the laboratory is well organised. Students stated that some computers are not powerful enough for simulation work.

The dormitories are renovated, comfortable, and have good internet connection.

The maintenance of laboratory has enough funding. Lecturers take care of the laboratories, but when needed there is maintenance staff.

Since no certification laboratory is available at VGTU, researchers carry out measurements of new equipment for industry before being sent for certification, usually outside Lithuania. Some of this equipment remains at the university and it is used later by students (master, PhD).

The resources in the library are enough, both in English and in Lithuanian, but also in other languages. The library has free access to standards to lecturers, but also for students. Enough electronic resources are available at the University.

External access to electronic material and laboratories for students is very good, even to simulation software.

Internet connexion with cable is very good, but wifi is not perfect along all the laboratories. The IT service is very good.

(2) Expert judgement/indicator analysis

For all studies, auditoriums and laboratories are available. Hardware and software is extensive and adequate; students have licenses that allow work from home. Equipment in the laboratory is extensive and adequate.

Laboratories related to renewable energies are more dragged by research than to a good plan with enough funding from the faculty/university.

Computers are available, although the renovation rate is a bit too low. Software availability is very good. IT service is very good.

There is a maintenance service, but since a lot of laboratories come from research, lecturers' involvement is quite high.

Library resources are very good, in books and e-books, and in data bases subscription.

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, around €120,000 are spent yearly for software and € 30,000 for wireless connection. Around 16% computer equipment and 10-15 auditorium equipment are updated yearly.

There is an extensive number of laboratories, but most equipment is quite old, with most installed from the 1980s to 2000s, only a few were installed in the last 10 years. Moreover, some modernisation was carried out in the last 20 years, but longer than 10 years.

During the visit interviews revealed that the University has some funding for renovation of laboratories. Moreover, donations are received. But also, a proportion of research income is used to maintain and update both teaching and research laboratories.

Software licences are paid regularly by the University. There is enough funding to improve library resources by the University.

The upgrading of the infrastructure is more closely linked to the resources available in the projects.

(2) Expert judgement/indicator analysis

Hardware and software are renovated at a quite slow rate (16% per year means that every computer is substituted every 5-6 years, which could be a bit too long). Equipment in the laboratory renovation rate is not enough.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Very good equipment for basic subjects (physics, chemistry, electricity, etc.).
2. Very good equipment for renewable energy related topics, but very related to research activities.
3. Very good library resources and services.
4. Active participation in the project allows to purchase the necessary equipment.

(2) Weaknesses:

1. There is no clear plan for renovation of laboratories, especially those more specialized.
2. Computers' renovation is too low.
3. The upgrading of the infrastructure is more closely linked to the resources available in the projects, help from alumni, 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 self-evaluation report provided details about the quality assurance systems. The main decision-making bodies at the University level are the University Study Committee, the Rectorate and Senate. At the faculty level, the Study Programme Committee (SPC), the Faculty Study Committee and the Faculty Council.

The dean appoints a Study Programmes Committee (SPC) composed of teaching staff of the department, social partners and students' representatives and chaired by the Head of the programme. The SPC is responsible for programme preparations and submission for internal and external evaluation and accreditation. SPC is also responsible for identifying issues that need improvement or change and implementing these changes.

This structure resembles the general organisation of quality issues in European Universities.

Internal quality is governed by a number of legal documents: Description of the model of research and study quality management system, University strategic development plans, Statute, Study regulations; University procedures; quality policy of university units; programme and module descriptions, methodologies, procedures and other internal and external documents that regulate University study and research activities.

The expert panel was concerned about the number of legal documents that members of the SPC need to comply with in their operation and decision making. During the visit, the expert panel was assured that there is a shorter document containing the main guidance and that decisions by the SPC are reviewed for compliance by experts from the university.

The quality of studies is ensured by applying internal study quality assurance system, external study assessment and accreditation of studies for the entire university and participation of all staff, students and social partners in the process of quality improvement of studies.

(2) Expert judgement/indicator analysis

The instruments and processes the university uses are generally well-developed and are suitable for improving the quality of teaching. The senior management and SER staff convinced the panel that all groups are familiar with the instruments and processes and use it in the way the report describes.

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

(1) Factual situation

The self-evaluation report states that the university involves social partners in the process of evaluation and improvement of the field of studies. It states that it carries out the following activities:

- Supports and develops student's participation in study quality assurance activities through involvement of students in university bodies and committees.
- Organises regular feedback from social partners using surveys.

The general results of the feedback are discussed at the meetings of the Rectorate, Dean, University Studies Committee and SPC. Survey results are available to teaching staff on the university website. Results of feedback surveys are used by SPCs to improve study programmes. Every year Deans of the faculties provide the summary of the activities completed in the faculty, taking into account the proposals of students.

The self-evaluation report does not provide adequate description of the students' feedback collection methods; however, the expert panel was assured during the visit that adequate processes are in place.

During the visit, students interviewed pointed out that there is widespread cheating in examinations and coursework which is not taken seriously by teachers or the university. Students also mentioned that there is a lack of communication to them about measures taken by the University to address their concerns provided in their feedback and that they do not notice changes following feedback given.

(2) Expert judgement/indicator analysis

The report and the confirmation by teachers and social partners indicated that the involvement of these stakeholders including students is adequate.

The panel has some concern about the lack of response to students following their feedback and the possibility that the issues they raise are not addressed as raised by one student. The university may need to explore the extent of this issue and if found necessary, to put in place a robust process to address students concerns and communicate the results to them.

The university may need to review their academic misconduct and cheating handling processes and if found necessary to put a more robust reporting and investigation methods and subsequent measures to reduce or eliminate these incidents if they are found to be widespread.

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 SE self-evaluation report provides details the publication of information on studies and their evaluation and improvements process. The study programmes objectives and learning outcomes are presented on the university web pages as well as the internal web pages (Intranet). Links to the university website are available to external parties such as pupils and social partners.

Faculty administration and teaching staff use an internal web-based system with multilevel of access depending on access permissions.

The self-evaluation report does not provide sufficient detail on the process of collecting and analysing data. However, questions were asked during the visit which shed more light on the data collection and analysis process which are considered to be adequate.

(2) Expert judgement/indicator analysis

Common processes are used to publish information on studies and their evaluations and the improvement process. Although the SER did not provide sufficient details on the data collection and analysis process, the expert panel were led to believe during the visit that the provision by the institution is adequate.

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

The survey of students uses the LimeSurvey application, and the Oracle database on a web-based system on the university website. A graphical representation of the survey system is reported in the SER, page 39.

Student surveys are carried out periodically during lectures, which aims to share examples of good practice at the University, and hence to contribute to dissemination of the survey results through various means such as public presentations that aim to lead to sharing best practice on best teaching experience and initiating the use of teaching innovations.

The SER did not provide sufficient detail on the quality and quantity of the surveys, but during the visit, the expert panel found out that the number of surveys conducted on students is excessive and does not have good focus.

(2) Expert judgement/indicator analysis

The expert panel believes that the quality and quantity of students' surveys requires improvement. There are too many surveys of students that may lead to survey fatigue, but also the quality of the surveys requires improvements

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Good inceptions with social partners and alumni.

(2) Weaknesses:

1. Excessive number of surveys of students.

IV. EXAMPLES OF EXCELLENCE

The programmes of study field have strong international collaborations and links.

Lecturers are provided with good opportunities for personal development including international engagements.

Staff are provided with financial incentives and support to undertake research.

A unique programme in the country for this kind of study.

Strong position in academic mobility of bachelor's students, outstanding results in attracting part-time students from abroad.

The university provides a clear path and process for the development of early career academic staff.

V. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	<p>The overall aims and objectives of the study fields are providing knowledge in Energy Engineering, specifically in relation to building energetics, it would be useful to provide for the institution to further emphasise the uniqueness of these programmes in the country.</p> <p>The institution is encouraged to accelerate the pace of keeping the all the programme subjects' descriptions up-to-date, particularly from the wider body of recent research as opposed to teachers' research projects only, to widen students' perspective, in the light of the fast changing energy market.</p> <p>More effort should be paid to promote the programmes among potential students to reverse the decline in recruitment</p>
Links between science (art) and studies	<p>A more systematic approach is required for collaboration with social partners in research projects.</p> <p>A more regular and organised involvement of social partners in improving study programmes needs to be implemented</p>
Student admission and support	<p>The declining student recruitment is of concern at least in the short term and requires a specific action plan, beyond the current practice of providing presentations to school children.</p> <p>The university should review claims by students on academic misconduct and, if found necessary, provide an action plan to crack down on student's plagiarism and collusion during assessments.</p>
Teaching and learning, student performance and graduate employment	<p>It is recommended that a clear and consistent process is set up to give students feedback on their work and assessment results and to provide better information to students at the start of the semester.</p>
Teaching staff	<p>Improvements are required for mobility of staff teaching at the second cycle level.</p>
Learning facilities and resources	<p>The university should provide more funding to develop and maintain laboratory equipment which currently relies mostly on research projects funds.</p> <p>There is a need to have a plan to continuously modernise and update computers used by students</p>
Study quality management and public information	<p>The quantity and quality of student's surveys require improvement. There is currently excessive number of surveys which may lead to student's fatigue.</p>

VI. SUMMARY

The building energetics Bachelors and building energy engineering Masters programmes aim to educate specialists who would be able to analyse and model energy conversion processes, identify, formulate and solve the engineering problems related to heat production, conversation, heat, gas supply, consumption as well as indoor air quality, design and use new and existing energy, thermal equipment and systems characterised by high efficiency, cost-effectiveness, quality, reliability, sustainable demand of resources and environmental impact. VGTU is the only university in the country offering these specialisations.

The aims of the study programmes are to provide knowledge in Energy Engineering, specifically in relation to building energetics, to develop the ability to find and apply new engineering solutions for buildings (first-cycle programme); to provide knowledge in building energy engineering (second-cycle programme). The institution needs to be more specific about the aims and objectives to provide more clarity to prospective students and employers.

The university administration provides good conditions for undertaking scientific and activities and for staff and students to participate in research work and external projects. Topics of the research are closely related to the study subjects underpinning teaching by latest developments in the field. In addition, the university organises student scientific conferences and encourages students to present results at these events

Although social partners get involved in supporting and assessing student's research projects, this seems to happen without specific organisation. Additionally, social partners involvement in feedback and improvements to the study programmes is also random. Consequently, a more systematic and organised approach for engagement with social partners could be beneficial to the future of the study programmes.

Recruitment to the study programmes has been in steady decline despite the uniqueness of the programmes and the expressed interest of graduates by social partners. This is a matter of concern that requires investigation of the true causes and implementing measures to reverse the decline. Improving recruitment to the first study cycle could provide a steadier recruitment to the second cycle.

Although students' mobility is actively encouraged, there seems to be much more incoming students than outgoing students. The reasons behind this are the engagement of home students with work during their studies. At the Masters level, there is hardly any mobility of students.

The institution is active in collecting feedback from students to facilitate continuous improvements. However, it seems, based on students' feedback, that there are too many

surveys and they require a lot of time to complete. The institution should review the quantity and quality of students' surveys.

The university facilities and operations have been adapted for students from socially vulnerable groups and students with special needs. Participation in additional projects strengthens and educates the institution and staff. However, proactive training and discussion are very relevant ways to educate the community and to get them to be prepared for potential challenges.

The laboratories are well equipped for fundamental study subjects as well as renewable energy study subjects. However, there does not seem to be a clear plan to keep the lab equipment up to date and perform regular maintenance.

The involvement of stakeholders including students is adequate. However, there is concern about the lack of response to students following their feedback and the possibility that the issues they raise are not addressed. The university need to put in place a robust process to address students concerns and communicate the results to them.

Expert panel chairperson signature:

Prof. Abdunaser Sayma