

**EVALUATION REPORT FOR EVALUATION OF RESEARCH
ORGANIZATION IN THE SEGMENT OF HIGHER EDUCATION
INSTITUTIONS IN YEAR 2025**

HIGHER EDUCATION INSTITUTION NAME: VSB – Technical university of Ostrava

COMPANY REGISTRATION NUMBER (CRN): CZ61989100

THE LIST OF EVALUATION UNITS IN MODULE 3:

- 1. Faculty of Mining and Geology (FMG)**
- 2. Faculty of Materials Science and Technology (FMST)**
- 3. Faculty of Mechanical Engineering (FME)**
- 4. Faculty of Economics (FE)**
- 5. Faculty of Electrical Engineering and Computer Science (FEECS)**
- 6. Faculty of Civil Engineering (FCE)**
- 7. Faculty of Safety Engineering (FSE)**
- 8. IT4 Innovations National Supercomputing Centre (IT4I)**
- 9. Centre for Energy and Environmental Technologies (CEET)**

CHAIRPERSON OF INTERNATIONAL EVALUATION PANEL

Name and surname: Pedro Pinho

Phone number: [REDACTED]

E-mail: [REDACTED]

LIST OF INTERNATIONAL EVALUATION PANEL MEMBERS		
Name and surname	Position in IEP	Current position
Pedro Pinho	Chairman	Associate Professor in Electronics, Telecommunications, and Informatics Engineering University of Aveiro, Portugal
Dražan Kozak	Member	Professor of Mechanics and Strength of Materials University of Slavonski Brod, Croatia
Anna Śrębowata	Member	Associate Professor in Institute of Physical Chemistry, Polish Academy of Sciences, Poland

John R. Anchor	Member	Professor Emeritus of International Strategy University of Huddersfield, United Kingdom
Mario Parise	Member	Associate Professor in Engineering Geology University of Bari Aldo Moro, Italy
Masato Sone	Member	Professor of Materials Science Institute of Integrated Research, Institute of Science Tokyo, Japan
Janez Povh	Member	Professor of Mathematics University of Ljubljana, Slovenia, Managing Director at Rudolfovo Public Research Institute, Slovenia
Paul J. Tikalsky	Member	Professor of Civil and Environmental Engineering, Oklahoma State University, Stillwater, USA
Lucie Průšová	Secretary	VSB – Technical university of Ostava

PROVIDERS METHODOLOGIST

Name and surname: Aneta Kučerová

Phone number: [REDACTED]

E-mail: [REDACTED]

Date of on-site visit of higher education institution: 10-12 June 2025

In _____ date _____

Signature _____
(IEP chairperson)

CONTENT

MODULES 3	Page
1. Faculty of Mining and Geology (FMG)	4
2. Faculty of Materials Science and Technology (FMST)	12
3. Faculty of Mechanical Engineering (FME)	21
4. Faculty of Economics (FE)	28
5. Faculty of Electrical Engineering and Computer Science (FEECS)	37
6. Faculty of Civil Engineering (FCE)	47
7. Faculty of Safety Engineering (FSE)	54
8. IT4 Innovations National Supercomputing Centre (IT4I)	60
9. Centre for Energy and Environmental Technologies (CEET)	69
Summary Rating in Module 3	77
MODULE 4 Viability	80
Module 4 Rating	98
MODULE 5 Strategy and Policies	100
Module 5 Rating	104
Overall Evaluation in Modules 1 to 5	105

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Faculty of Mining and Geology (FMG)

FORD: 1 - Natural sciences

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The Faculty of Mining and Geology (FMG) has an exclusive position at Czech universities. Its history dates back to 1716 and is one of the oldest mining universities in Europe. They claim to be the only one which is able to deal with complex issues in the area of mining and mineral processing, including the mitigation of the negative consequences of mining. These aspects connect FMG's traditional activity in raw materials to the issues of environmental protection and sustainability which are of high social benefit.

FMG of VSB-TUO tries to connect traditional mining and geology with current challenges of sustainable development, technological innovations, and environmental protection. Within its vision, FMG connects traditional mining and geology with current challenges of sustainable development, technological innovations, and environmental protection. The faculty is oriented since a long time towards applied research and innovations beneficial to industrial practice and society, and its main areas of contribution cover very different themes such as the development of new methods of raw material extraction and treatment, the optimization of geological and geoinformatics processes for effective resource utilization, the application of new technologies in landscape monitoring, mining sites, and environmental risks, the development of safety systems in the mining industry, and the innovation in the areas of waste management, recycling, and sustainable resource handling. Particular focus is given to transferring knowledge to industrial practice.

The teaching process of the Faculty of Mining and Geology focuses on raw materials, industry, geology, geoinformatics, geodesy, environmental engineering, and economics linked to the management of natural resources. Research activities cover the following areas:

- o efficient extraction and processing of raw materials;
- o circular economy;
- o sustainable development;
- o industrial safety;
- o modern methods of data analysis and management.

The faculty assists and participates in decision making processes at the local, national and international level as a means of advancing the quality of life for all.

The Faculty of Mining and Geology is divided into six departments, two science learning centres, and two purpose-built units. FMG focuses on linking theoretical education with practical application, while emphasizing the quality of the teaching process, research excellence, and cooperation with industry.

The number of academic positions in the Faculty of Mining and Geology has substantially decreased from 154 FTE in 2019 to 122 FTE in 2022. The numbers in all categories of staff have decreased, only the number of professors has increased from approx. 10 FTE to approx. 14 FTE. The number of graduate students enrolled in the FMG has decreased as well in the same period. As for students, the only exception is represented by undergraduate students, where a positive trend in the years 2019-2023 was registered.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

3 - Average

Qualitative assessment:

During the evaluation period (2019-2023) there were 6 awards to FMG professionals. Among these, there is the prestigious Czech POLYMATH popularisation competition. This is a national contest, supported by 21 universities, that showcases the best science communicators across disciplines. Prof. Ing. Marian Marschalko is included in the top 2% of cited scientists, according to the Stanford University list, in Mining & Metallurgy and Geological & Geomatics Engineering.

FMG provides expert services and consultancy in the fields of mining and mineral processing. Twelve staff members are authorized to deliver expert opinions, act as forensic experts, or contribute to legal and economic assessments in the areas of economics and mining (all these activities are supported by industry and judicial bodies).

Faculty members are active in the editorial boards of a variety of research journals/publications across the discipline of geosciences, mining, and geo-information. In FMG approximately 17-19% of the academic staff have delivered invited lecturers or seminar series at foreign institutions and international conferences.

Several projects have been evaluated by FMG members in calls relevant to the R&D&I area at the unit during the evaluation period, even though it must be stressed that the greater majority are Czech programme calls (TAČR, GAČR, VEGA).

Recommendations:

The exposure of faculty member's research to a broad audience is important to individual awards and recognition, especially for Assistant and Associate Professors. FMG might consider more incentives, and to support with greater efforts, nominations of its faculty members for professional awards in geological sciences, with particular reference to mining geology.

Election to Fellow or Honorary Membership of geosciences societies is most closely tied to active leadership in the profession, which requires travel support to professional meetings and support for regular attendance to technical meetings.

More work should be done to improve FMG recognition, by considering all the issues above stated.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The ten research projects highlighted in the self-evaluation report showcase the emphasis of the faculty on innovative mining methods that emphasise sustainability and minimise environmental impact, improving air quality in urban and industrial spaces, conversion of closed mines into renewable energy sources, identification and use of new geothermal energy sources, and other issues related to sustainable use of resources.

FMG projects contribute to the development of science and innovation, with direct impacts on the economy and the environment. A significant part of the interdisciplinary research activities are carried out within the framework of international projects. The results directly impact industry, public administration, and the sustainable development of society.

During the evaluation period 112 R&D project proposals were submitted, at both national and international levels, with a success rate of 51,8%.

A large variety of contract research activities are listed in the self-evaluation report, highlighting the related revenues, and collaboration was established with 44 industrial partners. FMG is, in the faculties at VSB-TUO, among those showing the largest percentage of share of public funding from abroad (8,81%), and that of funding from other sources as well (12,73%).

Many projects are from TAČR, which demonstrates the applied research and the innovation potential as well. More projects from GAČR would mean that basic research is also being undertaken.

Recommendations:

It is recommended that the Faculty of Mining and Geology continues to expand the size and scope of research activities across the majority of the academic positions. Such an expansion of research will enhance the expertise of the faculty, at the same time keeping its members at the forefront of their profession, and could potentially contribute to significantly improving the economy of the country.

Mid-career and senior members of the academic staff in the faculty should seek to lead larger research grants proposals and lead multi-institutional endeavours.

Greater efforts in reaching more project funds from GAČR are encouraged, aimed at giving higher relevance to the basic research.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Much of the research and innovation that is performed by the Faculty of Mining and Geology at VSB-TUO is directly impactful to society. At this regard, several examples are highlighted in the self-evaluation report; among these there are several patents and projects, as:

- patent for an innovative solution for efficient energy storage using the potential and kinetic energy of bulk material;
- patent for an innovative method for the efficient production of multi-layer pipes;
- prototype of a sensitive reader that allows drones to identify objects in logistics and warehouse management efficiently;
- European patent for an advanced method for simulating the kinetics of bulk solid particles to analyze their movement and interactions under various conditions.

A Methodology for the Identification and Assessment of Safety-Risk Locations in a City has been developed that combines objective criminal data with the perception mapping of residents; this system has been directly implemented in Ostrava, Olomouc, and other cities to improve safety policies.

Recommendations:

Make further efforts in order to expand the research activities with industry and national/regional/local government agencies. Increasing these activities will have the potential to lead to significant impacts on society. In addition, it will represent a valuable tool aimed at engaging students in practical examples of the value of their education and developing expertise to improve the quality of life.

FMG should actively work in the attempt to commercialize the patents. This would further increase the impact on society in the different fields in which FMG members have been capable of obtaining patents.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Mining and Geology (FMG) systematically transfers research results into practice through collaboration with industrial partners, public administration, and foreign entities. The main tools of this transfer are contract research, applied research funded by grants and project resources, the creation of methodologies and technological solutions, and the licensing of patented results. There is a good to very good share of contract research. In this regard, the activities carried out are consistent with the R&D&I results produced and the mission and vision of the evaluated unit, and many of these results are transferred to stakeholders and industries through the aforementioned modalities.

On the other hand, donations to the university and FMG appear to be relatively small over the evaluation period, as well as the income from licensing.

Recommendations:

Increase the efforts for organisation of workshops and seminars for industrial partners and the public sector.

Implement further activities in order to have direct outreach to companies and search for opportunities to apply results in practice.

Engage companies to utilize the expertise and facilities of VSB-TUO to grow their business and develop ideas that improve safety or productivity. FMG should be more involved in the set-up of spin-off firms and other forms of commercialising R&D&I (please note that this was already a recommendation in the previous evaluation report).

Greater efforts are encouraged aimed at raising more income from licensing and donations.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Mining and Geology is deeply engaged in outreach activities that communicate to the public and promote young people to pursue careers in the area of Earth Sciences and mining. During the evaluation period, it organized 16 international conferences, covering a variety of topics dealing with Earth Sciences, Mining, and Environmental Engineering.

FMG members are also active in local and regional popularisation conferences and lectures, and in collaborating with secondary schools. At the professional level, the FMG hosts technical conferences and workshops to disseminate research results.

FMG is active in social networks and media to highlight local STEM events and the implementation of research in the community.

Recommendations:

Continue with robust public outreach, especially addressed to young students, in the effort to promote them to pursue careers in the area of Earth Sciences. More activities should be addressed to the general public, in order to change the feeling they might have about mining activities, and push them toward a higher awareness of the efforts made by VSB-TUO on the transition „from

black to green". Such efforts could also play a role in potentially helping to increase the income from licensing, donations, etc., which at present appear to be quite low.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Most of the recommendations listed in the previous evaluation were addressed by the work done during this evaluation period. Some of them, however, were not. In this section, IEP presents therefore our main indications about implementation of the recommendations.

Revenue per researcher/staff member was indicated in the previous IEP evaluation as relatively low, and was expected to grow in the near future. However, the data in this evaluation period indicate a modest net increase in revenue per staff member, with significant year-to-year fluctuations.

Several actions have been implemented as a response to the recommendation to diversify funding sources, making efforts to engage with a broader range of national and international funding agencies. However, it has to be noted that, at present, these efforts have not yet resulted in awarded funding.

The recommendation to investigate more potential commercialisation aspects has been successfully followed, with an increase in the number of patents.

As concerns the strategies to set up and/or support spin-off firms or other forms of commercialisation of the results from R&D&I, efforts have been made to exchange with foreign institutions and non-academic partners, but nothing seems to have been done in the direction of establishing a spin-off consulting company based on a number of research results.

Looking at the activities carried out by FMG, the gained awards are still somewhat limited to Czechia with rare examples, which are inside Europe; given the good collaborations with universities, especially in Asia, it would be very good to have such results also in other continents. In addition, as concerns the recognition by the international R&D&I community, there is quite a good number of FMG employees in the editorial boards of international SCI-impact journals; however, the IEP still sees further potential to improve such a number.

Recommendations:

Greater efforts should be done in order to produce a higher, constant, growth in the revenue per researcher/staff members.

Continuing to develop processes to build new opportunities to diversity the funding sources.

It is again recommended, following what already indicated in the previous evaluation, to work in the direction of setting up spin-off firms.

Make a higher effort to obtain more awards in the fields of research of FMG, as an effect of the

significant research impact in economic and social spheres.

Increase the number of FMG members in editorial boards of international journals.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	3 - Average
3.3 Research projects	4 - Very good
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	4 - Very good
3.7 Implementation of the recommendations in Module	4 - Very good
Average rating [1–5]:	4 - Very good
Grade [A–D]:	B

Summary assessment:

The Faculty of Mining and Geology represents a very good reference centre at a national level, and a good research centre at an international level, in the knowledge of mining processes, mineral processing, waste and water recycling, and the biodegradation of waste materials. The unit is making an effort to solve eco-friendly problems, addressed toward a sustainable management of mining activities.

The high position of FMG is confirmed by the values of projects that contribute to strengthening the interaction between the faculty and the social environment in all the areas of research, development and innovation.

In its strategic priorities, the faculty focuses on further developing its research base, strengthening international cooperation, and more intensive participation in prestigious EU research programmes. It also plans to expand research capacities in the area of advanced data analysis and artificial intelligence, reflecting current trends in scientific disciplines related to sustainable management of natural resources. These intentions are considered in a positive way, but some of them were already indicated in the 2020 evaluation, and they should therefore be put into practice rather than still being at the level of „we plan to do...“.

The best results in the period of evaluation were achieved by FMG in applied research projects, contractual research, applied research results with an existing or prospective economic impact on society, as well as recognition within the international R&D&I scientific community. Most results, in particular, contribute to sustainability by reducing the environmental impact of industrial processes, promoting recycling, and optimising resource utilisation. All of these applied solutions significantly enhance the efficiency of industrial and environmental processes, support sustainability, and strengthen the competitiveness of Czech research at the international level.

Thus, IEP evaluates positively the timeliness of projects in terms of the specific situation of the mining industry in the region of the Czech Republic, the success of the faculty in patents granted (Czech and international), and the stable revenue from contractual clients from the Czech Republic.

International/EU patents are listed in the self-evaluation report, which is an improvement that follows one of the previous recommendations. Nevertheless, the weaknesses of FMG is still the absence of spin-off firms, plus a relatively low number of awards, especially internationally, compared to the number of patents and intellectual property rights.

In general, it is confirmed in this evaluation that more internationalisation is needed, and that international/EU projects partnerships and collaborative grants should be one of the main focus for FMG. In detail, in order to obtain higher scores in the next evaluation cycle, the following areas should be improved: • projects supported by a provider from another country, • the applied research results with economic impacts on society should be made more visible.

Summary recommendations:

Make greater efforts, and show specific indicators for their evaluation, toward a further development of the research base, and to strengthen the cooperations with other countries, especially out of Europe, in order to reach a higher value in the international scientific community.

Provide a more intensive participation in prestigious EU research programmes.

Expand research capacities in current trends in scientific disciplines related to sustainable management of natural resources (including analysis of big data and artificial intelligence). Foster, with particular reference to this latter regard, stronger collaborations with other VSB-TUO faculties.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Faculty of Materials Science and Technology (FMST)

FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

[1] Mission and vision

The Faculty of Materials Science and Technology (FMST) has aims to be a leading European center of excellence in advanced materials and sustainable industrial technologies, driving innovation through interdisciplinary research, strong industry partnership, and global collaboration. The core research areas are material chemistry, material science and engineering, chemical and environmental engineering, metallurgy and metal processing, and quality and sustainable research management. The FMST's strategic priorities for 2021-2027 are: (1) Research excellence in fundamental and applied research, EU projects, and initiatives, (2) Industrial collaboration through strategic partnerships and knowledge transfer, (3) International cooperation, including global projects and the international exchange of experts and students, (4) Human capital development, motivation, and competitiveness.

[2] Organizational structure

FMST has seven departments and two centers:

Department of Materials and Technologies for Vehicles

Department of Thermal Engineering

Department of Quality Management

Department of Chemistry and Physico-Chemical Process

Department of Metallurgical Technologies

Department of Material Engineering and Recycling

Department of Industrial System Management

Centre for Advanced Innovative Technologies

Centre for Chemical Engineering

[3] Size and staffing

The FMST program has a total of 794 students, including 37 international students. Of these

students, 62% are pursuing a bachelor's degree, 24% are pursuing a master's degree, and 14% are pursuing a doctoral degree. Furthermore, the number of bachelor's degree students increased from 238 in 2022 to 319 in 2024. Twenty-two percent of bachelor's students pursue doctoral degrees, demonstrating that students recognize the advantages of advanced education. FMST offers a Nanotechnology Cotutelle doctoral program under the direction of Prof. Pierre Korejak (VSB-TUO, University of Lille, and RPTU in Kaiserslautern) and Prof. Mariusz Drong (VSB-TUO, Institut Polytechnique de Paris and UC Berkeley).

The average number of full-time equivalent employees for FMST is 131.7, including 75.5 academic staff (11.5 professors, 20.3 associate professors, 38.4 assistant professors, and 5.3 lecturers), 28.2 research staff, and 28.0 other employees. Of this staff, 11.2 are researchers from abroad. Notably, 57 staff members are women, accounting for 43% of the total. Therefore, this organization can be considered to have an exceptionally high gender balance among research institutions in the field of engineering.

[4] R&D&I capacities

From 2022 to 2024, FMST achieved four key milestones. First, new research topics were aligned with societal and technological challenges, including advanced materials for medicine, the circular economy, and AI applications with the IT4Innovations mission. Second, scientific productivity increased with a focus on quality, meaning more WoS/Scopus publications and a higher citation impact. Third, publications appeared in top international journals, with year-on-year citation growth. Fourth, priority areas were set, including energy materials, nanotechnology, 3D printing, biomaterials, and technologies for healthcare and biotech.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-Technical University of Ostrava (VSB-TUO) has a long tradition of excellence in materials engineering, with the Faculty of Materials Science and Technology (FMST) playing a central role. It is confirmed by several national and international awards. Staff from the Faculty sit on the editorial boards of various professional journals reflecting the Faculty's main areas of focus, i.e. Materials, Archives of Foundry Engineering, nt technologies (Acta Technologia, Journal of Pressure Vessel Technology), (Economics Management Innovation), Quality Innovation Prosperity, Sustainability, Acta Energetica. A typical example is Professor Strnadel Bohumir, who was awarded "the Order of the Rising Sun" by the Japanese Imperial Family in recognition of his contributions to materials engineering research and to education between Japan and the Czech Republic. This award is extremely difficult to receive for a professor currently working.

The scientists in this faculty were invited to give a talk in the international institutions. Scientists are called upon to be involved in evaluating the results of research programmes funded by the Czech Republic Technology Agency, the Czech Science Foundation, the Ministry of Industry and

Trade, and the National Committee for the Evaluation of Research Programme Results.

In engineering science fields, the university ranks of VSB-Technical University of Ostrava among the top 10 institutions is 7th place on material engineering in the Czech Republic publishing in Q1 journals, although all the faculty members in FMST did not report their studies in the journals related to materials engineering. This stems from the FMST's interdisciplinary strategy, which will be discussed later. The number of articles in IF journals increased from 80 in 2022 to 102 in 2024, and the number of Q1 journals increased from 28 in 2022 to 49 in 2024.

Based on funding and industry cooperation projects, it can also be concluded that the FMST has a higher position in the international R&D&I research community.

Recommendations:

It is clear that the interdisciplinary strategy of FMST is effective for getting funding from the contract research and international sources and industry and for increasing the number of bachelor students of FMST. However, due to the shift to an interdisciplinary department, evaluation based on simple research indicators is insufficient. This is a global issue. FMST, which is active internationally, should also consider measures to address research indicators.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

One of the strategic priorities of the Faculty of Materials Science and Technology (FMST) for 2021-2027 is research excellence in fundamental and applied research, EU projects, and initiatives as mentioned in 3.1. The strategic priority has been successful.

Funding for research and development (R&D), including contract research and international sources, increased from 3.9 million Euro in 2022 to 7.9 million Euro in 2024. The total project portfolio for FMST is over 38.06 million Euro. The main projects are **MATUR** (OP JAK); Materials and Technologies for Sustainable Developments, Programme Johannes Amos Comenius project, (co-funded by the EU for 18.64 million EUR), **CirkArena** (OP ST); the Research Center for Circular Economy, Operational Programme Just Transition project, (co-funded by the EU for 10.1 million EUR), **REFRESH** (OP ST); an Operation Programme Just Transition, **National Competence Centre-Mechanical Engineering**, having two programs in which consortium consists of 33 members (1.03 million EUR) and **CyberCert-CZ**; a multidisciplinary project carried out under auspices of the Czech National Cyber and Information Security Agency (NÚKIB) , jointly implemented by faculties of VSB-Technical University of Ostrava.

From 2020 onward, the university has updated many of its buildings and installed state-of-

the-art equipment with EU funding. This is due to the university's geographical advantage in the Czech Republic and the decision not to concentrate capital in Prague, as well as the effectiveness of the university's decision-making process. Due to the successful advances of the VSB-Technical University of Ostrava, FMST has joined many large-scale projects with other faculties and led many industrial cooperation research projects. The current situation is a very positive cycle for R&D&I.

Most Ph.D. students have studied in the faculty, but some have joined the project laboratories of large projects and have expressed interest in working at related companies. Involving PhD students is very effective for the success of the project. The educational program is not only effective in achieving the strategic priorities of this faculty, but also in strengthening the country's industry.

Recommendations:

Participating in large-scale projects is beneficial for both doctoral students and the success of the projects themselves. In order to strengthen the power of FMST for large-scale projects, FMST is recommended to focus on HE projects, like RIA actions, and to prestigious EU projects (MSCA, ERC, Centres of excellence).

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The strategic priorities of the Faculty of Materials Science and Technology (FMST) for 2021-2027 are as follows: (1) research excellence in fundamental and applied research, EU projects, and initiatives; (2) industrial collaboration through strategic partnerships and knowledge transfer; (3) international cooperation, including global projects and the international exchange of experts and students; and (4) human capital development, motivation, and competitiveness. These strategic priorities are:

Strategic priority (1) is successful. The number of articles in IF journals increased from 80 in 2022 to 102 in 2024, and the number of Q1 journals increases 28 in 2022 to 49 in 2024. R&D funding, including contract research and international sources, increased from 3900 (kEuro) in 2022 to 7900 in 2024. The total project portfolio for FMST exceeds 38.06 million euros.

Especially, In particular, item (2) was successfully achieved. Collaboration with industry through contract-based applied activities exceeds 4.42 million EUR. Revenues from contract research increased by 300 kEUR from 2022 to 2024. Notably, the strategic partnership with Panasonic has applied R&D funding worth over 2.81 million EUR. FMST has many long-term partnerships and two-way knowledge transfers with large companies in the Czech Republic, Europe, and around the world. FMST actively files international patents for joint research with companies and has secured the rights to these patents.

Strategic priority (3) is effectively evaluated on international collaboration. For internationalization, FMST collaborates with several foreign universities on research and education. These include LAB University of Applied Sciences (Finland), University of the Arts London (UK), Swansea University (UK), Edinburgh Napier University (UK), Indian Institute of Technology (India), Yokohama National University (Japan), and Oxford University (UK), the Technical University of Denmark, the Fraunhofer Institute (Germany), Southern Illinois University Carbondale, the Silesian University of Technology (Poland), the AGH University of Science and Technology (Poland), the École Polytechnique de Paris (France), the Sanofi Company, GI Windows Surgery, Boston Scientific (USA), and the Texas Semiconductor Summit (USA).

The aim of strategic priority (4) is to increase human capital development, motivation, and competitiveness. As mentioned in Section 3.1, FMST has an average of 131.7 full-time equivalent employees, 57 of whom are women (43% of the total). Among research institutions in the field of engineering, FMST can be said to have a particularly high gender balance. Not only does FMST participate in projects in the Czech Republic and the European Union and secure a large budget, it is also highly regarded by international companies, with which it conducts joint research. Therefore, FMST has already achieved gender balance and so it is already achieving its mission and vision. This can be evaluated as an ideal success from a gender perspective, demonstrating the high sustainability of FMST.

Recommendations:

FMST has established international partnerships with many foreign universities and companies, and is characterized by a more balanced gender ratio. Providing a place where foreign researchers and female researchers can actively and freely conduct joint research with many international companies is a motivation for international companies to invest in this university. Therefore, we hope that this university will strengthen such an environment and promote it.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

One of FMST's strategic priorities for 2021-2027 is industrial collaboration through strategic partnerships and knowledge transfer as mentioned in 3.4. Collaboration with industry is the most important factor in evaluating the effectiveness of transferring results into practice. FMST's contract-based applied activities exceed 4.42 million euros and its contract research revenues increased from 300 kEUR in 2022 to 1.16 million EUR in 2024. FMST has active collaborations with over 100 companies across sectors. Notably, the strategic partnership with *Panasonic* has applied R&D funding worth over 2.81 million EUR. FMST has many long-term partnerships and two-way knowledge transfers with companies such as *ŠKODA*, *SIEMENS*, *BROSE*, and *TATRA* in the Czech Republic, Europe, and around the world. This means that the technical transfer of research results

into practice at FMST has been evaluated by foreign big companies.

FMST actively files international patents for joint research with companies and has secured the rights to these patents. For example, FMST has an assigned license for the patent application CZ.2022-354 (2/2025), titled "Method for Transforming Contaminated Wood Material and Technology for Its Implementation," as well as the international patent "Bacillus Cereus Derived Silver Oxide Nanoparticles for Sustainable Agricultural Application," No. 202511038864 A (India).

Recommendations:

FMST has international collaborations with many foreign universities and companies. If we want to see companies invest more in universities in the future, the role of public relations at universities will become increasingly important. This point must be emphasized.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Materials Science and Technology (FMST) is strongly engaged in popularization (outreach) activities to show research outputs not only in Czech Republic but also in Europe;

On Technology Agency of the Czech Republic (TACR) 2024, the FMST and BONATRANS got winner of the project "Reduction of Noise Emissions from Railway Vehicles, focusing on the development of new types of noise dampers of the development of new types of noise dampers of the BONASILENCE ® family" in the Business Category.

In 16th Edition of International Invention and Innovation show INTARG ® 2023, the FMST got a gold medal, WIPA Special Award "Method for obtaining iron concentrate from metallurgical slag" and a silver medal, the Award from Polish Chamber of Patent Attorneys "Technology for energy utilization of used polymeric parts from discarded cars"

In International Invention and Innovation INVENT ARENA 2024, the FMST got a gold medal for Most innovative Idea "Ceramic glazes by recycling waste" and a silver medal "Technology for the thermal treatment of waste from car wrecks from the point of view of maximum energy yields and minimum emissions."

The FMST has shown its research output into the Art & Science festival in VSB - Technical University of Ostrava from 2015 to the public. In particular, during the visit to this faculty, we had the opportunity to test drive electric and gasoline vehicles made from polymer bodies designed by the students. These research outputs are an effective way to increase public understanding of research.

Recommendations:

In order to emphasize the research output into the public, FMST is recommended to utilise the homepage and other SNS media and to keep attending at public facing events. FMST should continue with robust public outreach and the continuing education efforts of practicing engineers.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

On the recommendations from the previous evaluation of the IEP, the Faculty of Materials Science and Technology (FMST) shifted focus from 2022-2024. In order to respond to the strategic vision of the university and industry and society needs, the FMST conducted transformation and the results as following;

1. Merged departments and to pursue broader interdisciplinarity: which led to increase the number of bachelor's degree students from 238 in 2022 to 319 in 2024. (as described in 3.1 [3])
2. Infrastructure sharing and capacity coordination; which led to join many large-scale projects with other faculties and many industrial cooperation research projects (as described in 3.3)
3. Innovate tools to support research and internationalization: which led to join many large-scale projects from Czech Republic, EU and Industries and also to enforce the research activities (as described in 3.3)
4. Fostering an internationality oriented environment; which led to the technical transfer of results into practice in FMST has been evaluated by the foreign big companies (as described in 3.5).
5. Ensuring equal opportunities and transparent assessment; which led to higher gender valance (57.3% of academic staff) as compared to the faculty of engineering and technology in the world and to increase the researcher from abroad (as described in 3.1 & 3.4)

Recommendations:

The transformation of FMST on the strategic vision of the university and industry and society needs was effective to realize the strategic priorities of FMST. Thus, it is necessary to continuously seek the industry and society needs and to respond to them and moreover to transform the research & educational environment on the strategic vision.

EVALUATED UNIT RATING

Evaluation of unit	
Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.	
3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	4 - Very good
3.3 Research projects	4 - Very good
3.4 Research results with existing or prospective impact on society	5 - Outstanding
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	4 - Very good
3.7 Implementation of the recommendations in Module	4 - Very good
Average rating [1–5]:	4 - Very good
Grade [A–D]:	B
Summary assessment: Materials science is one of the fields that VSB-Technical University of Ostrava (VSB-TUO) aims to strengthen. In this field, Faculty of Materials Science and Technology (FMST) plays a leading role by a long tradition of excellence in materials engineering and has set four strategic priorities; (1) Excellence in research across basic research, applied research, EU projects, and initiatives, (2) Collaboration with industry through strategic partnerships and knowledge transfer, (3) International cooperation, including global projects and international exchange of experts and students, (4) Human resource development, motivation enhancement, and competitiveness. Under these strategic priorities, building renovations and the renewal of analytical equipment and instruments have been implemented, enabling participation in large-scale interdisciplinary projects and the initiation of international industry-academia collaboration projects. Moreover, the FMST shifted in focus in 2022-2024 and conducted the transformations, merged departments to pursue broader interdisciplinarity, infrastructure sharing and capacity coordination, Innovate tools to support research and internationalization, Fostering internationality oriented environment and Ensuring equal opportunities and transparent assessment. As a result, a positive cycle has emerged, characterized by the acquisition of sufficient research funds, the increased number of bachelor students, the recruitment of outstanding doctoral students, and the publication of high-quality papers, all stemming from the establishment of an excellent research environment. Thus, the FMST was evaluated to be successful in R&D&I field. It should be emphasized that the gender balance of the FMST is clearly higher than the faculty in the same field in another university and this is very plausible for research society.	
Summary recommendations: The FMST's excellent research environment, abundant research funding, recruitment of	

outstanding doctoral students, and high gender balance are advantages that give it an edge in large-scale domestic and international projects and large-scale research with companies. This is believed to be due to the tireless efforts of the faculty members. We look forward to their continued efforts to maintain this.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Faculty of Mechanical Engineering (FME)

FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The Faculty of Mechanical Engineering (FME) celebrates its 75th anniversary this year playing a key role in advanced mechanical engineering education, applied research, and industry collaboration, mainly with partners in the Moravian Silesian Region (MSR). The vision is to be a regional leader in technological progress and innovation, shaping the future of engineering through interdisciplinary research and strong connections with industry and society. FME focuses on Industry 4.0, automotive engineering, smart energy solutions, and advanced manufacturing. Beyond industrial cooperation, FME has a strong societal impact, influencing regional and national policies in engineering, energy, transport, and innovation.

FME conducts cutting edge research in several key areas:

- Additive manufacturing (3D printing) of metals and composite materials
- Mechatronic systems and intelligent automation
- Advanced materials for medical implants and industrial applications
- Automation, robotics, and artificial intelligence in engineering
- Innovations in the automotive and energy sectors.

In 2023, FME had 1,805 students, with enrolment numbers fluctuating between 1,762 and 1,825 over the five years (2019-2023); 242 employees (number of persons), including academic, research, and administrative staff, with workforce numbers ranging from 233 to 250 in recent years; 47 study programmes (12 bachelor's programmes, 20 master's programmes, and 15 doctoral programmes) consistently expanding to align with industry needs. One third of all employees are assistant professors (1/4 out of them are women), and they present the main driving force of the institution. Regarding the share of R&D&I capacities in some FORD fields, there are 4% in mathematics, 2% in computer and information sciences, 5% in electrical engineering, 74% in mechanical engineering, 10% in materials engineering, 3% in medical engineering, and 2% in environmental engineering.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

4 - Very good

Qualitative assessment:

FME achieves a solid performance across key indicators, including recognition in the research community and societal relevance at both national and international levels. Academic staff at the FME regularly received awards for their scientific work, mostly for their publications and patents (e.g. award given by Czech Engineering Academy for the best article of a scientific journal MM

Science for the year 2023; award for engineering creativity given by AGH University of science and technology in Krakow; best paper award in 2023 given by the Journal Polymers; but also from the companies as Siemens or Intarg Poland for the innovative solutions and patents).

Faculty academics are members of editorial boards of journals focused on scientific and research activities conducted at the faculty. They serve on editorial boards of some journals indexed in Web of Science as well as Scopus-indexed journals that align thematically with the faculty's mission but are not included in Web of Science. Thus, they are the members of editorial boards of the International Journal of Modern Manufacturing Technologies, Polymers, Applied Sciences, Scientific Papers of the University of Pardubice: Series B, MM Science Journal, International Journal of Fluid

Power, Applied and Computational Mechanics, etc.

They organize regularly invited lectures in additive manufacturing, materials science, control systems, technical problems solved by FEM etc. by their academic staff abroad (f.i. at the Polish Academy of Science, Krakow; Gunma University, Kiryu, Japan; Danang University of Technology, Vietnam; University of Salerno, Italy; University of Vigo, Spain, Warsaw University of Technology, Poland, as well as at the Ton Duc Thang University, Ho Chi Minh City, Vietnam). Similarly, foreign scientists and other relevant guests from f.i. Poland, Italy, Vietnam, Turkey, or Finland delivered their lectures at the FME.

Academic staff of the FME are also involved in the evaluation of national/European research project/programme calls relevant to the R&D&I area, but most often for Czech Republic agencies (TAČR) and Slovak Research and Development Support Agency (SAIA, VEGA). There are few examples of the FME staff engagement for the Horizon Europe projects, and Polish National Centre of science Sonata 17 call for research projects.

Recommendations:

- Promote greater international recognition through structured dissemination.
- Increase the participation of academic staff in editorial boards of Q1/Q2 scientific journals.
- Engage emerging researchers in editorial board activities.
- Encourage the academic staff to be more included in the evaluation of European research project/programme calls.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The faculty actively participates in numerous research projects with consistent project implementation what has led to impactful, real-world outcomes. Key research areas are intelligent transport and logistics, innovative and additive manufacture technologies, energy storage power plant, innovative steam generator, development of a new range of SPIDER mowers with grass compression function, research on the possibilities of robotizing metal and rubber product assembly

technologies, development of a new range of medium pressure gate valves, hybrid energy storage system using post mining infrastructure, and energy and software optimization of hydraulic stations over 100 kW. The Faculty of Mechanical Engineering is National Competence Center for

Mechatronics and Smart Technologies for Mechanical Engineering 2 (Brno University of Technology), National Centre for Energy II (VSB-TUO), Božek Vehicle Engineering National Center of Competence (Czech Technical University in Prague), Center of Advanced Nuclear Technology II (University of West Bohemia in Pilsen), National Centre of Competence - Polymer Materials and Technologies for the 21st Century (Tomas Bata University in Zlín), and National Centre of Competence ENGINEERING (VÚTS, Inc.). It works continuously not only with the other university faculties on interdisciplinary projects, but also with industrial entities in the development and testing of new technologies (f.i. Siemens, Škoda, Continental, SKF, Tatra, Honeywell, Maxion wheels, and many others). There are also some collaboration with international research institutions within European research initiatives. Within the project REFRESH (budget about 3 bln CZK) there were allocated 0,5 bln CZK for the Faculty of Mechanical Engineering, and they established new Energy Lab, Materials and Environment Lab, and Industry 4.0 and Automotive Lab. It is worthy to note that in the framework of the Infrastructure Support for PhD Programmes at VSB-TUO Key Activity 3 – Support of FME (2023 – 2026) the FME renovated the facilities – Robotics Centre (20 mln CZK - opened 11.9.2024), and additional 31 mln CZK for infrastructure equipment. As part of the project OP JAK-MATUR Project – Excellent Research Call at the Faculty of Mechanical Engineering (2023 – 2028), funds amounted to 17 mln CZK are provided for infrastructural equipment, and 8 mln CZK for the personnel costs. There are several projects that are coming to be realized such as 3,3 mil EUR for additive manufacturing (2025-2028), 207.000 EUR for WIDERA-2024-TALENTS, and Hydro power plants with EGU Brno, 2.58 mil EUR in total (2.03 mil EUR for FME).

IEP visited ProtoLab 3D Printing Centre that was established within the AD TECH Centrum project (registration number: CZ.01.1.02/0.0/0.0/15_035/0007158), funded by the Operational Programme Enterprise and Innovation for Competitiveness. It offers the services in 3D printing plastics, 3D printing metals, 3D printing composites, Reverse engineering, 3D modeling and optimization, and 3D scanning. The students are involved also in the restoration of Motorcycle JAWA 500 OHV (1931), and SAE International Formula what is an engineering design competition for undergraduate and graduate students where they conceive, design, fabricate, and compete with small formula-style racing cars.

In the role of beneficiary, FME has been supported by public funds with 1.11 million euros for 4 active projects in 2023, and in the role of another participant with additional 1.57 million euros participating in 5 projects. Contract research activities conducted on 2 main projects with the industry in 2023 earned approx. 829 thousands euros (mostly with Škoda Auto and ČEZ).

Recommendations:

- Continue fostering interdisciplinary proposals with external relevance.
- Strengthen internal support for managing complex, multi-partner research projects.
- Motivate academic staff to tight collaboration with industrial partners through Industrial board.
- Encourage the research project submissions with international partners.
- Even the number of project proposals between the departments.
- Continue with recruiting of excellent international researchers.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Research results have led to concrete applications and show promising societal benefits at the national and international level as well. In the period under evaluation, academic staff of FME developed: 1 International patent with certificate EP 3870 896 (2022) - Steam boiler for waste incineration; 4 European patents: EP 3390960 (2019), EP 3789729 (2023), EP 3936104 (2021), and EP 3191735 B1; 4 patents: 308321 B6 (2020), 309272 (2022), 309952 (2022), and 308030 B6 (2019); 1 utility model No. 36529 (2022) as well.

There are some practical applications of approved patents, as f.i. Patent 308321 B6 (2020) is among the significant patents, because in 2024 the patent license was sold, where the license was purchased by global company ABB s.r.o. Prague in the amount of EUR 30.000. The European patent EP 3390960 (2019) was used in cooperation with ŠKODA JS a. s. for the diagnostics of screens at the Dukovany nuclear power plant and was also tested at the Mochovce Nuclear Power Plant in Slovakia. The European patent EP 3789729 (2023) was used and tested by implementing technological equipment in the operation of the Production Plant VZ Kladno Sochorová válcovna (Třinecké železářny a. s.), where it is used in the renovation of rolls.

Until now, there is no spin off company founded as the outcome of aforementioned patents.

The results are proportionate to the R&D&I capacities of the evaluated unit, they fully contribute to the fulfilment of the mission and vision of the FME.

Recommendations:

- Introduce performance tracking of applied results.
- Increase visibility of high-impact outcomes.
- Create the prerequisites for establishing a sustainable spin-off company.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Transfer of FME research results into practice takes place mainly in the Moravian Silesian Region and the entire Czech Republic. Thus, research staff of FME develop advanced materials for metallurgy and optimization of production processes to enhance efficiency (Třinecké železářny, a.s., VÍTKOVICE HEAVY MACHINERY a.s.), develop the innovative structural solutions and application of modern manufacturing methods in the automotive industry (ŠKODA AUTO a. s., Moravian Silesian Automotive Cluster, z.s.), cooperate on projects focused on automation, robotics and energy systems (ABB a. s.), supports partnership in the field of digital factories, automation of production processes and energy saving solutions (Siemens s.r.o.), promotes joint research in the field of modular production and advanced engineering technologies (KOMA Industry s.r.o.), cooperates in the field of civil engineering, transport systems and energy efficient buildings (Metrostav a.s.), research and development in the field of energy, including energy storage, renewable sources and nuclear energy, joint projects focused on optimizing energy systems (ČEZ a. s.), research and development in the field of braking systems for the automotive industry (Brembo Czech s.r.o.), cooperation in the development of electromechanical systems for the automotive industry, development of window drives, seats for Brose CZ s.r.o. and joint research and development in the field of intelligent transport systems and vehicle electronics for Continental Automotive Czech Republic s.r.o.

The research results are being commercialized in companies with which the faculty cooperates

through contractual research, and commissioned development and innovation projects. They also provide professional consulting, expert analyses, and specialized assessments in key areas of technological development. The effectiveness of technology transfer and its practical application can be assessed:

- Patented metal 3D printing method - The technology has been licensed and implemented in the manufacturing process of a partner in the aerospace industry.
- Sensor systems for Industry 4.0 - Deployment of intelligent diagnostic sensors in collaboration with industrial partners
- Optimization of welding processes - Direct application in the automotive industry, improving production efficiency.
- Innovations in railway transportation - Implementation of new material solutions for railway vehicles.
- Predictive maintenance of manufacturing equipment - Commercialization of research results in the form of analytical software for industrial companies.

Another form of collaboration is the involvement of company representatives in teaching at the faculty, where they give lectures and lead specialized seminars strengthening the connection between academia and industry, providing students not only with theoretical knowledge but also direct insight into industrial practice.

From the summary of non-public revenues received during the period under evaluation it is evident that revenue value goes from 115.739 EUR in 2019 to 126.272 EUR in 2023.

Effective mechanisms are in place for result commercialization, although more systematic user feedback would be beneficial.

Recommendations:

- Expand engagement with industry partners through the Industrial Board of the FME.
- Develop a formalized impact tracking process.
- Continue with activities to increase the funding from non-public, non-grant sources.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

FME is active in R&D&I promotion through lectures, media, and cooperation with public institutions through a wide range of activities, such as:

- participation in scientific and popularization events (Night of Scientists, NATO days...),
- trade fairs and exhibitions (International Engineering Fair Brno, Gaudeamus),
- media outputs and online promotion,
- lectures and workshops (Professional lectures, such as Dana Drábová's lecture),
- cooperation with industrial partners,
- Open Days, etc.

Some events should be particularly highlighted:

- Opening of the Restoration Workshop of historic motorcycles,
- NATO Days is the largest security parade in Europe, held annually at the Leoš Janáček Airport in Ostrava where FME regularly participates,
- Chemistry at the Castle is a popularization event focused on presenting chemical sciences to the public, held at the Silesian Ostrava Castle,
- The International Engineering Fair Brno is a prestigious event in the field of mechanical

engineering in Central Europe where FME regularly participates,

- Lecture by Dana Drábová, a well known nuclear physicist and chairwoman of the State Office for Nuclear Safety, regularly lectures at VSB TUO, which would provide students and academics with the opportunity to discuss current topics in the field of nuclear energy,
- Art & Life is a cultural event combining art and lifestyle, where FME participates in this event by presenting technical projects with an artistic overlap, for example in the field of industrial design,
- The Night of Scientists is a pan European event aimed at popularizing science and research where FME regularly participates,
- Art & Science is an annual event organized by VSB TUO since 2015,
- Gaudeamus Prague is a prestigious post-secondary education fair that takes place in various cities in the Czech Republic, and
- Information days in Šumperk are focused on presenting universities and study programs to secondary school students, where FME attracts new students.

Research results, expert interviews, and educational content are sharing continuously on platforms such as Facebook, LinkedIn, and Instagram, reaching a broad audience interested in science and innovation.

FME regularly take part in recruitment campaigns: “Mechanical engineering is not horror”, “We create the world around us”, “Start your future”, “The least Mechanical Engineer”, “Show yourself”, “Be ahead of your time”). During the event “Open days” many meeting with the representatives of primary, secondary and tertiary schools are organized. It is worth noting that FME was on the 1st place in 2024 regarding the School Recommended by Employers Faculty Rankings.

Recommendations:

- Consolidate outreach into an institutional communication strategy.
- Encourage wider participation of students in public engagement.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Based on the recommendations from the previous evaluation of the IEP, the faculty intensified its efforts to focusing on strengthening funding from non-public sources, developing applied research, expanding industrial collaboration and technology transfer, and increasing international recognition of its scientific activities. Contract research and commissioned projects expanded, partially reducing the disproportion between public funding and private sources. The faculty expanded its activities in contract research and technology transfer, leading to a growth in revenues from industrial collaboration with key partners included Třinecké železářny, ŠKODA AUTO, Continental, and Siemens. The faculty continued to achieve excellent results in applied research, as evidenced by the increase in the number of patents and licensed technologies. Key areas of development included robotics, automation, and intelligent manufacturing systems. In the field of technology transfer, the faculty systematically supported patenting and licensing research results. The faculty continued to strengthen its international recognition of scientific activities. Although the Faculty expanded its cooperation with industrial partners what is in alignment with its long-term strategy for applied research development, the main priority still remains to increase

the research papers in the Q1/Q2 databases, especially in D1, if possible. Regarding the normalized number of articles in impacted journals in 2023 according to Web of Science, the FME is in 3rd place at the VSB TUO.

Recommendations:

- Develop a formalized system to implement a personalized plan for every academician together with a plan tracking of their scientific productivity.
- Continue to encourage the employees to be more active in submission of international project proposals with foreign partners.
- Continue to encourage the employees to be more active in submission of high-quality papers in excellent Q1/Q2 journals, particularly D1.
- Continue to increase the revenues from the non-public funds.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	4 - Very good
3.3 Research projects	5 - Outstanding
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	5 - Outstanding
3.7 Implementation of the recommendations in Module	4 - Very good
Average rating [1–5]:	4 - Very good
Grade [A–D]:	B

Summary assessment:

The unit presents a well-rounded societal profile, with tangible contributions through applied research, education, and public engagement. The institution achieved some measurable positive outputs in the evaluated period. There is still some space for improvement in the field of high quality research papers in Q1/Q2 databases, and particularly D1. The number of projects realized with the international partners, especially with the FME as a leading institution, should be increased. The internalization should be in focus in the next period where better scientific visibility of the institution is expected. Improving scientific visibility is crucial for academic careers, as it can lead to increased citations, collaborations, and recognition.

Summary recommendations:

- Systematic monitoring of employee career plans.
- Foster the academic staff to commercialize their research increasing the revenue from non-public funds.
- Strengthen the position of the Industrial Board.
- Focus on internationalization (mobility, European research funding programs/ERC grants, better scientific visibility and recognition).
- Continue with employment of the outstanding scientists.
- Find the ways to increase the number of high quality papers published in impacted Q1/Q2 Journals, paying special attention to D1 publications.
- Improve internal documentation of social impact.
- Strengthen integration between societal goals and scientific strategy.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Faculty of Economics (FE)

FORD: 5 - Social sciences

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The Faculty of Economics (FE) was founded in 1977. Total student numbers have increased by 11% during the evaluation period (from 2820 to 3120), making it the largest faculty at VSB-TUO according to this measure. FE currently offers six Bachelor's programmes (Economy and Management, Marketing, Finance, Accounting and Taxes, Economics, Informatics in Economics) and six „follow-up“ Master's programmes (Economy and Management, Marketing, Finance and Accounting, Economics, Information and Knowledge Management, Public Economics and Administration). There are four doctoral programmes (Economics, Economy and Management, Finance, Systems Engineering and Informatics), all of which are offered in both Czech and English. FE has accredited procedures for habilitation (the appointment of associate professors) and the appointment of professors in the same four fields. Progression rates from Bachelor to Master to Doctoral Studies are not documented. However, it is estimated that 6% of Master students move onto Doctoral studies in a typical year. Very few doctoral students are recruited externally. The number of doctoral students has been stable during the last five years and is approximately 80. Co-operation with practice is extensive in FE and the faculty has partnership agreements with several leading Czech companies and Czech subsidiaries. Students can undertake six-month internships and one semester business projects as part of their programme.

Total staff numbers have fallen by 15% (from 202 to 171) during the evaluation period. This is due to a decrease in both research staff and academic staff. Most of the reduction has been via the loss of staff with limited publication records and therefore the increase in the student/staff ratio is not considered to have impacted on research or its outputs. “The faculty’s strategy has shifted to focus on academic staff with research potential”. The Faculty of Economics operated with 14 departments in the years 2019–2020, and 12 departments from 2021 to 2023. These adjustments reflected internal restructuring processes aimed at better aligning the organisational structure with the faculty’s research and teaching priorities. As of 2024, the number of departments has been further reduced to 8. This significant change was implemented to enhance management efficiency and organisational flexibility, particularly in response to the introduction of a decentralised funding model at the faculty level. Under this model, departments are responsible for their financial results based on revenues from teaching, research outputs, and staffing costs. The streamlining of the departmental structure was a necessary step to ensure sustainable operation and more effective coordination of academic and research activities across the faculty. Consideration is being given to a further reduction to 6 departments for the same reasons. The average age of staff has increased slightly in the last five years. Its gender balance is largely unchanged: 56% of Assistant Professors, 41.5% of Associate Professors and 31.9% of Professors are women. Most academic staff were previously students in the Faculty.

60% of FE’s R&D&I capacity is in Economics and Business, which reflects its activities overall. According to an evaluation of Q1 and Q2 scientific publications, FE is ranked third in the field of Economics and Business in the Czech Republic out of 15 similar faculties in public universities. The

strategic goal of FE is to focus on selected research areas where it seeks to build recognised expertise and long-term research capacity. FE maintains a balanced research portfolio, covering both basic and applied research. This includes fundamental work in areas such as economic theory, financial stability, game theory, and behavioural economics, alongside applied projects supported by national and international funding agencies (e.g. GACR, TACR) with direct societal and policy relevance.

FE operates an incentive system for publications. It sets rewards, as additions to salary, for successful project bids and for articles published in Q1 and Q2 of journals which are indexed in the Web of Science. In addition, there is an annual Dean's award for the best publication. The evaluation and selection of publications is carried out by the Professors and Associate Professors of the Faculty. The basic evaluation criteria are level and field of the journal, the reputation of the publishing house, the topicality of the subject, the importance of the result in terms of contribution to knowledge and social relevance, the professional level and difficulty, the citation response and the importance of the publication for the Faculty.

Internationalisation is a priority for FE. The Faculty actively supports the international mobility of doctoral students. Between 2019 and 2023, a total of 30 doctoral students participated in outgoing mobility schemes, with annual figures as follows: 4 in 2019; 6 in 2020; 2 in 2021; 9 in 2022; and 8 in 2023. In the same period, 7 doctoral students arrived at the faculty through incoming mobility programmes. Outgoing doctoral mobilities were primarily carried out within the Erasmus+ programme, the VSB-TUO Scholarship Scheme (targeted at destinations outside the EU), an International Credit Mobility programme (Erasmus+ KA171), and other relevant international initiatives. A period of international mobility has been made a compulsory part of doctoral studies at FE from the academic year 2023/2024 onwards in line with national legislation.

FE has a well-established framework for supporting both research and teaching mobility of academic staff, which is embedded in the Faculty's Strategic Plan and is recognised as an integral part of individual career development. Research mobility is facilitated in two primary ways: Individually, through participation in externally and internally funded research projects; and institutionally, via competitive selection procedures coordinated either at the university or faculty level. At the university level, academic staff may apply through the VSB-TUO Internationalisation Programme, which focuses on mobility outside the EU. At the faculty level, staff may participate in selection procedures for Erasmus+ and International Credit Mobility (KA171) funding. In addition, individual academics may apply for support through various international schemes such as ACTION, AIA, DAAD, CEEPUS, the Visegrad Scholarship Programme, and the Fulbright Programme. The structured nature of this support reflects the faculty's ongoing commitment to fostering international academic engagement and enhancing the research profiles of its staff.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

3 - Average

Qualitative assessment:

FE is a recognised centre of excellence for its research in Finance and Economics. It has a close relationship with the Czech National Bank (CNB). During the evaluation period, Faculty staff received an award for the best CNB research paper on four occasions. These papers were published initially by the CNB and subsequently by leading academic journals. Research on macroprudential policy setting and economic shocks had a direct impact on policy makers – the project was undertaken by an FE internship and supervised by CNB staff. The findings were presented to leading officials in the CNB. The research of one other colleague has been recognised

by the World Health Organisation.

Academic staff and researchers are members of the editorial boards of high-quality international journals. These include Industrial Marketing Management and Applied Soft Computing, Communications in Nonlinear Science and Numerical Simulations, Dynamic Games and Applications, Journal of Economic Dynamics and Control, and Industrial and Corporate Change. 15% of academic staff undertake such work, a figure which has doubled since the previous evaluation period.

Academic staff and researchers of the Faculty of Economics have given 46 invited lectures and speeches at various institutions and universities around the world during the evaluation period. The presentations had an impact on both fellow academics and policy practitioners. 14% of academic staff undertook such work in 2023 - the percentage has more than doubled compared with the previous evaluation period. The number of lectures decreased from 13 in 2019 to 6 per year in 2020 and 2021 due to Covid restrictions and increased again in 2022 (10) and 2023 (11).

FE has attracted foreign and domestic researchers and domestic policy practitioners. These included a member of the Board of the Czech National Bank, who delivered a lecture on Monetary Macroeconomics and Central Banks in Turbulent Times and who has been a regular lecturer in the interfaculty economics course for doctoral students; and a member of the National Economic Council and Adviser to the Prime Minister of the Czech Republic, who delivered a lecture on academic publishing and performance-based evaluations. The number of events was as follows: 2019 (8); 2020 (1); 2021 (7); 2022 (9); 2023 (3).

Academic staff have taken part in the evaluation of research projects under various research calls. These include the Czech Science Foundation, the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic, the Slovak Academy of Sciences, the Grant Agency Academia Aurea, which specializes in supporting applied research and in international calls within the National Science Center in Poland, and the Science Fund of the Republic of Serbia. About 9 % of academic staff undertake this work and the trend is stable.

Recommendations:

- 1) Attempts should be made to increase recognition by the research community in areas other than Finance and Economics.
- 2) The proportion of academic staff who are members of editorial boards should increase to 25%.
- 3) To increase the number of external speakers in the Faculty, a regular programme of events should be established.
- 4) The proportion of academic staff who take part in the evaluation of research projects should increase to 15%.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

3 - Average

Qualitative assessment:

The total value of projects supported from public funds where FE was the main beneficiary fell from EUR 1, 006, 707 in 2019 to EUR 507, 811 in 2023.

FE has been successful in obtaining 22 research grants from the Czech Science Foundation in two fields: Economic Sciences, Macroeconomics, Microeconomics, Econometrics except Financial Econometrics, Quantitative Methods in Economics; and Business and Management Science, Finance, Financial Econometrics and Operational Research. 3 projects were rated as excellent; 7 succeeded according to their terms of reference; 1 was stopped after one year - deviation from plan and not implemented; 4 evaluations of the final report are awaited; 7 projects are in progress. Two projects from the Czech Science Foundation were rated as excellent. These were entitled „Modelling Credit Risk and System Risk in the Non-Insurance Sector (EUR 177,436) and „A Generalised Approach to Stochastic Dominance: Theory and Financial Applications“ (EUR 196,095). FE has been successful in obtaining 6 grants from the Technology Agency of the Czech Republic under various programme calls to promote applied research and experimental development in health economics, transport economics and financial management. 5 of these were as principal investigators, and 1 was a collaboration with the Faculty of Civil Engineering. 5 succeeded as assigned (with published or patented results) and 1 project is in progress until 2024.

FE has benefited from grants from the Ministry of Education, Youth and Sports, to improve the publication record of young researchers. These projects have enhanced the stability of research groups and increased the internationalisation of research via collaboration with authors from prestigious foreign institutions. Two of these projects were led by female principal investigators. Only one grant was obtained from the European Union during this period – and it was not a mainstream research grant.

In 2023, 11 R&D project bids were submitted by 9 researchers: 8 Czech Science Foundation (GACR), 2 Horizon projects and 1 EU project. 1 GACR bid was successful – this represents a 9% success rate in total or a 12 % rate among GACR projects. 7% of academics applied for these projects. However, two applied research projects were submitted in which the principal investigator was from another faculty or centre (FEI and ENER). Three professors from FE collaborated on these projects.

	Accepted	Rejected	Applications	Success rate (% of accepted projects)	% of faculty members with accepted project
2019	4	25	29	14%	3%
2020	8	17	25	32%	7%
2021	6	15	21	29%	5%
2022	3	16	19	16%	3%
2023	1	10	11	9%	1%

TACR projects are oriented to applied research and there was no call for social sciences in 2023. There were calls in 2022 and 2024. (This explains the low number of bids in 2023).

FE are active participants in the University's REFRESH project – 24 academic staff (mainly Professors and Associate Professors) and 2 PhD students.

20 contract research projects were obtained from 2019-2023. The contract research in 2019-2023 involved academic staff and other employees of the Appraisal Institute. The total income varied considerably from year to year. In 2020 it was EUR 4,497; in 2022 it was EUR 101, 855. All these projects were the result of a direct commission by the partner. Projects were agreed with national and regional bodies such as the Statutory City of Ostrava, Ostrava Waterworks and Sewage Works, and the Confederation of Industry of the Czech Republic. Women participated in two projects: namely Comparison of Physiological/Neurophysiological and Declarative Responses in the Evaluation of Verbal, Pictorial and Contextual Stimuli and The Strategic Plan for Sustainable

Development of the Slezská Ostrava District for the period 2022-2029.

Recommendations:

- 1) The proportion of academic staff with successful grant bids is low. More staff, particularly Assistant Professors, should be encouraged to engage in grant bidding.
- 2) The success rate of grant bids is variable. The reasons for success or failure – either academic or procedural – need to be understood better.
- 3) A staff development programme in grant bidding should be undertaken.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

In line with its mission, FE focuses on projects which have a positive impact on society, such as greater equality, support for vulnerable groups, better access to healthcare, improved logistics and municipal waste management. These are often funded by the Technology Agency of the Czech Republic. The Appraisal Institute at FE provides valuation services and is financed by non- public funds. Contract research requires close collaboration with funding/user groups and agencies in the Moravian-Silesian region. Three examples were provided which contributed to sustainable development initiatives.

Women were the principal investigators in the projects funded by TACR in the years 2019-2023. Women and men were always proportionally represented in each project. In terms of project outputs, the gender perspective is not systematically considered, or no gender-specific impact analysis is carried out. In the project entitled New Challenges in the Social Services Market for Seniors in the Moravian-Silesian Region, the prevalence of women in the social services sector is only noted, not analysed in terms of equality or intended advantages.

None of the research results have led to patenting, licensing or spin -off activity.

Recommendations:

1. Greater attention should be paid to gender equality issues in research projects.
2. The possibility of patenting, licensing or spin off activity resulting from research projects should be considered in project planning, although the challenges associated with this in the Social Sciences are recognised.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

3 - Average

Qualitative assessment:

The results of research are transferred to practice through several channels. Firstly, several

researchers/academic staff cooperate closely with the Czech National Bank, both within the framework of Czech Science Foundation projects and in the form of individual publications. The research results are then published not only in journals but also in the Czech National Bank's working paper series, which enables close discussion with policy makers and dissemination of the results to practice. Secondly, FE's Appraisal Institute cooperates with the Regional Courts in Ostrava, Brno, Prague, Olomouc, the Police of the Czech Republic, state-owned companies (e.g. DIAMO) and a number of commercial companies. Such reports have been used in court practice; for example, to determine the market value of rent, the amount of customary rent, and the market value of company shares. Thirdly, and most importantly, the results of TACR (Technology Agency of the Czech Republic) projects are transferred to practice, in collaboration with the application guarantors.

FE received EUR 16,600 in donations from non-public sources in the period 2019-2023. These resources were used to organise workshops for finding and solving applied research problems and promoting research results. FE is not involved in the support of spin-off firms or other forms of commercialisation of R&D&I. FE is generally involved in the analysis and the development of methodologies and therefore system and support of technology transfer and intellectual property protection is generally not applicable to these projects.

Recommendations:

1. The good practice which is associated with the collaboration with the Czech National Bank and Regional Courts should be extended to other areas of the Faculty's work.
2. FE should take more interest in the possibility of the spin offs or other forms of the commercialisation of R&D, although the challenges associated with this in the Social Sciences are recognised.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

3 - Average

Qualitative assessment:

The Department of External Relations at FE is involved in activities designed to popularise science and research among selected target groups and the public. Popularisation towards the public is carried out through the Junior University, Art & Science Festival and Researchers' Night events.

FE hosted 22 international conferences from 2019-2023. Within each conference, eminent personalities from academia or practice were invited as keynote speakers. All these conferences are also intended for the professional public, as well as academics, who can thus become familiar with the latest findings in the given research areas. Lists of participants are not available.

The Research Café allows researchers/academic staff to present their research to colleagues and interested members of the public and to receive feedback in a relaxed atmosphere. 29 presentations were made to the Research Café from 2019-2023. An accurate record of the list of participants is not available. After the Covid era, there was an increase in the number of participants at these lectures.

46 professional lectures were delivered at FE from 2019-2023. These are open to students, academics and the public. Seven examples are provided. 45 of these had distinguished, external speakers. There is not a list of the participants, but participation of the public varies depending on the invited speaker.

Cooperation with secondary schools, especially those with an economic focus, is used by FE to

communicate professional and research topics with the public. Since 2019, three competitions have been held regularly: (i) the Financial Literacy Day, (ii) DUEL which is focused on taxes, accounting, business economics, and legislation, (iii) Entrepreneurial Creative focused on business plan development with an emphasis on circular economy and product sustainability. In addition, the Department of Economics has organised the EconoVision competition from 2023 onwards. These competitions promote contacts with future potential applicants to study at FE and promote cooperation with secondary schools.

An important aspect of popularisation is the appearance of FE staff on Czech Television. Examples include „Employment in the regions“; „The secret of successful communication“; „Without money-Whom should the state help? „ – a discussion with the Minister of Finance and a prominent member of the political opposition. The Dean of the Faculty also spoke on Czech Radio Ostrava about the opening of the new Faculty of Economics building, with its modern facilities including a multimedia room and a behavioral laboratory. Faculty and university websites and popular social media (Facebook, Instagram, LinkedIn) are another standard communication channel for promoting the faculty's research activities and professional lectures.

Recommendations:

1. Records should be kept of attendees at public facing events.
2. Monitor the effect of the move of FE to the VSB-TUO's main campus on attendance at public events.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

3 - Average

Qualitative assessment:

„The main strengths are the revenues from contracts, the products they offer with impacts apart from financial and interactions with the non-academic application or corporate sphere. The main weaknesses of the unit are: - They do not present H2020 projects - Low amount of money from projects - Very low revenue from contracts - They do not have licences sold or spin-offs, etc. - Revenues from non-public contracts or sources are very low - Low number of projects with a clear impact on society from an economic perspective, but also with a social impact. - Low number of awards in relation to its size“.

„In order to obtain higher scores in the next evaluation cycle, the following areas should be improved: · projects supported by a provider from another country, · contractual research and revenue from non-public sources, · the applied research results with an other than economic impact on society should be more visible, · commercialisation of the research results using the support of University or other entities“.

The progress made by FE in relation to the recommendations of the previous evaluation is discussed below.

FE has actively searched for opportunities to increase its income from contractual research and other non-public sources besides grants. The faculty has more than doubled its non-public sources, as it received EUR 16.6 thousand in the period 2019–2023, compared to EUR 7.92 thousand in the period 2016–2018. Contract research income almost tripled, reaching EUR 236.2 thousand in the period 2019–2023, compared to EUR 80,99 thousand in the period 2016–2018.

FE has been actively working on the expansion of its research networks to improve the

internationalisation of its research and to gain sources from other than national programmes, e.g. by joining the U!REKA European University Alliance, participating in Erasmus + and COST projects. Researchers have been actively preparing international research projects. In 2023, FE, together with Akademia Leona Koźmińskiego from Poland, received the first international grant within the OPUS24/lead agency programme of the Czech Science Foundation entitled: State Capitalism Returns: The Impact of Government Ownership on Markets, Indebtedness, and the Environment, which started in 2024. FE has also promoted cooperation with Italian and Australian universities. As part of the REFRESH project, research focused on the Moravian-Silesian region, researchers closely cooperate with the Moravian-Silesian Innovation Centre and with the University of Ostrava within the Social Lab, among others. This project also promotes interdisciplinary research within the university, as researchers from the Faculty of Economics have also joined the other Living Labs, for example the Energy Lab to analyse socio-economic impact of implementation of new scientific knowledge.

FE has continued to develop cooperation with local and central decision makers, including the Czech National Bank, the Confederation of Industry of the Czech Republic; local government, including the City of Ostrava and the Slezská Ostrava District.

Researchers from FE joined the Czech Aerospace Research Institute (CAERPIN) to collaborate in space research and educational activities. The effects from this activity are expected to materialise during the next evaluation period in terms of participation in interdisciplinary research projects, publications, and potentially commercialisation of results.

FE regularly contributes its expertise to the regular surveys and evaluations of graduates' employability in the labour market, in cooperation with the company TREXIMA.

FE research was highly recognised by the Czech National Bank, as four papers received the Award for the Best CNB Research Paper. The faculty also made significant progress in the participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period. Several researchers are members of editorial boards of highly ranked journals. FE has increased its communication through its official website and social media, including Facebook, Instagram and LinkedIn. Members of the faculty have appeared in Czech media.

In general, the faculty has improved in several areas, although some limitations remain.

First, the volume of contract research at the faculty remains low. Aside from a few individually negotiated projects, most contract research was concentrated in the Appraisal Institute and focused on business valuation. This is now beginning to change thanks to the faculty's involvement in the REFRESH project, which has initiated cooperation with the University Energy Research Centre. This partnership is expected to facilitate participation in public tenders where economic research components are either required or form the core focus.

Second, the faculty has not yet been successful in securing international research grants under programmes such as Horizon Europe. While efforts have been made to join international research teams in recent calls, no projects have been awarded to date. One way forward lies in deeper collaboration with technical faculties at the university—an opportunity that is facilitated by the faculty's relocation to the centre of the university campus and its growing engagement in interdisciplinary initiatives such as REFRESH.

This connects to a third limitation, the lack of tradition in interdisciplinary research. Historically, the faculty has concentrated on disciplinary research in economics and business. Recent developments, however, show a clear shift, particularly due to the REFRESH and CAERPIN projects, which have enabled the faculty to engage in more interdisciplinary and nationally coordinated research initiatives.

Finally, public engagement and communication of research remain areas with room for further development. Although FE has become more active in recent years through social media, public media appearances, and outreach events such as Research Café, Small Talk, and Researchers' Night, it recognises the need for a more systematic and strategic approach to promoting its

research outputs to broader audiences.

It is important to note that most of these improvements have only emerged in the last two years, and as such, lie partially outside the current evaluation period (2019–2023). Nonetheless, they reflect the faculty's growing strategic focus and evolving research culture and represent tangible steps towards addressing long-standing challenges.

Recommendations:

1. FE should increase its grant funding from external sources.
2. FE should make particular efforts to obtain EU, and other international, research funding.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	3 - Average
3.3 Research projects	3 - Average
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	3 - Average
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	3 - Average
3.7 Implementation of the recommendations in Module	3 - Average
Average rating [1–5]:	3 - Average
Grade [A–D]:	C

Summary assessment:

FE has made considerable progress in the latter part of the assessment period in laying the foundations for an improved research performance. It has reduced the number of its departments from 14 to 8 to consolidate its activities. This is to be commended. Although there has been some effort to internationalise its academic staff, most of them are graduates of FE. Grant bidding and success is associated with a small number of staff. Finance and Economics are areas of excellence and enjoy highly productive relations with the Czech National Bank and other organisational actors. The challenge is for other subjects to develop in a similar direction. Interdisciplinary research is weak in FE, but the move of FE to the main campus in 2024 facilitates this. FE has not been successful to date in securing international grants e.g. via Horizon Europe. Collaboration with other Faculties is one way of achieving this. The external communication and public engagement of FE's research have improved but there is more that can be done to systematise it.

Summary recommendations:

- 1) FE should further reduce the number of its departments to bolster research activities.
- 2) FE should attempt pro-actively to employ academic staff from outside the University since "inbreeding" is generally considered to constrain research performance.
- 3) Interdisciplinary research should be enhanced via collaboration with other Faculties.
- 4) Assistant Professors should have greater involvement in grant bidding to bolster the "fire power" of the Faculty and to bolster their own career development.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Faculty of Electrical Engineering and Computer Science (FEECS)

FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The Faculty of Electrical Engineering and Computer Science (FEECS) is one of the largest and most research-active units at VSB – Technical University of Ostrava. Its mission is to advance knowledge, education, and innovation in electrical engineering, computer science, and related interdisciplinary fields. The faculty focuses on combining theoretical and applied research to address current and future technological challenges across automation, telecommunications, artificial intelligence, data science, and cybersecurity.

Organizational Structure and Staffing:

- The faculty is organized into several departments, including:
 - Department of Cybernetics and Biomedical Engineering
 - Department of Telecommunications
 - Department of Computer Science
 - Department of Electrical Power Engineering
 - Department of Electronics and Communications
- Staffing includes approximately 200 academic and research staff, with a core of experienced senior researchers and a growing number of junior academics and doctoral candidates.
- The faculty is led by a dean, supported by vice-deans for research, development, and international affairs.

R&D&I Capacities and Infrastructure:

- FEECS manages multiple laboratories and specialized research units, many of which are integrated into national and European research infrastructures.
- The faculty maintains strong cooperation with the IT4Innovations National Supercomputing Center and participates in cross-faculty R&D platforms.
- FEECS supports innovation through dedicated research centers such as the Center for Advanced Innovation Technologies (CAIT) and the Laboratory of Artificial Intelligence and Data Analysis.

Strategic Role:

- The faculty plays a leading role in VSB-TUO's digital transformation strategy, open science policy, and doctoral education reforms.
- It has a well-established presence in European research consortia and active involvement in Horizon Europe, Digital Europe, and national research grant programs.
- FEECS emphasizes the development of transferable skills, technology transfer, and industrial cooperation, especially in the Moravian-Silesian Region.

Educational Linkages:

- It provides education at all three levels (bachelor's, master's, and doctoral) and maintains strong links between teaching and research.
- Doctoral education is conducted through structured programs in electrical engineering,

informatics, and systems control, with multiple SGS-funded doctoral projects.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The Faculty of Electrical Engineering and Computer Science (FEECS) enjoys a strong and recognized position in the national and international R&D&I landscape, particularly in the fields of electrical engineering, cybersecurity, artificial intelligence, and computational sciences. The weight of bibliometric performance, internationally visible scholars, competitive publication venues, and extensive service on editorial and evaluation bodies together support a rating of 5 – Outstanding.

Publication Output and Quality

- FEECS consistently produces a high volume of high-quality scientific outputs in top-tier journals and conferences, particularly in computer science, signal processing, and automation.
- Bibliometric indicators show a strong presence in Q1 and Q2 journals, with 62 % of 2024 WoS-indexed papers in Q1 journals.
- Output intensity remains high: 1.5 WoS-IF articles per research FTE in 2024, well above the Czech engineering median.
- Several publications have received Web of Science Highly-Cited Paper distinctions in the 2023–2024 window.
- A growing number of publications are co-authored with international researchers, demonstrating integration into global research networks.

Membership and Reviewer Roles

- Staff are widely represented on international scientific committees, editorial boards, and programme committees of leading journals and conferences.
- FEECS researchers hold numerous editorial-board appointments in Q1 venues and act as expert evaluators for Horizon Europe / ERC and other competitive agencies.
- Several researchers serve as reviewers for prestigious funding agencies and journals, underlining the faculty's visibility and the trust placed in its expertise.

Awards and Recognition

- Multiple faculty members have received national and international awards, including for contributions to cybersecurity and AI applications.
- Two FEECS professors are listed in the Stanford “world-top 2 % scientists” ranking in each year 2020–2024.
- Research groups within FEECS have been recognized by the Czech Science Foundation and by industry bodies for innovation and applied research impact.

International Collaboration

- The faculty is highly active in Horizon Europe and Digital Europe projects, frequently in leadership or coordinating roles.
- It collaborates with world-class institutions such as ETH Zurich, KU Leuven, and Fraunhofer Institutes, and participates in large international consortia on digital technologies, AI ethics, and smart energy systems.

Infrastructure and Institutional Roles

- FEECS contributes to the operation and development of national research infrastructures, including the IT4Innovations National Supercomputing Center.
- Faculty experts are represented in national policy discussions on AI, cybersecurity, and

engineering education.

In conclusion, FEECS demonstrates strong recognition by the research community, particularly in high-impact areas like nanotechnology, biomedical systems, artificial intelligence, and signal processing, and the research community within the Czech Republic increasingly sees FEECS as a serious academic partner — both for interdisciplinary science and for industrially applied R&D. However, despite strong individual performance, FEECS still lacks broader institutional leadership in shaping national or European R&D agendas. For example, few staff are involved in program committees, editorial boards, or international evaluation panels. Leadership is also overly concentrated in a small number of senior researchers, while early-career academics are not yet consistently visible at an international level.

Recommendations:

- Continue leveraging faculty visibility to expand strategic partnerships with high-profile international institutions.
- Formalize a talent-attraction strategy to recruit top global researchers, especially in emerging digital fields.
- Encourage more early-career researchers to take leading roles in research consortia to foster generational renewal of excellence.
- Expand dissemination of flagship research outputs through curated showcases or policy briefs to increase societal visibility.
- Encourage more keynote/invited talks at flagship IEEE/ACM/IFAC conferences to enhance international prestige.
- Develop a formal recognition mechanism for awards and appointments internally to maintain motivation and reward excellence.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

Scope, leadership and impact of the project portfolio FEECS manages a *truly internationally competitive* mix of national, European, and contract-research projects that aligns perfectly with its mission in advanced digital and energy technologies.

External R&D income has risen steadily over the past five years, culminating in CZK 185 million (€ 7.5 million) in 2024 – the highest of any unit at VSB-TUO, together with the faculty's 48 % success rate in TAČR calls.

- **European leadership.** FEECS is a coordinator or principal investigator on at least two Horizon Europe projects, one Digital Europe action, and an ESA contract.
- **International talent magnet.** Eighteen foreign researchers were hired on EU-funded projects between 2021-2024, strengthening interdisciplinarity and global reach.
- **Flagship topics with market pull** include cybersecurity of critical infrastructure, AI for edge devices, smart-grid optimization, and digital-twin platforms. These projects already feed demonstrators and pilot deployments with partners such as ČEZ, ABB, and Siemens.

- **Application and innovation pathways** Several projects have yielded commercial licenses, patents, and spin-off activity (e.g. Autinno s.r.o.) and TRL6-7 demonstrators in energy optimization and autonomous control. Industrial partners provide clear routes for adoption, while pilot installations validate real-world utility.
- **Interdisciplinarity and collaboration** Projects routinely bring together electrical engineering, computer science, materials science, and economics experts; many involve cross-faculty teams with IT4I and CEET. This breadth matches FEECS's vision of integrated digital-technology solutions for smart industry and society.
- **Capacity alignment** the workload is proportionate to the faculty's R&D&I capacity: a stable cadre of experienced PIs is buttressed by post-docs and doctoral candidates who make up >30 % of research staff on EU projects. Project management offices and financial controllers ensure compliance and risk mitigation.

However, coordination of projects—especially at the European level—remains underdeveloped. While FEECS participates actively as a partner, its leadership role in large consortia is limited. There is also an uneven distribution of research project participation across departments, with a few groups absorbing most of the external funding while others remain more passive.

Recommendations:

- Secure long-term sustainability by planning successor phases (e.g. Horizon Europe Scale-up, Digital Europe Deployment) for expiring flagship projects.
- Institutionalise cross-faculty research platforms to cement the productive collaboration model pioneered with IT4I and CEET.
- Expand ERC, EIC Pathfinder support (proposal clinics, mock interviews), NATO Science for Peace, or Digital Europe to increase success in frontier-science schemes.
- Support junior researchers in leading smaller grant projects to strengthen next-generation research capacity.
- Set internal targets or incentives for researchers to pursue project leadership roles

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Electrical Engineering and Computer Science (FEECS) delivers a very high volume of applied R&D&I results with tangible and growing societal and industrial relevance.

Practical Application and Societal Relevance:

- Many of the faculty's research outputs have been directly implemented by industry, including:
 - Smart grid monitoring systems
 - Cybersecurity solutions
 - AI-based decision-support tools
 - Control systems for renewable energy
- Projects often result in prototypes, licensed software, or commercial solutions, some of which are deployed in critical infrastructure sectors (e.g., energy, public administration, health technologies).

Alignment with Mission and Vision:

- These results are highly consistent with the faculty's mission to develop cutting-edge

digital and electrical solutions for societal needs. - There is clear alignment with smart specialization priorities, particularly in advanced digital technologies and energy systems, contributing to the region's and the Czech Republic's innovation ecosystem. Proportionality and Capacity Use: - The scope and sophistication of the applied research results are very well proportioned to the faculty's R&D&I capacities. - The faculty effectively leverages its infrastructure, partnerships, and human capital to deliver high-quality outcomes. Gender and Sustainability Dimensions: - While not systematically reported in all cases, some research initiatives address sustainability goals, particularly in energy efficiency, smart cities, and automation. - The gender dimension in research design is still limited in explicit articulation but appears as an emerging topic in selected research fields such as inclusive technologies and digital accessibility. In conclusion, FEECS produces research with strong potential societal relevance, and robust industrial cooperation. However, there is limited systematic documentation of how these outputs translate into societal change. There is also a lack of engagement with frameworks such as the Sustainable Development Goals (SDGs), gender-responsiveness, or long-term tracking of deployed technologies.
Recommendations: - Strengthen documentation of long-term societal impact (e.g., through structured follow-up with industrial users and public authorities). - Encourage broader integration of sustainability and gender-sensitive research design, in line with Horizon Europe principles. - Increase visibility of applied outcomes via open access demonstrators, case studies, and public engagement platforms. - Continue reinforcing collaborations with societal stakeholders to co-design future research agendas around pressing social and environmental challenges.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.	
Rating [1–5]:	5 - Outstanding
Qualitative assessment: FEECS exhibits exceptionally effective transfer of R&D&I results into practice. The faculty not only commercializes outcomes at a scale unusual for Czech technical universities but also does so in ways that mirror its mission to deliver digital and cyber-physical innovations for industry and society. Commercial traction and user reach - The 2022 spin-off autinno s.r.o. already recorded CZK 6.75 million turnover in 2024 and serves customers on three continents, demonstrating global market pull for FEECS intellectual property. - Contract-research revenue totaled CZK 63 million over 2020–2024, with a balanced client	

portfolio in energy, smart manufacturing and telco sectors.

- The faculty executed three patent-license agreements worth more than CZK 2 million in the same period, signaling the monetary value of its protected know-how.
- An active partnership program, delivering more than 40 industry lectures per year, continuously attracts new end-users and feeds back real-world requirements into research agendas.

Alignment with mission and vision

All transfer activities revolve around the faculty's strategic pillars—cybersecurity, AI, smart grids, and digital twins—ensuring that commercial outputs reinforce, rather than distract from, core scientific goals.

Institutional support and maturation pipeline

A mature workflow—jointly run by the Technology Transfer Office and the Innovation Support Centre—guides result from proof-of-concept through a Technology-Readiness-Level ladder to spin-off or license. Researchers receive IP counselling, prototype seed funding, and market-validation support, lowering barriers to commercialization.

Impact and sustainability

The combination of spin-off revenue, sizable contract research, and patent income provides a stable, non-grant income stream that both diversifies faculty finances and evidence societal uptake of research outputs—well above the national norm for engineering faculties.

Nonetheless, the overall ecosystem for knowledge and technology transfer is underdeveloped. There is no dedicated unit for commercialization or spin-off support. Activities remain ad-hoc and dependent on personal contacts between faculty and companies. There is no clear process for assessing commercial potential, protecting IP, or supporting staff in licensing or entrepreneurship. Compared to similar faculties in Europe, FEECS is behind in institutionalizing tech transfer as a strategic activity. As M17+ also considers social relevance through industrial usability, this area needs significant reinforcement.

Recommendations:

- Scale the autinno model by scouting two additional spin-off candidates per year, targeting TRL 6-9 technologies in edge-AI and smart-energy control.
- Embed a formal TRL and impact-tracking dashboard in project management software to spot commercial opportunities earlier.
- Expand international contract-research marketing, leveraging the 40-lecture partnership program to secure non-EU clients.
- Extend innovation-management training for doctoral students and post-docs to maintain a future pipeline of entrepreneurial talent.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

4 - Very good

Qualitative assessment:

FEECS is exceptionally active and effective in popularizing R&D&I and engaging the public, achieving measurable reach that places it among the most visible STEM promoters in Central Europe.

Public-facing flagship activities

- **Top-tier international recognition:** in 2024 FEECS was ranked top 10 worldwide in the onsemi STEAM Education Grants competition—one of only two European institutions on the list—confirming the global quality of its outreach programs.
- **High-impact STEM calendar:** every year the faculty organizes the Night of Scientists, Science & Technology Week, and more than 40 themed workshops for secondary-school students (robotics, AI ethics, cyber-safety).
- **Audience scale:** faculty logs show aggregate on-site visitors of 5 400 in 2023, while online and social-media campaigns reached 1.2 million impressions in 2024, demonstrating sustained growth beyond local boundaries.

Media visibility and storytelling

Research breakthroughs and student innovations are routinely picked up by regional broadcasters, national tech magazines, and international specialist blogs. Continuous content on FEECS' social channels amplifies this: live-streamed lab tours, short explainer videos, and infographics turn complex results into accessible narratives for non-experts.

Partnerships and societal relevance

- Collaboration with schools, municipalities, and NGOs yields open educational resources, citizen-science hackathons, and smart-city demonstrators, all aligned with the faculty's mission of digital empowerment.
- Researchers provide expert commentary for parliamentary hearings and national media on cybersecurity and AI, strengthening FEECS' role as a trusted public voice.

Strengths

- Measurable international reach is validated by an external award (onsemi).
- Large, diverse audience base—thousands on-site, over a million online.
- Consistent linkage between outreach themes and core research areas (AI, energy tech, cybersecurity), reinforcing the faculty's reputation.

However, broader communication—targeting national stakeholders or international audiences—remains modest. Public-facing storytelling, documentary videos, and participation in national science initiatives are areas still to be developed. Faculty websites, English-language summaries, and non-specialist reports could also improve public understanding.

Recommendations:

- Scale multilingual content (English, German) to widen international engagement.
- Expand public communication training for researchers, especially early-career staff.
- Develop a citizen-science pipeline for data-collection projects in smart-energy or environmental monitoring, turning passive audiences into active contributors.
- Publish an annual impact storybook that pairs quantitative reach with qualitative testimonials from teachers, industry partners, and policy-makers.
- Leverage success stories and alumni cases to strengthen faculty reputation in the region and attract young talent.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

FEECS has demonstrated a serious and structured response to the recommendations made during the previous 2020 evaluation, showing commitment to continuous improvement in its R&D&I mission.

Notable Improvements Since 2020:

- **Research Focus and Visibility:**
 - The faculty streamlined research focus areas and created clearer thematic clusters, which improved both internal coherence and external visibility.
 - Stronger emphasis has been placed on applied research, particularly in digital technologies, embedded systems, and intelligent automation.
- **Internal Support Structures:**
 - A dedicated project support office was established to help researchers with grant preparation and reporting — one of the key points raised in 2020.
 - A more transparent internal evaluation system has been introduced, linking performance to internal resource allocation.
- **Internationalization Efforts:**
 - The faculty has increased its participation in EU projects (especially Horizon Europe) and improved support for outgoing and incoming mobility, albeit unevenly across departments.
- **Human Resource Development:**
 - Postdoctoral support and the recruitment of early-career researchers have improved, especially through SGS and junior grant schemes.
 - However, there is still no unified career development framework or structured mentoring policy, which was a 2020 recommendation.

Remaining Challenges:

- Interdisciplinarity across faculties remains limited and depends heavily on informal cooperation or project-specific needs.
- Gender and inclusion strategies are still underdeveloped in R&D planning and leadership recruitment.
- There is a need to better embed sustainability and open science practices across all research agendas.

Recommendations:

- Fully implement a faculty-wide HR development strategy, including mentoring, tenure-track schemes, and support for junior researchers.
- Promote systematic inter-faculty research collaboration, perhaps through seed grants or thematic working groups.
- Embed open science, gender equality, and sustainability principles in all new research and innovation policies.
- Maintain momentum in the internationalization process and consider defining long-term mobility goals linked to performance indicators.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation

NOT RATED

3.2 Recognition by the research community	5 - Outstanding
3.3 Research projects	5 - Outstanding
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	5 - Outstanding
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	4 - Very good
3.7 Implementation of the recommendations in Module	4 - Very good
Average rating [1–5]:	5 - Outstanding
Grade [A–D]:	A

Summary assessment:

The Faculty of Electrical Engineering and Computer Science (FEECS) at VSB – Technical University of Ostrava presents a solid and evolving profile in terms of societal relevance. The faculty exhibits a well-articulated mission, supported by a growing record of internationally visible research activities and a portfolio of applied R&D&I projects that are strongly aligned with industrial needs and societal challenges.

FEECS has gained increasing recognition within the scientific community, particularly through participation in EU-level initiatives and editorial roles, although further consolidation in top-tier platforms would be beneficial. The research project portfolio is diverse and application-driven, with good proportionality to internal capacities and a visible alignment with strategic goals.

The research results produced by FEECS show meaningful prospective and existing impact, particularly in digital technologies, automation, and smart systems. However, commercial transfer mechanisms—though present—are still under development, with room for further structuring and valorization. On the other hand, science popularization and outreach efforts are dynamic and growing, demonstrating a clear institutional commitment to engagement with non-academic audiences.

Finally, the faculty has shown a clear and measurable response to the recommendations from the 2020 evaluation, particularly in improving publication quality, international cooperation, and societal engagement.

In conclusion, FEECS has made significant progress in international visibility, scientific output, and applied project implementation since the last evaluation. It demonstrates high research quality and presents strong industrial links and developed several interdisciplinary research clusters.

Nonetheless, weaknesses persist in systemic commercialization, Horizon Europe project coordination, and full integration of societal and environmental impact considerations.

FEECS stands out as a high-performing faculty in the Czech context and is on track to become a regional innovation leader if it builds on recent progress and addresses these structural gaps.

Summary recommendations:

- Improve commercialization pathways by developing structured support mechanisms and incentives for tech transfer, licensing, and industrial partnerships.
- Enhance public communication efforts, including visibility campaigns, interactive science events, and digital content aimed at non-academic audiences.
- Institutionalize career development policies, with a focus on mentoring, mobility, and internal career tracks for early-stage researchers.
- Embed open science, gender, and sustainability principles more deeply into project calls and evaluation criteria.
- Foster interdisciplinary initiatives within and across faculties to maximize the systemic impact of research.
- Embed Gender Equity and Sustainability Goals in Research Practices. Leverage the university's Gender Equality Plan to systematically integrate gender, diversity, and

sustainability considerations into research design and assessment.

- Continue investing in junior researchers' development, ensuring long-term sustainability and generational renewal in project leadership and visibility.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:
Faculty of Civil Engineering (FCE)
FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The university has a well-defined mission: "VSB-TUO is a university with a technical and economic focus. The mission of the university is to shape the society through education, research, and innovation." The VSB-TUO Faculty of Civil Engineering is well aligned with that fundamental mission. FCE is deeply engaged with education and participating in research and innovation with its students and academic staff.

The university's Vision is stated in the present, rather than the future or its long-term aspirations. The Faculty of Civil Engineering has developed an excellent aspirational vision. "The long-term vision of the faculty is to become a recognized leader in research and education in the fields of civil engineering, advanced building materials and technologies."

The Faculty of Civil Engineering is divided into ten departments and has a focus on research in the following areas:

- Advanced building materials
- Energy efficiency technologies
- Building and infrastructure safety
- Sustainable development
- Assessment and reduction of the environmental impacts of the built environment

The academic staff assists and participates in decision making processes at the local, national, and international level as a means of advancing engineering and the quality of life for all.

The academic positions in the Faculty of Civil Engineering have remained approximately the same size from 2019 to 2023 (~96-98) with a growth of those in the professor rank rising from 5% to 10%. The overall management and support of R&D&I staffing as well as graduate student enrolment of the FCE have both decreased by 7% in the same period.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

3 - Average

Qualitative assessment:

During the evaluation period (2019-2023) there were two major awards for FCE professionals. The CKAIT award is a career achievement by the Professional Licensing board for contributions to Civil engineering and innovation. The other was a lifetime achievement award from the Czech Road Society. No academic staff were elected to fellow or honorary membership in any professional societies.

The academic staff are active in editorial boards of a wide variety of research journals/publications across the discipline of civil engineering. A number of these same academic staff are also invited lecturers and evaluators in the for the Czech Science Foundation (GACR) and the Technology Agency of the Czech Republic (TACR). Multiple professionals from FCE are also engaged in the evaluation of international research grants, including the European Union and Slovakia.

The FCE has mostly regional invited lectures with workshops and conferences in central Europe and in Czechia. Similarly, the foreign scientist and guest lectures invited to VSB are mostly regional (central Europe, Balkans, Turkey).

Many of the academic staff in each of these areas are the same 10-15 academic staff. This was confirmed in the teams on campus interviews with the academic staff leadership. The engagement of 10-15% of the academic members in R&D&I is limiting the competitiveness and potential impact VSB TUO FCE. The methodology document would indicate that the existing average participation limits the recognition that could be attained by the program.

Recommendations:

The exposure of a broader spectrum of academic members to research and research that has an international impact is important to gain the recognition that is sought by the defining methodology. Assistant and Associate Professors should be building a research portfolio to be competitive throughout their careers.

FCE might consider supporting broader participation in Czech and European engineering societies as well as codes and standards organizations. Leadership of these organizations can be a powerful means of improving the profession and building a reputation as leaders in R&D&I. Election to Fellow or Honorary Membership of engineering societies is most closely tied to active leadership in the profession. This requires travel support to professional meetings and support for regular attendance at technical meetings.

FCE might also consider helping to reinvigorate the Engineering Academy of the Czech Republic (EACR). VSB-TUO has a long history of membership in the EACR.

Supporting or incentivizing a broader group of academic members participating in GACR and TACR evaluations will strengthen the academic staff understanding of grantsmanship for their own submissions for research in the future.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

3 - Average

Qualitative assessment:

The theoretical research projects highlighted in the self-report showcase the emphasis of the academic staff on computer-based simulations and predictive modelling across multiple fields. The integration of digital data and modelling techniques provide predictive models. The numerical models were integrated into tools that could be used by designers.

The research programs conducted in collaboration with VUT (Prague) and CVUT (Brno) and various industrial and government partners related to polymeric and alternative cementitious materials utilized the modelling expertise of the academic staff at VSB-TUO to implement innovative new materials to projects in the field. One of the cited research projects directly impacted on the

community of Ostrava and created pathways for sustainable design and urban planning that will benefit the local community.

Each of the research projects are quality projects in critical areas that impact the future infrastructure, environment, and safety of society throughout Czechia, Europe, and the world. There is clearly greater potential available in the coming years.

Progress has been made since the last evaluation of the recommendation to broaden funding agencies. This is illustrated by some of the largest projects listed in the self-report:

1. GACR €177k HSS durability
2. Rada Building SRO €160k Building products development.
3. GACR €130k Modelling of Steel bolt connections.
4. TACR €112k Information modelling
5. CZ Ministry of Culture €97k Landscape of Moravian-Silesian Borderland
6. TACR €97k Sustainable Housing in Ostrava
7. TACR € 89k Water Information Strategy
8. H2020 €62k Geopolymer Production
9. Ministry of Trade and Industry CZ €61k Fluidized bed ash for earthworks

Public agencies are the primary source of funding for civil engineering research throughout the world, so it would be expected that most of the funding would come from European or Czech public research agencies or ministries. However, considering the size and quality of the academic staff, FCE has the capacity and expectation to support a larger spectrum of projects and funded support for F&D&I. The ten departments with FCE appear to splinter the academic staff into small groups and inhibit collaboration.

The small testing services contracts (less than €5000) should not be listed as research.

During the on-campus conversations with the leadership of FCE and the other faculties, it is clear that the number and percentage of FCE academic staff participating in fully funded R&D&I is much less than stated in the self-report (63 academic staff in 29 projects) because of the very small testing contracts that are included in the numbers. The stated numbers in the meeting on campus were 20+ academic staff engaged in some level of academic research and single digit numbers in major research efforts. This is the smallest among the engineering programs at VSB-TUO.

With an average academic staff number of 98 (Assistant Professors, Associate Professors, Professors) and the research support services cited, the R&D&I of the Faculty of Civil Engineering from 2019-2024 was less than one might expect from comparable universities in the region. There is substantially more capacity and potential to contribute to the broad field of Civil Engineering from the FCE.

Recommendations:

It is recommended that the Faculty of Civil Engineering expand the size and scope of research activities across the majority of academic positions. Engaging 50% of the academic staff in research with substantive funding (public or industry funded) research is a reasonable expectation for similar universities across Europe. This expansion of research enhances the expertise of the academic staff, keeps members of the academic staff at the forefront of their profession, engages students in entrepreneurial experiences, and improves the economy of the country.

To reach the next level, mid-career and senior members of the academic staff should seek to lead larger research grants proposals and lead multi-institutional endeavors.

Improving the physical research infrastructure to allow greater full-scale or scaled testing that can be used to verify the computer modelling will be essential to compete with top research institutions.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

3 - Average

Qualitative assessment:

Much of the research and innovation that is performed by the Faculty of Civil Engineering at VSB-TUO is directly impactful to society.

The self-report highlights the following examples of the implementation of research results:

- Use of high-performance concrete research by FCE to enhance new and existing small businesses in the Czech Republic in concrete sinks, countertops, and urban furniture. These products are sustainably produced in the Czech Republic and used both in the country and exported to high end users.
- Research on urban planning has directly impacted the community of Ostrava through improvements in public space, engagement of local citizens providing vested interests in housing and neighborhoods.
- Improved safety measures for those living in mining communities.
- Improved safety technology for high level nuclear storage facilities

The TACR research that is conducted by the FCE is focused on the impact on the Czech Republic and much of the industrial collaborations are focused on developing new products or expanding business operations in the CR.

The research that is conducted is right on target to improve the safety, environmental sustainability, and future infrastructure of Czechia. The issue remains that the number of projects and the percentage of the academic staff that are creating applied research results is quite limited. Regarding the gender dimension, neither the report nor the visit to campus indicated that women are leading substantial R&D&I efforts, as most of the women in the FCE are assistant or associate professors and the examples do not indicate the academic staff involved.

Recommendations:

It is recommended that FCE expand research with public research agencies, Czech ministries, industry, and local government agencies.

The expansion of research should focus on applied research that directly improves the lives of people in the Czech Republic and Europe and provides innovation for new or more sustainable solutions for critical problems.

Major societal impacts from R&D&I and engaging students in R&D&I are notable examples of the value of a university, as well as the education and developing expertise. FCE should seek funded R&D that engages 50% of their graduate students.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialized (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercializing the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

3 - Average

Qualitative assessment:

Much of Civil Engineering is in the public sector and not easily turned into licensing revenue or entrepreneurial enterprises. No patents or trademarks were created by FCE during this period. This is similar to other civil engineering programs throughout the world. However, with a academic staff the size of FCE, there can be an expectation that a larger proportion of the academic members are transferring results and changes in standards into practice through workshops to practicing engineers or commercial support for their research.

The Faculty of Civil Engineering has a small continuous stream of income from the licensing of software, hosting professional conferences and workshops and other auxiliary activities. This has grown over the evaluation period (2019-2023).

Donations to the university and FCE are relatively small but grew more than 75% over the evaluation period. This is evidence of alumni or companies expressing the value of graduates or R&D&I from VSB-TUO.

Recommendations:

Provide training to young academic staff on technology transfer, including economic models for that transfer.

Engage companies to utilize the expertise and facilities of VSB-TUO to grow their business and develop ideas that improve safety or productivity.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularization of R&D&I and communication with the public.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Civil Engineering is deeply engaged in popularization (outreach) activities that promote young people (K-12) to pursue careers in the area. They are also active in local and regional outreach that promotes an appreciation for civil engineering. At the professional level, the FCE hosts technical conferences and workshops to disseminate research results and to provide continuing education to practicing engineers.

The academic staff also publish practical handbooks for practitioners and government agencies in multiple forms.

FCE is active in social media to highlight local STEM events and the implementation of research in the community.

Recommendations:

Continue with robust public outreach and the continuing education efforts of practicing engineers.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

3 - Average

Qualitative assessment:

The previous evaluation identified multiple recommendations that would assist in advancing the R&D&I of the Faculty of Civil Engineering at VSB-TUO. Key recommendations are below:

- The researchers in this unit must focus on applying for more projects with the potential for higher income, and particularly as the direct beneficiary of projects supported by Horizon 2020.
- While the number of projects has increased, many of them are testing type contracts with very low financial support (less than €5000). The recommendation was to focus on larger projects with higher value to elevate the R&D&I enterprise. There has been some improvement in this recommendation.
- FCE should generate revenues from licenses sold and from spin-offs.
- The unit must focus its effort on producing more patents.

Patents are not common in civil engineering. There are not any new patents.

- Develop good cooperation between the FCE and the local authority.

There seems to be strong cooperation with the Ostrava Housing Authority and several grants from local industries and agencies. This should continue to develop over the coming years.

- Proactive participation in regulatory matters, standardization, and development of methodologies for government agencies

Academic staff are active members of standards or code agencies in transportation, building codes, construction standards and the new BIM standards.

- FCE should increase its interaction with foreign companies.

None were cited.

Recommendations:

Continue to increase the number and funding for R&D&I.

Work with public agencies and ministries on the next generation of issues that need to be resolved in buildings, infrastructure, environment, and public safety.

Continue to engage and work toward academic staff in leadership of standards and codes in the Czech Republic.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarize your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	3 - Average
3.3 Research projects	3 - Average
3.4 Research results with existing or prospective impact on society	3 - Average

3.5 Transfer of results into practice	3 - Average
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	4 - Very good
3.7 Implementation of the recommendations in Module	3 - Average
Average rating [1–5]:	3 - Average
Grade [A–D]:	C
Summary assessment: The Faculty of Civil Engineering at VSB TUO currently has the size and breadth of expertise to compete and succeed in research, development, and innovation with the best universities in the Czech Republic and regional countries. FCE does not appear to be constrained by space or facilities. There seems to be a concerted emphasis on undergraduate teaching and quality undergraduate education. This is similar to most of their peers in the nation and region. Over an extended period of time, there has been a lack of expectation or incentive to conduct major research programs that engage graduate students and scholarly publications. The student to academic staff ratio is between 10 and 14, which is competitive or advantageous with peer institutions. The number of full-time PhD students pursuing research is very low. In the meeting with the Dean, there are less than 10 PhD students in full-time study/research. Many of the doctoral candidates seem to be studying Architecture (not considered a research doctorate in FCE). In an overall assessment, the team of evaluators consider the level of funded research support for R&D&I in FCE well below the potential or capacity of the unit and VSB TUO.	
Summary recommendations: “The long-term goal of the faculty (FCE) is to contribute to the development of the construction industry through research focused on sustainability, modern technologies and improving the quality of life.” To reach this goal, a much broader section of the academic staff must participate in funded research activities. It is recommended that the leadership of FCE ● Consolidate departments to form broader more collaborative groups, ● Articulate research and scholarly publication expectations, ● Encourage academic staff to mentor multiple PhD students, ● Expect academic staff to engage is professional standards and organizations, The VSB TUO incentive programs should be implemented for academic staff that are contributing to the R&D&I goals. It is recommended that academic staff pursue larger grants and research contracts to support a larger number of PhD students in research. With such research, it is recommended that scholarly publication be submitted to 1st and 2nd quartile journals to improve peer review of the work and to improve the reputation of FCE and VSB TUO.	

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:
Faculty of Safety Engineering (FSE)
FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

The university has a well-defined mission: "VSB-TUO is a university with a technical and economic focus. The mission of the university is to shape the society through education, research, and innovation". The VSB-TUO Faculty of Safety Engineering's mission is well aligned with that fundamental mission. E.g. "to educate creative professionals capable of addressing the security challenges of the modern world and to develop the common discipline of security."

The Faculty of Safety Engineering has developed an excellent aspirational vision. It envisions itself "to become a leading educational and research centre in the field of safety in the Czech Republic, recognized and respected internationally."

The Faculty of Safety Engineering has a research focus in the following areas:

- Fire Safety,
- Safety and Security Technologies, and
- Resilience.

These research activities are closely connected with... FSE is deeply engaged with education, applied research and advances in technologies that address real-world challenges and strengthen the resilience of society to safety threats.

The FSE organization, comprising the Dean's Office, academic departments, and specialized units. The academic departments and units are the following:

- Department of Fire Protection,
- Department of Occupational and Process Safety,
- Department of Civil Protection,
- Department of Security Services,
- Laboratory and IT Operations, and
- The Centre of Simulation Technologies.

FSE operate 33 experimental labs and share computational infrastructure with the university. There were 49 academic rank academic staff in 2023, an increase of 32 percent from 2019. There has been similar growth in technical and economic support for the research enterprise. The undergraduate enrolment has grown by more than 60 percent from 2019 to 2023 and the graduate enrolment has both grown and contracted in the same period. In 2023, there were 270 graduate students. This is about 10 percent lower than 2019. Outreach courses to professionals have increased substantially during this time.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

4 - Very good

Qualitative assessment:

During the evaluation period (2019-2023) there were four (4) major recognitions awarded to the Faculty of Safety Engineering. One of those awards recognized the entire FSE. That was the State Security Council Award from the Ministry of Interior of the Czech Republic. Three academic staff were awarded major Honors for their work in safety research and development. The Red Rooster and the Golden Rescue Cross are among the highest personal honors. These Honors were national and international awards of the highest nature.

Four different academic staff were on the editorial boards of international journals, and three other academic staff were invited lecturers at multiple international universities or conferences. FSE also hosted lectures from scholars from Italy, Portugal, Malta, Bulgaria and the United States. Two academic staff are active in evaluating R&D&I for the TACR and the Czech Ministry of the Interior.

Recommendations:

The exposure of academic staff's research to a broad audience and leadership in technical committees related to safety engineering are important to individual awards and recognition, especially for Assistant and Associate Professors. FSE might consider supporting nominations of academic staff for engineering society or professional awards as warranted by their career progression. FSE might also consider helping to reinvigorating the Engineering Academy of the Czech Republic (EACR). VSB-TUO has a long history of membership in the EACR.

Election to Fellow or Honorary Membership of engineering societies is most closely tied to active leadership in the profession. This requires travel support to professional meetings and support for regular attendance to technical meetings.

Continuing to support a broad group of academic staff participating in TACR or European union evaluations will strengthen research in the future.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The financial support for the research of the FSE is well documented with multiple years of funding over a million Euros for the FSE R&D&I. In addition, the support is across a broad number of agencies including: the Ministry of Education, Youth, and Sports; European Commission; TACR; and Ministry of the Interior. Both would indicate a recognition of the expertise provided by the FSE and innovation they bring to safety and security in the Czech Republic and Europe.

The FSE has developed substantial expertise in the identification and protection of critical infrastructure in order to strengthen the resilience of the national systems. This includes energy,

transport, communications and emergency management. This extends to the cyberinfrastructure and physical resilience of cities and so-called soft targets.

Another area of R&D&I in FSE is creating life-cycle management / reuse of environmentally sensitive materials. This covers private industry as well as the public sector. The work involves risk prevention and environmental stewardship of environmental hazards as well as pharmaceuticals, micro-pollutants and hormone compounds.

The above areas of expertise are adding to historic expertise in fire safety engineering. This work continues with new ideas on the design of optimized fire suppression systems, fire investigations, fire suppression chemicals.

Each of these areas are strongly based on the mission of the FSE and are at the forefront of developing technologies around the world. The FSE has a large number of young academic staff that may be driving new innovations through collaborative research and innovation. Nearly all the work is applied research, and a large percentage seems to be computer modelling, electronic based tools, or use of future AI in safety engineering.

Recommendations:

It is recommended that the Faculty of Safety Engineering continue to build on their aspirational research activities and utilize the majority of the academic positions. This expansion of research enhances the expertise of the academic staff, keeps academic staff at the forefront of their profession, engages students in entrepreneurial experiences and improves the economy of the country.

A select number of academic staff leading large research grants will allow the FSE to be dominant in the field and the preferred leaders of multi-institutional endeavours.

Support for international collaborations may be an excellent investment in larger collaboration and recognition.

There should be an increased effort to see EU projects in safety engineering, e.g. HE project or European defence funded research.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Nearly all the research, development, and innovation that is performed by the Faculty of Safety Engineering at VSB-TUO is directly impactful to society and the nation.

The self-report highlights the following examples of the implementation of research results:

- Modular equipment that can be deployed after industrial accidents or fuel spills has direct applications in emergency situations and events.
- Implementation of technical measures that protect railway stations and railway infrastructure is moving forward with selective projects on the Czech railway system.
- Mobile respiration devices that can be implemented in the event of epidemiological events or bio attacks.
- Methodology to right-size fire extinguishing water/agent supplies is directly applied to new construction to optimize delivery and potentially capture contaminated water during a fire event.

Practical applied research is valued by VSB-TUO and directed at the mission of the institution.

Other more theoretical or cost prohibitive work may keep innovations and research results off the market for some years. Even in those cases, the next generation may be an even greater technology.

Recommendations:

Continue to expand research with industry and local government agencies. These lead to major societal impacts and engage students in great examples of the value of their education and developing expertise.

A plan for monetizing the patents is needed – from the SER, we cannot detect any ambition in this direction.

The models and methodologies seem promising – use these results for attracting new projects and for new publications.

Find a mean to value and recognize security type research that may not be published.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The FSE has created partnerships with the Police of the Czech Republic, local and regional emergency response agencies. These partnerships have led to emergency preparation and crisis plans and simulations of the implementation of the plans.

Faculty of Safety Engineering also contributes to national safety standards and accident prevention standards of practice. Most of the work in safety engineering is done in the public realm, and it is transferred without patents or in an open source format for municipalities, agencies, and industry to use to preserve lives and communities.

Information technology transfer for most of the R&D&I from FSE research occurs through technical conferences and workshops with professionals throughout the country. The agencies funding the research directly benefit from the recommendations. These are transferred into new safety standards.

Tables 3.3.2 (contract research revenue) and 3.5.1 (Summary of non-public revenues received during the period under evaluation) show that the academic staff performs modestly in monetising the R&D&I results on the market, outside the traditional (classical) funding schemes.

Recommendations:

Providing fee-based workshops to safety professionals and emergency responders may be a way to support additional technology transfer activities.

Training to young academic staff on technology transfer, including economic models for hosting conferences or outreach courses to professionals.

Partner with companies that create safety equipment to utilize FSE expertise and facilities of VSB-TUO to grow their business and develop ideas that improve safety or productivity.

Use public funding schemes and references obtained by providing knowledge/solutions to public entities to increase the R&D&I activities for the private companies.

A very good quantity of publicly funded projects should result in more contract research and more non-public revenue from knowledge transfer, since this would give stability for the future and would additionally prove the relevance of the FSE to society.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

4 - Very good

Qualitative assessment:

The Faculty of Safety Engineering is engaged in popularization (outreach) activities that promote safety and resilience programs throughout Europe. They participate in international events that showcase innovations in safety research and collaboration with industry and the various armed forces. FSE hosts open forums and lectures on civil protection, crisis management, and fire safety. These lectures reach not only professionals, but high school students and the public sector. Audiences can witness practical demonstrations of modern security technologies and methodologies. FSE is active in local and regional outreach that promotes an appreciation for safety engineering to elementary school children as well.

The great majority of activities are focused on young people, which is positive and also has a positive impact on the number of students (we observe these numbers are growing). However, there are also other important groups of citizens who need attention.

Recommendations:

Continue with robust public outreach and the continuing education efforts of practicing engineers. Place greater emphasis on engaging other groups of citizens, such as the elderly and immigrants, who should also be informed about various security risks posed by new technologies and societal changes.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

A major recommendation from 2020 was to expand the funding base of contract research. Both from industry sources and from international clients.

- The number and size of awards have increased since the last review. Major support from multiple Czech ministries is noted as sign the program is engaged in relevant topics that have impact to the nation.
- Many of the industrial contracts are small testing and evaluation contracts. This is a good start to engage industry.
- The quantity of contract research and the revenue from knowledge and technology transfer are still very low, as exposed above.

A secondary recommendation was to continue to conduct R&D&I activities that have societal and economic impacts

- Much of the work conducted by FSE is directly related to societal and economic impacts. In recent years security impact has been added to this list.
- The emphasis on predictive modelling and simulations may be impactful, however it is hard to judge whether this work is valued until it is tested in real scenarios.

Utilize social networks to promote safety systems and accident prevention.

- This should be continued emphasis. There is not much in the report or at the on campus visit on the development of this recommendation.

Recommendations:

Helping companies develop new ideas is the next step beyond testing and evaluation. Bringing FSE expertise and innovation will help industry engage more fully. The value of new products is the key to industry partnerships.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	4 - Very good
3.3 Research projects	4 - Very good
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	4 - Very good
3.7 Implementation of the recommendations in Module	4 - Very good
Average rating [1–5]:	4 - Very good
Grade [A–D]:	B

Summary assessment:

The Faculty in Safety Engineering is clearly a leader in the Czech Republic and the region. Its expertise has broadened with the expanding needs of society and technology. The growth in their staffing has not kept pace with the growth of their enrollment. A student to academic staff ratio of greater than 20:1 will inhibit the potential for R&D&I growth in the coming years.

Many of the PhD students appear to be working for and supported by industry or public agencies.

Summary recommendations:

Expand your academic staff numbers as your research grows.

Pursue larger research projects that engage PhD students. This will expand your full time PhD students and catalyse more innovation. This will also increase the reputation of FSE and VSB TUO. Avoid the expansion of new departments. It is recommended that FSE work on building interdisciplinary areas of R&D&I to address the evolving challenges in safety and security.

Be more proactive in international research funding (HE, post-HE program, EDF).

Be more proactive in attracting contract research projects and in monetizing knowledge and technology transfer.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

IT4Innovations National Supercomputing Center (IT4Innovations or IT4I)

FORD: 1 - Natural sciences

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

University vision:

We are a confident, industry respected university that successfully cultivates the individual professional and personal aspirations of future graduates. We are a unique, living laboratory with high-profile and internationally recognized research that addresses the society's future challenges in real time. Everyone at the University contributes to the future success of individuals, the University itself, and society as a whole.

IT4I vision: To become a leading supercomputing center that provides professional services and conducts excellent research in the field of high-performance computing and processing of advanced data sets for the benefit of science, industry, and the whole of society.

The university vision is very broad and general, while the IT4I's vision is clear and focused and is therefore also well aligned with the university's vision.

Established in 2011, IT4Innovations has made significant progress by 2023, reaching several important milestones:

- **Supercomputing leadership:** IT4I has become one of the few centers in Europe operating the most powerful supercomputers. It maintains this position through regular upgrades and the deployment of new systems, ensuring continuous alignment with the latest technological standards.
- **Quantum computing research:** A dedicated quantum computing group has been established. While most notable results are expected from 2024 onwards, this initiative represents a strategic step toward the future of computational science.
- **Human resources growth:** By 2023, IT4I had attracted approximately 158 full-time equivalent staff members. This number has been stable over the last 5 years. The age distribution is particularly promising, with nearly half of the R&D&I personnel in the 30–39 age group, ensuring a strong foundation for future development.
- **European integration:** IT4I has successfully joined all key European associations in the domains of high-performance computing, quantum computing, big data analytics, and simulation technologies, which is costly in terms of time and membership fees, but pays back by influence, impact, and new projects.
- **Centers of Excellence:** The center has been accepted into several prestigious European Centres of Excellence, which focus on domain-specific HPC applications and reinforce IT4I's role as an important player in the European research and computational infrastructure landscape.

- IT4I is very successful in attracting national and international research, development, innovation, and infrastructure funding, which constitutes a great majority of their budget and is very diverse to ensure quite stable funding. However, too much dependence on project funding has some risks, including a lack of long-term support, which is essential to contribute deep, highly visible results.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

IT4Innovations (IT4I) is a highly focused research center with two primary missions: (i) providing cutting-edge computing infrastructure, along with comprehensive user support and training for current and future users, and

(ii) conducting its own research related to or utilizing this infrastructure. By design, this approach yields several excellent results, though it also comes with certain limitations in terms of broader academic recognition.

IT4I is a highly visible and influential member of several international associations and institutions, where its representatives serve in various roles. These memberships enable IT4I to advocate for its own ideas at the decision-making level and increase its success rate in securing international research funding. Key affiliations include: EuroHPC JU, PRACE, BDVA, ETP4HPC, EUDAT CDI, EOSC, I4MS, VI-HPS, iRODS, and Women in HPC.

The list of research awards is notable. It includes the recognition of Prof. Rogach as a *Highly Cited Researcher*, although a quick review of his publications does not clearly show an affiliation with IT4I. Other distinctions include a *Best Poster Award* at Supercomputing 2022, one of the two most prestigious conferences in high-performance computing (HPC) globally, and several innovation awards, primarily from the European Commission.

Several IT4I researchers—particularly those holding professorships at VSB–Technical University of Ostrava (VSB-TUO)—serve on editorial boards of international journals. These include:

- *Aggregate* (Wiley-VCH)
- *Particle and Particle Characterization Systems* (Wiley-VCH)
- *Nanomaterials* (MDPI)
- *International Journal of Parallel, Emergent and Distributed Systems*
- *MENDEL Soft Computing Journal*
- *Sensors* (MDPI)
- *Journal of Advanced Engineering and Computation*
- *Journal of Marine Science and Engineering*
- *Mathematics*

While there is ongoing skepticism within parts of the scientific community regarding journals published by MDPI, the MDPI journals co-edited by IT4I-affiliated researchers appear to maintain

stable positions in international ranking systems.

During the evaluation period, IT4I researchers delivered several keynote presentations at high-ranking international conferences and workshops, including:

- HBond 2023
- AI in Science Expert Workshop (European Commission), focused on AI infrastructure access and sharing
- ACS Fall 2022
- SIGGRAPH 2021
- WATOC 2020,
- AVS 66th International Symposium & Exhibition, Columbus, OH, USA
- etc.

IT4I has hosted several outstanding visiting researchers from all around the world. Their network goes far beyond Central Europe.

IT4I also plays a significant role in the evaluation of national and European research projects. Its experts frequently review for funding bodies such as the Czech Science Foundation, Swiss National Science Foundation (SNSF), CETPartnership, Technology Agency of the Czech Republic, and conduct research infrastructure evaluations for the Ministry of Education, Youth and Sports of the Czech Republic, ANR (Agence Nationale de la Recherche), France, etc.

Recommendations:

1. Keep doing these activities, and ensure that all academic staff strictly put their IT4I affiliation and funding acknowledgement on their results.
2. Get more involved in the project where IT4I gives computing resources, such that researchers of IT4I also get credit (co-authorship) on the publications resulting from these computations.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

IT4I excels in securing and participating in highly prestigious European projects, including Centres of Excellence across various domains related to high-performance computing. These projects are funded by EuroHPC, national government grants for research infrastructure, and other Horizon 2020 and Horizon Europe initiatives.

The total funding obtained through national and international grants is substantial—consistently the highest within the university, reaching or exceeding €10 million annually in most years.

Collaboration with industry is active and ongoing, but it is primarily supported by public funding

mechanisms such as the EDIH and EuroCC projects. As a result, the volume of purely contract-based research remains relatively low. This represents a potential vulnerability in the event that public funding for industry collaboration is reduced in the future.

Recommendations:

The high dependence on project-based funding introduces a risk regarding long-term sustainability, which is essential for delivering profound and highly visible scientific results, so we recommend **increasing stable national funding** to balance fluctuations coming from project funding.

Although EU and national grants are an excellent source of substantial funding—including for collaboration with industry—it is important to also **improve the volume of contract research** to mitigate potential risks of funding cuts for industry-academia cooperation.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

IT4I reports several results with significant societal impact, including:

- Portals and services that enhance the experience of HPC users and improve resource allocation
- Middleware solutions for high-performance computing systems
- Development of computational platforms
- Solutions for energy optimization in HPC systems
- Tools for improved data visualization
- Contributions to state-of-the-art open-source scientific codes that more effectively utilize next-generation computing infrastructures

These results clearly have a strong impact on the scientific computing community. IT4I demonstrates that it is actively shaping the HPC landscape by delivering innovative solutions that are valued both by researchers who use HPC systems and by the user support and operations teams at HPC centers.

Most users of these results come from the same ecosystem—the European HPC community, particularly those engaged in various EU-funded initiatives and projects.

These results required significant effort and are proportionate with the R&D&I capacity of IT4I. They are very well aligned with the mission and vision of IT4I and support sustainability in several ways: these results are needed in HPC centers, so further development of them and transfer to users will contribute to sustainable funding for IT4I. Results related to energy optimization of HPC centers, optimization of allocation of computing resources, data transfers, etc., contribute to the sustainability of IT4I and society in general. The gender dimension and more general inclusiveness of underrepresented groups are appropriately addressed in most of the results from 3.4.1. The horizontal activity, initialized by IT4I, called Woman in HPC, supports the efforts to attract more females on all levels of jobs in the HPC world.

Recommendations:

Consider strategies to disseminate—and potentially commercialize—these results to the global HPC community, including HPC systems vendors and providers of HPC software solutions.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

IT4I vision: To become a leading supercomputing center that provides professional services and conducts excellent research in the field of high-performance computing and processing of advanced data sets for the benefit of science, industry, and the whole of society

Based on Section 3.5 of SER, IT4I has an internal system for transferring the R&D&I results into practice. They have an internal sales manager, and they are included in big projects where the main goal is knowledge and technology transfer to the business community (EDIG, EuroCC). They also rent their HPC infrastructure to end users that do not fit into existing schemes for publicly funded access.

In most cases, the results are transferred to other HPC centers and to HPC users. Among the users, we can see SMEs, including startups, large companies, and other public entities, like University Hospital Ostrava. The results that are reported in 3.5 are very consistent with the vision of IT4I and with the R&D&I results reported in previous sections of SER.

IT4I is very successful in attracting new users to their results, including new users of their HPC infrastructure, which may also be considered as their result.

The list of non-public non-grant sources is extensive, including renting HPC infrastructure, gifts from private companies, licensing revenues, and proportions of revenues from completed projects. However, the amount of non-public non-grant sources (in €) that do not come from renting the HPC infrastructure and giving the related user support is modest.

Recommendations:

Increase the amount of non-public non-grant sources, especially those that do not come from renting the HPC infrastructure and giving the related user support.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

IT4 has an impressive list of activities related to the popularisation of R&D&I and communication with the public, including participation in the major HPC events around the world, European Researchers' Night, carrier events, and science to public events of VSB-TUO, giving guided tours for the visitors interested in the HPC systems, events organized by Czech Academy of Science, events for high school students etc.

They have a very well-organised PR group which is strongly engaged and realizes very good media outreach, including great visibility through the web and social media.

Recommendations:

We can only recommend keeping these activities in the future.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

IT4I has received 5 recommendations which were addressed as follows:

Recommendation 3.2, 3.3 and 3.4:

The achievements in chapters 3.2 - 3.4 deserve excellent scores. However, the IEB agrees that contractual research should be developed in the future as well.

IT4 has explained that the volume of contractual research has increased, but the income for this activity has decreased. They explained this by new publicly funded projects (mostly National Centre of Competence in HPC and EDIH) which covers these costs.

This is a reasonable explanation, but it also reveals a risk of what will happen with contract research once these projects will stop.

Recommendations 3.5 and 3.6:

IT4I might also focus on applied research results in the non-economic sphere and could increase research with a non-economic impact on society. The IEB also agrees that IT4I might have greater opportunity to collaborate, and gain commercialisation in more diverse research fields.

IT4I explained progress in the last period. The diversity of research fields has increased, and the non-economic impact on society has grown. The great majority of international projects have broader societal impact and still cover the research costs, so great progress in attracting these types of grants is also a response to these recommendations.

Recommendations 3.7, 3.8 and 3.9:

Another main recommendation from the IEB is to participate in the set-up and support of spin-offs.

IT4I has addressed this recommendation. They have their own technology transfer strategy and rely a lot on the VSB-TUO property and technology transfer support office.

It hasn't succeeded in creating a spin-off company, but is very active (is co-creator) in two platforms and programs for cooperation with industry (EDIH, National Centre of Competence in HPC).

IT4I keeps planning to be more active in this direction.

This recommendation remains relevant for the next period.

Recommendations 3.10 and 3.11:

In terms of recognition by the scientific community, IT4I's achievements deserve the highest score. To obtain the same excellent score in the next evaluation cycle, the activities mentioned in 3.10 and 3.11 should also be continued.

Correctly addressed. IT4I is very active in international organizations, which was already exposed in this report.

Recommendation 3.12:

The main recommendation is to continue doing this type of popularisation of their research activities and use their knowledge to provide service learning for society.

Correctly addressed. Great results in this domain were also exposed in the current report.

Recommendations:

Almost all recommendations are well-addressed. The recommendation that needs further effort is the recommendation to participate in the setup and support of spin-offs. Similarly, IT4I is exposed to the risk of what will happen with contract research once the publicly funded projects that cover collaboration with industry stop.

EVALUATED UNIT RATING

Evaluation of unit

Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.

3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	5 - Outstanding
3.3 Research projects	5 - Outstanding
3.4 Research results with existing or prospective impact on society	4 - Very good
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	5 - Outstanding
3.7 Implementation of the recommendations in Module	5 - Outstanding
Average rating [1–5]:	5 - Outstanding
Grade [A–D]:	A

Summary assessment:

IT4I has demonstrated strong performance across several key areas. Most notably, it has been highly successful in attracting national and international funding for research, development, innovation (R&D&I), and infrastructure. This funding forms the majority of IT4I's budget and is well diversified, contributing to its financial stability. Nevertheless, the high dependence on project-based funding introduces a risk regarding long-term sustainability, which is essential for delivering profound and highly visible scientific results.

IT4I has achieved international recognition in the fields of high-performance computing (HPC) and quantum computing. It hosts one of the leading computing infrastructures in Europe, which has enabled its participation in several European Centres of Excellence—a testament to the centre's scientific and technological excellence.

Originally established as a computing infrastructure provider, IT4I has evolved into a highly regarded research institute in the domain of computational science, with expertise spanning various application subdomains. It maintains strong links with international scientific and

professional associations, further reinforcing its visibility and credibility in the global research community.

Collaboration with industry is active and ongoing; however, it relies predominantly on public funding mechanisms such as the EDIH and EuroCC projects. As a result, the volume of purely contract-based, privately funded research remains limited. This dependency represents a potential risk if public funding for industry collaboration were to decrease in the future.

IT4I has produced several impactful results, particularly within the scientific computing community. It is actively contributing to the development of the HPC landscape through the delivery of innovative solutions that are widely valued by researchers, HPC users, and operations teams across HPC centres.

The results generated at IT4I are frequently transferred to other HPC centres and users. IT4I is particularly effective at attracting new users to its services and infrastructure. While the list of non-public, non-grant funding sources is extensive, the share of income from these sources—excluding income from infrastructure rental and associated user support—remains modest.

IT4I also has a commendable track record in the dissemination and popularisation of R&D&I outcomes, as well as in public communication. Its well-organised PR team is highly engaged and delivers strong media outreach, ensuring excellent visibility via digital platforms and social media.

Finally, IT4I has addressed nearly all of the recommendations from the previous evaluation. The one area identified as needing further effort is the establishment and support of spin-offs, where additional development is encouraged.

Summary recommendations:

Here we summarize the recommendations given above:

1. Keep doing these activities, and make clear that all academic staff strictly put their IT4I affiliation and funding acknowledgement on their results.
2. Get more involved in the project where IT4I gives computing resources, such that researchers of IT4I also get credit (co-authorship) on the publications resulting from these computations.
3. The high dependence on project-based funding introduces a risk regarding long-term sustainability, which is essential for delivering profound and highly visible scientific results, so we recommend increasing stable national funding to balance fluctuations coming from project funding.
4. Although EU and national grants are an excellent source of substantial funding—including for collaboration with industry—it is important to improve the volume of contract research to mitigate potential risks of funding cuts for industry-academia cooperation.
5. Consider strategies to disseminate—and potentially commercialize—these results to the global HPC community, including HPC systems vendors and providers of HPC software solutions.
6. Increase the amount of non-public non-grant sources, especially those that do not come from renting the HPC infrastructure and giving the related user support.
7. Nevertheless, the high dependence on project-based funding introduces a risk regarding long-term sustainability, which is essential for delivering profound and highly visible scientific results.

Beside them, we also give a generic recommendation to

1. extend and deepen the cooperation with the faculties and the other institute at VSB-TUO in terms of (i) motivating their research and academic staff to use computational infrastructure of IT4I, and (ii) being more involved in the master and PhD programs of the university, and (iii) to have more joint research project.
2. It is very important that IT4I keeps doing their own research and development, besides infrastructure, user support, and training activities.

EVALUATION REPORT IN MODULE 3

NAME OF EVALUATED UNIT:

Centre for Energy and Environmental Technologies (CEET)

FORD: 2 - Engineering and technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

Indicator 3.1 is a non-evaluated indicator that provides basic information about the evaluated unit such as its mission and vision, organizational structure, size and staffing, or R&D&I capacities.

Commentary:

Centre for Energy and Environmental Technologies (CEET) is a university institute at VSB-TUO, which was established on January 1, 2021, through the fusion of the 4 university institutes: Nanotechnology Centre, Energy Research Centre, ENET Centre, and Institute of Environmental Technology (the decision of the Academic Senate of VSB-TUO on November 24, 2020).

Currently, CEET consists of four centres which conduct interdisciplinary research in four main areas:

- ❖ Materials for Energy and Environmental Technologies
- ❖ Utilisation of Secondary Raw Materials and Alternative Energy Sources
- ❖ Energy Storage, Transformation, and Management
- ❖ Environmental Aspects and Technologies.

There are 20 thematic teams operating within CEET that cooperate with each other. Moreover, Centres are an educational and scientific workplace.

CEET's mission is focused on research and development in the field of low-carbon and sustainable energy and environmental technologies in line with the principles of the circular economy. CEET is open to cooperation on various levels and sharing of the unique laboratory base with experts for research, development and education of students at all levels of study.

CEET's Vision is to become a recognised university institute focused on developing new technologies and materials for low-carbon and sustainable energy and environmental technologies in line with the principles of the circular economy, which are open to cooperation on current and strategic projects at the national and international level.

Nanotechnology Centre (CNT) guarantees a Nanotechnology study program, and other research centres participate in educational activities by supervising students' final theses and involving them in research projects.

The CEET research teams comprise 244 staff members (mainly under 50 years of age), including 130 researchers, 15 academic staff (5 professors, 6 associate professors, 4 assistant professors), as well as 99 administrative staff members and technical support specialists. Each team includes both experienced researchers and young scientists. The proportions of experienced researchers and young staff are good, ensuring the training of young staff and the continuity of achieving the intended research goals. Involvement of the mid- and early-stage career scientists, empowered by the established researchers, creates the environment for the education of the future leaders and

promotes European leadership in essential technological areas such as catalysis, next-generation materials, environmental protection and energy.

The merger of 4 university institutes was an excellent decision. By a significant share of more than 25% of the total scientific output of the university in 2023 (expressed as a financial share from DKRVO, i.e., MEYS contribution to the long-term conceptual development of a research organisation), CEET confirmed and consolidated its strong position among the university units in the field of research and development.

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

Evaluate the position of the evaluated unit in the R&D&I research community based on the facts presented in indicator 3.2 and its annexed tables (3.2.1 to 3.2.5).

Rating [1–5]:

5 - Outstanding

Qualitative assessment:¹

Scientists employed in CEET are recognisable and occupy an essential place in the scientific world. The strong position of the evaluated unit in the R&D&I research national and international community is confirmed inter alia by:

- ❖ The membership of the CEET scientists in editorial boards of 16 international scientific journals (Natural Sciences and Engineering and Technology, e.g. Chemical Engineering Technology, Catalysts, View, Applied Materials Today, Polish Journal of Chemical Technology, Scientific Reports, PLOS ONE, Detritus, Frontiers in Chemistry);
- ❖ The membership of CEET scientists in the scientific councils in other Czech universities, e.g. UCT Prague Faculty of Chemical Technology, Faculty of Chemical Engineering and Faculty of Environmental Protection Technology University Institute, CXI Technical University of Liberec;
- ❖ The involvement in the activities of several national and international scientific organisations (Czech Chemical Society, Czech Society of Chemical Engineering, EFCATS, Czechoslovak Microscopical Society, Czech Society for Research and Utilisation of Clays, Czech and Slovak Crystallographic Association, Jan Marek Marci Spectroscopic Society and Association of Authorised and Accredited Persons);
- ❖ Election of CEET scientists as the reviewers, panel chairpersons and evaluators of national and international projects financed by the Czech Science Foundation, European Research Council, such as ERC Advanced, ERC Consolidator and the scientific projects with the application sphere of MIT OP PIK, MIT OP TAK, MIT DNSH and TACR;
- ❖ Election of CEET scientists as members of several professional societies during the period under review, such as:
 - EFCATS European Federation of Catalysis Societies
 - Board and Main committee members of the Czech Society of Chemical Engineering
 - ATD C R, Reg. Assoc. Association of Technical Diagnosticians of the Czech Republic
- ❖ 15 prestigious national and international awards won by CEET scientists in the evaluated

¹ Provide verbal assessment of the indicator and briefly comment on the reasons for awarding the specific rating. Follow a similar procedure for the other indicators.

period, e.g. gold medal awarded at the INTARG® international innovation exhibition in Katowice (2022) for nitrogen oxide reduction technology; personal awards: Highly Cited Researcher 2021, Materials Science in Czech Republic Leader Award (2023, 2022) and the Chemistry in Czech Republic Leader Award (2023) from Research.com, the Miloš Hudlický Award (Czech Chemical Society, 2023) for outstanding contribution in the field of chemistry; the Prof. Ferdinand Schulz Medal for her long term cooperation in the field of energy and environmental technologies and the Rector's awards for successfully obtaining a projects, and young scientists personal awards: gold medal for the best dissertation. (2022); 3rd place for the best diploma thesis in the Werner von Siemens Prize competition (2020).

- ❖ Organisation of annual international conferences, e.g. Nano Ostrava, Energy and Environment, CzePoCat, Doctoral Catalytic Seminar, which are recognised in the European scientific environment.
- ❖ Membership in the organising committee of the most prestigious European catalytic conference – EuropaCat 2023 in Prague.

It should be emphasised here that 27 prestigious foreign scientists accepted the invitation to give a talk in CEET.

The recognition and prestigious position of CEET in the international scientific community is also evidenced by the fact that very reputable young scientists from prestigious teams apply for employment in research teams led by CEET leaders, or they want to create their own teams in CEET.

Recommendations:

CEET scientists are recognised in a scientific unit, with a high and established position in the international scientific community. In the longer term, it would be advisable to increase the visibility of young scientists working in the Centre for Energy and Environmental Technologies.

RESEARCH PROJECTS

3.3 Research projects

Evaluate the most important research projects of the evaluated unit, especially regarding the results achieved and the application potential of the project, the proportionality with respect to the R&D&I capacities of the evaluated unit, the degree of interdisciplinarity and collaboration with other parts of the evaluated HEI, and the consistency with the declared mission and vision of the evaluated unit. Use the data from the full list of research projects and contract research activities in Tables 3.3.1 and 3.3.2 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

CEET considered the most important projects to be: 2 financed by the European Union, 2 financed by the Technology Agency of the Czech Republic (TA CR), 5 financed by ITI, the Ministry of Education, Youth and Sport, and 1 financed by the Ministry of Industry and Trade within the TRIO programme. All of these ambitious projects are in line with the CEET and VSB-TUO mission. They are in the mainstream of searching for new solutions important for sustainable development, energy conversion and environmental protection and next-generation catalysts. Some of them are still in progress.

The results obtained within these highly interdisciplinary projects were published in the renowned scientific journals with a high and very high impact factors, technical books, books chapters, chapters, conference papers, as semi innovations, utility models, software solutions, functional samples, industrial designs, pilot plants or were presented to potential users from various organizations across Europe. Some of them were patented. Moreover, they were a basis for subsequent sub-projects (e.g. Institute of Environmental Technology - Excellent Research with 3 international projects, or National Centre for Energy (project NCE I) with 33 sub-projects with high commercial potential). It is expected that their implementation will bring further tangible results in the coming months and years. Moreover, it should be stressed here that the National Centre for Energy is the only entity with such competencies in the country. Among the listed projects was also the Doctoral Grant Competition of VSB-TUO, oriented on the new scientific and pedagogical staff improvement to increase the quality and strengthen human resources for research and development to a level comparable to leading European universities and to achieve international competitiveness within the European and global research area.

It is worth noting that, between 2019 and 2023, CEET implemented 170 national and 6 international research projects of basic and mainly applied research with a total funding of 36.868 million CZK (102 as a leader). CEET was also the originator of, e.g. the REFRESH project, which is important for the entire scientific community of the VSB-TUO.

Recommendations:

CEET is on a good course when it comes to acquiring projects. The effectiveness is revealed by an upward trend every year. However, most of them are still supported by national sources. So far, CEET has implemented large, interdisciplinary infrastructure projects, in cooperation on a local (with other university units), national and international scale. They constitute an excellent basis for further work on acquiring projects of a typically scientific and applied nature. It is expected that having modern research infrastructure combined with the international cooperation established during the implementation of projects constitutes an excellent foundation for acquiring new interdisciplinary high-risk/high-gain European projects, e.g. ERC projects, MSCA, and EU Centre of Excellence.

3.4 Research results with existing or prospective impact on society

Evaluate the research results already applied in practice or intended to be applied in practice. When evaluating, consider whether the results are proportionate to the R&D&I capacities of the evaluated unit, how they contribute to the fulfilment of the mission and vision of the evaluated unit and, if stated in the self-evaluation, how the results take into account the gender dimension and sustainability. Use the data from the full results summary in Table 3.4.1 to supplement the evaluation.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

CEET plays an essential role in the work for the benefit of society, for example, supporting the Czech Republic's transition to low-carbon technologies, the development of hydrogen technologies, waste-to-energy solutions, and environmental technologies. This is revealed in the form of implemented projects dedicated to e.g. biomass conversion, plastic utilization, reduction of NOx emissions, creation of the technology of incineration of sewage sludge, creation of the special software for simulating energy balances and economics of operation of technologies for electricity, hydrogen and related commodities, establishing and operating a local platform for disaster risk reduction, creation of the eco-friendly anti corrosion treatment of AISi alloys). Based on the examples listed, the topics covered and the research results achieved reflect the mission and vision of CEET and the entire university. This is translating into concrete solutions that are important for society, e.g.:

- ❖ reduction of the waste that would end up in landfills, and protecting the soil and groundwater;
- ❖ improvement of the air quality, which has a direct positive effect on human health and the environment (reduction of CO₂, HCl, HF, SO₂ emissions);
- ❖ the implementation of renewable energy sources, to increase energy self-sufficiency and the availability of decentralised energy production in rural and urban areas, and to reduce the economic burden on SMEs through lower operating costs;
- ❖ promotion of sustainability, economy and technological progress;
- ❖ the implementation of renewable resources to produce 'green hydrogen', which reduces emissions and supports the transition to an emission-free energy sector;
- ❖ increasing the safety and reliability of electricity supply by minimising voltage and frequency fluctuations, reducing the risk of power outages and contributing to the protection of the health of the population;
- ❖ to establish a platform for community and civil society support in both disaster prevention and mitigation, enabling a more effective overall disaster risk reduction process;
- ❖ creation of the eco-friendly method, guaranteeing corrosion resistance.

During the evaluated period, 2 pilot plants, 5 patents, 1 software, 1 utility model and methodologies certified by the authorised body were applied in practice, all of direct importance to society.

The IEP on-site visit revealed other solutions important for society, such as the mobile measurement of harmful mercury content in the environment.

It is worth emphasising that all of the listed research results have a positive effect on sustainability, mainly by increasing energy independence, supporting the EU's emission limit targets and the priorities of the circular economy.

The gender dimension in research content is not relevant in the case of the presented data.

Recommendations:

It is stated that the results are proportionate to the R&D&I capacities of the Centre for Energy and Environmental Technologies. The research topics implemented in CEET have the potential to serve society in the long term. Therefore, it remains recommended to obtain such good effects for society in the long term.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

Evaluate the effectiveness of the transfer of results into practice by the unit being evaluated. Pay attention to whether the composition of the stated users of the results or the way the R&D&I results are commercialised (if stated) is consistent with the R&D&I results produced and the mission and vision of the evaluated unit and how successful the evaluated unit is in its activities, such as attracting new users of the results, commercialising the R&D&I results and obtaining funding from non-public, non-grant sources.

Rating [1–5]:

4 - Very good

Qualitative assessment:

CEET transfers the scientific results into practice via strong cooperation with industrial partners and the application sphere through contract research and partnerships in research projects, via participation in technology fairs, conferences and meetings focused on technology, and via support through the Technology Transfer Centre of VSB-TUO. Moreover, there exists the VSB-TUO

Green Light innovation and start-up support programme organised at the university level, which is dedicated to young scientists and students in the application of their results in practice.

CEET is most active in partnerships with the application sphere in the areas of electricity, gas, steam and air conditioning supply (16,2 %), manufacturing (31,7 %), and professional, scientific and technical activities (16,8 %). The effectiveness of the transfer of results into practice by the unit being evaluated is at a high level.

The industrial users of the results belong to the energy sector, chemical industry, waste management, environmental technologies, and mechanical and automotive industries. Scientists from CEET also provided services and consultations to public administration sector companies. Cooperation with the Ministry of Environment consisted of creating the methodology for demonstrating waste incineration through the analysis of ash samples taken from the operator. Within another project was created the system for online monitoring measurements of air pollutant concentration, working with data, graphs and models. This system is dedicated to public administration guaranteed by the Ministry of Environment and operated by CEET. Moreover, the Centre for Energy and Environmental Technologies efficiently cooperated with international organisations. Every year, CEET Energy Research Centre organised the testing programme for accredited group members "Determination of the mass flux of particulate matter (PM) in flowing air" on a unique test track built in the Modern Heating Systems Laboratory.

In addition, CEET continued to seek new users via, e.g. participation in forums, results promotion, organisation of professional workshops and seminars and also through the website, CEET Newsletter and the Centre's social networks, and cooperation with the University's Centre for Technology Transfer in approaching potential partners. Moreover, a new position of "Director of Sales and Strategy" was created, whose agenda includes prospecting for new users.

R&D&I results commercialisation occurred via three pathways: direct cooperation with application partners, the sale of licences under agreement with partners from the application, public or governmental sphere.

During the evaluation period, the results were commercialised. A summary of non-public revenues received during the period under evaluation revealed an increase every year, and finally has quadrupled since 2019.

Recommendations:

Generally, in the evaluated period, the Centre perfectly realised the transfer into practice, commercialisation and acquiring new users. The only thing missing is a spin-off. Because the documentation shows that there is potential for such activity, the recommendation is to create at least one spin-off in CEET.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

Evaluate how active and successful the evaluated unit is in the field of popularisation of R&D&I and communication with the public.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

CEET very actively popularised the R&D&I results by events and public lectures, popular science publications and media (TV and radio), cooperation with schools and educational activities, online

communication and social networks, and podcasts on a national and international level. Moreover, the CEET website is very informative and contains news. Therefore, the information had a wide reach.

The following deserve special mention:

- ❖ managing and regularly publishing news on social media, hosting the Podcast Science is calling, thanks to which information reaches society;
- ❖ cooperation with schools and supporting educational activities, regular holiday camps and events for children, thanks to which the stimulation of curiosity and development of interests in the research carried out by CEET takes place from the earliest years;
- ❖ popularisation of unique equipment, thanks to which not only scientists but the entire society has the opportunity to gain knowledge about modern research equipment;
- ❖ participation in the international exhibition Infotherma, which focuses on heating, energy savings and renewable energy sources;
- ❖ popularisation of the ENREGAT Large Research Infrastructure during professional conferences and the seminars for students, via Facebook, LinkedIn and YouTube.

Recommendations:

The activity of CEET in the field of popularisation of R&D&I and communication with the public is very successful and at a very high level. The Centre for Energy and Environmental Technologies uses all available tools to popularise its R&D&I activities. Maintaining this high level of engagement in the coming years is recommended.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

Evaluate how the evaluated unit has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the evaluated unit has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The most important recommendation was the formation of CEET, which happened. Additionally, individual centres implemented practically all the suggested changes. Due to the strong polarisation of CEET towards processes related to environmental protection and alternative energy sources, only the works on nanomaterials for neuromorphic and biomedical applications were not pursued. However, this fact does not affect the very high assessment of the effectiveness of implementing the recommendations.

The implementation of the changes occurred in three stages as part of the reorganisation and merging of the four research Institutes into one Centre for Energy and Environmental Technologies.

Recommendations:

The strategy of combining four institutes into one Centre for Energy and Environmental Technology has been successful and was effective in realising the mission of VSB-TUO. Currently, it is essential to keep all the implemented changes and continuous development on these excellent foundations.

EVALUATED UNIT RATING

Evaluation of unit	
Having evaluated the individual criteria of module M3, please summarise your evaluation in the context of the module, describing and justifying the strengths and weaknesses of the unit being evaluated.	
3.1 Introductory information about the unit under evaluation	NOT RATED
3.2 Recognition by the research community	5 - Outstanding
3.3 Research projects	5 - Outstanding
3.4 Research results with existing or prospective impact on society	5 - Outstanding
3.5 Transfer of results into practice	4 - Very good
3.6 The most important activities in the field of popularization of R&D&I and communication with the public	5 - Outstanding
3.7 Implementation of the recommendations in Module	5 - Outstanding
Average rating [1–5]:	5 - Outstanding
Grade [A–D]:	A
Summary assessment: The Centre for Energy and Environmental Technologies is a strong research unit created on solid foundations. It is also an example of an entity with exemplary gender balance. CEET implements projects that fit into the latest research trends, not only in Europe but also in the world. It should be emphasised here that CEET conducts interdisciplinary research at the highest level, with great interest from industry and society, as confirmed by numerous scientific publications in internationally circulating journals, numerous patents, and licenses. The data presented shows that the mission of CEET fits into the mission of the entire university. CEET occupies a very important place not only in the structure of VSB-TUO and in the Moravian-Silesian region, and Europe.	
Summary recommendations: The Centre for Energy and Environmental Technologies is confirmation that employing passionate scientists in one place, creating one team focused on achieving a common mission, is a recipe for success. It is strongly recommended to create a mentoring system based on supporting early-stage scientists in acquiring and leading their own research projects to strengthen the next generation of researchers. Moreover, it is important to increase the number of Q1 and Q2 publications. Further strengthening of international cooperation is crucial for acquiring new international projects. It is also crucial to further develop cooperation with other VSB-TUO units for the purpose of acquiring interdisciplinary high-risk/high-gain projects. For the further development of the unit, it is important to create at least one spin-off and increase the visibility of educational activities, mainly consisting of the formal assignment of engineering, master's and doctoral theses, which in practice are created in CEET.	

SUMMARY RATING IN MODULE 3

MODULE 3 – SUMMARY RATING

After evaluating the individual units, please provide a summary evaluation of social relevance in Module 3 for the HEI as a whole. Please assess the balance of the evaluated units, how they contribute to the mission and vision of the HEI and describe the strengths and weaknesses of the HEI assessed in Module 3.

The summary rating is determined in accordance with the rules of the Methodology HEI2025+ as the average of the grades of the individual units, weighted by their size in terms of FTE staff.

EVALUATED UNIT	Grade [A–D]
Faculty of Mining and Geology (FMG)	B
Faculty of Materials Science and Technology (FMST)	B
Faculty of Mechanical Engineering (FME)	B
Faculty of Economics (FE)	C
Faculty of Electrical Engineering and Computer Science (FEECS)	A
Faculty of Civil Engineering (FCE)	C
Faculty of Safety Engineering (FSE)	B
IT4Innovations National Supercomputing Center (IT4I)	A
Centre for Energy and Environmental Technologies (CEET)	A
Summary grade	B

Summary quality assessment:

VSB–Technical University of Ostrava (VSB-TUO) demonstrates a broadly positive and, in several areas, exemplary level of social relevance and impact within Module 3. The University’s research and innovation activities show clear alignment with its mission to contribute to regional transformation and to address global technological and environmental challenges. At the same time, the level of maturity and external visibility varies substantially between units, resulting in a pattern of “islands of excellence” alongside faculties where potential remains under-realised.

Three units—FEECS (Faculty of Electrical Engineering and Computer Science), IT4Innovations National Supercomputing Center (IT4I) and CEET (Centre for Energy and Environmental Technologies)—form the University’s leading edge. These units combine high scientific visibility with strong integration into international networks (especially Horizon Europe and other EU schemes), well-articulated partnerships with industry and public bodies, and evidence of translating research results into practical solutions (e.g., digitalisation tools, energy-transition technologies). They exhibit mature management of intellectual property, consistent generation of third-party income, and a culture of outreach (workshops, open days, media engagement). The evaluators judged these three units at the “A” level for Module 3, reflecting best practice in both the quality and consistency of societal impact activities.

A second group—FMST (Faculty of Materials Science and Technology), FME (Faculty of Mechanical Engineering), FMG (Faculty of Mining and Geology) and FSE (Faculty of Safety Engineering)—earns an overall “B” rating. These faculties benefit from strong historic ties with industrial partners in the Moravia–Silesia region, well-defined application areas (advanced manufacturing, critical infrastructure, mining rehabilitation, safety and risk management) and steadily improving publication and patent records. Nevertheless, the social-relevance profile in these units typically relies on a limited number of senior academics who act as “gatekeepers” for major grants and international

collaboration. Early-career researchers (ECRs) are active but under-represented in leadership roles, which could pose a sustainability issue as senior researchers retire or shift focus. In addition, while consultancy and contract research are healthy in these faculties, the pathway to higher-impact, collaborative R&D projects (especially in Horizon Europe) is less systematic than in the A-rated units. There is clear potential to elevate performance by formalising mentoring, internal proposal review, and cross-faculty clustering around shared societal missions (e.g., decarbonisation of heavy industry, smart manufacturing).

The Faculty of Economics (FE) and the Faculty of Civil Engineering (FCE) were assessed at “C”. Both units fulfil important educational and regional service roles but lag in terms of internationally visible research, high-value external grants, and wider knowledge transfer. FE’s societal engagement appears to be primarily local and consultative (e.g., studies for regional authorities), with limited evidence of scalable outputs (datasets, tools, policy briefs) that gain traction beyond the immediate stakeholder group. FCE exhibits pockets of specialised expertise but struggles to assemble critical mass, especially in doctoral supervision and project leadership. Both units would benefit from stronger integration into the University’s central support structures (e.g., project office, technology transfer office), more proactive pursuit of interdisciplinary collaborations with the STEM faculties, and targeted investment in staff development to raise their participation in competitive schemes.

Across the University, several cross-cutting strengths stand out:

- Clear thematic relevance: Digitalisation, smart systems, sustainable energy and environmental remediation are recurring, mission-oriented themes that resonate with both regional priorities and EU policy directions.
- Growing culture of engagement: Even where impact remains modest, most units now recognise the need to demonstrate societal benefit, and they are developing internal indicators and outreach activities.
- Infrastructure and platforms: VSB-TUO maintains or partners with specialised infrastructures (e.g., supercomputing at IT4I, energy labs within CEET) that attract industrial and public-sector collaborations and enhance research visibility.

At the same time, there are systemic weaknesses that constrain the University’s ability to convert strong research into broad, sustained impact:

- Uneven participation in EU and international collaborative projects—several faculties remain largely national or regional in focus, missing out on resources and networks that could elevate their societal reach.
- Fragmented technology transfer and spin-off support—practices differ across units, and central services are not yet universally perceived as proactive partners in commercialisation.
- Variable doctoral capacity and supervision quality—some faculties have limited PhD enrolment and lack structured training programmes, which impacts both research depth and future impact potential.
- Limited institutional narrative for impact—while individual units communicate achievements, the University lacks a cohesive, cross-faculty story that can attract external partners and funding on a larger scale.

Summary recommendation:

University-wide priorities and actions for the next evaluation cycle (3–5 years):

- Institutionalise Technology Transfer and Commercialisation
Create a central, professionalised technology transfer framework that proactively scouts for results with commercial potential across all faculties. Standardise IP procedures, offer tailored support for proof-of-concept development, and introduce seed funding or “innovation vouchers” to de-risk early-stage ideas. Ensure that the successful models in

FEECS and CEET are scaled University-wide.

- **Build Cross-Faculty 'Mission Clusters' to Win Competitive Grants**
Form interdisciplinary clusters around 2–3 high-impact, externally resonant missions—e.g., “Digital Industry & Smart Infrastructure,” “Clean Energy & Circular Resources,” “Resilient Regions & Critical Infrastructure Safety.” Resource these clusters with dedicated proposal-writing support, internal peer review panels, and small bridging grants to make the leap into Horizon Europe or similar programs, particularly extending support to FE and FCE.
- **Empower Early-Career Researchers (ECRs) and Diversify Leadership**
Implement structured mentoring, grant-writing workshops, and internal leadership programmes to broaden the pool of academics capable of leading large projects. Tie promotion and internal funding to demonstrate engagement with impact pathways (industry co-authorship, policy inputs, start-up support), not just publications.
- **Strengthen Doctoral Capacity Where It Is Thin**
In units with fewer PhD students or weak completion rates (notably FE and FCE), establish targeted scholarships, co-supervision schemes with A-rated faculties, and thematic doctoral schools aligned with the mission clusters. This builds long-term research depth and essential human capital for sustained societal impact.
- **Standardise Impact Evidence and Monitoring**
Introduce a central dashboard to track key Module 3 indicators—patents filed, licences granted, spin-offs created, contract-research volume, policy briefs and standards contributions, outreach events and audience reach. Use this data actively: (a) in annual performance discussions with Deans; (b) as feedback to researchers; and (c) to craft a shared narrative for external stakeholders.
- **Develop a Unified Communication Strategy for Societal Impact**
While local outreach is strong, the University should craft a common narrative and visual identity for impact stories. Leverage professional communication staff to package case studies, infographics and video explainers that can be used by all faculties, ensuring coherence and greater external visibility.
- **Foster Inclusive and Diverse Research Teams**
Address gender imbalance and broader inclusion issues, especially within STEM faculties, by formalising equality plans, transparent recruitment procedures, and mentoring programmes for under-represented groups. Diversity will strengthen creativity and problem-solving capacity in teams tackling complex societal challenges.
- **Encourage Structured Industry Partnerships Beyond Consultancy**
Move from ad hoc contract research towards longer-term strategic partnerships with key companies and public bodies, with multi-year research roadmaps, co-funded PhDs and embedded researchers. This enhances both impact depth and financial sustainability.
- **Create Internal Funding Lines for High-Risk/High-Impact Pilots**
Provide small, competitive internal grants for interdisciplinary pilot projects that explicitly target societal challenges and future external funding. Require clear impact statements and external partner letters to build early momentum.
- **Benchmark and Learn Externally**
Systematically benchmark the University’s Module 3 practices against comparable European technical universities. Use study visits, joint workshops and staff exchanges to import effective approaches in commercialisation, policy engagement, and citizen science.

By acting on these recommendations, VSB-TUO can leverage its existing centres of excellence to raise the overall baseline, transform promising initiatives into institution-wide systems, and present a compelling, coherent profile of societal relevance in the next evaluation cycle.

EVALUATION REPORT FOR MODULES 4 & 5

HIGHER EDUCATION INSTITUTION NAME:

VSB – Technical University of Ostrava

COMPANY REGISTRATION NUMBER (CRN): CZ61989100

MODULE 4 – VIABILITY

ORGANISATION AND MANAGEMENT OF R&D&I

4.1 Organisation and management of R&D&I

Evaluate the organizational structure and setup of the R&D&I management system in relation to the size and type of the university and its mission and vision. Also consider comparisons with foreign universities of similar size and focus.

Rating [1–5]:

4 - Very good

Qualitative assessment:²

Section 4.1 of the SER provides a comprehensive explanation of the governance structure at VSB-TUO. It establishes that the Rector is the central decision-making authority of the university, which is expected, but the competencies in decision making of the other university bodies are not clear.

The only real self-governing body (besides the rector) of the university is the Academic Senate (AS), which is introduced as the representative body of the Rector. It operates independently and is elected separately from the Rector. Each faculty is represented by three members in the AS, while the university institutes and other university-wide centers are jointly represented by three members. If this distribution is mandated by law, there may be limited room for improvement. However, if it is not, we recommend increasing the representation of academic institutes and university-wide centers to better reflect their role.

The Scientific Board (SB) is the main body for research, development, and innovation (R&D&I). It is chaired by the Rector, and its members are also appointed by the Rector. This composition may again be prescribed by higher education legislation, but it effectively means that the SB is a consultative rather than a decision-making body. It is unclear to what extent the Vice-Rector for Research is involved in the SB's work.

Another body relevant for R&D&I is the Industrial Board, which is also advisory in nature and chaired and appointed by the Rector.

The SER lacks a clear distinction between the roles and competences of the various university bodies. Specifically, it is unclear which types of decisions are made by which body.

For daily management, the Rector is supported by the Rector's College, a permanent advisory body consisting of all vice-rectors, deans, directors of university institutes, the chair of the AS, and others. However, the size of this group may be too large for efficient operational work and decision-making support, and the inclusion of the AS chair could raise concerns regarding the separation of powers and responsibilities.

² Provide verbal assessment of the indicator and briefly comment on the reasons for awarding the specific rating. Follow a similar procedure for the other indicators.

The functioning of the Rector's team (Vice_rectors) is not clearly described. While it should be a small team that should operate as a management board, its structure and mode of operation remain vague.

The Rector is supported by four vice-rectors:

- Vice-Rector for Studies
- Vice-Rector for Science and Research
- Vice-Rector for Strategy and Cooperation
- Vice-Rector for Quality and Investment Construction

R&D&I responsibilities primarily fall under the Vice-Rector for Science and Research, who is also responsible for the Strategic Analysis Unit—a somewhat surprising assignment, as this unit would logically fall under the Vice-Rector for Strategy.

In terms of R&D&I management, Section 4.1 of the SER is vague. It states:

“Each university-wide unit is led by a head, director, or Vice-Rector, who is directly responsible either to the Rector or to the relevant Vice-Rector for their activities and the activities of the unit they lead. The Rectorate oversees and administers R&D&I through the following mechanisms: distributing the R&D budget based on the performance of individual departments, funding development projects, and acquiring equipment to support the advancement of strategic R&D&I areas.”

This description lacks clarity regarding the specific responsibilities of the Vice-Rector for Research, the Vice-Rector for Strategy and Cooperation, and their respective offices. Moreover, it is not clear how the essential R&D&I support is organised. In Section 4.2, the Technology Transfer Center, Project Support Center, R&D department of the Rectorate, and Commercialization Board are introduced, without explanation about the structure, hierarchy, responsibilities, and line of reporting. It is also written in Sec 4.2 that the Industrial Council exists. Is this the same as the Industrial Board? Open Science support is not mentioned in 4.1 and 4.2, but is also crucial for the modern R&D&I ecosystem.

Additionally, the process for decision-making regarding new project proposals—particularly those funded by EU programs with national co-funding—is not explained, but is crucial since these projects are often negotiated with the national or local government and should be inclusive internally.

During our visit, we were explained that the university has a special bonus system that rewards outstanding R&D&I performance. We were also provided with the internal salary regulations, but these do not make it clear how the bonuses are specifically calculated or allocated. Nevertheless, the system appears to be effective, as evidenced by visible progress in securing new international projects and improvements in both the volume and quality of scientific publications.

Recommendations:

1. Clarify and make more transparent the management system for R&D&I. In particular, clearly define the responsibilities of the Vice-Rector for Research, the Vice-Rector for Strategy and Cooperation, the Academic Senate (AS), the Industrial Board (IB), and the Scientific Board (SB) in relation to R&D&I activities.
2. Clearly describe how the Rector's Office is structured to support R&D&I, including the roles and responsibilities and the reporting line of units such as Technology Transfer Center,

Project Support Center, Commercialization Board. Who is responsible for Open Science at the university level?

3. Reconsider whether the inclusion of the Chair of the Academic Senate in the Rector's College is consistent with the principle of separation of powers between the Academic Senate and the Rector's executive team, as this separation is an important element of stable and transparent governance.
4. Unless required by law, consider increasing the independence of the Industrial Board and the Scientific Board by modifying the current system in which all members are appointed solely by the Rector.
5. We recommend that the Vice-Rector for Research establishes a dedicated research college (if not already in place) composed of all vice-deans for research and directors of university institutes, to ensure coordination and alignment of R&D&I activities across the university.
6. Consider increasing the representation of academic institutes in AS to better reflect their important role in the university's research ecosystem.

R&D&I QUALITY MANAGEMENT AND SUPPORT SYSTEM

4.2 System of support for a quality R&D&I environment and incentive measures for quality science

Evaluate the systems/measures/tools described to stimulate high-quality science at the HEI being evaluated. In your evaluation, consider the documented effectiveness of the measures described, their impact on achieving the mission and vision of the HEI being evaluated, the realization of excellent science and the possible absence of key systems/measures/tools.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Section 4.2 of the SER outlines several measures that aim to support a high-quality R&D&I ecosystem, including high-level descriptions of incentive mechanisms for promoting research excellence.

It is stated that the university has established tools to motivate academic staff and researchers to engage in international consortia and to prepare project proposals. While this is a positive direction, the description lacks details. Nevertheless, the SER claims—supported by other documentation—that the university has made notable progress in securing new project grants and improving the volume and quality of publications.

Section 4.2 also mentions that the university offers support for researcher training and professional development. However, again, no specifics are provided, and no quantitative data accompanies this claim.

One of the most commendable aspects of the university's approach is its support for young researchers. We regard the following initiatives as particularly positive:

- PhD Academy
- Student Grant Competition
- Support System for Students and Early Career Researchers
- Support for Talented Doctoral Students at VSB-TUO

- Global Postdoc Program
- Strategic Support for Creating and Strengthening Research Teams
- Support Schemes for Excellent Science
- Support for Interdisciplinary Research and Internal Collaboration

The university attributes its overall progress in R&D&I performance in part to these initiatives. However, the management structure of these programs is not clearly described. Furthermore, the SER does not provide any quantitative data—e.g., how many PhD students, researchers, or academic staff have participated in these programs, how many new research grants were acquired, or what tangible outputs (e.g., publications, research equipment) have resulted from these actions. This quantitative data was later provided upon additional request, but should be initially part of SER.

The Strategic Analysis Unit, under the Vice-Rector for Research and Development, is responsible for conducting university-wide strategic analysis. The unit focuses primarily on scientometric analysis, which is used for budget allocation, program quality assessment, and regular reporting. Additionally, a dedicated R&D portal has been created to provide departments and employees access to selected scientometric reports. This is a positive development.

At the conclusion of Section 4.2, the SER states:

“A key element is the creation of a motivational and infrastructural framework that enables individual departments to independently identify and develop promising topics in cooperation with partners from industry, the public sector, or international research institutions.”

We consider this intention to be very positive. However, the SER should include a brief report on the university’s concrete actions toward implementing this goal during the evaluation period, along with a self-assessment of progress made.

Recommendations:

1. Provide a quantitative report detailing the outcomes of all implemented measures within the described system of support for a quality R&D&I environment and incentive measures for quality science as a regular part of SER.
2. Expand the mandate of the Strategic Analysis Unit to include monitoring of broader aspects of research excellence, beyond bibliometric indicators. This should include roles in editorial boards, keynote and invited lectures, research and innovation grants, innovation awards, and other relevant achievements.
3. Establish a clear accountability framework, specifying who is responsible for each measure within the R&D&I system and what is the reporting line for oversight and coordination.

4.3 Quality control system for R&D&I environment

Evaluate the described internal and external evaluation system in terms of its quality, effectiveness and suitability for the HEI.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The internal and external evaluation of the quality of R&D&I is verified by means of the internal regulation “Rules of the Quality Assurance System for Educational, Creative, and Related Activities and the Internal Evaluation of the Quality of Educational, Creative, and Related Activities of VSB-TUO”. By applying such regulations, a quality assurance system is implemented regularly, and the quality evaluation verifies the fulfillment of the mission and objectives of VSB-TUO and the compliance with the standards of university activities.

The main reference document is the so-called Report on the Internal Evaluation of the Quality of Educational, Creative, and Related Activities of VSB-TUO, prepared by the Internal Evaluation Council (IEC) every 5 years. However, it must be stressed that in its evaluation the Internal Evaluation Council (IEC) may also consider the results of quality assessments of VSB-TUO activities conducted by third parties, especially by international evaluation agencies. This was introduced by VSB-TUO in order to provide valuable input for improvements and suggestions for introducing new tools for more efficient management, based on best practices from other universities across the EU.

VSB-TUO underwent an international evaluation in 2021, and requested a re-evaluation three years after the initial evaluation (which already provided numerous suggestions and recommendations for improving its strategic management from international experts).

Further, in order to provide recommendations for the definition and evaluation of the strategic directions of the scientific and educational activities, VSB-TUO has established the International Scientific Advisory Board (ISAB), with the tasks to provide suggestions for improving the quality of scientific and educational activities in order to enhance the international reputation of VSB-TUO and strengthen its position as an internationally recognized research university.

As regards the ethical aspects of the research, VSB-TUO has a system for reporting illegal activities, with a specific procedure to submit reports, and to assess them, in accordance with the law. The Ethics Commission is established to evaluate submissions for compliance with the moral values outlined in the VSB-TUO Code of Ethics and to provide opinions, particularly on project proposals, student theses, and scientific research publications. It is worth to recall that VSB-TUO has also an ombudsperson, who contributes to a more effective resolution of conflicts and problems at the university and acts as a mediator between the university management, teachers, and students or employees and their superiors. The PhD Academy is also active in the field of education on the ethical aspects of R&D&I.

Recommendations:

Quality control system for R&D&I environment is complex and meticulous. It consists of internal and external evaluation according to the highest standards. Moreover, it is still maintained, created and developed.

1. VSB-TUO is a large entity bringing together students and scientists of various nationalities, religions, sexual orientations and worldviews. Therefore, it seems reasonable to create an additional position of the ombudsman.

4.4 Sustainability and resilience of R&D&I

Evaluate the described system of measures for sustainability and resilience of R&D&I in terms of their quality, effectiveness or possible absence of key measures.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-TUO activity for the sustainability and resilience of R&D&I is very effective and demonstrates a high degree of university involvement not only at the university level but also at the regional and national levels. Activities related to sustainable development and social responsibility are coordinated by the Sustainability Manager.

Sustainability and resilience of the R&D&I strategy of VSB-TUO is based on the synergy of activities in the area of research and innovation, education and students, employees and operations, and public engagement. It is described in the document entitled SUSTAINABLE DEVELOPMENT STRATEGY VSB-TUO 2024+ (available online <https://www.vsb.cz/udrzitelnost/en/SDS-2024/>). This strategy emphasises the importance of collaboration, innovation, and a responsible approach to the environment and society, which are essential factors for achieving sustainability goals. It is

worth noting that among the 17 United Nations Sustainable Development Goals (SDGs), VSB-TUO supports and implements with success 15 of them (goals number 2- Zero Hunger and 14 – Life Below Water are not realised for obvious reasons).

The implemented solutions based on circular economy, ecological innovations are a tangible confirmation of the university's high activity in the area of sustainability. These includes e.g. modernized buildings (up to 85% of the University's buildings meet the latest energy standards), the alternative energy sources in the form of photovoltaic power plants, solar panels, and geothermal systems, rainwater recirculation, living laboratories like beehives and the production of organic honey, or flower meadows with insect houses on the university campus, bike-sharing stations and bike racks, as well as a low-emission vehicle fleet and extensive charging infrastructure for the University's electric service vehicles, as confirmation of a commitment to sustainable mobility. Moreover, VSB-TUO intensively participates in activities for improving the living standard in the Moravian-Silesian Region via educational programmes for schools, community events, outreach activities, cooperation with non-profit organisations, and public authorities. The implemented measures have been appreciated by prestigious awards both at the Moravian-Silesian regional level and nationally for its systematic application of social responsibility principles, and by the silver quality certificate for the new building of the Faculty of Economics: high proportion of renewable energy produced, the use of certified and health-safe materials, high user comfort, especially indoor air quality, and the participation of the building's target users.

Effective knowledge transfer to society, industry, and the public sector is supported by the VSB-TUO Technology Transfer Centre, which assists scientists in intellectual property protection, the commercialisation of R&D results (including Proof of Concept), and innovation and entrepreneurship (including spin-off creation). Moreover, the Technology Transfer Centre is responsible for delivering two PhD Academy courses in the field of science and research management. In 2024, the Technology Transfer Centre (TTC) launched the pilot edition of the Transfer Academy - an educational module consisting of five workshops designed for academic staff, researchers, and PhD students. Additionally, TTC regularly organises expert seminars for staff and PhD students in the field of e.g. artificial intelligence and intellectual property, intellectual property infringement, technology transfer and contracting.

The fact that the Industrial Board, as an advisory body to the Rector, exists to strengthen the university's links with the business community is good practice.

The university's activity for the benefit of society is also worth emphasising. This is manifested not only through science popularisation, seminars, cultural programmes, summer schools, and active cooperation with the city and the region, among other activities, but also tangible effects in crisis situations (alcohol-based disinfectant production and distribution throughout the region, 3D printing of face shield components during a market shortage).

Unfortunately, a unified approach to research data management has not yet been centrally established at VSB-TUO. However, work on it is ongoing. Currently, the data is stored on personal computers, portable media, and cloud storage. Scientists upload the data themselves to the selected repository, where it is assigned persistent identifiers and licenses upon submission. A data steward is responsible for reviewing the data for compliance with the FAIR principles. Similarly, there is no institutional open science strategy. The issue of Open Access is currently covered by the directive TUO_LEG_15_004 - Open Access Policy to Scientific Information. Currently, the Central Library collects information on APC (Article Processing Charges) payments and submits this data to the OpenAPC database.

Because ethics and data protection are key to the sustainability and resilience of science and research at the university, ensuring transparency, credibility, and social responsibility in academic activities, VSB-TUO makes every effort in this aspect. The regulation of intellectual property protection issues is also worth appreciating. The institutional resilience of TSB-TUO manifests itself on many levels, such as supporting research and innovation, protecting the health and safety of students, staff, and visitors, financial stability through the diversification of income sources, or the transition to online teaching (demonstrated in practice during the COVID-19 pandemic).

Recommendations:

The system of measures for sustainability and resilience of R&D&I at the University is developed and implemented efficiently. VSB-TUO meets the highest standards in this area.

It is advisable to maintain such high standards to ensure the sustainability and resilience of the R&D&I of VSB-TUO.

It is recommended:

1. Complete the work on a centralised approach to research data management as soon as possible;
2. Implementation of the institutional open science strategy in a short time;
3. Further work on the energy transformation of the campus and off-campus units.

PERSONEL POLICY

4.5 Structure of human resources

Evaluate the described structure of human resources at the evaluated HEI in terms of age composition, degree of internationalization, distribution by job classification, and gender balance. For the assessment, use the data from the annexed tables 4.5.1 and 4.5.2; it is also possible to draw on the more detailed staffing data presented in indicator 3.1 of the self-evaluation reports for the evaluated units.

Rating [1–5]:

4 - Very good

Qualitative assessment:

An evaluation of the human resources structure at VSB-TUO in terms of age composition, degree of internationalisation, distribution by job classification, and gender balance was prepared based on a comparison of the data from 2020 and 2024.

In general, only the number of professors and technical and economic staff expressed as FTE increased slightly across the entire VSB-TUO. The number of remaining employees has decreased. However, the changes are not major. VSB-TUO attributes these changes to the restructuring of some university units.

During the period under review, the percentage share of the older professors (from 60 to over 70 years old) was reduced due to retirement. Still, the percentage of professors between 40 and 59 years old significantly increased. However, the number of professors increased slightly compared to the reduced number of associate professors. Therefore, promoting associate professors to a professor position could not be the only reason for the decreasing number of associate professors. Moreover, this phenomenon has not affected the percentage of women employed in the position of associate professor. It could suggest that both promotion, resignation from work at the university and retirement of the associate professors are unrelated to gender.

Since 2020, the number of assistant professors and assistants has also decreased, including women. This phenomenon is related to the reclassification for another job position, or may be associated with the interruption of a scientific career due to starting a family, especially in the age

range of 29 to 39.

It should be stressed that only a slight decrease in early career researchers was detected. Another situation is the case of the scientists, researchers, and development staff involved in teaching activities, where employees are significantly lost. It is related to retirement and a lower number of students.

An increase is observed in the number of foreign employees across all categories, mainly driven by foreigners' involvement in new R&D projects. The number of technical and economic staff remained at the same level.

In the case of the associate professors, there was a smaller percentage share in the same age group, but it increased in the 50-59 age group, especially among women. This phenomenon means that some employees were not promoted and remained in their positions. Only slight changes can be seen in the case of the assistant professor positions. The percentage of assistants and early career researchers under 29 increased significantly, which is related to the employment of young scientists in R&D projects. It decreased in the other age groups, due to career advancement or finishing the contract within the project. In the case of other job titles, significant changes are not observed.

Although the general comparison of the data concerning the staff numbers for 2020 and 2024 shows no significant differences, their careful analysis revealed some differences in trends.

The Faculty of Mechanical Engineering and the Faculty of Safety Engineering are characterised by an increase in the number of employees, regardless of the job title, opposite to the Faculty of Materials Science and Technology and the Faculty of Economics, where a decrease in the number of employees, regardless of the job title and gender, was observed in the evaluated period. In the case of the Faculty of Mining and Geology, the number of associate professors has decreased in favour of the increasing number of professors, including women. The number of employed assistant professors fluctuated during the evaluation period, but the number of women successively decreased in this category. There is a visible increase in the number of scientific, research and development staff involved in teaching activities. In the case of the Faculty of Electrical Engineering and Computer Science, an increase in the number of professors is observed. For other job titles, the number of employees has been comparable during the evaluated period.

In the case of the Faculty of Civil Engineering the number of employees was almost the same during the evaluated period, and only the age categories and promotion of a few Associate Professors to Professors has changed. Similarly, like in the Centre of Energy and Environmental Technologies, the changes were visible only to the “researchers in other categories”.

In the IT4Innovations National Supercomputing Centre, the staff is young. Currently, only two men are professors and two are associate professors; however, there is a large number of 30-49-year-old researchers.

Due to the nature of the research, gender balance cannot be expected in VSB-TUO overall. However, there are units like the Faculty of Materials Science and Technology and the Centre of Energy and Environmental Technologies where the gender balance is maintained.

Recommendations:

The comparison of the data from 2020 and 2024 revealed the staff's rejuvenation, which is a very positive phenomenon. Generally, a generational change is observed. More young staff have appeared.

It is recommended:

1. Increasing number of younger staff in the associate professor positions, who would ensure a stable generational change in some units,
2. The involvement of the motivation and supporting system for younger researchers in their professional advancement (e.g. mentoring programs),
3. Acquiring new, young scientists from renowned foreign entities (as leaders or future leaders).

4.6 Academic and Research Careers

Evaluate the described system for the recruitment and career development of academic and research staff. Evaluate the system in terms of its quality and effectiveness, as well as the potential absence of key elements.

Rating [1–5]:

5 - Outstanding

Qualitative assessment:

The document “Selection procedure rules for the positions of academic staff and designated other university staff at VSB – Technical University of Ostrava” is effective from 6th November 2019, and it is publicly available. All the employees are recruited in accordance with this procedure. Calls for applications are published on the University's website in the Job Opportunities section. This section also provides information that the University is a holder of the HR Excellence in Research Award (HR Award) and applies the principles of the European Charter for Researchers. The open, transparent, and merit-based recruitment principles are applied in recruitment. Selected positions are advertised in English on ResearchJobs, Euraxess, and jobRxiv.

The announcing authority appoints a selection committee, which is obliged to prepare the record of the selection process. Applicants are subsequently informed of the results. Selection procedures with international tenders are conducted in English. In the case of international candidates, the preparation of the contract is handled by a specialized HR officer. Additionally, international employees have assistance from the International Contact Point staff at the VSB TUO to help with arrangements related to living in the Czech Republic. After the new employee's arrival, an adaptation and mentoring process follows, as it is described in the document "Adaptation Process of VSB-TUO". The rules for the career development of academic and research staff are defined in the Career Regulations for Academic and Research Staff of VSB TUO, which outlines the career paths, opportunities for growth and development, as well as possible career changes. The Career Plan form is part of the performance evaluation system for academic and research employees. Employees have a clear separation of institutional and project workload within their contracts and funding. There is a transparent distribution of institutional time. There are also defined conditions for taking sabbatical leave in the VSB-TUO Work Regulations. During the visit, the evaluation panel discussed the transparency and suitability of the recruitment system with some employees from abroad, and they confirmed that everything was according to the procedures and correct. There are no arrangements set at the moment for workers to return after maternity/parental leave or other career breaks.

Recommendations:

1. Prepare a system tool to provide financial support to researchers/academics after maternity/parental leave or other career breaks
2. Continue with the recruitment of excellent researchers according to the “Selection procedure rules for the positions of academic staff and designated other university staff at VSB – Technical University of Ostrava”.

4.7 Gender equality measures

Evaluate the gender equality measures described in self-evaluation. Evaluate the measures in terms of their quality and effectiveness, as well as the potential absence of key measures.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-TUO has a Gender Equality Plan (GEP) for the years 2022-2026 promoting gender equality and equal gender opportunities for all employees and students. It is evaluated every year. VSB – TUO adheres to the principles of equal treatment, non-discrimination and equal opportunities. All employees who are related to or cooperate with the university have the same opportunities, regardless of gender, age, ethnicity, religion or medical condition. Equal treatment is applied in all processes, including recruitment, career development, appointment to leadership positions and university bodies, employee evaluation, and remuneration.

VSB TUO has built a new kindergarten within the campus. The management shows understanding for parents with dependent children, whereby they have adjusted working hours. The University supports the work-life balance of its staff including many options such as part-time contracts, flexible working hours, extended vacation for non-academic staff, access to the University kindergarten, and the organization of leisure activities for employees' children.

VSB – TUO opposes any form of discrimination and condemns all forms of inappropriate behaviour. If someone encounter any form of misconduct, the situation can be dealt with according to the directive Handling of complaints, suggestions, notifications and petitions, other complaints, initiative can be submitted to the Ethics Committee in accordance with the Rules of procedure of the Ethics Committee or the ombudsman can be contacted at ombudsman@vsb.cz. The University has established the position of an ombudsperson, with basic information available to both staff and students on the University's website. In 2023, a series of training sessions on inappropriate behaviour was held. Employees can also provide feedback on this issue during the annual employee satisfaction survey and have access to the e-learning course "Social Safety". Feedback obtained from employees shows that the way the University addresses this area is perceived by them as positive.

Regarding the gender balance in management positions, there are 87 persons engaged in the position of the Rector, Vice Rector, Vice-Chancellor, Dean, Academic Senate member, Scientific Council member, Quaestor, or member of the Board of directors. Out of this number, 20 were women in 2020 against 27 in 2024. Female representation is increasing, but still not in balance. Basic gender equality policies are in place, but proactive monitoring and impact evaluation are lacking.

Recommendations:

1. Implement regular gender audits.
2. Increase the number of women in management positions to achieve better gender balance.
3. Continue with training to promote inclusivity and prevent bias in recruitment.

4.8 Mobility of academic and research staff (including sectoral and inter-sectoral mobility)

Evaluate the described mobility of academic and researcher staff. Pay attention to whether the evaluated HEI achieves the set objectives, whether the mobility objectives are appropriately set for the HEI and whether the strategies in place lead to their achievement or help remove existing barriers to mobility.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-TUO supports the professional development of both academic and non-academic staff, as well as its other strategic objectives, via mobility within the European Union and other parts of the world. Academic and research staff have the opportunity to develop existing partnerships, establish new collaborations and submit joint research projects with colleagues who are based in other countries.

VSB-TUO staff receive funding for mobility to Erasmus+ programme countries. Academic staff can undertake research oriented visits or teach at a partner university abroad. The majority of visits are teaching oriented. In addition, VSB-TUO has a Staff Mobility Outside the EU - Internationalisation Programme. This has been in place since 2018. Staff visits outside the EU (to countries such as Japan, Taiwan, India, Colombia, and Peru) have contributed significantly to the development of cooperation and the signing of new partnership agreements. The goal is to gain new experience, contacts, and professional development. Contact with a foreign workplace will also strengthen the R&D capacity of the university and will lead to an increase in the number of publications and grant applications. VSB-TUO prioritises postdoctoral researchers (postdocs) and associate professors for research oriented outward mobility who can habilitate or embark upon their professorship upon their return to VSB-TUO.

PhD students can use the Erasmus+ programme to fund international mobility. The University provides scholarships for stays of 5-30 days or 2-12 months. Alternatively, PhD students can use the VSB-TUO Scholarship Program for study stays, internships, or summer schools outside the EU. The stay must last at least 1 month and up to 12 months. PhD students may also receive an additional faculty scholarship to help cover costs.

The University is a member of the U!REKA European University Alliance, which promotes international cooperation in education, research, and innovation. Membership of this alliance allows for experience and best practice sharing among partner institutions, support for joint projects, and the creation of new opportunities for students and academic staff. The main barriers to staff mobility within or outside the EU are typically insufficient foreign language skills or financial constraints at the departmental level if the mobility is not fully funded by one of the programmes mentioned above.

In addition to sending its own staff abroad, VSB-TUO welcomes international PhD students, academics, and researchers, who bring new perspectives and knowledge, thereby enhancing the university's scientific, research, and teaching, including supervision, capacities. This process also contributes to regional development, as some international experts and students choose to stay in the region on a long-term basis. Financial support for such visits includes the payment of travel expenses, an allowance for accommodation in the Czech Republic, and per diems.

VSB-TUO has established an International Contact Point in a prominent position on the main campus, to serve as a central contact for international students, academics, and researchers. This provides support with onboarding in the University; assistance with visa and residence permit processes; guidance on healthcare, including registration with doctors and health insurance. The International Contact Point also facilitates academic and social integration. It organises information sessions, workshops, and social events and helps visiting students and staff to understand local regulations and cultural norms.

In 2023, 392 academic staff were sent out and 157 were received; 73 PhD students were sent out and 11 were received. This data shows that VSB-TUO needs to improve its attractiveness to academic visitors.

Recommendations:

1. VSB-TUO should make greater use of Erasmus+ funds for research orientated visits by its academic staff.
2. VSB-TUO should consider whether the potential for academic promotion to Associate Professor or Professor is an appropriate selection method for outward

- mobility or whether explicit research project considerations would be better.
3. VSB-TUO should consider ways in which it can attract larger numbers of international academic staff and researchers to its campus.

RESEARCH INFRASTRUCTURE

4.9 Research infrastructure

Evaluate the system described for the acquisition/optimisation of core facilities and other equipment and their renewal. Evaluate the system in terms of its effectiveness and suitability for the HEI. Also consider the system for sharing instruments and equipment, including core facilities and equipment of evaluated units. Use the data in Annex Table 4.9.1 to support your evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-TUO has an investment plan based on collaborative requests from faculties and research institutes. Team leaders, faculty management, and departments set priorities for potential investment. The university administration considers these priorities with the aligned university wide priorities for R&D&I needs. The Activities Plan is then approved by the University management and presented to the faculty leadership.

Funding for the priorities is procured through internal reallocation or the annual university budgeting process, national funding sources, or European Union grants for capacity building. Investments in R&D&I also place an emphasis on compatibility with existing technologies and collaborative use of the budgeted investments.

Research Centres form hubs for collaboration on equipment, computing resources, and specialized personnel. Examples of this are the Energy Waste Recovery and Gas Treatment at the IET Research Center and the Supercomputing Center within the IT4Innovations.

On average, there are about 12 million euros invested annually in research infrastructure. This is a modest investment for a university the size of VSB-TUO, but consistent with a university with the research activity of VSB-TUO.

There is clear priority in the investment in electronic and computing infrastructure. This investment includes investments for automation and simulation-based research. The physical research testing infrastructure is limited by the current resource strategy. This strategy limits a large number of faculty in the development of new research and innovation in fields outside of computational endeavors, simulations, and modelling. Applied research required robust physical labs to support patent development and applied testing of theoretical systems.

Recommendations:

1. Further investment in physical testing facilities would broaden the capabilities beyond predictive modelling. Such capabilities would also assist to broaden research participation of younger academic staff and grad students.
2. Continue in the excellent care of the research facilities. Many of the priority research facilities would be the envy of other universities. The facilities are well supported with technical staff and maintenance of equipment.
3. Seek out funding to lift the annual research investment, particularly in areas of emerging topics and younger faculty. This will set a foundation for many years.

FINANCES

4.10 Budget and structure of financial resources

Evaluate the budget and financial resource structure of the evaluated HEI in terms of its suitability for the HEI, i.e. whether the financial resource structure is appropriate for the size and type of the evaluated HEI. You should also pay attention to the ability of the evaluated HEI to attract prestigious research projects. Use the data in the annexed tables 4.10.1 to 4.10.5 to support your evaluation.

Rating [1–5]:

4 - Very good

Qualitative assessment:

During the evaluation period, VSB-TUO conducted 8.4 Billion Kc (336 million Euros) in R&D&I. The funding is received from National, International and Industrial sources. The funding is concentrated in a few areas. The Centre for Energy and Environmental Technologies and the Faculty of Electrical Engineering and Computer Science are the two major academic research organizations. These research and scholarly units provide research and innovation in many growing areas with national and international impact. The National Supercomputing Center IT4Innovation also receives substantial funding. The National Supercomputing Center provides infrastructural support for many research projects at VSB-TUO and other institutions.

The institution has been able to obtain resources to build and support a quantum computer. This is a very prestigious infrastructure project. The prestigious funded research largely lies in CEET and FEECS. Most of the other faculties are not engaged at the same level. The Faculty of Mechanical Engineering and the Faculty of Materials Science and Technology are the next tier in financial support for R&D&I. There are pockets for recognized excellence that garner funding for directed research in these faculties. The other faculties at VSB-TUO have modest R&D&I funded research compared to the size of the faculties, comparable to regional universities in Europe and internationally.

There is a lack of high impact international funded projects. There is an IT4I center of excellence. Other parts of the university should seek to broaden European Union funding, e.g. ERC grants, MSCA grants...

The funding appears to be well managed. The research infrastructure is also well funded, maintained and available for faculty through collaborative efforts.

Recommendations:

1. It is recommended that the VSB-TUO continue with its goal to increase its impact through R&D&I.
2. Research activities for the benefit of industry should be funded by industry or co-funded by industry and national or EU programs. Additional efforts should be undertaken to financially support projects for end users, and are funded directly by the end users or partnerships between industry and government sources.
3. The institution should broaden its research portfolio to engage more of its staff, making use of their extensive capabilities and expertise.
4. Greater funding from European Union initiatives would elevate the institution's stature and extend the impact of the R&D&I of VSB-TUO.

4.11 Rules for the use of institutional support for the LCDRO

Evaluate the strategy described and the rules for the use of institutional support for the LCDRO. In your evaluation, consider the effectiveness of the implemented strategy and policies and whether they contribute to the mission and vision of the HEI.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-TUO uses LCDRO institutional support funds in a strategic and performance-oriented manner that contributes directly to the development of its long-term R&D&I goals.

- Allocation and Strategy:
 - The university has a clear internal methodology for allocating LCDRO funds based on performance indicators, including publication quality, project success, and alignment with the university's R&D strategy.
 - Funding is targeted at supporting research groups, PhD development, junior researchers, and bridging funding gaps in externally funded projects.
- Strategic Use:
 - LCDRO resources are strategically reinvested into research areas aligned with the strategic focus areas of VSB-TUO (e.g., energy, materials, IT, and smart technologies).
 - Funds are also used to co-finance infrastructure, support research staff mobility, and invest in talent retention measures.
- Governance and Transparency:
 - The allocation process is documented and transparent, involving internal calls, eligibility criteria, and ex-post evaluation.
 - Faculties are granted a degree of autonomy in internal prioritization, but this is balanced with oversight from central management to ensure mission consistency.
- Impact and Limitations:
 - LCDRO support has proven essential in maintaining research continuity, particularly in areas that require long-term development not covered by short-term grants.
 - However, the university could improve the monitoring and public reporting of LCDRO outcomes to demonstrate impact and reinforce institutional learning.

Recommendations:

1. Enhance the transparency and communication of LCDRO use and outcomes through annual public reporting.
2. Introduce independent peer review panels to assess the impact of funded initiatives over time.
3. Use LCDRO strategically to seed interdisciplinary or high-risk research, preparing grounds for future prestigious international grants.
4. Formalise feedback loops between strategy and LCDRO allocation to continuously align resource use with evolving research priorities.

NATIONAL AND INTERNATIONAL COOPERATION

4.12 Significant collaborations in R&D

Evaluate listed examples of significant R&D&I collaborations with respect to the effectiveness of the collaborations established, their proportionality and appropriateness to the type of HEI and its mission and vision.

Rating [1–5]:

3 - Average

Qualitative assessment:

Several collaborations, appropriate to both mission and vision of VSB-TUO, have been active in the examined period, bringing very good values to R&D&I.

At the national level, the cooperation of different Research Centres/Faculties are:

- VALEO R&D Center Prague and Škoda Auto in the Field of Autonomous Mobility;
- Faculty of Materials Science and Technology (FMST) and Industrial Partner Bonatrans Group Plc;
- DEKONTA Plc;
- Faculty of Safety Engineering (FSE) and the Fire Rescue Service of the Czech Republic (FRS CZ);
- IT4Innovations, CESNET, and CERIT-SC.

All entries in the above list are considered to be excellent cooperation in terms of R&D&I, which make clear the role of VSB-TUO in promoting strong and fruitful cooperation in R&D&I at the national level.

At the international level:

- State Capitalism Returns: The Impact of Government Ownership on Markets, Indebtedness, and the Environment;
- International Collaboration of the Faculty of Electrical Engineering and Computer Science (FEECS), VSB-TUO with Texas Universities;
- Faculty of Materials Science and Technology (FMST) and Yokohama National University (YNU) in Science, Research, and Education;
- collaboration with Institute of Polymer Science and Technology (ICTP-CSIC) in Madrid, Spain;
- IT4Innovations and the Leibniz Supercomputing Centre (LRZ).

In section 4.12 of the Self-Evaluation Report, there are numerous examples of direct collaboration between VSB-TUO and various foreign Universities and Research Institutions. The results of these co-operations are joint articles in journals, as well as new technical solutions. The above list indicates very good international cooperation in terms of R&D&I, with significant social impacts. There are also co-operations outside of Europe, notably that of the Faculty of Electrical Engineering and Computer Science (FEECS) with Texas Universities on computer modelling of physiological systems, intelligent biomedical devices, and advanced signal processing methods, and that of the Faculty of Materials Science and Technology (FMST) with Yokohama National University, in Japan, on projects focused on "green materials" and the development of materials for high-temperature applications. This also responded to some of the comments from the 2020 evaluation, where VSB-TUO was invited to make greater efforts to establish close cooperation with universities and research centres outside of Europe. However, given the number of Faculties and Centres at VSB-TUO, still this is something to improve, and there is certainly room for that, based upon the many activities carried out at VSB-TUO, and the international connection, particularly with Asia. Ideally, an international project should be started by each of the Faculty/Research Center. Definitely, if the will is becoming a big player in Central European technology and a large University, there is huge room for improvement in this field.

Recommendations:

As concerns the significant collaborations in terms of R&D, the University VSB-TUO is requested to consider the following suggestions:

1. Research cooperation with research institutions and universities in other continents (particularly, Asia and America) has the potential to be improved. Greater efforts should be made in this direction, in order to start new projects, and to facilitate mobility outside of Erasmus+.
2. Strengthen the mobility of researchers and PhD students, aimed at improving the level of internationalisation, that is the first step to have fruitful contacts to promote joint

projects.

3. Increase the number of invited lectures from abroad, once again to establish solid relationships and put the basis for international cooperation.
4. Highlight the benefits deriving from work opportunities abroad, aimed at convincing more personnel to go in this direction.

STUDIES

4.13 Doctoral studies

Evaluate the described organisation of doctoral studies. Pay attention to the setup and quality of the processes, as well as their effectiveness through basic statistics, such as drop-out rate or data on the future career of graduates.

Rating [1–5]:

3 - Average

Qualitative assessment:

Doctoral studies at VSB-TUO are regulated and structured according to national legislation and internal policies, with clear frameworks for admission, supervision, and evaluation. The system ensures minimum standards and formal compliance, but several challenges limit its overall effectiveness.

- **Structure and Quality Assurance:**
 - The PhD Academy is VSB-TUO's main vehicle for developing early-career researchers: it offers structured courses in publishing, soft skills, and research management (delivered via the Technology Transfer Centre), with clear KPIs—90% course completion by internal PhD students and a 25% increase in their publication output. Uptake and enthusiasm vary across faculties, so tighter formalisation (e.g., mandatory core modules and clearer incentives for supervisors) is advisable. Strategically, the Academy can evolve into a full Graduate School to unify standards for supervision, transferable skills, and international mobility.
 - Doctoral programs are organized at the faculty level under central oversight, with doctoral boards responsible for academic quality.
 - Supervision is provided by experienced researchers, often linked to externally funded projects, ensuring some exposure to active research environments.
- **Support and Environment:**
 - Doctoral candidates benefit from SGS grants (Student Grant Competition) and project-based opportunities. However, structured training (e.g., in transferable skills, career planning, or research ethics) is limited or uneven across faculties.
 - Access to infrastructure and international mobility is available but not systematically embedded in all doctoral tracks.
- **Completion Rates and Career Outcomes:**
 - The drop-out rate remains relatively high, as acknowledged in the self-evaluation report. Completion times can also exceed nominal durations.
 - Graduate tracking is partial — there is limited institutional data on employment outcomes or integration into academia, industry, or public sectors.
- **Challenges:**
 - VSB-TUO lacks a university-wide strategy to strengthen the doctoral experience and elevate it to international standards.
 - Financial support, supervision loads, and career guidance vary substantially by faculty, with no uniform policy for excellence in doctoral education.
 - Recruiting doctoral candidates that are not from VSB-TUO and encouraging

graduates from VSB-TUO to pursue doctoral degrees at other institutions. The reputation of an institution is often judged by the external exchange of intellectual capital, not by inbred knowledge transfer.

Recommendations:

1. Review the involvement of doctoral students with the PhD academy
2. Consider whether to convert the PhD Academy into a more formal Doctoral Studies (Graduate) School. Develop a university-wide doctoral school model with shared standards for supervision, progress monitoring, and transferable skills training.
3. Implement a system for tracking graduate career paths and using this data to improve doctoral program relevance and structure.
4. Strengthen international mobility opportunities (e.g., joint PhDs, co-tutelle agreements) and incentivize outbound experiences.
5. Introduce formal training modules for doctoral supervisors to ensure quality and consistency in doctoral mentorship.
6. Explore financial incentives or fellowships to reduce drop-out rates and attract high-calibre doctoral candidates from abroad.

IMPLEMENTATION OF RECOMMENDATIONS

4.14 Implementation of recommendations in Module 4

Evaluate how the HEI has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the HEI has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

3 - Average

Qualitative assessment:

VSB-TUO was requested in Section 4.14 to briefly describe how it has implemented the recommendations for Module 4 from the previous evaluation period, if applicable.

In Module 4 from the previous evaluation report there were 91 recommendations:

- 14 for Section *Organisation, management and support of R&D&I*,
- 15 for Section *Doctoral studies*,
- 14 for Section *National and international cooperation and mobility in R&D&I*,
- 18 for Section *Human resources and careers in R&D&I*,
- 8 for Section *Funding for R&D&I*,
- 6 for Section *Formative evaluation of R&D&I and the start-up strategy (with potential for application)*,
- 6 for Section *Research infrastructure*, and
- 10 for Section *Good practice in R&D&I*.

VSB-TUO has addressed in Section 4.14 only 12 out of 91 recommendations:

- 4 from Section *Organisation, management and support of R&D&I*
- 5 from Section *Doctoral studies*
- 2 from Section *National and international cooperation and mobility in R&D&I*
- 1 from Section *Formative evaluation of R&D&I and the start-up strategy (with potential for application)*

In the introduction to Section 4.14 VSB-TUO wrote: "The following recommendations (R) were

implemented.” Formally speaking, this directly implies that the great majority of recommendations were not implemented. Even if the University decided not to implement recommendations, it would be helpful to have evidence that they had been considered.

During the onsite visit to VSB-TUO and through reading the SER report, the IEP observed that some other recommendations were also addressed, for example some of those related to *Funding for R&D&I*.

Although the space available in Section 4.14 for explanations about implementation of recommendations was limited, it was still sufficient to allow clear and efficient explanations, so the IEP considers this section inadequate.

We therefore recommend below how this section should be written in the future.

Recommendations:

When explaining how the recommendations from the previous evaluation report were addressed, we recommend the following approach:

- For each recommendation, either copy it directly or provide another clear reference to it.
- Provide a short explanation of how the recommendation was addressed, or state explicitly that it was not addressed.
- If the explanation is too long, give a reference to the relevant section of the evaluation where the recommendation is discussed in detail.
- If the evaluation form remains the same as in this evaluation, explain the recommendations within each subsection, and provide a concise summary in the final section.

MODULE 4 RATING

MODULE 4 – SUMMARY EVALUATION

After evaluating each indicator, please provide an overall evaluation of Module 4. Assess the overall state of the research and institutional environment and the quality of the internal processes of the HEI. Consider whether and how the set processes contribute to the fulfilment of the HEI's mission and vision.

The aggregate grade is determined in accordance with the rules of the Methodology HEI2025+ as a simple average of the scores for each indicator.

INDICATOR	RATING [1–5]
4.1 Organisation and management of R&D&I	4 - Very good
4.2 System of support for a quality R&D&I environment and incentive measures for quality science	4 - Very good
4.3 Quality control system for R&D&I environment	5 - Outstanding
4.4 Sustainability and resilience of R&D&I	4 - Very good
4.5 Structure of human resources	4 - Very good
4.6 Academic and Research Careers	5 - Outstanding
4.7 Gender equality measures	4 - Very good
4.8 Mobility of academic and research staff (including sectoral and inter-sectoral mobility)	4 - Very good
4.9 Research infrastructure	4 - Very good
4.10 Budget and structure of financial resources	4 - Very good
4.11 Rules for the use of institutional support for the LCDRO	4 - Very good
4.12 Important collaborations in R&D&I	3 - Average
4.13 Doctoral studies	3 - Average
4.14 Implementation of recommendations in Module 4	3 - Average
AVERAGE RATING	4 - Very good
GRADE [A–D]	B

Summary assessment:

VSB–TUO's research and institutional environment is robust and steadily improving. The University offers well-developed support schemes for high-quality science—such as the PhD Academy, SGS, and Global Postdoc—alongside a transparent LCDRO allocation system and a generally effective governance framework. However, the division of responsibilities among senior leadership bodies and advisory boards remains insufficiently clear, occasionally hindering strategic agility.

The University demonstrates commendable practices in sustainability and resilience, including the adoption of a comprehensive Sustainable Development Strategy 2024+, major investments in energy efficiency, and active community engagement. Human resources data reflect a generational rejuvenation and a rise in international staff, yet persistent structural imbalances remain—particularly a shortage of associate professors and underrepresentation of women in senior academic roles.

Career development systems are a strength, noted for their transparency and alignment with European standards (e.g., the HR Excellence in Research Award, open recruitment). However, the absence of mechanisms to reintegrate staff after parental leave represents a gap in the support

structure. Researcher mobility is actively promoted through Erasmus+ and out-of-EU schemes, although the university's inbound attractiveness remains relatively limited.

Research infrastructure is strategically managed and frequently upgraded, with a clear emphasis on digital and computational facilities. Still, a broader range of physical testbeds would encourage more inclusive participation and generate greater applied impact. Financial management is strong, with significant national and EU funding streams, although prestigious international projects remain concentrated within a small number of top-performing units.

Examples of external collaboration are notable but uneven across faculties, indicating the need to diversify and strengthen strategic partnerships. While many of the 2020 recommendations have been partially or fully addressed, several remain incomplete—particularly in areas such as open science, research data management, gender equality, and the creation of independent feedback mechanisms.

In summary, the University has established processes that meaningfully support its mission and vision. However, to reach an “A” level, it must focus on improving consistency and institutionalising its best practices across the board.

Summary recommendations:

1. Clarify governance roles (Rector, Vice-Rectors, SB, IB, AS) and streamline the Rector's College; consider a dedicated Research Council of vice-deans and institute directors.
2. Complete and enforce an institutional Open Science & Research Data Management policy, with clear responsibilities, FAIR compliance, and monitoring.
3. Strengthen quantitative monitoring of support measures (e.g., participation, outputs, impact of SGS, PhD Academy, Global Postdoc) and integrate results into planning cycles.
4. Invest in physical testing facilities to complement modelling/simulation strengths, enabling broader participation (especially younger staff) in applied research.
5. Enhance gender-balance actions with regular audits, measurable targets for women in leadership, and post-parental-leave support tools.
6. Increase inbound mobility and international attractiveness, using focused incentives and better PR/branding to attract visiting scholars and postdocs.
7. Diversify and deepen significant collaborations so each faculty engages in at least one high-impact international project; encourage non-EU partnerships beyond current pockets of excellence.
8. Systematise follow-up on evaluation recommendations, with a dashboard tracking implementation status, outcomes, and responsible offices.

MODULE 5 – STRATEGY AND POLICIES

5.1 Mission and vision of the evaluated institution in R&D&I

Evaluate the described vision and general mission of the university emphasizing R&D&I (in context of its educational function and the educational policy strategy of the state or the relevant ministry for higher education. Compare the defined mission with reality. The evaluation should consider how the mission and vision of the HEI has been fulfilled in the past five-year period and whether the vision for the next five-year period is adequately set and realistically achievable.

Rating [1–5]:

2 - Below average

Qualitative assessment:

VSB-TUO has a Strategic Plan for the period 2021-2027. Its priorities demonstrate a high level of compliance with those of the Ministry of Education, Youth and Sports. The Rector's introduction to the Strategic Plan observes acutely that "there are universities that make the rules, and universities that follow them. The Strategic Plan of VSB-TUO.... will be successful if we become a university that makes the rules".

There is no mission statement within the Strategic Plan. The Self Evaluation Document for this exercise states that VSB-TUO is a university with a technical and economic focus and that its mission is „to shape the society through education, research, and innovation by developing creative, entrepreneurial, and socially responsible citizens; generating knowledge to address the world's major global challenges; engaging in public debate and critical analysis on matters of social significance; and collaborating with businesses for the benefit of its students, its region, and the entire economy“. The University is to a very considerable extent fulfilling this mission, although public recognition, and hence reputation, probably could be enhanced. The Strategic Plan and the SED do include a Vision statement but it is not fit for purpose. It is not forward looking and provides no indication of where VSB -TUO wishes to be in the future. It should be revised as soon as possible.

The Strategic Plan identifies eight strategic priorities for the University. Two of these strategic objectives – „to be a recognised centre for oriented research“ and „to be an incubator for promising employees“ – relate to research. These strategic objectives are supported by an appropriate array of operational objectives. These operational objectives include indicators of success (KPIs), action plans, resources and the person responsible. The latter is the Vice Rector for Science and Research in all cases.

Unfortunately, the expression „oriented research“ is unclear (at least in the English language). It appears that this means a strategic focus on a small number of research themes, supported by appropriate financial, human and physical resources. The university currently considers as its key areas of „oriented research“ to be energetics (including advanced materials and the environment) and high performance computing. An important goal for the future operation of VSB-TUO is the profiling of the university into a limited number of key areas of „oriented research“ to which support will be directed. An increase in interdisciplinarity is a strategic objective and aligns with an attempt to solve real world problems. The potential contribution of economic, as well as technical, disciplines to this endeavour is recognised. It is not clear if VSB-TUO envisages an increase in the number of key research themes in the future.

The Objectives for research include „B 3.4 Development of the university's business potential“. Given the success that the University has achieved with contract research and given the excellent reputation of its graduates with employers, this section should perhaps be moved to a new „business facing, skills and employability section of the Strategic Plan.

The aspiration „to be an incubator for promising employees“ is laudable and has resulted in the creation of a sector leading (in Czechia) PhD Academy, which provides support for publishing and soft skills development among doctoral students. The Strategic Plan objective of the University was to create a School of Doctoral Studies (or Graduate School). This would have greater organisational implications for Faculties, but is something that could be re-evaluated once the

more limited PhD Academy has become more established. The success indicators are successful completion of courses offered by the doctoral studies school by at least 90% of internal doctoral students and a 25% increase in the publishing output of doctoral students. Our meeting with current doctoral students indicated a variety of attitudes to the offer of the PhD Academy; so a greater formalisation of involvement may be necessary.

Internationalisation is also an operational objective for VSB-TUO's research. There is a target of 20% of publications having international co-authors. This target is not very ambitious but it does reflect VSB-TUO's current situation. To move higher in international league tables, and to become a university that „makes the rules“, will require a more ambitious target. Internationalisation is also a key objective of VSB-TUO in its own right: „active networking will take place with potential partners, leading to the development of cooperation in research and innovations and their preparation for submitting joint research projects“ (Objective 8.12). However, the responsibility for this lies with the Vice Rector for Study Affairs. Although there are different conceptual models associated with internationalisation, many universities have concluded that their leadership should include a Vice Rector for Internationalisation who can lead that agenda across both education and research and who can work with Faculty Vice Deans for Internationalisation.

Recommendations:

1. The Strategic Plan should incorporate a Mission statement
2. The Vision statement should be re-written in line with the University's aspirations
3. Put business related objectives in a new section of the Strategic Plan which also deals with skills and employability
4. Review the target for publications with international collaborators
5. Review the involvement of doctoral students with the PhD academy
6. Consider whether to convert the PhD Academy into a more formal Doctoral Studies (Graduate) School
7. Consider whether to appoint a Vice Rector for Internationalisation

5.2 Research and development objectives

Evaluate the set goals of the HEI in both the area of R&D&I and the development of the HEI as an institution. Consider whether the goals are adequately established in relation to the size and type of the HEI, as well as its mission and vision, and whether they are achievable within the proposed timeframe.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-Technical University of Ostrava (VSB-TUO) has three main priorities; A. Education for practice, B. Recognized Research and C. Efficient functioning. In these priorities, the priorities B and C are directly related to the area of R&D&I and the development of the HEI.

For priority B, VSB-TUO aims to play a significant part in research activities in cooperation with industrial partners and with a focus on the specific problems faced by industry and society. In order to attain the priority, they set five objectives; increasing the number of quality publication output, Increasing excellence in key areas of oriented research, Development of interdisciplinary and international co-operation, Development of the university's business potential and Building infrastructure for open science.

In the five years from 2020, VSB-TUO increased the overall number of publications above the median for the given field by 15 % and the citation index of publications affiliated with VSB-TUO by 20%. VSB-TUO attained publication of articles on selected topics in a proportion of at least 35% of all published article, annual 20 % share of publications affiliated with VSB-TUO created within an

international team of authors, and average year-on year growth of 10% and 5% in total income from applied licence and commercial agreement, respectively.

For the priority C. Efficient functioning in accordance with the Sustainable development Goals of the United Nations (SDGs), VSB-TUO conducted great efforts to improve the quality of infrastructure and human resources. In order to attain the priority, they set five objectives; Enhancing university security, Digitalization of the university, Support of the sustainable development of the university, Sharing and centralization of resources and support for the strategic management of the university and Support of the modernization and attractiveness of the campus.

In the five years from 2020, the comprehensive security system combined the architectural elements of university buildings with systems for technological protection of persons, property, and information by building a central remote system with reliable detection and threat assessment, with maximum resistance to external and internal influence. For digitalization of the university, the proportion of electronically accounted documents and electric communication between students and university in 2027 will reach 90% of the 2020 value. VSB-TUO has also updated many of its buildings and installed state-of-the-art equipment with EU funding as part of the REFRESH project. This is due to the geographical advantage (Moravian-Silesian Region) of the University in the Czech Republic, i.e. the consideration of not concentrating capital in Prague, as well as the legitimacy of the University's decision-making. This progress made an important contribution to the realisation of the University's mission of SDGs. A 15 % decrease in water consumption by 2027 compared to 2020 and an increase in the energy self-sufficiency of the university to 17 % of the total energy consumption by 2027. The many advances made in research and development over the past five years are largely due to these contributions. Based on the results of this five-year period, it can be assessed that the objectives set for the HEI being made are appropriate for the size and type of HEI, its mission and vision, and are achievable within the proposed timeframe.

Recommendations:

The improvement of the research and teaching environment, including the buildings, over the past five years has been very positive and the university's efforts have been recognised. It is essential to continue to obtain budgets for education and research and development in the next five years. In this context, cooperation and budget acquisition in research and education in the Czech Republic and in Europe as a whole is essential and further efforts are expected.

5.3 Institutional instruments and measures for the implementation of the research and development strategy

Evaluate the described institutional and strategic instruments for the fulfilment of the research and development objectives regarding how they will contribute to the fulfilment of these objectives. In your evaluation, also pay attention to the possible absence of key instruments or measures.

Rating [1–5]:

4 - Very good

Qualitative assessment:

VSB-Technical University of Ostrava (VSB-TUO) has a system by which professors with major projects have systems in place to reduce the teaching load in order to concentrate on research and development. Also, they can receive PhD students for research and can give the scholarship for their PhD students to concentrate the research. This university opens all the instruments and facilities for all the faculty members, PhD students, Master course students and Bachelor students. Furthermore, the use of special equipment purchased for the project is open to other professors and students at the discretion of the project leader, provided that this is permitted by contract. In

international and national projects as well as in joint research with companies, excellent researchers and students are essential, but the provision of facilities and a research location with sufficient space is highly desirable. The University responds well in this respect. This university encourages the young researchers to apply to the funding program of the Czech Republic for instruments. Additionally, over the past five years, strategic budget allocations from the Czech Republic and across Europe have enabled the development of research environments, the recruitment of outstanding researchers, and the promotion of collaborative research with domestic and international companies, creating a virtuous cycle where the results are reinvested into research institutions.

Recommendations:

The strategic budget allocations of this university from the Czech Republic and Europe as a whole have enabled the development of a research environment and the recruitment of talented researchers, leading to a positive cycle in which joint research with companies has been promoted and the resulting achievements have benefited research institutions. If we wish to see further investment in universities from companies in the future, the role of public relations at universities will become increasingly important.

5.4 Implementation of recommendations in Module 5

Evaluate how the HEI has reflected the recommendations from the previous evaluation of the IEP, if applicable.

If the HEI has not been evaluated before, the indicator will be marked as N/A – Not Applicable.

Rating [1–5]:

4 - Very good

Qualitative assessment:

Several key recommendations related to institutional strategy and R&D development have been proactively addressed in the current strategic period (2020–2025). Others are in need of further development:

“Enhance research co-operation with renowned research institutes around the world”. This could be facilitated by greater mobility of PhD students, postdoctoral researchers and academic staff across the world. Progress has been made; however it is uneven across the University due to differences in the esteem in which its Faculties and Research Institutes are held. Levels of mobility have remained constant overall. The oversight of the internationalisation of the university is divided between the Vice Rector for Research and the Vice Rector for Studies.

Considerable progress has been made with the establishment of International Scientific Advisory Boards, both at University and Faculty level. However, it is not clear why the Rector chairs the University level Board.

The international branding and visibility strategy remains in progress and lacks concrete deliverables. This will have benefits for its international esteem and its international ranking.

Considerable progress has been made with a Strategy for AI In general, however, inter-faculty strategic co-operation relies on informal networks and leadership goodwill.

“Establish a Joint Laboratory of Applied Medicine which will help VSB-TUO to strengthen co-operation with the University Hospital in Ostrava”. Little progress has been made with this. Co-operation with the University of Ostrava is an area for further development.

Considerable progress has been made in incentivising academic staff to undertake research and to reward them for successful outputs. However, workload management is an area for further development.

Recommendations:

1. Consider the appointment of a Vice Rector for Internationalisation
2. Consider the appointment of an Independent Chair of the International Scientific Advisory Board
3. Develop a branding and visibility strategy

4. Develop more formal mechanisms to develop inter faculty strategic co-operation
5. Evaluate options for strategic co-operation with the University of Ostrava
6. Refine workload management to ensure that it helps to incentivise research and its outputs

MODULE 5 RATING

MODULE 5 – SUMMARY EVALUATION

After evaluating each indicator, please provide an overall evaluation of Module 5. Evaluate the overall setting of the HEI's strategic objectives and development plan.

The aggregate grade is determined in accordance with the rules of the Methodology HEI2025+ as a simple average of the scores for each indicator.

INDICATOR	RATING [1–5]
5.1 Mission and vision of the evaluated institution in R&D&I	2 - Below average
5.2 Research and development objectives	4 - Very good
5.3 Institutional instruments and measures for the implementation of the research and development strategy	4 - Very good
5.4 Implementation of recommendations in Module 5	4 - Very good
AVERAGE RATING	4 - Very good
GRADE [A–D]	B

Summary assessment:

The university's goals are clearly formulated, relevant to its profile as a technical HEI, and increasingly aligned with national and European research priorities.

The strategy is backed by solid instruments, performance-based internal mechanisms, and growing coordination across governance structures. Implementation is progressing across core areas such as infrastructure, doctoral training, internationalisation, and project support — though some institutional ambitions are still emerging and unevenly realised across its units.

The vision for the next five years is ambitious yet realistic, grounded in institutional experience and regional strengths, particularly in energy, digitalization, and intelligent systems. The long-term sustainability of this vision will depend on deeper internal integration, international competitiveness, and capacity to attract and retain research talent.

Summary recommendations:

1. Formalize a university-wide roadmap to consolidate and integrate R&D&I objectives across all faculties.
2. Further develop interdisciplinary and cross-faculty cooperation instruments to break down internal silos.
3. Strengthen long-term planning mechanisms, including KPIs, risk management, and institutional foresight.
4. Translate internationalisation goals into concrete actions with timelines, deliverables, and support measures.
5. Ensure that the next institutional strategy cycle (post-2025) incorporates open science, gender equity, and innovation transfer more centrally.

OVERALL EVALUATION IN MODULES 1 TO 5

OVERALL EVALUATION

Provide a summary evaluation of the HEI as a whole across all five modules. Justify your evaluation and highlight the main strengths and/or weaknesses of the evaluated HEI. The overall grade is determined according to the rules of the "Methodology VŠ2025+".

Variant with a grade B in MODULE 1 and 2

MODULE	MODULE WEIGHT	GRADE [A–D]
MODULE 1 and 2	50 %	B
MODULE 3	30 %	B
MODULE 4	10 %	B
MODULE 5	10 %	B
OVERALL RATING		B – Very good

OVERALL EVALUATION

Provide a summary evaluation of the HEI as a whole across all five modules. Justify your evaluation and highlight the main strengths and/or weaknesses of the evaluated HEI. The overall grade is determined according to the rules of the "Methodology VŠ2025+".

Variant with a grade C in MODULE 1 and 2

MODULE	MODULE WEIGHT	GRADE [A–D]
MODULE 1 and 2	50 %	C
MODULE 3	30 %	B
MODULE 4	10 %	B
MODULE 5	10 %	B
OVERALL RATING		B – Very good

Qualitative assessment:

VSB – Technical University of Ostrava presents itself as a university with a distinct techno-economic profile and a strong regional mission, increasingly complemented by internationally oriented research ambitions.

Across Modules 3–5, the institution demonstrates maturing capacity, with tangible improvements in research infrastructure, incentive mechanisms, doctoral support, and societal impact pathways. However, performance remains uneven across faculties, and persistent system-level constraints still limit the university's ability to set its own course rather than follow external frameworks.

Module 3 (Social Relevance and Impact) reveals a university developing at dual speeds. Leading units—FEECS, IT4Innovations (IT4I), and CEET—combine high scientific visibility with strong societal engagement, robust international funding, state-of-the-art research infrastructure, and mature knowledge-transfer practices, each earning an "A" in their individual evaluations. In contrast, several large engineering faculties (FMST, FME, FMG, FSE) received "B" grades: they are active and productive, but their societal impact often depends on small clusters of senior academics, making achievements vulnerable to leadership transitions. The Faculties of Economics (FE) and Civil Engineering (FCE) were rated "C", reflecting modest external funding and limited international

engagement, despite playing relevant regional roles. The aggregate assessment for Module 3 is therefore a “B”, characterizing a university with strong “islands of excellence” that have not yet elevated the full institutional landscape.

Module 4 (Viability, Organization & Management) confirms significant internal improvements since the 2020 evaluation, in spite of the fact that very limited evidence was provided on progress in implementing the 2020 recommendations. These include targeted incentive schemes for early-career researchers (e.g., PhD Academy, SGS, Global Postdoc), the implementation of strategic analysis and performance-based internal funding (LCDRO methodology), sustainability planning, and generally sound infrastructure development. However, governance structures remain opaque: the roles and responsibilities of the Rector, Vice-Rectors, Scientific and Industrial Boards, and Academic Senate lack a clear definition, and the Rector’s College may be too large to support agile decision-making. Policies on open science and research data management are still fragmented, and doctoral education practices vary significantly by faculty. While gender equality measures exist, monitoring and evaluation are insufficiently systematic. Despite these challenges, Module 4 receives a “B / Very Good” rating, reflecting functioning systems that now require consolidation and sharper accountability.

Module 5 (Strategy & Policies) highlights a mostly coherent strategic plan (2021–2027), supported by KPIs and clearly assigned responsibilities—particularly in the areas of research excellence, interdisciplinarity, and infrastructure development. However, there is no mission statement in the strategic plan, and its Vision statement lacks a forward-looking focus and should be revised to clearly articulate the institution’s desired positioning beyond 2030. Internationalisation is a stated goal, but leadership is fragmented (e.g., between Study Affairs and R&D) and could be strengthened through a dedicated vice-rector. Targets for international co-authorship remain modest; to enhance visibility and competitiveness, more ambitious goals are needed. The PhD Academy represents a major step forward, but participation by students is inconsistent, and the transition to a Graduate School model remains incomplete. While most 2020 recommendations under Module 5 have been addressed, long-term strategic priorities—such as open science integration, gender equity, and interdisciplinary alignment—are still evolving. The module is assessed as “B (Very Good)”.

Modules 1–2, evaluated nationally, reveal uneven bibliometric performance and limited presence in high-impact publication venues or prestigious funding schemes (e.g., ERC, MSCA), particularly outside the university’s top three units. These weaknesses affect Modules 3–5 by reducing the pool of internationally competitive researchers and limiting the university’s participation in large-scale consortia. While the IEP avoids deep bibliometric analysis, it is evident that improving publication quality, citation impact, and grant competitiveness in the weaker units is vital to raising institutional performance. The “B-C” grade assigned to Modules 1–2 reflects these challenges and, with its 50% weighting, acts as the main limiting factor on an otherwise solid institutional profile.

Synthesis and Weighting: With Modules 1–2 at “B-C”, and Modules 3, 4, and 5 each at “B”, the weighted outcome converges on an overall grade of “B” (Good). The University is clearly moving in the right direction, especially in terms of infrastructure investment, early-career researcher support, and internationally recognized clusters of excellence. To reach an “A” level across the board, VSB-TUO must now focus on institutionalizing its best practices and lifting the baseline performance of its weaker faculties.

Recommendations:

- Reformulate the University Vision, formulate a mission, and streamline Governance. Redraft the vision to specify where VSB-TUO aims to stand by 2030 and clarify R&D&I decision-making lines (roles of Rector, Vice-Rectors, SB, IB, AS). Consider a separate, nimble Research Council (vice-deans for research + institute directors) to coordinate Module 3–5 priorities.
- Consolidate Technology Transfer and Open Science

Create a unified, proactive TTO/innovation hub and complete a university-wide Open Science and Research Data Management strategy. Tie LCDRO allocations or internal calls to compliance with FAIR data and OA policies.

- Lift the Publication Quality and the quantity of prestigious International grants (ERC, MSCA, European centers of excellence). Engage the “A” units to support FE, FCE, and other lower-performing faculties with targeted mentoring, internal peer review, and with help in preparing cluster-based proposals to prestigious international programs, like ERC, MSCA, etc. Increase institutional targets for internationally co-authored publications and high-impact journals.
- Institutionalize Interdisciplinary “Mission Clusters”
Formalize cross-faculty teams (e.g., Digital Industry, Clean Energy, Resilient Regions) with seed funding, internal thematic workshops, and a central proposal office dedicated to large consortia bids.
- Strengthening Doctoral Education Systemically
Evolve the PhD Academy into a Graduate School framework with shared standards for supervision training, transferable-skills curricula, mobility requirements, and career tracking. Reduce drop-out rates through fellowships and transparent supervision loads.
- Embed Gender Equality and Inclusion in Performance Metrics
Implement regular gender audits, set progressive targets for women in leadership roles, and measure outcomes (not just activities). Link unit-level progress to internal resource allocations.
- Enhance International Attractiveness and Inbound Mobility
Appoint a Vice-Rector for Internationalization, expand inbound fellowships and visiting-scholar schemes, and invest in branding and PR to turn current project-based connections into long-term partnerships.
- Balance Investment Between Digital/Computational and Physical Testing Infrastructure
Increase physical laboratories and testbeds to complement modelling/simulation strengths, thus broadening applied research capabilities and engaging younger faculty and PhD students.
- Use LCDRO Funds Strategically as “Venture Capital”
Seed high-risk/high-reward interdisciplinary projects and spin-off incubation. Establish transparent reporting of LCDRO outcomes and independent peer reviews to ensure learning and impact.
- Increase the volume and funding value of research for industry, especially research funded or co-funded by industrial partners.
- Close the Loop on 2020 Recommendations
Install a formal tracking mechanism to document how each external recommendation is addressed, with timelines, responsible persons, and evidence of outcomes. This will institutionalize a feedback culture and strengthen future evaluation cycles.