FINAL REPORT

ON THE EXTERNAL INTERNATIONAL EVALUATION

of the Study Programme

"Energy Efficient and Sustainable Buildings"
MAJOR
"Construction" (08.04.01)

Delivered by "Peter the Great St. Petersburg Polytechnic University"

accredited 07/2017-06/2019

Saint Petersburg, 2017

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Chair of the External Review Panel	Zima Elena Alekseevna

Saint Petersburg, 2017

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INTRODUCTION

The external review of the study programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major delivered by the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" (hereinafter referred to as the University or SPbPU), was held on April 11th to 12th, 2017 and involved the analysis of the self-evaluation report, the site visit to the University by the external review panel and the preparation of the present report.

The main objective of the external review is to identify the compliance of study programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major delivered by the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University", with the standards and criteria of international public accreditation, developed by the National Centre for Public Accreditation, Russia (hereinafter NCPA), in cooperation with the Evaluation Agency Baden-Württemberg, Germany (hereinafter evalag) in accordance with the European standards for quality assurance in higher education ESG-ENQA (hereinafter standards for joint international accreditation).

The report on the results of the external review is the basis for the National Accreditation Board and the Accreditation Board evalag to make a decision on international public accreditation of the educational programmes.

1. CONTEXTS AND MAIN STAGES OF THE EXTERNAL REVIEW

1.1 Grounds for the External Review

In accordance with Paragraph 1, Article 3 of 96 Federal Law of 29 December, 2012 No 273 - FL "On Education in the Russian Federation" institutions carrying out educational activities may undergo public accreditation in various Russian, foreign and international organizations; employers and their associations as well as their authorized organizations shall have the right to carry out professional public accreditation of professional educational programmes delivered by an educational institution.

1.2. Composition of the External Review Panel

Foreign experts were nominated by Evaluation Agency Baden-Württemberg evalag, Germany.

Russian expert, representative of the academic community, was nominated by the Guild of Experts in the Sphere of Higher Education, Russia.

Expert representing the international professional community was nominated by Evaluation Agency Baden-Württemberg evalag, Germany.

Expert representing the student community was nominated by the Kazan National Research Technological University, Russia.

The Review Panel composition was approved by NCPA and evalag.

The Review Panel consisted of four experts:

- **Elena Alekseevna Zima,** PhD in Engineering, Associate Professor, Rectorate Adviser, Saint Petersburg State Chemical Pharmaceutical Academy of the Ministry of health of the Russian Federation ex vice-rector for Academic Affairs, Novosibirsk State University of Architecture, Design and Arts, Secretary of Regional Commission for quality assessment of Higher Education in the Siberian Federal District — Russian expert, Review Chair
- **Prof. Dipl.-Phys. Axel Bretzke,** Professor for Energy Use and Energy Technology, Biberach University of Applied Sciences, energy consultant for cities, government and industry, member of head from energy company and city energy management, Hessian Ministry of Environment, member of German Engineer Association and German Network of Energy Consultants — foreign expert, Deputy Review Chair

- **Julia Jedelhauser,** Head of the Markt Pfaffenhofen Building Authority, member of the Bavarian Chamber of Architects (Munich, Bavaria), 15 years lecturer in facility management, sustainability and innovatives in construction industry and 10 years external lecturer at the University of Applied Sciences Nürtingen - Geislingen — foreign expert, representative of professional community, panel member

- **Denis Valerevich Nizhegorodtsev,** 1st year Master student, Faculty of Civil Engineering, Saint-Petersburg State University of Architecture and Civil Engineering — Russian expert, representative of student community, panel member

Field-oriented expertise of the panel members, as well as their extensive, diverse and years-long experience in the system of higher education and profession, active position of students' and employers' representatives formed the basis for the effective work of the panel on reviewing the entire scope of issues and problems in the course of evaluation.

Involvement of representatives of both German and Russian systems of higher education in the External Review panel provided an opportunity to analyze the delivery of programmes undergoing accreditation both in line with global quality assurance trends in higher education and in the context of the national education system.

1.3 Purpose and Objectives of the Review

Public accreditation is aimed at enhancing the quality of education, developing the quality culture in educational organizations, identifying the best practices for continuous improvement of the quality of education and informing the public about the organizations that deliver educational programmes in compliance with the European standards of quality.

The main objective of the external review is to identify the compliance of educational programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" delivered by the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic

University", with the standards and criteria of international public accreditation, developed by NCPA in cooperation with evalag and aligned with the European standards for quality assurance in higher education ESG-ENQA as well as the to make the recommendations for the enhancement of the content and organization of the educational process within the programmes undergoing accreditation.

1.4 Stages of the External Review

The External Review consisted of three main stages:

1.4.1 The review of the Self-evaluation report

The Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" was responsible for the self-evaluation procedure, preparation and timely submission of the Self-Evaluation Report of the educational programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major to NCPA and evalag.

In compliance with the "Guidelines for Self-Evaluation of the Educational Programmes", developed by NCPA in cooperation with evalag, the self-evaluation report on 41 pages includes: introduction, results of the self-evaluation procedure, conclusions and a list of the enclosed annexes. The self-evaluation procedure was carried out with regard to each NCPA and evalag standards based on the SWOT-analysis.

In compliance with the programme of the review, the self-evaluation report of the educational programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major was submitted to NCPA and evalag, and the Panel members 30 days prior to the site visit to the HEI.

When reviewing the self-evaluation report, the external review panel had the opportunity to form a preliminary opinion on the educational programme undergoing accreditation and to analyze the compliance of the programme with the standards and criteria, developed by NCPA and evalag, and with the European standards of education quality.

The external review panel members assessed the level of the self-evaluation report in terms of the structure, compliance of the information with the sections, the quality of perception, sufficiency of the analytical data, availability of the references to supporting documents and completeness of the data, which provided the possibility of forming a preliminary expert judgment.

The panel members noted the following suggestions for improvement of the self-evaluation report: The following missed data would have enabled the external review panel to get a clearer idea on some aspects of the study programme:

- The programme courses (modules) do not contain research results, experience of the staff in relation to the taught competencies and other components that would enable undergraduates to develop the competencies in

terms of "energy efficiency and sustainable buildings and other components that would enable undergraduates to develop the competencies in terms of "energy efficiency" and especially the competences referring to "sustainable buildings";

- From the self-evaluation reports the link of the study programme and the funded research is not clear enough;

- The compliance of the study programme with the requirements of standard 6 "Quality assurance" is insufficiently described;

- The two versions of self-evaluation reports in Russian and English are different;

- The name of the study programme in Russian provided in the Report runs counter with the name of the same programme in Russian taken from the official University website;

Based on the results of preliminary work of the external review panel the following conclusions were made:

- In general the data provided in the report enable the panel members to carry out the preliminary evaluation of the "Energy Efficient and Sustainable Buildings", programme 08.04.01 "Construction" major in terms of its compliance with the standards of international accreditation of the study programmes.

- The final conclusion whether the "Energy Efficient and Sustainable Buildings" programme complies with the set standards can be carried out upon the results of the site visit of external review panel to "Peter the Great St. Petersburg Polytechnic University"

According to NCPA and evalag joined international standards and criteria, the preliminary assessment of the educational programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major can be formulated as 'compliance".

During the external review, the following issues required more detailed analysis:

- The presence of research results in the contents of the programme courses (modules) and other components that would enable undergraduates to develop the competencies in the field of "energy conservation" and result in compliance of the study programme with the criteria of standard 1. Programme profile, standard 2. Curriculum, standard 5. Resources;

- Compliance of the study programme with the criteria of standard 6 Quality assurance.

During the preliminary meeting, the panel members formulated the proposals, which determined the general strategy of the site visit.

1.4.2 The site visit to Peter the Great St. Petersburg Polytechnic University

The review panel visited Peter the Great St. Petersburg Polytechnic University on April 11-12, 2017 in order to confirm the reliability of the data of the self-evaluation report, collect additional information with regard to the programme delivery and identify the compliance of the programme with the Standards and Criteria, developed by NCPA and evalag.

The dates and the programme of the site visit were preliminary determined by NCPA and evalag and approved after coordination with the University administration and the panel members.

During the site visit, the panel held meetings and interviews with the University administration, heads of departments, teaching staff, students and employers. During the review, the external review panel studied the presented documents and requested for additional materials. The review chair supervised the work of the panel.

The panel notes that the self-evaluation report provided by the University allowed the experts to form a clear idea of the peculiarities of the study programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major delivery.

During the site visit, the panel reviewed the documentation, held face-to-face meetings, inspected research and university laboratories, it allowed the experts to obtain more complete information, which turned to be sufficient for objective and integral evaluation of the quality on the study programme undergoing accreditation.

The review panel considers it necessary to note the effective cooperation of experts with the NCPA and evalag staff during the preparation and site visit to SPbPU. The panel notes high level of organization and efficient work.

For conducting the site visit, the University administration provided the external review panel with administrative support, including organization of the meetings and interviews, facilities, computers with the internet access and the necessary scientific, educational and methodological materials.

On the last day of the visit the review chair presented the oral report on the results of the visit to the University administration, teachers and students. The detailed programme of the panel visit is available in the Annex to the present report.

1.4.3 Conclusion on the Results of the External Review

Following the results of the External Review of the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University", the external review panel presented to NCPA and evalag the report on the results of the external review of the study programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" major, which is delivered by the educational institution.

The working version of the report on 16 pages without annexes was prepared by the review chair and submitted to NCPA and evalag after coordination with other review panel members. After that, the report is to be submitted to the University administration to correct possible factual errors.

2. DESCRIPTION OF THE EDUCATIONAL PROGRAMMES

The purpose of the Master's students' specialized training programme "Energy Efficient and Sustainable Buildings" is to develop knowledge among the students about new energy efficient and sustainable constructive solutions of buildings and structures, computation of energy source losses norms and ways to set quotas for energy resource consumption, procedure for implementation and registration of energy survey results (energy audit).

The study period of the educational programme is 2 years, intramural. The overall period of studies is divided into semesters (4 semesters altogether). The first semester is held at "Peter the Great St. Petersburg Polytechnic University". The programme allows students to complete a part of the programme at one of SPbPU partner universities. The key university partners participating in the programme delivery are Vilnius Gediminas Technical University (Lithuania); Riga Technical University (Latvia); Technische Universität Graz (Austria).

The programme is based as the premises of the Institute of Civil Engineering, the administration department is the Department of Construction of unique buildings and structures.

The Master programme supports student research in the following fields:

- technical and economic grounds and selection of methods ensuring thermal protection of buildings and structures;
- technical and economic grounds and design options for building structures and engineering systems of buildings and constructions;
- Development of the method for loss calculation in energy carriers and methods for standardisation of energy consumption;
- Development of energy-saving programmes and providing technical and economic grounds for regular energy-efficient measures;
- Development of technological and construction solutions for buildings and constructions in order to enhance their energy efficiency;
- Improvement of the methods for development of energy efficient programmes;
- Development of new engineering methods of energy efficiency enhancement in buildings and constructions.
- No research especially in the topics of sustainable buildings

On-the-job placements is provided by the leading St Petersburg entities involved in the energy audits of buildings and structures as well as design and construction companies of St. Petersburg, state institutions and engineering authorities, expert organisations involved in building and constructions.
The graduates from the programme may be employed by:

- Companies carrying out energy audits of buildings and structures;
- Construction and design organizations preparing design documents for buildings and structures of different purposes;

- General contractor and subcontractor's companies;
- Public services (Construction Committee, State Construction Supervision and Expertise Department, etc.);
- Institutions involved in design documentation expertise;
- Enterprises manufacturing building envelopes;
- Higher education institutions.

Fluency in English is one of the enrolment eligibility requirements. Entrance examinations include interdisciplinary entrance exam in "Construction" (written test) and an interview with a Director of the Institute of Civil Engineering in English.

Students' academic achievements within the programme are assessed as "excellent", "good", "satisfactory", and "fail" for exams and "pass" or "fail" for tests.

Twenty teachers are involved in the educational process delivery including 13 (65%) with scientific degrees, including 7 (35%) with a Doctor's degree. Most teachers (70%) are the leading practitioners. None in the sustainable building industry.

Three types of equipment are used in the study programme: equipment on mechanics of liquids and gas, heat and gas supply and ventilation, structural physics and material science equipment, machinery used to inspect buildings and structures.

Computer training of Master students is delivered in computer classrooms, equipped with state-of-the-art hardware and software necessary for the learning process. Lecture rooms are equipped with overhead multimedia projectors. All the computers are linked together via LAN and have corporate Internet access. All the installed software is licensed.

The University e-library provides access to the library systems and databases worldwide including Scopus, Web of Science, Cambridge University Press, Elsevier eBooks Collections, Oxford University Press, OATD (Open Access Theses and Dissertations), etc.
The Moodle platform is integrated into the learning process and is actively used by students (http://dl.spbstu.ru/)

3. RESULTS OF THE EXTERNAL REVIEW

3.1 Standard 1. Programme profile

*Compliance with the standard**: Satisfactory***

Table 1 – Criteria with regard to Standard 1

No	Aspect of review	Assessment
1.	Correspondence of the objectives of the study programme to the profile and strategic goals of the HEI	**3**
2.	Definition of the intended learning outcomes of the programme and their accessibility	**2**
3.	Correspondence of the intended learning outcomes to the level of awarded qualification	**3**
4.	Consideration of academic and professional requirements (standards), public needs and the demands of the labour market in the intended learning outcomes	**3**
5.	Relation of the study programme to research (provision of scientific methods in theory and practice, research based teaching)	**2**
6.	Compliance of the programme's profile with internationally accepted standards	**1**
7.	The international dimension of the programme	**4**
8.	Correspondence (adequacy) of the teaching staff's qualifications to the profile and objectives of the programme	**2**

The study programme "Energy Efficient and Sustainable Buildings" takes an important place in training well-qualified specialists in order to meet the regional demand for specialists in the development of new energy efficient constructive solutions applicable to buildings and structures based on the methods of energy carrier loss calculations and approaches to standardise consumption of energy resources and carry out energy audits. The competences of the topics referring to sustainable building industry are missing (sustainable systems, sustainability in the building environment – focus on building and design, e. g. facility management, maintenance, etc.)

The study programme "Energy Efficient and Sustainable Buildings" is delivered in English for both national and international students, which fosters students' and teachers' academic mobility and allows integrating new achievements gained in the subject area into the learning process first hand.

Unfortunately the programme profile doesn't contain formalised students' competencies related to energy efficiency and conservation as well as the competences in sustainable buildings. Regulatory and guidance documentation of the study programme undergoing accreditation does not reflect interaction with employers and has no evidence of orientation to professional standards including international ones.

Achievements:

- High degree of programme internationalisation;
- Availability of research journals indexed in SCOPUS and Web of Science;
- Implementing a variety of student support including support of students' academic mobility.

Areas for improvement:

Definition and availability of intended learning outcomes – with focus to sustainability:

- Students should be educated to analyse, synthesise and apply sustainable building theory and principles to address industry issues, and implement new directions in sustainable building design.
- They should be able to professionally communicate their ideas and strategies, justifying decisions to diverse stakeholders, including government and industry stakeholders.
- The students should have knowledge of sustainable building and performance theory, and leading technologies, to develop solutions that respond to the diverse needs of sustainable building project stakeholders. They should be able to critically examine and reflect on their work, as well as on sustainable building theory, to question accepted building solutions, design strategies, design practices and decision making approaches.
- They should be able to apply appropriate research methods, tools and technical skills to plan and evaluate projects that contribute to the profession and the field of knowledge of sustainable buildings.
- If the word sustainability is in the programme title/profile – it should be anchored in the lectures as well;

- Link of the study programme with research results including students' involvement in funded research;
- Compliance of the programme profile and its objectives with the international professional standards and to HEI;
- Employing well-qualified teaching stuff in compliance with the set goals and objectives of the programme (pertaining to "Energy conservation").

Recommendations:

- All the set goals of the study programme should be clearly specified in the regulatory and guidance documents pertaining to "Energy efficiency and energy conservation" as well as to "sustainable buildings".
- Communication with employers and orientation towards professional standards including international professional standards should be formalised and documented regularly.
- It is necessary to enhance the activity of the teaching staff to do funded research and involve students.
- It is necessary to implement regular measures of attracting well-qualified personnel in order to achieve the programme goals related to energy conservation and sustainably buildings.

3.2 Standard 2. Curriculum

*Compliance with the standard**: Satisfactory***

Table 2 – Criteria with regard to standard 2

No	Aspect of review	Assessment
1.	Structuring of the programme and ways of achieving intended learning outcomes	**2**
2.	Mechanisms for providing knowledge in the corresponding discipline in the framework of the delivered programme. Application of scientific methods in the delivery of the programme	**2**
3.	Organization of learning experience with the account of the diversity of students and their needs and appropriate student-centered teaching. Encouraging students to take an active role in creating the learning process	**3**

The study programme combines theoretical and research components in training students. The curriculum and the working programmes of the courses allow designing individual learning trajectories including national and international academic mobility.

E-learning and distant learning technologies are widely used in the programme delivery; the needs and requirements of working students and students with health restrictions are also taken into consideration.

The key drawback of the programme is the insufficient documented contents, which can result in developing insufficient students' competencies related to energy conservation and sustainability, which is not referred to in the curriculum (e.g. there is no lecture on this topic).

Achievements:

- Modular structure of the study programme allows designing individual learning trajectories including international academic mobility periods;
- The learning process incorporates a variety of learning and teaching methods including distant learning;
- Students' individual needs and requirements are taken into consideration, including the needs of students with health restrictions.

Areas for improvement:

- The programme should be better structured in order to attain the set learning outcomes in the field of energy conservation and sustainable building industry;
- Mechanisms of gaining knowledge upon the programme courses completion and developing students' competencies in the field of energy conservation and building sustainability;
- Insufficient number of real practical courses;
- Active involvement of students in the planning of their learning process.

Recommendations:

- It is recommended to review regulating and guiding documents of the programme together with the staff, thus attaining the set learning objective – development of students' competencies in the field of energy conservation and sustainable buildings;
- It is advisable to keep students and even the staff informed on how they can contribute to the contents of the learning process, students should be more actively involved in such activities;
- It is recommended to increase the share of the practical disciplines in form of additional practice-oriented selective courses within the curriculum and to increase the share of on-the-job placement at employer's premises.
- There should be particular lectures which identify the topic of sustainability.

3.3 Standard 3. Student assessment

*Compliance with the standard**: Very good***

Table 3 – Criteria with regard to standard 3

No	Aspect of review	Assessment
1.	Organization of assessment of intended learning outcomes	**3**
2.	The adequacy of the amount and requirements of assessments with regard to the intended learning outcomes	**3**
3.	The correspondence of the requirements of the thesis to the level of the degree	**4**
4.	Transparency and consistency of assessment criteria	**3**
5.	Adequacy of the qualifications of the staff undertaking assessments	**4**
6.	Availability of examination regulations	**4**
7.	Availability of clear and objective regulations for student absence, illness and other mitigating circumstances	**4**

The intended learning outcomes are assessed in accordance with the developed and approved local regulatory acts in compliance with the acting law on education of the Russian Federation.

In all the courses, practical training sessions and research work delivered within the programme, there seems to be adequate criteria for evaluation. The graduation theses also comply with the level of the awarded qualification.

There is a flexible system of distinct and objective rules regulating students' missing classes because of illnesses or other mitigating circumstances.

Achievements:

- High level of qualification of the teaching staff assessing students' achievements;
- Distinct and objective rules regulating students' missing classes because of illnesses or other mitigating circumstances;
- High level of graduation theses.

Areas for improvement:

- Using a 4 level assessment system ("excellent", "good", "fair/ satisfactory", "fail") severely limits the possibilities of accounting students' academic achievements, first of all in foreign educational institutions;

- Keeping students informed on the applied criteria for evaluation and students' academic achievements exists on the normative level, however, not all the teachers know and follow it;
- The assessment system is represented with an extensive set of documents, but there is not description of the activity or procedure that would link all these documents.

Recommendations:

- It is recommended to implement a more flexible point and ranking system in order to evaluate students' achievements and make it compatible with the ECTS.
- Particular attention should be paid to the processes connected with informing students on the criteria for evaluation of their academic achievements, possibly including this aspect into a feedback questionnaire within the quality management system.
- There should be a rationale in optimising the system of documents regulating students' achievements in order to ensure its transparency.

3.4 Standard 4. Organisation of the study programme

*Compliance with the standard**: Good***

Table 4 – Criteria with regard to Standard 4

No	Aspect of review	Assessment
1.	Appropriateness of entry qualifications	**3**
2.	Regulations for the recognition of qualifications (i.e. Lisbon Convention)	**4**
3.	Organisation of the study process and achievement of intended learning outcomes. Consideration of the diversity of students and their needs	**3**
4.	Management of the study programme (roles and responsibilities)	**2**
5.	Adequacy of the workload of the programme with respect to the necessity to reach the intended learning outcomes in the scheduled time frame	**3**
6.	Organization of the student life cycle (i. e. all (organisational) relationships between the student and the institution from enrolment to graduation)	**4**
7.	Student support system (care services and student advisory services)	**4**
8.	Cooperation with internal and external partners	**3**

Students' admission to the programme, the process of teaching and learning and their graduation procedures are regulated by the regulatory and guidance acts developed and approved by the University in compliance with the current legislation of the Russian Federation.

The University is eligible to acknowledge students' background education or qualification, scientific degrees or titles obtained abroad in accordance with the procedures established by the University.

International students benefit from the flexible support system.

Upon the programme completion students may receive the European Diploma Supplement.

Achievements:

- Flexible support system for international students;
- European Diploma Supplement;
- Active involvement of the University in international partnerships enabling students with extensive international opportunities;
- Taking into consideration the diversity of students' needs when implementing a programme.

Areas for improvement:

- Admission requirements to the programme disregard its profile;

- Management of the study programme (distribution of roles and responsibilities) are not formalised documented. The Programme is managed "in manual mode"; who has to be ask for what is unclear for staff and students.
- Students' independent work is large in terms of academic hours, however, it is not supported with adequate requirements to its results.
- Obey the fact, that some students have to go to work for 2-3 days a week

Recommendations:

- It is necessary to involve the teaching staff employed in the programme delivery in development and expertise of the entrance assessment materials (tests);
- It is recommended to distribute roles and responsibilities on the level of regulating documents of the programme management;
- It is advisable to optimise students' workload carried out independently, thus, making the workload of students' independent work comply with the requirements to its results.
- There should be minimum one staff meeting every semester - internal and external lecturers as well as students for coordination (administrative as well as content belongings).

3.5 Standard 5. Resources

*Compliance with the Standard**: Good***

Table 5 – Criteria with regard to standard 5

No	Aspect of review	Assessment
1.	Sustainability of funding and financial management	**4**
2.	Adequacy of the number and qualification of academic staff (full-time and part-time) to ensure intended learning outcomes	**2**
3.	Availability of strategies and processes for the staff recruiting and staff development	**3**
4.	Availability, sufficiency and quality of facilities and equipment for the provision of the programme (library, laboratories, teaching rooms, IT equipment)	**3**
5.	Sufficiency and quality of the resources provided to reach the objectives of the programme	**3**

The study programme "Energy Efficient and Sustainable Buildings" is properly and adequately financed from different sources. Students' and teachers' academic mobility is financed in the framework of European grants for academic mobility, such as Erasmus + Key Action 1 in cooperation with over 20 European universities.

In compliance with the current Russian legislation there are regular procedures used to employ the teaching staff and assess their qualification, which ensures the adequate quality of courses (modules) delivery, meant to develop students' competencies in the sphere of energy efficiency and sustainable buildings. There are regular further training sessions for the (internal and external) teaching staff.

The study programme uses the library, which provides access to the global e-library systems and databases like Scopus, Web of Science, Cambridge University Press, Elsevier eBooks Collections, Oxford University Press, OATD (Open Access Theses and Dissertations) etc.
The programme is provided with all the necessary resources and equipment (laboratories, IT equipment, software) aimed at competencies development in the sphere of energy efficiency. However the laboratory is lacking laboratories of energy conservation and sustainability in the building industry (ecological building material footprints, grey energy (embodied energy) of building material, LLC (life cycle costs), TCO (total costs of ownership), cradle to cradle, etc.).

Achievements:

- Regular further training for the teaching staff, including foreign language training (English);
- Free access to e-library systems and global databases;

- Diverse and numerous sources of finance ensuring the stability of the study programme;
- Contemporary IT equipment and software necessary to develop students' competencies in the sphere is energy efficiency and sustainability (life cycle costs, total costs of ownership, maintenance, facility management, etc.).

Areas for improvement:

- Teaching and learning resources related to energy conservation as well as sustainabilities in the building industry.

Recommendations:

- It is necessary to establish regular procedures aimed at attracting well-qualified teaching staff in order to meet the programme goals in the sphere of energy conservation. Knowledge and experience of the staff for the competencies to be conveyed has to be documented.
- It is recommended to establish laboratories for research into the impact of sunlight on different materials, install ventilation and conditioning equipment, and the equipment for assessment of the air quality, daylight use, as well as sustainability (ecological building material footprints, grey energy (embodied energy) of building material, LLC (life cycle costs), TCO (total costs of ownership), facility management, cradle to cradle, etc.).
- It is necessary to install up-to-date software in order to carry out quality activities in the sphere of energy conservation as well as the topic of sustainability in the building industry.

3.6 Standard 6. Quality assurance

*Compliance with the standard**: Satisfactory***

Table 6 – Criteria with regard to Standard 6

No	Aspect of review	Assessment
1.	Design, approval and implementation of the programme; monitoring procedures	**2**
2.	Availability of a quality assurance concept of the programme and how it is connected to the quality assurance system of the institution	**2**
3.	Quality assurance processes and instruments of the programme	**2**
4.	Effectiveness, regularity and systematic character of the quality assurance system	**1**
5.	Availability of mechanisms for closing quality feedback loops	**2**
6.	Collecting, analysis and use of data by the persons responsible for implementing the programme	**1**
7.	Involvement of stakeholders (students, teachers, administration, external experts, alumni, employers) in quality assurance	**1**
8.	Making students and prospective students aware on the programme	**3**

The concept of the University quality assurance is regulated by the Quality management policy of SPbPU developed in the framework of the certified Quality Management System (QMS). The concept of the study programme quality is regulated by the University (local) educational standards which are developed and implemented along with the programmes for development and procedures of the attestation of the University subdivisions.

The system of quality assurance is adequately developed on the level of documents, however it is still in an early stage of its development in terms of practical application.

Achievements:

- The document support of the quality assurance in education is adequate;
- Current and prospective students are properly informed on the programme;
- Employers demonstrate high interest to the study programme.

Areas for improvement:

- Procedures of development, monitoring and update of the programme;
- The link between the programme quality assurance and the University quality assurance;
- Practical application of the procedures and instruments of the programme quality assurance;

- Practical application of the mechanisms for closing quality feedback loops;
- Collecting, analysis and use of data by the persons responsible for implementing the programme;
- Involvement of stakeholders (students, teachers, administration, external experts, alumni, employers) in quality assurance.
- Contact to employers should be formally and intensively looked after

Recommendations:

- It is necessary to bring in compliance the concept of quality assurance of the study programme and the concept of the quality assurance of the University, thus, ensuring practical application of the necessary procedures and instruments of the programme quality assurance as well as procedures for mitigating the revealed drawbacks;
- Students and teachers should be more closely involved in the procedures of development, monitoring and improvement of the programme. There should be at least one meeting every semester referring to content and organisational matters.

4. STATEMENT OF THE UNIVERSITY

МИНОБРНАУКИ РОССИИ
федеральное государственное автономное
образовательное учреждение
высшего образования
«Санкт-Петербургский политехнический
университет Петра Великого»
(ФГАОУ ВО «СПбПУ»)

Statement of the University

The Institute of Civil Engineering expresses its gratitude to the expert group for their expert report on the international accreditation of the study programme «Energy Efficient and Sustainable buildings», delivered by the Federal State Autonomous Institution of Higher Professional Education «Peter the Great St. Petersburg Polytechnic University».

No factual errors have been revealed in the report.

We would like to express once again our gratitude to the expert group, German accreditation agency evalag and national accreditation agency NCPA for the large scope of highly professional work on preparing and drawing up the expert report on evaluation and accreditation of the study programme « Energy Efficient and Sustainable buildings » of the field of study «Construction» (08.04.01).

Director of the Institute of Civil Engineering Vatin N.I.

5. RECOMMENDATIONS FOR IMPROVEMENT (SUMMARISED)

Thus, based on the analysis of documents submitted, meetings and interviews, which were held during the site visit to SPbPU, the external panel made a list of recommendations, which would be useful for the improvement of the quality of the programmes' delivery:

The key drawback of the study programme "Energy Efficient and Sustainable Buildings" is in compliance of its purpose aimed at training specialists in the sphere of energy conservation as well as sustainability in the building industry and the contents of the programme, which eventually results in the necessary resources.

1- Programme Profile

R1[1] All the set goals of the study programme should be clearly specified in the regulatory and guidance documents pertaining to "Energy efficiency and energy conservation" as well as "sustainable buildings".

R2 Communication with employers and orientation towards professional standards including international professional standards should be formalised and documented regularly.

R3 It is necessary to enhance the activity of the teaching staff to do funded research and involve students.

R4 It is necessary to implement regular measures of attracting well-qualified personnel in order to achieve the programme goals related to energy conservation and sustainably buildings.

2- Curriculum

R5 It is recommended to review regulating and guiding documents of the programme together with the staff, thus attaining the set learning objective – development of students' competencies in the field of energy conservation and sustainable buildings.

R6 It is advisable to keep students and even the staff informed on how they can contribute to the contents of the learning process, students should be more actively involved in such activities.

R7 It is recommended to increase the share of the practical disciplines in form of additional practice-oriented selective courses within the curriculum and to increase the share of on-the-job placement at employer's premises.

R8 There should be particular lectures which identify the topic of sustainability.

3- Student Assessment

R9 It is recommended to implement a more flexible point and ranking system in order to evaluate students' achievements and make it compatible with the ECTS.

R10 Particular attention should be paid to the processes connected with informing students on the criteria for evaluation of their academic

[1] R = recommendation

achievements, possibly including this aspect into a feedback questionnaire within the quality management system.

R11 There should be a rationale in optimising the system of documents regulating students' achievements in order to ensure its transparency.

4- Organisation of the study programme

R12 It is necessary to involve the teaching staff employed in the programme delivery in development and expertise of the entrance assessment materials (tests).

R13 It is recommended to distribute roles and responsibilities on the level of regulating documents of the programme management.

R14 It is advisable to optimise students' workload carried out independently, thus, making the workload of students' independent work comply with the requirements to its results.

R15 There should be minimum one staff meeting every semester – internal and external lecturers as well as students for coordination (administrative as well as content belongings).

5- Resources

R16 It is necessary to establish regular procedures aimed at attracting well-qualified teaching staff in order to meet the programme goals in the sphere of energy conservation. The knowledge and experience of the staff for the competencies to be conveyed has to be documented.

R17 It is recommended to establish laboratories for research into the impact of sunlight on different materials, install ventilation and conditioning equipment, and the equipment for assessment of the air quality, daylight use as well as sustainability (ecological building material footprints, grey energy (embodied energy) of building material, LLC (life cycle costs), TCO (total costs of ownership), facility management, cradle to cradle, etc.).

R18 It is necessary to install up-to-date software in order to carry out quality activities in the sphere of energy conservation as well as the topic of sustainability in the building industry.

6- Quality Assurance

R19 It is necessary to bring in compliance the concept of quality assurance of the study programme and the concept of the quality assurance of the University, thus, ensuring practical application of the necessary procedures and instruments of the programme quality assurance as well as procedures for mitigating the revealed drawbacks.

R20 Students and teachers should be more closely involved in the procedures of development, monitoring and improvement of the programme. There should be at least one meeting every semester referring to content and organisational matters.

6. CONCLUSION OF THE EXTERNAL REVIEW PANEL

Based on the analysis of submitted documents, data and interviews, the External Review Panel made a conclusion that the study programme "Energy Efficient and Sustainable Buildings", 08.04.01 "Construction" delivered by the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" **in general** complies with NCPA and evalag standards and criteria.

The Review Panel recommends the National Accreditation Board and evalag Accreditation Council to accredit the study programme "Energy Efficient and Sustainable Buildings" of the training field "Construction" (08.04.01), which is delivered by the Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" **for the period of 2 years**.

On behalf of the External Review Panel:

Elena Alekseevna Zima
Review Chair

7. DECISION OF THE EVALAG ACCREDITATION COMMISSION AND NCPA ACCREDITATION COMMISSION

The accreditation commissions of NCPA and evalag accredited jointly the Master's programme Energy Efficient and Sustainable Buildings of Peter the Great St. Petersburg Polytechnic University. The **evalag** Accreditation Commission awarded the **evalag** label for international programme accreditation on 27th June 2017, the NCPA Accreditation Commission awarded the NCPA label on 29th June 2017. The accreditation is valid from 1st July, 2017 until 30th June, 2019.

To further improve the programme the accreditation commission affirms the recommendations given by the expert team.

Programme Profile

R1 All the set goals of the study programme should be clearly specified in the regulatory and guidance documents pertaining to "Energy efficiency and energy conservation" as well as "sustainable buildings".

R2 Communication with employers and orientation towards professional standards including international professional standards should be formalised and documented regularly.

R3 It is necessary to enhance the activity of the teaching staff to do funded research and involve students.

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Curriculum

R5 It is recommended to review regulating and guiding documents of the programme together with the staff, thus attaining the set learning objective-development of students' competencies in the field of energy conservation and sustainable buildings.

R6 It is advisable to keep students and the staff informed on how they can contribute to the contents of the learning process, students should be more actively involved in such activities.

R7 It is recommended to increase the share of the practical disciplines in form of additional practice-oriented selective courses within the curriculum and to increase the share of on-the-job placement at employer's premises.

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Student Assessment

R9 It is recommended to implement a more flexible point and ranking system in order to evaluate students' achievements and make it compatible with the ECTS.

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Organisation of the study programme

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Resources

R16 It is necessary to establish regular procedures aimed at attracting well-qualified teaching staff in order to meet the programme goals in the sphere of energy conservation. The knowledge and experience of the staff regarding the competencies for the study programme has to be documented.

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Quality Assurance

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R20 Students and teachers should be more closely involved in the procedures of development, monitoring and improvement of the programme.

ANNEX A

EXTERNAL EXPERT COMMITTEE VISIT SCHEDULE

Time	Event	Participants	Venue
April 10th, Monday			
During the day	Experts' arrival to St.Petersburg, Transfer to the "Dostoevsky" Hotel (19, Vladimirsky prospect)		
17.00 — 18.30	Training meeting for expert teams		"Dostoevsky" Hotel, Conference Hall
20.00	Dinner (for foreign experts)		The Hotel cafe
April 11th, Tuesday			
08.20	Meeting in the Hotel hall (for foreign experts). Transfer to SPbPU.		"Dostoevsky" Hotel (19, Vladimirsky prospect)
08.45	Arrival to SPbPU		16th Academic Building (28a, Grazhdansky prospect)
09.00 — 10.30	**Internal preparatory meeting of expert team**	Expert team	Room 220a
10.30 — 11.30	**General meeting of the University heads, heads of departments and Expert team**	Rector, Vice-rectors, Heads of the departments, Expert team	Room 220
11.30 — 12.00	Document review. Expert evaluation of the graduation thesis works	Expert team	Room 221
12.00 — 13.30	Lunch	Expert team	University canteen
13.30 — 13.45	Transfer to the SPbPU Main Building		29, Politekhnicheskaya str.
13.45 — 14.15	**Visit to the Library Complex**	Expert team	The Main Building Library
14.15 — 14.30	Transfer to the Institute of Civil Engineering		10th Academic Building (29, Politekhnicheskaya str.)
14.30 — 15.15	**Meeting with Institute Director and Deputy Heads**	Institute Director, Deputy Heads, Expert team	Room 220,
15.15 — 15.30	Coffee-break		Room 411

Time	Event	Participants	Venue
15.30 — 16.30	**Meeting with program manager, teaching and administrative staff**	Head of the Department, program manager, program coordinator, Expert team	Room 411
16.30 — 17.30	**Tour through the Academic Building: visits to the main rooms, labs, equipment review**	Expert team	
17.30 — 18.00	**Meeting with employers and alumni**	Employers, Alumni, Expert team	Room 241
18.00 — 18.15	Internal meeting of expert team	Expert team	Room 411
18.20	Transfer to the Hotel		29, Politekhnicheskaya str.
20.00	Dinner at the Hotel (for foreign experts)		The Hotel cafe
April 12th, Wednesday			
08.30	Meeting in the Hotel hall (for foreign experts). Transfer to SPbPU.		"Dostoevsky" Hotel
08.50	Arrival to SPbPU		16th Academic Building (28a, Grazhdansky prospect)
09.00 — 09.15	Internal meeting of expert team	Expert team	Room 221
09.15 — 10.15	**Meeting with students**	The students, Expert team	Room 220a
10.15 — 10.30	Coffee-break	Expert team	Room 220
10.30 — 12.00	**Meeting with teaching staff**	The teaching staff, Expert team	Room 220a
12.00 — 12.45	Extra meeting (upon request)	Expert team	Room 220a
12.45 — 14.00	Lunch		University canteen
14.10 — 16.00	**Internal meeting of expert team** **Assessment form completing, work with the report.** **Preparation of oral report.**	Expert team	Room 221
16.00 — 17.00	**Feedback to program management.** **Final meeting of expert teams with University representatives**	University representatives, Expert team	Room 220
17.00 — 17.30	Free communication with the experts		Room 220
17.40	Transfer to the Hotel		
20.00	Dinner at the Hotel (for the foreign experts)		

LIST OF PARTICIPANTS

The University heads, responsible for the accreditation process:

№	Name	Position	Contacts
1.	Andrey Rudskoy	Rector	rector@spbstu.ru
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№	Name	Position	Contacts
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№	Name	Position	Contacts
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№	Name	Position	Contacts
1.	Akishonkova Natalia	Employer, the company "Bonava"	natalia.akishonkova@bonava.com
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Teaching staff:

№	Name	Position	Contacts
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4.	Maria Vrublevskaya	Head of the Centre "International marketing and recruitment of foreign students"	vrublevskaya@spbstu.ru
5.	Mikhail Kitain	Assistant of the department "Hydraulics"	kmb33@yandex.ru
6.	Daria Zaborova	Assistant of the department "Hydraulics"	zaborova-dasha@mail.ru
7.	Olga Nikonova	Senior lecturer of the department "Water Resources and Hydrotechnical Engineering"	olganikonova@yandex.ru
8.	Irina Kudryashova	PhD in Tech. Sc., Associate Prof. of the department "Water Resources and Hydrotechnical Engineering"	kudr@cef.spbstu.ru

Students:

№	Name	Field of study, program name	Year of study	Contacts
1.	Asylgaraeva Margarita	Energy Efficient and Sustainable Buildings	1	margarita.asylgaraeva@yandex.ru
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8.	Dzampaev Timur	Energy Efficient and Sustainable Buildings	2	dzampaevtemur@gmail.com
9.	Baiguskarov Dinar	Energy Efficient and Sustainable Buildings	2	dinarbay@gmail.com
10.	Pakut Mariia	Energy Efficient and Sustainable Buildings	2	luck2362615@gmail.com

ANNEX B

ASSESSMENT PARAMETERS OF THE STUDY PROGRAMME

No	Standards	Assessment of study programme			
		Very good	Good	Satisfactory	Unsatisfactory
1.	Programme Profile			√	
2.	Curriculum			√	
3.	Student assessment	√			
4.	Organization of study programme		√		
5.	Resources		√		
6.	Quality assurance			√	