STUDIJŲ KOKYBĖS VERTINIMO CENTRAS
CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

CHEMICAL ENGINEERING FIELD OF STUDY

Klaipeda University

EXTERNAL EVALUATION REPORT

Expert panel:

1. Panel chair: Prof. Dr. Barbara Hinterstoisser …….. (signature)
2. Academic member: Prof. Dr. Michael Morris
3. Academic member: Assoc. Prof. Dr. Blaž Likozar
4. Social partner representative: Dr. Milda Petrulevičienė
5. Student representative: Džiugas Vyšniauskas

SKVC coordinator: Dr. Ona Šakaliene

Report prepared in 2026
Report language: English

CONTENTS

I. INTRODUCTION

1.1. OUTLINE OF THE EVALUATION PROCESS

The field of study evaluations in Lithuanian higher education institutions (HEIs) are based on the following:

- Procedure for the External Evaluation and Accreditation of Studies, Evaluation Areas and Indicators, approved by the Minister of Education, Science, and Sport;
- Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (SKVC);
- Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

The evaluation is intended to support HEIs in continuous enhancement of their study process and to inform the public about the quality of programmes within the field of study.

The object of the evaluation is all programmes within a specific field of study. A separate assessment is given for each study cycle.

The evaluation process consists of the following main steps: 1) Self-evaluation and production of a self-evaluation report (SER) prepared by an HEI; 2) A site visit by the review panel to the HEI; 3) The external evaluation report (EER) production by the review panel; 4) EER review by the HEI; 5) EER review by the Study Evaluation Committee; 6) Accreditation decision taken by SKVC; 7) Appeal procedure (if initiated by the HEI); 8) Follow-up activities, which include the production of a Progress Report on Recommendations Implementation by the HEI.

The main outcome of the evaluation process is the EER prepared by the review panel. The HEI is forwarded the draft EER for feedback on any factual mistakes. The draft report is then subject to approval by the external Study Evaluation Committee, operating under SKVC. Once approved, the EER serves as the basis for an accreditation decision. If an HEI disagrees with the outcome of the evaluation, it can file an appeal.On the basis of the approved EER, SKVC takes one of the following accreditation decisions:

- **Accreditation granted for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points), or good (3 points).
- **Accreditation granted for 3 years** if at least one evaluation area is evaluated as satisfactory (2 points).
- **Not accredited** if at least one evaluation area is evaluated as unsatisfactory (1 point).

If the field of study and cycle were **previously accredited for 3 years**, the re-evaluation of the field of study and cycle is initiated no earlier than after 2 years. After the re-evaluation of the field of study and cycle, SKVC takes one of the following decisions regarding the accreditation of the field of study and cycle:

- To be accredited for the remaining term until the next evaluation of the field of study and cycle, but no longer than 4 years, if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).
- To not be accredited, if at least one evaluation area is evaluated as satisfactory (2 points) or unsatisfactory (1 point).

1.2. REVIEW PANEL

The review panel was appointed in accordance with the Reviewer Selection Procedure as approved by the Director of SKVC.

The composition of the review panel was as follows:

1. Panel chair: Prof. Dr. Barbara Hinterstoisser, Professor i.R. at BOKU University, Department for Natural Sciences and Sustainable Resources, Institute of Physics and Materials Science, Vienna (Austria);
2. Prof. Dr. Michael Morris, (member of the academic community) Director AMBER Research Centre, and Professor of Surface and Interface Chemistry at Trinity College Dublin, The University of Dublin (Ireland);
3. Assoc. Prof. Dr. Blaž Likozar, (member of the academic community) Associate professor, research professor and head of the Department of Catalysis and Chemical Reaction Engineering senior research associate at National Institute of Chemistry (Slovenia);
4. Dr. Milda Petrulevičienė, (representative of social partners) Senior Research associate at Center for Physical Sciences and Technology Department of Chemical engineering and technology (Lithuania);
5. Džiugas Vyšniauskas, (student representative) Second-year graduate student of the Life and Chemical Physics program at the Faculty of Physics, Vilnius University (Lithuania);

1.3. SITE VISIT

The site visit was organised on 11 of November, 2025 onsite. Prof. Dr. Michael Morris participated online.

Meetings with the following members of the staff and stakeholders took place during the site visit:

- Senior management and administrative staff of the faculty(ies);
- Team responsible for preparation of the SER;
- Teaching staff;
- Students;
- Alumni and social stakeholders including employers.

There was no need for translation and the meetings were conducted in English except for some minor translations during the meeting with the students.

1.4. BACKGROUND OF THE REVIEW

Overview of the HEI

Klaipėda University (KU) is a state university established in 1991. It is located in Klaipėda, Lithuania's only seaport city and a major transport hub. The university has excellent connections to the European Union and global markets via an extensive network of international transport corridors and routes by land, air, sea and rail. KU comprises three faculties: the Faculty of Social Sciences and Humanities, the Faculty of Marine Technologies and Natural Sciences, and the Faculty of Health Sciences. There are also two institutes: the Institute of Baltic History and Archaeology, and the Institute of Marine Research. The faculties and institutes comprise 16 departments, nine science and/or study centres, two museums and 55 laboratories. The KU Faculty of Marine Technology and Natural Sciences (FMTNS) comprises three departments: Engineering; Marine Engineering; and Informatics and Statistics. The FMTNS offers first and second degree courses relevant to the region in the fields of chemical engineering, electrical engineering, electrical and electronic engineering, mechanical engineering, production engineering, informatics, informatics engineering, civil engineering and marine engineering. KU is currently implementing I'st Cycle programmes for Chemical Engineering (Environment and Energy) and II'nd Cycle programmes for Innovative Process Engineering.

Klaipėda University (KU) does not appear in the top rankings for chemical engineering specifically, as there are no global subject-specific for KU in any of the world rankings. Overall rankings for KU show its overall position in Europe and the world, which is lower than the top-tier institutions for chemical engineering. For example, while KU ranked 445th in the QS World University Rankings: Europe for 2024 it is not listed among the world's best for chemical engineering programs.

Overview of the study field

In 2024, KU prepared the "Strategic Plan for Improving the Competitiveness of Engineering Studies 2024-2028" to increase enrollment and improve the quality of engineering education. The Chemical Engineering program in Klaipėda has been started since 1997. Klaipėda University has a strong partnership with the local chemical industry, which employs a lot of its Chemical Engineering grads. KU is currently implementing first cycle programs for Chemical Engineering (Environment and Energy) and II'nd cycle for Innovative Processes Engineering. The Klaipėda University (KU) Faculty of Marine Technology and Natural Sciences (FMTNS) and the Department of Engineering (DE) are actively advancing the Klaipėda 2030 Economic Development Strategy. This strategy prioritizes growth in the blue economy, high-tech industry, bioeconomy, and creative and service sectors. The strategy aims to boost the city's economic capacity significantly by doubling its output, establishing 2000 new companies, creating 25000 workplaces, and launching 100 investment projects expected to attract €1.5 billion in foreign investment. Klaipėda's smart specialization framework for 2030 highlights three strategic areas: the maritime sector, smart technologies, and bio-based industries. As a member of LINPRA (the Lithuanian Engineering and Technology Industries Association), KU collaborates with industry and academic partners to conduct relevant research and development (R&D), address challenges faced by the chemical and industrial sectors, and prepare qualified engineers and researchers to support these development priorities. FMTNS and DE also make sure their work lines up with the development priorities and challenges of the Baltic Sea region. DE's academic activities are key to boosting regional competitiveness. They do this by working on research and development projects and by teaming up with companies in the Klaipėda area.

Previous external evaluations

The chemical engineering program in Klaipėda was launched in 1997, taking into account the needs of the chemical industry in Klaipėda. Cycle I comprises the chemical engineering program (environment and energy) and Cycle II comprises innovative process engineering for chemical engineering. The last external evaluation of these programs was carried out in 2016 by the Study Quality Assessment Center (SKVC), and the programs were accredited for 7 years.

The SER summarizes the recommendations of the last evaluation. Worth mentioning are the critical but improved safety aspects – both in terms of buildings and personal safety in laboratories. Furthermore, further improvements in teaching techniques are called for. Formal mechanisms are required for the maintenance of equipment, textbooks, subscriptions to databases and journals, and software versions (applies to study cycles I and II). More technical English is recommended for both study cycles. There is also a call for a stronger focus on biological techniques and processes. The low number of students and the low mobility of students is noted. The faculty must develop mechanisms to keep an eye on longer-term measures, taking into account international developments in the field of chemical engineering.

Documents and information used in the review

The following documents and/or information have been requested/provided by the HEI before or during the site visit:

- *Self-evaluation report and its annexes;*
- *Final theses:*
    - *3 Bachelor theses (in English) + several additional Bachelor theses on desk in Lithuanian*
    - *12 Master theses (in English)*

Additional sources of information used by the review panel:

The following additional sources of information have been used by the review panel:

https://www.ku.lt/en/

II. STUDY PROGRAMMES IN THE FIELD

Title of the study programme	First cycle/LTQF 6	Second cycle/LTQF 7
	Chemical Engineering (environment and energy)	**Engineering for Innovative Process**
State code	6121EX061	6211EX069
Type of study (college/university)	University	University
Mode of study (full time/part time) and nominal duration (in years)	Full-time (4 year)/ Part-time (5 years, not relevant since 2023 admission)	Full-time, 2 years
Workload in ECTS	240	120
Award (degree and/or professional qualification)	Bachelor of Engineering Sciences	Master of Engineering Sciences
Language of instruction	Lithuanian, English	Lithuanian, English
Admission requirements	At least secondary education or equivalent	Higher (Bachelor's degree or equivalent) Bachelor's qualification
First registration date	19/05/1997	6/16/2000
Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision)		

III. ASSESSMENT IN POINTS BY CYCLE AND EVALUATION AREAS

The **first cycle** of the *chemical engineering* field of study is given a **positive**/**negative** evaluation.

No.	Evaluation Area	Evaluation points[1*]
1.	Study aims, learning outcomes and curriculum	4
2.	Links between scientific (or artistic) research and higher education	3
3.	Student admission and support	3
4.	Teaching and learning, student assessment, and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Quality assurance and public information	4
	Total:	26

The **second cycle** of the *chemical engineering* field of study is given a **positive**/**negative** evaluation.

No.	Evaluation Area	Evaluation points[2*]
1.	Study aims, learning outcomes and curriculum	4
2.	Links between scientific (or artistic) research and higher education	3
3.	Student admission and support	4
4.	Teaching and learning, student assessment, and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Quality assurance and public information	4
	Total:	27

1*, 2*

1 (unsatisfactory) - the area does not meet the minimum requirements, there are substantial shortcomings that hinder the implementation of the programmes in the field.
2 (satisfactory) - the area meets the minimum requirements, but there are substantial shortcomings that need to be eliminated.
3 (good) - the area is being developed systematically, without any substantial shortcomings.
4 (very good) - the area is evaluated very well in the national context and internationally, without any shortcomings.
5 (exceptional) - the area is evaluated exceptionally well in the national context and internationally.

IV. STUDY FIELD ANALYSIS

AREA 1: STUDY AIMS, LEARNING OUTCOMES AND CURRICULUM

1.1.	Programmes are aligned with the country's economic and societal needs and the strategy of the HEI

FACTUAL SITUATION

1.1.1. Programme aims and learning outcomes are aligned with the needs of the society and/or the labour market

The Klaipėda region is part of a Free Economic Zone (LEZ) with a bunch of industrial plants in various fields. The chemical industry is well developed, therefore there is huge demand for employees with a degree in chemical engineering who know about modern technologies and understand the processes involved in production. The Lithuanian Association of Engineering and Technology Industries says that more than 12000 new job positions are going to be created in the engineering sector in the coming years. Future engineers will need to know a lot about a lot of things. For example, they'll need to know about digital technologies, process control and management, how to use resources and raw materials sustainably, and alternative energy solutions. A multitude of chemical companies in the Klaipėda region have a pronounced and escalating demand for highly skilled professionals. This demand is expected to rise further as new technologies emerge and industrial practices evolve. Chemical engineers in Klaipėda face particularly robust employment prospects, attributable to the proliferation of disciplines such as nanotechnology, alternative energy, and biotechnology. The ongoing demand for engineers is evident across a diverse array of manufacturing sectors.
The bachelor's program in Chemical Engineering (Environment and Energy) is designed to train engineering professionals with a broad, interdisciplinary academic background for careers in chemical, manufacturing, and processing industries, as well as in energy production and oil and gas refining. The program focuses on using new technologies and developing new products, while thinking about technology, the economy, society, energy, and the environment.
The study plan of the chemical engineering (environment and energy) study program includes all types of chemistry, mathematics, engineering subjects, instrumental analysis methods, mechanics, biotechnology, process engineering, environmental technology, energy and carbon reduction technology, process and equipment simulation, etc.
In 2023 three bachelor works were defended. During the visits, it was mentioned that not many students choose chemical engineering, therefore the university started an active campaign to get more students to join the program. The goal is to reach 20 students in the bachelor program every year. Lecturers visit secondary schools to talk about how the program is relevant to students and to teach lessons. A STEAM center has also been opened in Klaipėda, so it is hoped that a new generation will grow up and come to study chemical engineering. Careers days are carried out presenting the study program. The subjects taught demonstrate that the programs being developed can prepare a wide range of chemical engineers. However, the number of final projects indicates that the number of students is small and needs to be increased in order for the programs to continue.

The Master's Program in Chemical Engineering (Innovative Processes Engineering) is designed to train experts and researchers in chemistry and process engineering, providing them with advanced skills in complex process design, alternative and renewable energy, new product development, and sustainable technologies for managing raw materials and energy resources. The program

encourages green thinking in industrial, economic, and advanced manufacturing contexts, aligning with current national and international standards.
The Innovative Processes Engineering study program (full-time, available in Lithuanian and English) includes a wide range of subjects that build advanced competencies in modern chemical and process engineering. The program covers Research and Innovation, Conventional and Advanced Fuels, Numerical Modeling of Engineering Systems (FEM), Cleaner Production and Ecodesign, Sustainable Energetics, Heat and Mass Transfer, New Product Development, Biofuel and Biorefinery Technologies, Sustainable Resource Management, Composite Materials Manufacturing and Analysis, Corrosion Engineering, Chemical Reaction Engineering, and Production Management Methodology. Students also have Numerical Engineering Methods, Oil and Gas Terminals and Pipeline Technologies, Advanced Environmental Engineering, Functional Materials and Coatings, Modern Production Technologies, Chemical Reactors, Modern Processing Methods, and Petroleum Chemistry and Technology, ensuring strong preparation for work with contemporary and emerging industrial technologies.
In 2024, five Master degree works were defended. The subjects taught in the program can prepare innovative process engineers.

Graduates of chemical engineering study programs begin their careers in Lithuanian chemical industry companies, mostly in Klaipeda. The main employers include SC “KN Energies” (LNGS terminal), ASC „ORLEN Lietuva“, JSC „NEO GROUP“, JSC „Orion Global Pet“, SC „KLASCO“, JSC „Bega“, JSC „Mestila“, JSC „Retal Baltic Films“, JSC „REHAU“, JSC „KLASCO“, JSC „SCT Lubricants“, JSC „Krovinių terminalas“ and others. A significant number of graduates also continue their careers in foreign companies. There has always been demand for graduates in the labour market, but only recently has there been a significant increase.
The number of programs is reasonable. The programs are taught in English and Lithuanian, so foreign students can also study in the programs.
For evaluation, three bachelor's and six master's theses were submitted, covering engineering topics, but some of the theses are more theoretical and review-oriented than practical. The topics of the theses are related to fuels, raw material and waste collection/processing, and green hydrogen. Since the study programs are engineering-oriented, the theses could include more experimental/practical data, as well as modelling part.

1.1.2. Programme aims and learning outcomes are aligned with the HEI’s mission, goals, and strategy

The mission of the Engineering Department of Klaipeda University is: A key institution for the sustainable social, cultural, and economic development of the region dedicated to nurturing creative individuals and contributing to public welfare. Vision: A future-oriented university with internationally recognized achievements in science and studies and innovations that contribute to the prosperity of the Baltic Sea Region. KU’s Departments of the Faculty of Marine Science and Technology, including the Department of Engineering, implement the strategic research programme “Sustainable Technologies, Blue and Green Growth, and a Healthy Ocean”. The chemical engineering curricula encourage students to choose relevant topics for long-term programmes or research projects, thus contributing to the well-being of the region’s society.
The documents clearly show that there is a high demand for chemical engineers, that the programs taught meet market needs, and that the specialists trained acquire knowledge in various industrial fields. The main problem is that there are not enough students.
There is a high demand for employees. During meetings with employers, alumni, and students, it was confirmed that students start working as early as their third year of bachelor's studies. They can

also do internships in different companies. The university works closely with industry representatives, and the topics of final theses come from the labour market.
Programme aims are aligned with the HEI's mission, goals, and strategy, however learning outcomes, which are related to the number of students, should be increased. Alumni mentioned that the problem may lie in salaries, that salaries are low and therefore few students are willing to choose difficult studies for low pay. As well as the demographic situation was mentioned.

ANALYSIS AND CONCLUSION (regarding 1.1.)

The chemical engineering program meets the needs of society and the labor market. The university works closely with industry and businesses.

From all the meetings, both lecturers, students, and social partners seem to be positive. Chemical engineering covers a wide range of subjects, mentioning that there are also lectures on the hydrogen industry and green energy. Alumni are satisfied with their work. Students mentioned that it is easy to find work during their studies and that their studies are tailored to their work as an advantage. However, the small number of students raises many questions that remain unanswered. Both the university administration and social partners assured that great efforts are being made to attract students, involving high schools and STEAM centers, but there are still not enough students. Final theses should be improved in the future expanding the experimental/practical part, as well as modelling part.

1.2.	Programmes comply with legal requirements, while curriculum design, curriculum, teaching/learning and assessment methods enable students to achieve study aims and learning outcomes

FACTUAL SITUATION

1.2.1. Programmes comply with legal requirements

Pursuant to the Order of the Minister of Education and Science of the Republic of Lithuania (No. V-1168 of 30 December 2016 "On the Approval of the Descriptor of the General Requirements for the Implementation of Studies", as amended by Order No. V-953 of 7 July 2023) the legal requirements for both study cycles are met. This means that the basic principles for the organization of study cycles, which are necessary for creating a suitable learning environment and achieving the required quality of study, are guaranteed.
The general requirements are based on national legislation and relevant European quality assurance frameworks, including the Lithuanian Qualifications Framework, the ESG, the European Approach for Joint Programmes, and the ECTS User's Guide.

The I'st cycle programme (*Chemical Engineering (environment and energy)*) as well as the II'nd cycle study programme (*Engineering for Innovative Process)* offered by the Department of Engineering meet the requirements of the Lithuanian Qualifications Framework, and of the professional standards, approved by the Minister of Education, Science and Sport.
The first cycle study programme counts 240 ECTS and awards a Bachelor of Engineering Science. The second cycle study programme counts 120 ECTS and awards a Master of Engineering Sciences. The principles for awarding academic credits (ECTS) are outlined in the KU Study Regulations (2024). They specify the guidelines for the number of hours of supervised and independent work in various degree programs and levels.

The study cycle descriptors, established under Order No. V-1012 (16 November 2016), define learning outcomes and align qualification degrees with the Lithuanian and European Qualifications Frameworks.
By that it informs future students, stakeholders and employers as well as people responsible for the implement and assess study programmes about requirements necessary for degree attainment. Concerning the two study programs the knowledge and its application required in study and professional activity fields are described in the papers provided to the evaluation panel.
These provisions confirm that the programme structure is adequate for achieving intended learning outcomes.

1.2.2. Programme aims, learning outcomes, teaching/learning and assessment methods are aligned

The Studies evaluated belong to the study fields of Engineering Sciences. The KU Faculty of Marine Technology and Natural Sciences (FMTNS) offers the relevant courses for the I'st cycle and the II'nd cycle programmes. In some cases teachers cover an incredibly broad spectrum of knowledge - as is visible in the SER (Annex 3). It would be advantageous to additionally try to bring specialists to the university, particularly in the fields of biotechnology and biochemistry. As written in the SER: "The critical mass of the scientific staff must be increased in order to enable participation in larger scale scientific projects."

The I'st cycle programme is structured as follows to provide students with the knowledge and skills to a high level, in line with the learning outcomes of their chosen study field, and to prepare them for their future academic and professional careers. The I'st cycle programme covers all the necessary basic subjects such as chemistry, mathematics, and physics, and builds on these with engineering subjects, instrumental analysis methods, mechanics, biotechnology, process engineering, environmental technology, energy technology, etc. According to the low number of students the assessment methods are adequate. The Bachelor's program in Chemical Engineering (Environment and Energy) interface between study results and subjects is clearly defined in the SER. (Table 1.5)
The II'nd cycle programme was developed based on the first cycle program with a focus on practical application to train experts and researchers in chemistry and process engineering. To this end, knowledge is imparted according to defined learning outcomes in complex process design, alternative and renewable energies, product development, and generally sustainable methods for the management of raw materials and energy resources. Problem-solving skills and environmentally conscious thinking are covered based on national and international standards. The master's program in Innovative Process Engineering establishes a clear connection between study results and subjects, as outlined in SER. (Table 1.6)
In general according to the SER and the discussion of the members of KU with the expert panel the programme aims, programme learning outcomes, teaching/learning and assessment methods are defined and aligned. Both programs comply with the requirements of the above-mentioned legal instruments in terms of their structure and are also in line with the recommendations of the European Federation of Chemical Engineering.

1.2.3. Curriculum ensures consistent development of student competences

The Chemical Engineering study programmes at Klaipeda University are structured to guarantee systematic development of both subject-specific and general competences throughout the study period. Competences are developed progressively through a balanced combination of theoretical instruction, laboratory practice, and research-based learning.
The curriculum of the I'st cycle programme is built of general education subjects (21 ECTS), so-called programme subjects (179 ECTS), optional items (10 ECTS), practical training (15 ECTS) and

the final work (Theses 15 ECTS). This gives in total 240 ECTS. The programme subjects include a broad range of different subjects ranging from human safety to Natural resource processing technologies. The curriculum meets all requirements for a consistent development of the students' competences.

The Graduates gain a bachelor's degree in engineering sciences. Students can tailor the study program to suit their individual interests. To do so, they can choose subjects from a suggested list or from the EUs-CONEXUS minor catalogues.

The II'nd cycle programme "Innovative Process Engineering" is part of the chemical engineering program. Graduates receive a master's degree in engineering. In this master program, which totals 120 ECTS, 30 ECTS are allocated for the final thesis. Individual study plans are determined by the selection of courses from a specially compiled list and by the choice of topic for the final thesis. 24 ECTS are reserved for optional subjects in the field of study and 66 ECTS account for general aspects of the programme axis. The study program enables students to develop their skills step by step.

In general the EU-CONEXUS Skills Map plays a major role in the set-up of the two consecutive study programmes, which outlines the necessary and expected key-competences in the blue economy sectors.

1.2.4. Opportunities for students to personalise curriculum according to their personal learning goals and intended learning outcomes are ensured

The possibilities for students to customize their studies are set out in the Study Regulations of Klaipėda University (2018 version) itself, the Rector's orders on the procedure for the autumn/spring semester examination session of the corresponding academic year at Klaipėda University, and other internal documents (e.g., faculty and department decisions).
In the I'st cycle programme students can tailor the study program to suit their individual interests. The programme is divided into two specializations, namely "environment" and "energy." Within these specializations, 21 ECTS credits are optional. Further optional subjects in the field of study count 10 ECTS. The practice (15 ECTS) and the final theses work (15 ECTS) also allow free choice of topics. The choice of topics for the course projects integrated into the bachelor's programs also allows for individualization of the degree program.
Students in the II'nd cycle programme can also customize a large part of their coursework. The thesis, which is usually linked to applied research work, is worth 30 ECTS credits, which is in line with general EU regulations. Research projects account for 12 ECTS and elective courses in the field of study account for 20% of the program's total 120 ECTS credits.
The possibilities for individualizing the study programmes are much more extensive than mentioned here, as discussions of the panel with students and teachers have shown.

1.2.5. Final theses (applied projects) comply with the requirements for the field and cycle

The process for final theses at KU follows a structured schedule. For the final thesis topics are announced by the department within the first two weeks of the penultimate semester for the I'st cycle students. Thesis topics for the students in the II'nd cycle study programme are already announced at the end of the first semester. Students are allowed to propose topics of their own interest as well. There exist strict rules concerning the thesis defense procedure and thesis evaluation criteria. Several thesis topics are developed in collaboration with external stakeholders, including the Ministry of Transport and Communications of the Republic of Lithuania, Klaipėda municipality, and various

technology companies. These are primarily applied research, but they meet all academic requirements. The presented examples of theses (3 Bachelor theses written in English plus several additional Bachelor theses presented at the meeting at KU written in Lithuanian, and 12 Master theses written in English) illustrate the quality of research and teaching at KU. Since most of the work is carried out within the framework of industrial cooperation, it must also be ensured that the work is blocked for a defined period of time, i.e., not accessible to the public. Some bachelor's theses do not contain an experimental part, but rather a literature review or something similar. This is also common in other European countries, but the panel agrees that the experimental part should be part of the thesis work concerning the study field.
Summarizing, the final theses comply with the requirements for the field and the study cycles.

ANALYSIS AND CONCLUSION (regarding 1.2.)

The bachelor's degree program in chemical engineering (environment and energy) and the master's degree program in engineering for innovative processes comply with Lithuanian legal requirements and EU regulations. Both innovative degree programs could not only motivate students from Lithuania - especially from the Klaipėda region - to enroll at KU, but are also sure to appeal to international students. Due to its geographical location, Klaipėda has the advantage of attracting students from Latvia, Estonia, and Finland in particular and of the EU-CONEXUS partner Universities. Not all modules or courses are offered in English which is a disadvantage for international students. In general students have access to elective courses - as required for European study programmes in both cycles creating possibilities to personalize the curriculum for individual specialisation. Bachelor's theses are written in Lithuanian or English, with the latter being preferable, as is experimental work.
Both study programmes are very well described, contain required descriptions of the studies and define the responsible module teachers.
The meeting of the evaluation panel with representatives of industry and social partners revealed that there is a considerable demand for chemical engineers in Lithuania. The environmental and energy sectors in particular need graduates. Therefore, great efforts are being made to increase the number of students. The various initiatives to promote the study programmes must be continued in order to have well-trained engineers for the challenges of the present and the future.

AREA 1: CONCLUSIONS

AREA 1	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Cooperation with commercial enterprises and industrial companies in the Klaipėda region is an advantage of KU’s location. In turn, KU students and graduates represent a valuable asset for these enterprises and companies in the region.

2. KU’s focus on new technologies and the inclusion of future-oriented topics in the study programmes make KU a centre of innovation.

RECOMMENDATIONS

To address shortcomings

1. No shortcomings to address

For further improvement

1. Bachelor's theses should include an experimental part and should preferably be written in English. A summary should be in Lithuanian and English.

AREA 2: LINKS BETWEEN SCIENTIFIC (OR ARTISTIC) RESEARCH AND HIGHER EDUCATION

2.1.	Higher education integrates the latest developments in scientific (or artistic) research and technology and enables students to develop skills for scientific (or artistic) research

FACTUAL SITUATION

2.1.1. Research within the field of study is at a sufficient level

Klaipeda University is an important partner in the development of the Baltic Sea region. Research in chemical engineering at Klaipeda University (KU) focuses on innovative, sustainable processes and product development. In line with the current state of knowledge and the requirements of the times, great attention is paid to the development of technologies for the reuse and recycling of organic and polymeric materials based on the principles of the circular economy, and this is reflected in the curricula. Other areas of focus include the development of new products and fuels for shipping, the development of solutions for shipping in terms of environmental management and the decarbonization of shipping, the development of biopolymer materials, and research into renewable energy sources, new composite materials, computer system security, and many other contemporary research topics. This is outlined in Annex 3, which introduces the faculty members with their research areas and the most important publications on these topics.

The quality and impact of Klaipėda University’s research are evaluated through national and international peer reviews in accordance with the Procedure for Allocating State Budget Funds for Research, Experimental Development, and Artistic Activities to Higher Education and Research Institutions, approved by the Resolution of the Government of the Republic of Lithuania No. 149 of 1 March 2017. The Research Council of Lithuania conducts annual quantitative assessments and comprehensive expert evaluations every five years. In the most recent evaluation covering 2018–2022, Klaipėda University’s Chemical Engineering research was awarded a score of 3 out of 5.

Experts who evaluated the R&D activities in the field of chemical engineering concluded that the unit operates at a high state-of-the-art level and is recognized both locally and nationally. The unit has successfully carried out several notable research and development projects with positive social, economic, and ecological impacts in Lithuania. These projects have led to the development of prototypes and the establishment of new companies that manufacture marketable products demonstrating best practices. Although the research has not yet had a global impact, it shows strong

potential for future development and contributes to regional growth in line with the guiding principle of the bioeconomy. Scientists of the faculty of the Marine Science and Technology of the KU approved in 2020 the Description of the strategic research strand “towards sustainable technologies, blue and green growth and a healthy sea” (SER top 18. and 90) goals set out in the EU Strategy papers “Europe 2020”.

The research at KU in the field of study is at a sufficient level. This is consistent with the HEI’s expert group assessment in 2023. However, care must be taken to maintain that score. The research carried out is pertinent to the field of study and brings a focus on developing engineering solutions to issues of local, national and international importance.

The teaching staff is active in research and some areas of this research show competitive international performance. Since 2021, the teaching staff have authored around 50-75 international peer reviewed papers. Around 60% of these papers include international colleagues. Whilst this shows good performance, the proportion of activity in the field of chemical engineering or process research is lower as most of the activity takes place in environmental or materials science areas. The SER cites 16 research projects/contracts performed or completed between 2021 and 2024. However, only three of these appear to be active in 2024. This compares to a number of active projects in 2022 of more than double that. The formalised (i.e. funded projects) projects is a low number for a department and may indicate some decline from the last research and experimental development evaluation and the last comparative expert evaluation in the field of research. This 2023 report concluded that R&D activities are of a high level and have been recognized at both local and national level. The projects provided in the SER show both national and international funding has been achieved. However it should be noted that many of the projects do not relate to ‘core’ engineering and focus on a wide range of ancillary research including strategy documents. It is clear that staff are developing strategies to collaborate in other areas but a lack of focus on engineering is a concern.

A further concern is the lack of international impact of the research carried out. In the SER examples of international conferences attended by staff are given but these appear to be in 2021 and prior to this period of consideration. They are also lower-prestige conferences. A non-exhaustive list of (9) international publications is given indicating the internationally competitive research being carried out at KU in the field. However, this list spans the period 2021-24 and indicates only limited annual publishing rate. Any of the published research carried out in core engineering appears to have limited international visibility and Scopus/Google Scholar searches “Klaipeda + chemical engineering” and similar terms related to the course titles yielded less than 20 results over the same period. It is somewhat difficult to see high impact research activity in chemical engineering because there does not appear to be a focus on this in the SER. E.g. an important EU project is not described (TechUPGRADE). Care should also have been taken to provide a more comprehensive list of published papers and conferences attended. Further a dedicated web-site area to the research of the course teachers and the wider contributors should be developed. The web-available information is less than might be expected. Similarly, the research focus and strategy within the subject areas is very limited on the university hosted web-sites.

Some of the course deliverers have good citation rates, with more than 10 international peer-reviewed articles since 2021. Due to the very young engaged teaching staff, an increase in research metrics is expected in the coming years. Undergraduate and graduate students are involved in research projects carried out as part of their undergraduate or graduate studies, with the majority of the latter projects being carried out remotely with industry partners. Some of the final year first cycle research projects (an important element of the course) had minimal laboratory or modelling research

content and were largely literature reviews and this is not adequate for a practical course. There is evidence of participation in national and international (EU) based programmes but little evidence of EU grant coordination although the recent award of a major coordinator award was noted. The uptake of post-graduate Erasmus programmes was less than expected although efforts to promote these are significant. More practical experience from industry in the field of chemical engineering among the teaching staff is desirable, as the discussion with industry representatives showed. On the other hand, at least two staff members have spin-off experience in related fields as indicated in the SER. The engagement of local industry in the research at both undergraduate and postgraduate level is good. They offer project internships for students in relevant fields of study. This is a major advantage of the program and greatly benefits students, as it provides them with better opportunities and many of them find employment with their internship provider. In terms of developing a research profile, the very strong role of the affiliate companies may be an impediment.

The lack of students on the course will impact the continued viability of the research programme. Lack of students means lack of people to do research. Institutional support for research and general laboratory infrastructure in struggling courses is always a threat to financial viability. There is also the threat that a less strong course will allow attraction and retention of high-quality staff. This may be linked to recent recruitment (according to the panel discussion with the management) where experience and credentials are at the lower end of what might be hoped.

2.1.2. Curriculum is linked to the latest developments in science, art, and technology

The academic and applied research carried out by the members of the faculty relate directly to activities related to the field of study. As was demonstrated in the SER these are integrated into impacts/outputs such as scientific journal papers and conference presentations. The research is closely linked to the teaching curriculum at both undergraduate and master levels. As discussed above the research and projects in the field of chemical engineering are mostly cross-disciplinary due to the limited number of scientists. The research carried out focuses on relevant (for the courses) topics including the development of new products and fuels for shipping and other applications, recycling waste and biomass, finding solutions related to port operations, and optimizing chemical processes. It is noted that good research infrastructure is available and the construction of a new laboratory building is planned. The role of research networks such as EU-CONEXUS is noted for developing state of the art research infrastructure. The relevance of the work is underlined by the award of a 2 million plus EUR grant to develop materials from nature with oil-degrading micro-organisms for the treatment of oil pollutants at sea and in port areas from the EU EIC-Accelerator programme in 2024. The research in Chemical engineering is obviously supported by a number of national and international research grants, funded by different agencies but these are not detailed comprehensively in the SER.

As indicated in the external assessment interviews, the course has broadened its research remit to encompass modern issues such as sustainability, digitalisation, process modelling and theory and renewable resources and energy. The research carried out aims to achieve the goals set out in the EU Strategy papers “Europe 2020”, “Green growth”, “Blue growth”, “EU Strategy for the Baltic Sea Region, South Baltic Programme, Smart specialization lines “Energy and sustainable Environment”, “New production process, materials and technologies”, and “Smart, Clean, Integrated (linked) Transport”. The research efforts reflect the university goals to develop strategy “towards Sustainable technologies, Blue and Green growth and a Healthy Sea”.
The research in these areas is informing curriculum development and this is very welcome. There are good, high profile papers (cp. https://scispace.com) in marine engineering, renewable materials and environmental engineering which support these observations In general the curriculum is modern and research needs aligned.

2.1.3. Opportunities for students to engage in research are consistent with the cycle

The University and the Faculty provide conditions for students to systematically engage in scientific and applied activities that are integrated into the study process and contribute to their professional development.

Students actively engage in research in both – first and second cycles. Masters students actively participate in funded research projects, and a number of MSc thesis have been published in related fields to the project defined research. A proportion of these students have published work in scientific journals as a result of their MSc projects as would be expected. Although indicative examples were given in the SER, quantitative analysis should have been given with % of students publishing papers per year. Course work has been developed to allow students time for self-research in a good range of topics. All undergraduate and postgraduate students participate in extended research projects and placements. Students have a good choice of research projects in both cycles. The projects at second cycle carried out as industry placements were of a good quality and were beneficial to the students.
Majority of second cycle students, together with programmer and Faculty teachers, work on research within the KU accredited scientific programmer “Resource efficient, circular economy-based technologies”. The findings were published and resulted in 9 publications in high-level WoS journals, as shown in SER.

Klaipėda University, together with Vilnius University and Kaunas University of Technology, organized a conference on chemistry and chemical technology, providing students with the opportunity to present the results of their ongoing scientific or applied research. Three university students were awarded prize-winning places.

ANALYSIS AND CONCLUSION (regarding 2.1.)

The level and quality of research are consistently good. A clear strategy for improving the international visibility of research is desirable. The number of international peer-reviewed publications is as expected given the low average age of the teaching staff and shows potential for improvement. Research is closely linked to the degree programs. It can be described as research-led teaching. Student participation in research is evident in both the first and second cycle. Most research projects in master's programs are linked to industry, which has a positive effect on the practical relevance of the work, but on the other hand, a stronger connection to the university and its teaching/research staff would be desirable. An increase in the number of students would also be beneficial, as this would strengthen the research areas.

AREA 2: CONCLUSIONS

AREA 2	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle			X		
Second cycle			X		

COMMENDATIONS

1. The availability of relevant and good quality external research collaborators at commercial partners is at a good level and their role in providing opportunities for IInd cycle research was attractive and of value to the students.
2. Course and research reflect current needs and areas of high impact research.
3. Well considered research informed programmes in terms of local needs and a number of employment fields are open to graduates.

RECOMMENDATIONS

To address shortcomings

1. Continue actions to increase recruitment into undergraduate and postgraduate courses to increase the amount of high quality, international standard research.
2. Increase involvement of academic staff with industry partners by devising joint research studies and continual student mentoring and engagement.
3. While indicative data is provided, there are clear gaps in the SER around total numbers, grant awards, number of student academic papers etc. Care should be taken in providing quantitative and qualitative information.

For further improvement

1. Devise a clearly articulated research strategy with clear objectives and milestones. This may focus on how to advantage schemes such as Erasmus, publishing research further and providing easily obtained information.
2. Increase the visibility of research being carried out through a well constructed web-site that clearly points to the research being carried out.
3. In order to improve there is a need to increase the research quality of teaching staff aiming at recruits with a high research profile.

AREA 3: STUDENT ADMISSION AND SUPPORT

3.1.	Student selection and admission is in line with the learning outcomes

FACTUAL SITUATION

3.1.1. Student selection and admission criteria and procedures are adequate and transparent

Klaipėda University admission criteria for first and second cycle studies in Chemical Engineering follow strictly regulated national rules and ensure complete transparency since all first cycle study admissions to all universities in Lithuania are organized via central LAMA BPO systems. The entrance requirements and competitive scores are publicly disclosed and consistently maintained to sustain transparency and ease of access. The entrance scores for admission to first cycle studies in this programme were an average of 6,36 with a minimum of 4,68. The admission scores for second cycle students were significantly higher where the average was about 8 and with a minimum of 7,11. However, small numbers of admissions have been maintained from both bachelor and master degree programmes. During the whole evaluation period, for 1st cycle there were 28 first priority applications and 58 other priority applications. From them, only 5 signed state funded studies and 7 non state funded studies. For 2nd cycle there were 13 first priority applications and 25 other priority applications. From them, 13 signed state funded studies and 1 non state funded studies. It has to be noted that for half of the accreditation period, there weren`t enough students to form a study group.

Attendance challenges would indicate sustainability issues despite marked labour market requirements for chemical engineers. Non-completion of study courses stands minimal, however it was noted during the visit that many students take prolonged academic leave. Overall, the student admission process is adequate, transparent and robust. And high graduation rates show that students can successfully finish their studies.

3.1.2. Recognition of foreign qualifications, periods of study, and prior learning (established provisions and procedures)

Klaipėda University has established detailed and officially approved processes for evaluation of foreign diplomas, experiences for prior learning, and study periods spent abroad. The University has legal recognition to evaluate academic foreign education enabling it to make decisions to assess applicants' diplomas directly. The assessment of applicants' diplomas is conducted by qualified staff members from the Study Service Centre who check diplomas submitted for evaluation and have applicants submit originals if needed and make decisions based on national recommendations from the Study Quality Assessment Centre (SKVC). Applicants have the right to appeal decisions in 14 days. Study abroad is validated by ECTS mobility procedures in ERASMUS+ learning agreements to ensure recognition of successful study completion in the form of coursework, internships, and research. Credits from study abroad are transferred to KU's Academic Information System after submission of the official transcript, and all credits transferred to the student's home institution are shown in Lithuanian and English in the diploma supplement. KU shows willingness to accept learning from other Lithuanian and/or foreign institutions even if their study programs have not been harmonized. The decision to accept credits rests with the relevant head of department and program leader who compares this learning based on content, learning results/outcomes, and must align with at least two-thirds of KU's contents. Also, there are established processes in place for the recognition of non-formal and informal learning at the University. During the review period, two foreign students were admitted to 1st cycle and one foreign student to 2nd cycle programs. Recognition can be applied towards up to 50% of the learning volume of any particular programme. In general, it can be seen that for KU these procedures are sufficient, well-structured and aligned with national and European practice.

ANALYSIS AND CONCLUSION (regarding 3.1.)

Overall, it is evident that Klaipėda University maintains, a clear commitment to transparency regulated and up-to-date procedures for student admissions and recognition of prior learning, foreign qualifications and study periods. Admissions for both first- and second- cycles comply with LAMA BPO procedures and ensure fairness and easy process to its applicants. Altogether, KU has a decent framework for admissions and credit recognition, though enrollment trends may require strategic attention to ensure long-term viability for its programs.

3.2.	There is an effective student support system enabling students to maximise their learning progress

FACTUAL SITUATION

3.2.1. Opportunities for student academic mobility are ensured

The framework offered by the Klaipėda University involves facilitating opportunities for student academic mobility. The University has been operating within the framework of the Erasmus+ mobility scheme. Students involved in the exchange before joining the mobility scheme sign a three-part Erasmus+ learning contract that allows the attainment of full credit recognition upon return, thereby addressing the continuity of study objectives. As noted in the SER, the university has been engaging

with the student community through regular seminars, internet materials, and faculty-level communication. However, the University recognizes that the level of student engagement has been low due to factors related to the demographic situation, of fewer numbers of students due to early engagement of students in the industry and also due to factors of COVID-19 and geopolitical issues in the region that affected student outward mobility in recent years. The university is currently in the process of evaluating the situation to identify ways to improve engagement through considerations of increasing the destinations of student mobility, preparing more engaging topics of study and internship opportunities, and also increasing the possibility of online student mobility. In this regard, the university has ensured the availability of opportunities and support structures of student academic mobility.

3.2.2. Academic, financial, social, psychological, and personal support provided to students is relevant, adequate, and effective

The university provides continuous student progress review at the subject, coursework, and program levels through numerous lecturer reviews and the Moodle learning environment. Since there is only a limited number of students in each class, the students can be given more personal academic support. The University provides social support and inclusion services to ensure that special needs students are provided with adjusted learning materials and remote sessions, as well as fully accessible infrastructure in its newer buildings, which include residences and STEAM Centers. Other support services such as reading assistance devices and a friendly website for the visually impaired also contribute to improved study environment support. The University also provides psychological support and personal services such as individual counselling and support from university staff involved in the mobility and study organization and welfare processes. Financial assistance schemes are also articulated clearly and seem effective, especially through the specific regulations regarding additional financial support in the Erasmus+ scheme. Overall, financial flexibility options are available at KU through access to scholarships, additional grants, and support for engagement in cultural and sports activities. The university reports that no students of chemical engineering received targeted funding or social scholarship from KU, however there were two 2nd cycle students which received a scholarship from the municipality for their masters thesis. Additionally, there are financial support possibilities through student loans available from the university. Together, it is indicative that the university has a support framework that helps with student performance, financial considerations, psychological wellness, and community engagement.

3.2.3. Higher education information and student counselling are sufficient

There are adequate and organized sources of information regarding higher education opportunities at Klaipėda University available to the student before and during their studies at the university. Students will be introduced to the study programme and its requirements through an organized system of information: the information about the programme and the rules will be available through the University's Academic Information System. During the study programme enrollment and introduction to the programme at the university, the student will be informed about the study requirements of the Chemical Engineering field. The information will be presented through consultations about the study programme requirements at the university. Continuous counselling services are also offered throughout the duration of study. Student performance is also continuously tracked at the subject level, course level, and programme level. Lecturers also hold consultations face-to-face as well as through the university's Moodle online learning platform where the student can track their mid-term results and access written personalized feedback. Support goes beyond educational topics: they are also made aware of their opportunities in the field of mobility through seminars, social media notifications, internal notifications from the department, and direct

counselling from the Erasmus+ coordinators. They are also updated regarding support services regarding accessibility initiatives and Student Services. In general, the University makes sure that information about higher education is clear and available and constantly updated, while the counselling, whether academic or administrative, is continuous and personalized.

ANALYSIS AND CONCLUSION (regarding 3.2.)

Klaipėda University creates a structured and student-centered environment which provides access to academic mobility, support services, and higher education information. Though the university's student mobility has been affected due to certain demographic, economic, and geopolitical considerations in recent years, the university has been maintaining the requisite framework. As well as university administration has been seeking avenues to promote their student mobility through mixed destinations, deeper academic programs, and online mobility opportunities. All things considered, it can be said that the university has been maintaining the requisite and efficient framework which supports student continuity, student wellness, and student engagement awareness.

AREA 3: CONCLUSIONS

AREA 3	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle			X		
Second cycle				X	

COMMENDATIONS

1. University demonstrates a strong commitment to supporting students with their work-life-study balance by allowing flexible scheduling of lectures, exams and workload distribution.

RECOMMENDATIONS

To address shortcomings

1. Bachelor program students are seldom engaged in mobility programs. University should take steps to encourage students to participate more actively.
2. Bachelor program number of students is unstable and low, which suggests that the program needs to have a strategic shift in marketing or structure.

For further improvement

1. KU should try to attract more international students in order to have a higher number and a more diverse group of students.
2. The university website could be updated to reflect relevant information for potential students.

AREA 4: TEACHING AND LEARNING, STUDENT ASSESSMENT, AND GRADUATE EMPLOYMENT

4.1.	Students are prepared for independent professional activity

FACTUAL SITUATION

4.1.1. Teaching and learning address the needs of students and enable them to achieve intended learning outcomes

Chemical engineering programmes offer a wide range of study methods: lectures, exercises, team and group work etc., which are aligned with expectations. Students also have the opportunity to see their interim results and exam grades in Moodle environments provided for all study programmes, which allows them to continuously monitor progress.
During the period under review, the 3 chemical engineering graduates chose the phase III studies. That is rather low, so it can be considered disadvantageous. Since 2023, the lifelong learning programme has been implemented by EU-CONEXUS stakeholder Academia, which is positive in general.
KU's recently opened STEAM methods Centre, which can be helpful in attracting more prospective students. The opportunity to participate fully in university life and pursue academic goals is very well addressed.
90% of graduates are employed immediately after graduation or begin working in their final year of study. Very fast employment is confirmed by alumni.
As evidenced by alumni, as well as students, the level of knowledge that is conveyed is adequate for chemical engineering positions that graduates would typically fill – teaching/learning is well personalised, adjusting to the needs of attendees, hence making this a very suitable approach. Some minor reservations can be seen as to the level of general chemical engineering curriculum breadth, as opposed to what is expected internationally, but this is not extensively outlined.

4.1.2. Access to higher education for socially vulnerable groups and students with individual needs is ensured.

Klaipėda University demonstrates a commitment to ensure access to higher education for socially vulnerable groups and students with individual needs. It is supported by a system of consultations, adapted learning environments, and customised integration solutions. The University guarantees personalized study processes, adapted learning materials in virtual formats, accessible digital resources, and personalized study support from the lecturers and administrative staff. New Klaipėda University buildings are adapted for people who have mobility and visual impairments, with ramps, elevators, and safety systems. Furthermore, the library offers personalized reading devices and a website friendly to visually impaired users. Integration into the academic community is facilitated through both social and academic initiatives. KU supports students' involvement in university cultural groups, sports clubs, and student collectives. Small student groups and close interaction with teachers help ensure that students with additional needs are taken care of on an individual basis. This also contributes to smoother social integration in classes and project groups. In general, Klaipėda University ensures a supportive, inclusive, and accessible learning environment, characterized by active counselling, flexible learning arrangements, and infrastructural adaptation.

ANALYSIS AND CONCLUSION (regarding 4.1.)

In terms of regional, as well as national teaching aims, these are met in full, providing high enough quality engineering graduates, which fit well with local industrial demand, whereas in terms of the

excellence for further research (e.g. PhD), this could be improved, which is evidenced by low II'nd cycle to PhD spill-over. A further reason for this low spill over could be that graduates want to be employed immediately after they finish. PhD leads to a more research focussed future which may be not as attractive for the graduates. Low student numbers in general are a challenge, which burdens otherwise well in place approaches (feedback, the level of flagship engineering courses, such as thermodynamics, transport, kinetics…) both in I'st as well as II'nd cycle.

4.2.	There is an effective and transparent system for student assessment, progress monitoring, and assuring academic integrity

FACTUAL SITUATION

4.2.1. Monitoring of learning progress and feedback to students to promote self-assessment and learning progress planning is systematic

University monitors the academic progress of chemical engineering students at several levels: subject, course, programme, which is expected – students confirm that this is well established, except for the extent of feedback, which is limited due to overall student numbers. The student feedback, an integral part of the study progress monitoring, is, nonetheless, very positive, as well as students evidencing that it is assessed diligently.
Due to smaller student numbers, students' groups are small, so teachers are familiar with their potential and goals, allowing them to often tailor assignments to individual needs.
The vast majority of students in chemistry programmes successfully complete their studies. According to the three-year data, 100% of first-year students obtain a bachelor's degree, and the indicator for master's degree is analogous - 100%. Nonetheless, students evidence that some of enrolled student candidates do drop out of studies.
The monitoring of students' learning progress is carried out systematically with teachers using the collected questionnaire information to guide instructional curriculum decisions. The variations in present student–teacher ratio are managed effectively, enrolment is modest, and when numbers are low, teachers use the opportunity to engage learners more deeply through some research-based activities. Present student numbers fluctuate minimally, effort is made to increase the number of students, and these do not extensively disrupt ongoing monitoring or feedback processes. Feedback is regularly provided to support the students in evaluating their own performance, planning their next learning steps and, while challenging, work/class time scheduling is balanced. The programmes also offer a very broad range of general career options, which provides an early meaningful guidance, helps students set realistic progress goals, while, at least locally, general industrial feedback is overwhelmingly positive.

4.2.2. Graduate employability and career are monitored

KU graduates' employability is good. In SER, it is explained that surveys are carried out with graduated students about employability and careers. Meetings are also organised where graduated students can meet with current students and share information about career opportunities. A graduate survey conducted between 2020 and 2023 shows that 90% of graduates are employed immediately after graduation or begin working in their final year of study. The analysis of the data collected on the employability of graduates of the Chemical Engineering (Environment and Energy) programme showed that 100% of graduates are employed according to their qualification level 12 months after graduation. During meetings with the administration, employers, social partners, and alumni, it was presented that surveys are conducted to find out where alumni find employment. The surveys are conducted two years after graduation and official statistics are kept. Most students start working during their bachelor's studies, so some employers mentioned that they do not yet have

sufficient skills, but the employers themselves train the students, who then stay on to work in those companies. Employers have no negative comments about students who have completed their master's studies.

4.2.3. Policies to ensure academic integrity, tolerance, and non-discrimination are implemented

Principles and measures for ensuring academic integrity, tolerance and non-discrimination are set out in the KU Code of Academic Ethics, which means that there is a framework that has been established. The latter seems to be well in place, considering also implementation, which is quite crucial.
Teachers must respond to and inform the Ethics Committee of cases of fraudulent student behaviour, such as plagiarism, purchasing written work and submitting it for evaluation by a member of the Academic Community, etc. There were no such cases that have been mentioned, visiting KU. The Description of the general ¸requirements for self-written work of KU students, 2020, also states that students must adhere to the principle of academic integrity when writing written work. The latter is in place for 5 years already, containing expected itemised requirements, which are quite common.
Ensuring academic integrity is well in place, as there is no adverse feedback, as well as SER is indicating that the latter is something that is duly considered, following most established international university guidelines. Additionally to non-discrimination, programme teaching staff is actively trying to accommodate the availability of students, when the latter is challenging due to work or other non-study obligations; this was specifically singled out by alumni.

4.2.4. Procedures for submitting and processing appeals and complaints are effective

Students' right to appeal the assessment of the performance is regulated in the KU's 2024 study regulations for in paragraphs 172 to 178, entitled "Appeals procedure". The procedure for an appeal is thus well documented, while there were no noted testimonials that would indicate it otherwise.
Appeals are admissible in the following cases: assessment of academic performance; unlawful refusal to defend the final thesis or to take the final examination, violation of the procedure for defending the final thesis, and violation of academic principles during the defense. None were noted. Following SER, during the analysed period, no such incidents were recorded with students of Chemical Engineering study programs. This makes the procedure quite effective considering that there were no adverse opinions, which would be raised during onsite live visits, particularly from students themselves.
Procedures are quite clear – there are some questionnaire challenges due to a limited student number, which makes it statistically less representative, anonymity is difficult, as well as any alumni non-participation quite notable. Nonetheless, when needed, needs are being met effectively.

ANALYSIS AND CONCLUSION (regarding 4.2.)

Students fluctuate minimally; efforts are made to increase the enrolment without disrupting ongoing monitoring or feedback processes. Feedback supports the self-assessment, learning goal planning and scheduling of work/class. The programme offers a range of general career options, providing guidance, helping students set realistic progress goals with local industry feedback being largely positive. The policies on integrity, tolerance and non-discrimination are well implemented.

AREA 4: CONCLUSIONS

AREA 4	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements,	Good - 3 Meets the requirements, but there are	Very good - 4 Very well nationally and	Exceptional - 5 Exceptionally well nationally

		but there are substantial shortcomings to be eliminated	shortcomings to be eliminated	internationally without any shortcomings	and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Staff is very established adjusting to students, which do not have any major criticisms to policies or procedures, while the employment of students is fast, as well as high, students also being predominantly satisfied with their further careers, stemming from knowledge attained.

RECOMMENDATIONS

To address shortcomings

1. No shortcomings to address

For further improvement

1. While clear to staff/management itself, a higher student number would address setbacks outlined. High school student drafting should be intensified at as many events as possible.

AREA 5: TEACHING STAFF

5.1.	Teaching staff is adequate to achieve learning outcomes

FACTUAL SITUATION

The Chemical Engineering study field at KU is supported by a highly qualified or qualified and diverse academic staff. 26 lecturers teach subjects in the field of study, and their workload depends on the number of students and the subjects they choose. 42% of teachers are docent professors, 27% professors, 4% doctoral lecturers, 19% non-graduate while these coordinate and teach modules, supervise research and final theses, and contribute to both first and second cycle programmes. The teaching team is international.

The distribution of teachers by age is 27% for teachers under 45, 54% for teachers aged 45-60 and 19% for teachers over 60. This indicates quite healthy dynamics in the continuity of tenures, while appropriate gender balance is also very commendable, considering the field of studies, often a challenge (>60% female).
As student numbers declined, faculty members employed at the KU were laid off. The ratio between the number of chemical engineering teachers and the number of students in this field is about 3. To compensate for the reduced teaching load, an increase in the proportion of academic positions was proposed. Being more invested in research or teaching at other university programmes is positive.
The teaching staff is regulated by the “General requirements for the conduct of studies”: 57% (at least 50%) of first-level subjects are taught by researchers with a master’s certificate or similar, of which 100% (at least 80%) hold a doctorate. This is commendable, but more PhDs should be targeted.

According to the KU Statute, university teachers may be released from teaching duties for a maximum of one year every five years for research purposes and to improve their academic or pedagogical qualifications. Longer foreign stays, common elsewhere are beneficial.
Between 2020 and 2023, Lithuanian-speaking teachers of the programme attended over 100 training courses, seminars and specialized professional development courses. This is positive, but internationalisation should be strived for, aiming at international event (active) participation or promotion.
The number, qualification and competence of existing teaching staff are sufficient to achieve intended learning outcomes. Approximately a half of programme course teachers are the traditional chemical engineers with remainder including chemists, biochemists and other related specialists, two permanent teachers were invited from abroad, adding some international perspective, and notable cross-fertilisation with related engineering disciplines is mentioned. Tenured staff contracts become permanent after a five year period, if requirements are met, with no strict enforced retirement conditions, supporting stability, continuity and sustainability. Teaching, research and innovation teacher responsibilities are flexibly distributed, allowing staff to balance duties, while adhering to regulations. Overall, the present student–teacher ratio is adequate, permanent staff turnover is low, while students are not as many as desired (measures to attract them are in place), contributing to consistent course delivery, high quality hands on learning experiences and lecture time flexibility.

ANALYSIS AND CONCLUSION (regarding 5.1.)

The existing teaching staff is qualified, competent and experienced, half being chemical engineering majors, some are other specialist engineers, and two are permanent international staff. Contracts become permanent after 5 years, ensuring stability. Teaching, research and innovation are flexibly managed. Turnover is low, teachers are proactive in attracting students, and learning is practical. While indeed challenging, increasing the number of students would be helpful to courses also.

5.2.	Teaching staff is ensured opportunities to develop competences, and they are periodically evaluated

FACTUAL SITUATION

5.2.1. Opportunities for academic mobility of teaching staff are ensured

The mobility process is regulated by Senate Resolution No 11-60 on the adoption of provisions for improving the qualifications of KU lecturers and researchers, which provides for academic stays. This implies that mobility has not only been recognised/put into provisions as vital, but is promoted (predominantly via ERASMUS+).
During the period 2021-2024, 4 lecturers participated in the Erasmus+ lectures and internships exchange programme, while some of these over many sequential years, as well as various host institutions. The latter affords teachers a broadness of experience, but also provides (collaboration) connections.
Between 2021 and 2024, six researches joined the Department of Engineering as part of ERASMUS + Exchange Programme for lecture and internship. Nonetheless, there is also KU Science and Studies Support Fund that is being used prudently. 53% teachers participated in mobility, which is positive.
The opportunities for the active academic mobility of present teaching staff exist, though overall longer stays are not very common, no mandatory exchange is required, and internalisation could be more extensive. Previously, Erasmus+ stays averaged approximately six months, but active participation abroad has decreased with >5 signed agreements now being inactive, there being only

a limited outgoing engagement from staff, and students having difficulties as well due to the balancing with work. Inbound staff mobility has been implemented, but remains rare, indicating a room for improvement. Mobility-based research projects, such as those under EU-CONEXUS, provide additional active international engagement opportunities. Increasing both outgoing / incoming staff faculty exchanges could strengthen direct academic mobility, international collaboration and research outcomes.

5.2.2. Opportunities for the development of the teaching staff are ensured

Implementation of the updated procedure according to the improvement of the competence of staff began in 2022-2023. The latter is also being backed by universities, providing a framework, which enables all interested individuals or teachers to participate, whereas they are also paid in full simultaneously.
The university organizes an average of ten courses per year. These are as diverse as foreign language learning, but all the way to various digital tools, which is very welcome, especially in the age of digitalisation, which is also evidenced by the requirements of industry, as well as, by proxy, students.
Some tentative examples of courses are thus as follows: English proficiency, digital skills training, micro-credential, challenge-based training, gender-reflective higher education teaching, gender-based violence, leadership & skills training at every stage of academic, scientific, & administrative careers etc.
The opportunities for the development of existing teaching staff are actively ensured through the engagement in various scientific, professional and didactic activities. Staff typically attends three scientific conferences *per* year, the participation in various international projects, such as interinstitutional gender-focused higher education initiatives, provides additional professional growth, while events are also organised at KU. Some programme studies, courses and materials are offered in English, which is positively commended. Professional teacher quality is measured through publications, the leadership in international consortium projects and reviews, reflecting a balanced multifaceted approach to continuous staff development. While most course teaching is live, around 20% is delivered online, offering students the balance, flexibility and innovation in variable instructional methods.

ANALYSIS AND CONCLUSION (regarding 5.2.)

Academic staff mobility exists, but is limited, with few long stays, rare inbound visits and some internationalisation activities. Projects, like EU-CONEXUS, support engagement. Faculty staff development is fostered through conferences, projects and English courses. Their professional quality is measured *via* the publications, projects and leadership with 20% of teaching being online approximately. Teaching is excellent, but more research integration could be quite welcome as well.

AREA 5: CONCLUSIONS

AREA 5	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Teachers are commended by alumni, especially for their flexibility in terms of lectures and time.

RECOMMENDATIONS

To address shortcomings

1. No shortcomings to address

For further improvement

1. As noted, mobility is something that is presently a bit underrepresented, but is on track. This means that both students, as well as teachers should be stimulated to attend Erasmus+ more.

2. It would be advantageous to bring more specialists to the university as written in the SER: ”The critical mass of the scientific staff must be increased in order to enable participation in larger scale scientific projects.”

AREA 6: LEARNING FACILITIES AND RESOURCES

6.1.	Facilities, informational and financial resources are sufficient and enable achieving learning outcomes

FACTUAL SITUATION

6.1.1. Facilities, informational and financial resources are adequate and sufficient for an effective learning process

Klaipėda is a young university. This is reflected in its quite new facilities and resources. The evaluators' visit to the site confirmed this. The students' laboratories for Chemistry, Physics and Materials Science are well equipped and give enough space for the experimental work. Teachers and technicians are on site, which is very important for efficient teaching and training. Laboratory work plays an important role in almost all courses, as stated in the SER (p: 40). Chemical engineering laboratories and the associated equipment are described in detail in Table 6.1 of the SER. The equipment allows for excellent practical training with state-of-the-art devices. Unique are the Research Vessel “Mintis” and the mobile air pollution research laboratory. It would have been

interesting to see those in real life. Connected to the well equipped labs the list of available software for the students is a long and impressive one.
The lecture halls are well equipped. One minor criticism: in the AULA Magna, it is not possible to use the blackboard and the projection screen at the same time (inspection on site) – a flaw that can also be found at many other universities – as at least two different media should be available for teaching purposes. Very innovative are the big touch screens in the smaller seminar rooms as well as in the study area at the library. The library is - as seen during the site visit - a good place for students to work, well equipped concerning necessary journals and easy access through a standard database. The facilities also offer good opportunities for people with disabilities, but improvements are desirable.
The financial resources are described in detail (SER p: 43-44). It goes without saying that a university's financial resources could always be better - but this is on the one hand a matter for the relevant ministry. KU is clearly making efforts to secure third-party funding from various projects with industry partners and the EU. One notable example of this is its successful participation in EU-CONEXUS.

6.1.2. There is continuous planning for and upgrading of resources.

Discussions with KU management, social partners, industrial partners and researchers have made it clear that the university is future-oriented. Efforts to upgrade resources in order to guarantee students state-of-the-art teaching and learning are described in the SER, but are also emphatically underlined by the aforementioned discussion partners with the panel. Student satisfaction and graduate employability also make this very clear. Of course there are hurdles when it comes to speed up the upgrading of resources. One point e.g. are the funnels as cultural heritage, making the renovation and updating of some laboratories more time consuming - but it is worth it to keep these unique equipment. Planning of new houses is always time consuming - the main point is to keep on with these projects - as is done by the management (topic in the site visit).

ANALYSIS AND CONCLUSION (regarding 6.1.)

In summary and conclusion, it can be said that the facilities meet the requirements and are state-of-the-art, and are available to both first- and second-cycle students. Internships with industry and social partners are mandatory for students – according to feedback from students and partners, availability is not a problem. The information material on financial resources shows a well-thought-out investment plan and a well-coordinated plan that also reflects a continuous planning process to upgrade all necessary resources.

AREA 6: CONCLUSIONS

AREA 6	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. Learning facilities - especially well equipped laboratories and state of the art digitalization - demonstrate the strength of the study programmes.

RECOMMENDATIONS

To address shortcomings

1. No shortcomings to address

For further improvement

1. The continuous improvement process should be sustained in order to boost the attractiveness of the university in general and of the engineering programmes in particular.
2. Investment in a new building planned is very much recommended.

AREA 7: QUALITY ASSURANCE AND PUBLIC INFORMATION

7.1.	The development of the field of study is based on an internal quality assurance system involving all stakeholders and continuous monitoring, transparency and public information

FACTUAL SITUATION

7.1.1. Internal quality assurance system for the programmes is effective

In accordance with the Self Evaluation Report (SER) KU's internal quality assurance system for studies is implemented through a set of defined quality management processes. These include designing, evaluating and continuously improving study programmes; delivering studies; organising studies in accordance with international standards; implementing international partial studies; managing students' scientific and artistic activities; providing student training; offering career guidance and management; managing student and audience admissions; managing stakeholder feedback; and managing non-conformities, among others. Each process description specifies all stages of the quality cycle (planning, implementation, monitoring and improvement) and outlines the related activities, outcomes, responsible persons and key regulatory documents. Internal evaluations are typically conducted on an annual basis. The quality assurance of the programme is overseen by the Study Committee for Chemical Engineering (SFC), together with the Study Quality Commission, which was approved by the Senate and established by order of the Rector of KU. All parts collaborate to make decisions related to the management and quality assurance of the study programme. The SFC engages students, social partner representatives, teachers as well as the Senate's Academic Commission and the Department of Engineering in decision-making processes related to the quality assurance of existing study programmes. During the semester, the Department of Engineering holds regular meetings to discuss quality issues affecting the programme and to gather feedback on courses. Some of these meetings also include external stakeholders, who are invited to suggest improvements to the programme. The programme's overall quality and yearly performance are reviewed at a public faculty council meeting once a year.

During the meetings with administrations and teachers it was confirmed that there are formal mechanisms (reports, surveys, meetings) and more 'ad-hoc' assessment methods (course providers, student committees, engagement with external stakeholders etc.) carried out regularly. The teaching staff are highly responsible and professional in carrying out and being informed by the information they gather.

7.1.2. Involvement of stakeholders (students and others) in internal quality assurance is effective

KU's internal quality assurance system for studies operates according to a specific protocol. The principles of internal study quality assurance take into account key European Union higher education policy documents (e.g. the Bologna and Copenhagen declarations, the Berlin and Bergen communications), and are consistent with the European higher education quality assurance regulations and guidelines, as well as the Republic of Lithuania's fundamental laws and legal acts regulating higher education.

In accordance with the SER Employers are actively involved in assessing and improving the quality of studies. Each study field committee includes social partners, employers, and students, who contribute to evaluating the curriculum, suggesting improvements, and ensuring the program meets current industry needs. Companies are selected based on their relevance to the field, with several key industry partners participating to provide diverse perspectives. In practice, all engineering students complete their final theses in collaboration with businesses and industry, either by choosing topics proposed by municipalities and ministries or by participating in long-term research programs and projects run by the department. Students also are included in internal quality assurance surveys.

7.1.3. Information on the programmes, their external evaluation, improvement processes, and outcomes is collected, used and made publicly available

The SER provides a comprehensive account of the bachelor's and master's degree programmes that are available. The quality of the programs is ensured by a quality management system that specifies how the quality system should operate in accordance with the quality management standard. KU adheres to the principles and criteria outlined in the ISO 9001:2015 quality management standard. KU conducts internal surveys involving students, lecturers, employers, and administrative staff. Surveys are conducted and the results are processed. Furthermore, the annual indicators specified in the relevant process descriptions are collected and analysed in accordance with the Quality Management System in place. All members of the academic community are at liberty to familiarise themselves with these indicators during faculty annual report presentations and department meetings. As outlined in the annual KU report, a summary of the relevant information is published on the KU website. Information pertaining to study programmes, including their results, qualifications and career opportunities, is published on the KU website. The results of programme evaluation studies and feedback from social partners are also published. Feedback from students who have discontinued their studies is analysed, as are the reasons for discontinuation.

7.1.4. Student feedback is collected and analysed

Klaipėda University has an organized and systematic approach for gathering and addressing students' feedback. It is regularly collected via online questionnaires at the end of the semester. In these questionnaires, focus areas cover matters like subject value, evaluation methodologies, lecturer communication, access to study materials, and overall satisfaction with the subject. These reviews are anonymous, however, due to the low number of students, the participation is quite low. Apart from these questionnaires, program leadership and faculty members engage students continuously with discussions on study performance, challenges, and areas of improvement. Feedback analysis takes place at various levels: individual lecturers, program committees, individual departments. Occasionally, bodies like Student Union or Study Councils become involved if necessary. The analysis outcomes are then used to modify programs or courses based on specific areas needing improvement or advancement while incorporating new courses if necessary. It is

evident that the University not only collects but utilizes student responses for improvement of academic standards.

During the meetings it was find out that students are addressed at all levels and this was very welcome. The students clearly enjoyed the study programmes and the depth of engagement (both formal and informal) was highly praised. Student feedback is collected, analysed and acted on. It was shown that various feedback was actioned and improved the course.

ANALYSIS AND CONCLUSION (regarding 7.1.)

From the SER and meetings with teachers, students, managers, and employers, it's clear that the quality of bachelor's and master's courses is checked using a quality management system. We check the quality of our programmes inside and outside the company, and we make improvements based on the results of these checks. The Study Committee for Chemical Engineering (SFC) and the Study Quality Commission make sure that the programme is of good quality. The SFC and the Study Quality Commission were approved by the Senate and set up by the Rector of KU. Everyone involved works together to make decisions about how the study programme is managed and how to make sure it is of good quality.
During the meetings, teachers, students, the administration, alumni, social partners and employers confirmed that the quality assessment system is working effectively and that all relevant parties are included in the assessment procedure. Students and recent graduates expressed satisfaction with the calibre of their education and reported a high level of employment success during and after their studies.

AREA 7: CONCLUSIONS

AREA 7	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
First cycle				X	
Second cycle				X	

COMMENDATIONS

1. The broadness of the engagement with stakeholders in programmes assessment and improvement was excellent.
2. The willingness to engage with students and their feedback was of the highest quality.

RECOMMENDATIONS

To address shortcomings

1. No shortcomings to address

For further improvement

1. Comparative assessment with national and international universities should be considered.

V. SUMMARY

Klaipėda University (KU) was a relatively young university established in 1991. It is an indispensable center of education and research in the region and has established itself both nationally and internationally.

KU's chemical engineering programs meet the needs of society and the labour market. The university works closely with industry and businesses specially around Klaipėda but also internationally. The panel expressly welcomes the numerous efforts made by KU to increase the number of students in the two study programs, which could and should be expanded further because graduates are urgently needed, especially in industry. In future - as a recommendation of the expert panel - final theses should be improved by expanding the research section, as well as the practical/results and engineering/modelling sections.

KU has created a strong base for supporting most parts of student admission and everyday life. They have a structured environment that provides access to academic mobility, educational information, and financial, academic, and psychological support. It has to be noted that the university has a low mobility rate due to personal, demographic, economic, and geopolitical reasons among students. For this reason, additional measures should be taken to encourage students to participate in mobility programs.

The teaching and learning environment and the resources needed to deliver high-quality teaching for both study programs and to provide students with the necessary teaching materials and learning facilities are very good. In general the facilities at KU meet the requirements and are state-of-the-art. They are available to both first- and second-cycle students. Internships with industry and social partners are mandatory for students and are well organized. KU has a well-thought-out investment plan that intends to upgrade all necessary resources. The further expansion and renovation plans explained to the panel should definitely be supported.

The level and quality of research are satisfactory given the predominantly young, committed teaching staff, some of whom are still relatively new to their research careers, and the small size of the student group. An increase in the number of international peer-reviewed publications is expected but is not yet very visible. A strategy to improve the visibility of research work is recommended. Students contribute to research through project work and theses, often supervised externally. A stronger connection to the faculty is just as desirable as a clear perspective for an internal doctorate.

In summary, it can be said that both study programs, Chemical Engineering (environment and energy) and Engineering for Innovative Process are promising and that the prerequisites for successful implementation are in place.