MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

SELF-EVALUATION REPORT MODULE 3

EVALUATED UNIT: University Centre for Energy Efficient Buildings (UCEEB)

FORD: Engineering and Technology

MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

MODULE 3 SOCIAL RELEVANCE

SOCIAL RELEVANCE / SOCIAL BENEFIT OF THE EVALUATED UNIT[1]

3.1 General self-assessment of the social benefit of R&D&I in the fields of research at the evaluated unit, and of the evaluated unit as a whole

The evaluated unit gives a concise, general but informative account of the benefit of R&D&I in the fields in the 2014–2018 reporting period.

Self-evaluation:

UCEEB is a research centre focused on cooperation with the civil engineering industry and on sustainable development. Through this cooperation, UCEEB delivers research results to the general public. The Center assists municipalities on their path towards smart city development. In the field of education, UCEEB is a place of interconnecting education, where students can develop their creativity and also their practical skills.

HTML links to additional documentation:

APPLIED RESEARCH PROJECTS

3.2 Applied research projects [2]

The evaluated unit presents a maximum of the five most significant (from the perspective of evaluated unit) applied research projects in the 2014–2018 reporting period from the complete list in the appendix (tables 3.2.1 and 3.2.2), particularly with regard to the results achieved or a project's potential for application.

[1] In accordance with Section 22(1) of Act No 111/1998 on universities, amending certain acts (the Universities Act), as amended.

[2] Under Section 2(1)(b) of Act No 130/2002, applied research is theoretical and experimental work aimed at gaining new knowledge and skills for the developing of new or substantially improved products, processes or services; applied research includes industrial research or experimental development, or a combination of both. Under Article 2 of Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, industrial research means planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products, processes or services, or for bringing about a significant improvement in existing products, processes or services. It comprises the creation of component parts of complex systems, and may include the construction of prototypes in a laboratory environment or in an environment with simulated interfaces to existing systems as well as of pilot lines, when necessary for the industrial research and notably for generic technology validation; experimental development means acquiring, combining, shaping and using existing scientific, technological, business and other relevant knowledge and skills with the aim of developing new or improved products, processes or services. This may also include, for example, activities aiming at the conceptual definition, planning and documentation of new products, processes or services.

Self-evaluation:

MORE-CONNECT **is an H2020 project focused on deep retrofitting of multi-family houses. The result is a system of pre-fabricated external insulation units with an integrated building infrastructure. With this system, a multi-family house can be refurbished within days, minimizing the impact on the residents. Some of the outcomes of the project are used in an approach already implemented in EU countries for single-family houses. The Czech partner, RD Rýmařov, is already using a production line upgraded within the project, and the first demonstration building in Milevsko is under consideration.**

FINERPOL **– an Interreg project focused on financial instruments. The results of the project are now in use all around the EU.**

UCEEB++ - National Sustainability Programme **– this is a follow-up project, based on a start-up project. Strategic R&D is performed, and a knowledge base for other projects is being developed. Topics include sustainability theory, LCA, local energy systems, special sensors, etc.**

The new generation for roof windows **– this is a large research project focusing on roof windows for passive houses (in which roof windows have not been installed in the past). The product proved to be commercially feasible.**

Advanced concrete elements with fibre reinforcement **– this is a long-term research project, in which we developed an ultra-high-performance concrete element with carbon fibre reinforcement in the form of a seamless column. Concrete elements of this type are an innovation. The column is highly suitable for pre-fabrication and has the potential to lower the CO2 footprint of concrete buildings by as much as 50%.**

HTML links to additional documentation:

3.3 Contract research [3]

The evaluated unit briefly comments on revenues from contract research for the 2014–2018 reporting period from the complete list in the appendix (tables 3.3.1 and 3.3.2).

Self-evaluation:

UCEEB was officially opened in 2014. We will focus on the data from the later years of the 2014 – 2108 reporting period, which are more representative than the data from the years when UCEEB was still being set up. The revenues from contract research are now around CZK 40 mil. per year, which is at the limit of 20% set by the EC directives. UCEEB has around 100-120 contracts every year. A significant amount of work is done on "hard" development topics (e.g. special sensors and building components) and on specialized measurements (acoustic measurements, fire measurements, climatic measurements, etc.) The rest of the contracts are mainly for consultancies, both for industry and for municipalities, on sustainable development and social responsibility policies. UCEEB's contracts are with both Czech and foreign customers.

HTML links to additional documentation:

3.4 Revenues from non-public sources (besides grants or contract research) from research work

The evaluated unit briefly comments on revenues for the 2014–2018 reporting period for R&D&I from non-public sources, besides grants or contract research (e.g. licences sold, spin-off revenues, gifts, etc.). It presents a complete list in the appendix (table 3.4.1).

Self-evaluation:

As UCEEB began working in 2014, the first revenues for licensing came atthe end of the reporting period. However, the licensing process and the spin-off process were developed within the reporting period. They are now being implemented, and have brought in increasing revenues since the end of the reporting period.

HTML links to additional documentation:

[3] For a definition of contract research for the purposes of evaluation in the universities sector, see Article 2.2.1 of the Community framework for State aid for research and development and innovation (2014/C 198/01).

APPLIED RESEARCH RESULTS

3.5 Applied research results with an existing or prospective economic impact on society

The evaluated unit briefly comments on a maximum of the five most significant (from the perspective of the evaluated unit) applied research results that have already been applied in practice, or that will realistically be applied, in the 2014–2018 reporting period from the overview in the appendix (table 3.5.1).

Self-evaluation:

Brownline **– we worked on a system and an algorithm for undersea boring using inertial navigation and magnetic sensors for alignment of the boring devices. The system was developed under a contract (no public funding) and is being used by the Dutch company Brownline.**
Fenix **– development of new range of electric heating devices, financed by a series of funded projects and contracts. The range has been on the market since 2016.**
ENVILOP **– this environment-friendly light façade panel based mainly on wood and other natural materials is fully certified and documented. The technology transfer started in 2018. (As of 2020, three licenses have been sold, and the first building using the ENVILOP system is under construction (by Subterra)).**
Wave **– this Organic Rankin Cycle device for heat recovery was developed within the reporting period and won an E.ON Energy Globe Award. (As of 2020, two pilot plants are working and there are five commercial systems in productio.**
MPC (Model-based Predictive Control) **a high-end control algorithm that achieves optimal use of resources. (As of 2020, about 20 controllers have been implemented, in the Czech Republic and also abroad, achieving average energy savings of around 15-20%).**

HTML links to additional documentation:

3.6 Significant applied research results with an impact other than an economic one on society

The evaluated unit gives a concise account of a maximum of the five most significant (from the perspective of the evaluated unit) applied research results with an impact other than an economic one on society in the 2014–2018 reporting period (typically results from disciplines in the humanities and social sciences) from the overview in the appendix (table 3.6.1).

Self-evaluation:

SBToolCZ - School Buildings **– an evaluation tool for sustainability assessment of school buildings. The tool evaluates all the sustainability pillars, and is used as a non-economic criterion in public tenders. It is now a standard for many municipalities and real-estate developers.**
Catalogue of recycled materials **– the first of its kind, this catalogue summarizes the materials suitable for recycling in the construction industry. (It is now being used by many companies, municipalities and ministries in the Czech Republic, and similar catalogues are now being assembled in cooperation with our partners in Belgium, Germany and Switzerland).**
Financial instruments **– research performed on modern financing of sustainable projects within the Interreg FINERPOL project. (The methods are now being implemented in many EU countries, including the Czech Republic).**
Participative design **– a method enabling citizens to participate in public investment projects (schools, libraries, sports facilities, etc.) (The method is now used in around 20 public projects every year).**

HTML links to additional documentation:

COOPERATION WITH THE NON-ACADEMIC ENVIRONMENT AND TECHNOLOGY TRANSFER

3.7 The evaluated unit's most significant interactions with the non-academic application/corporate sphere

The evaluated unit gives a concise account of the most typical users of its outputs. It explains whether and how it identifies them and how it works with them. It provides examples of a maximum of ten of the most significant interactions with the non-academic environment in the 2014–2018 reporting period.

Self-evaluation:

With typically 200 projects annually at UCEEB, it is difficult to pick out our ten most significant partners. Our typical partners include:

- **Material manufacturers for joint research in new materials and tests (e.g. Wienerberger)**
- **Building contractors for integrated building design (Metrostav, Trigema, etc.)**
- **Real estate developers seeking advice on sustainability and comfort (JRD, FINEP, etc.)**
- **SMEs developing specific products for buildings (Regulus, NWT, etc.)**
- **Municipalities in the area of municipal development (Praha, Kladno, etc.).**

HTML links to additional documentation:

3.8 System and support of technology transfer and intellectual property protection (can be extended to the whole university, emphasising the specific features of the evaluated unit)

The evaluated unit gives a concise account of its system of technology transfer. It conducts an evaluation of the quality of its applied research and the effectiveness of technology transfer using the data presented in the appendix (table 3.5.1). This commentary will highlight the number of filed and granted patents (Czech and international) and licences sold.

Self-evaluation:

As UCEEB started working in 2014 and the first results came later, only four patents were granted within the reporting period, and three licenses were sold. Some of the work done within the reporting period will continue to bring revenue to UCEEB after 2018. We consider TT and IP to be a promising field for UCEEB. However, direct contracts were much more efficient in the first development phase of UCEEB. Within the reporting period, we issued a technology transfer methodology, which is a minor extension of the central technology transfer policy of the university.

HTML links to additional documentation:

3.9 Strategy for setting up and support of spin-off firms or other forms of commercialization of R&D&I results (can be extended to the whole university, emphasising the specific features of the evaluated unit)

The evaluated unit gives a concise account of the practical use of its intellectual property in the form of setting up spin-off firms or other forms of commercialising R&D&I results (both with or without the participation of the university) established by the evaluated unit (university), another entity controlled by the evaluated unit (university), or an employee of the evaluated unit, presenting the model for their functioning and coordination, and control of intellectual property management of the evaluated unit (university).

Self-evaluation:

UCEEB has no special methods of commercialization, which is promoted centrally by the university rectorate. We have prepared a process for the official establishment of a spin-off company, 100 % owned by the university and serving for the purposes of UCEEB, based on the model of SINTEF in Norway. (The legal process was launched in 2019, after the reporting period).

HTML links to additional documentation:

RECOGNITION BY THE SCIENTIFIC COMMUNITY

3.10 The most significant individual awards for R&D&I

The evaluated unit presents a maximum of ten examples of the most significant R&D&I awards received (in the Czech Republic and in other countries) in the 2014–2018 reporting period.

Self-evaluation:

As UCEEB shares most of its R&D&I staff with the faculties of CTU in Prague, the required statistics is mostly gathered by and for the faculties.

HTML links to additional documentation:

3.11 Recognition by the international R&D&I community

The evaluated unit provides the following information / examples demonstrating recognition by the international scientific community in the 2014–2018 reporting period, with a commentary:
It presents a maximum of ten examples of its academic staff's participation on the editorial boards of international scientific journals (e.g. editor, member of the editorial board) in the appendix (table 3.11.1),
It presents a maximum of ten examples of the most significant invited lectures by the evaluated unit's academic staff abroad in the appendix (table 3.11.2),
It presents a maximum of ten examples of the most significant lectures by foreign scientists and other guests relevant to the R&D&I field in the appendix (table 3.11.3),
It presents a maximum of ten examples of the most significant elected memberships of professional societies (table 3.11.4).

Self-evaluation:

As UCEEB shares most of its R&D&I staff with the faculties of CTU in Prague, the required statistical data are mostly gathered by and for the faculties.

HTML links to additional documentation:

POPULARISATION OF R&D&I

3.12 The most significant activities in the popularisation of R&D&I and communication with the public

The evaluated unit gives a concise account of its main activities in the area of popularisation of R&D&I and communication with the public in the 2014–2018 reporting period, and presents a maximum of ten examples that it considers the most significant.

Self-evaluation:

The popularization (2014) of results was originally focused on industrial partners, in order to support the marketing strategy of UCEEB. The activities are very broad and include:

- **Publications in general media (around 300 hits per year)**
- **Regular news (weekly) and a newsletter, also published on Facebook and LinkedIn**
- **Two regular meetings with partners, with 50-80 partners attending regularly**
- **Visits for school groups – monthly**
- **Open-door-type events (for children, co-workers, the local community)**
- **Participation in popularizing events (Science Café, TED Talks).**

HTML links to additional documentation:

APPENDICES (TABLES)

3.2 Applied research projects

3.2.1 Projects supported by a provider from the Czech Republic

As the beneficiary						
Provider	Project title	Support (EUR thousand)				
		2014	2015	2016	2017	2018
MEYS co-financed EC	ED2.1.00/03.0091 University Centre for Energy Efficient Buildings (2014: MEYS: 2 ths. EUR, EC: 12 778 ths. EUR; 2015: MEYS: 51 ths. EUR, EC: 289 ths. EUR)	12 780	340	0	0	0
MEYS co-financed EC	ED3.1.00/13.0283 Intelligent buildings (2014: MEYS: 54 ths. EUR, EC: 310 ths. EUR; 2015: MEYS: 15 ths. EUR, EC: 89 ths. EUR)	364	104	0	0	0
MEYS	8E18B012 Low cost turboexpanders for decentralized energy applications – possibilities of 3D print manufacturing from modern plastic materials	0	0	0	0	13
MEYS	LO1605 University Centre for Energy Efficient Buildings – Sustainability Phase	0	0	1272	1265	1249
MH	NV17-32285A Functionalized nanofibers for preventing incisional hernia formation	0	0	0	69	93
TACR	TA04021195 Energy-active curtain walling facade	0	45	83	84	0
TACR	TA04021243 A sustainable energy source for nearly zero energy buildings	0	52	127	130	0
TACR	TH01021120 New generation of roof windows (skylights)	0	35	70	73	54
TACR	TH02010917 Innovation and Development of New Fixings for Timber and Timber-concrete Structures	0	0	0	32	32
TACR	TH03020341 Autonomous curtain wall panel	0	0	0	0	71
TACR	TJ01000090 Research on the possibilities of additive manufacturing (3D printing) for the manufacture of expanders for low temperature decentralized energy applications	0	0	0	12	88
TACR	TJ01000115 Predictive control of battery storage using a photovoltaic energy source based on cloud irradiance forecasts	0	0	0	13	46
TACR	TJ01000195 Advanced control of heating and cooling systems by thermal comfort	0	0	0	9	38

TACR	TJ01000384 Decision support system of urban mobility and intelligent settlement service, including the specific needs of individual persons	0	0	0	0	70
TACR	TJ01000432 Interruption of a thermal bridge with variable applications	0	0	0	14	49
TACR	TJ01000457 3D active ceiling for indoor environment improvement	0	0	0	17	68
TACR	TK01020061 Combined heat and power (CHP) ORC unit with thermal output of 120 kW in a containerized configuration	0	0	0	0	37
TACR	TK01020075 Battery storage integration into a woodchip fired micro CHP (combined heat and power) ORC unit with thermal output of 50 kW	0	0	0	0	46
TACR	TK01020180 An innovative ventilation unit with thermoelectric modules for control of air temperature	0	0	0	0	46
TACR	TL01000555 Livable cities and communities: Guidelines for public space planning in the digital era	0	0	0	0	40
The City of Prague	UH0364 Smart Prague Technology Transfer	0	0	0	0	331
MI	VI20152018010 Functionalized nanofibers for collection, identification and long-term storage of scent imprints	0	60	115	119	118
Total		**13 144**	**636**	**1667**	**1837**	**2489**

As another participant

Provider	Project title	Support (EUR thousand)				
		2014	2015	2016	2017	2018
MIT	EG15_019/0004577 Modular air-conditioning units	0	0	0	22	24
MIT	EG15_019/0004894 Autonomous power stations	0	0	11	19	18
MIT	EG15_019/0004906 System for efficient energy management	0	0	0	19	48
MIT	EG15_019/0004908 Advanced Concrete Elements with Fibre Reinforcement	0	0	23	61	53
MIT	EG15_019/0004976 Utilization of waste heat by transforming it into electric energy	0	0	0	42	40
MIT	EG16_084/0009838 Tools for active energy management	0	0	0	6	60
MIT	EG16_084/0009975	0	0	0	4	25

	Development of new technologies for firing lightweight ceramic aggregate					
MIT	EG16_084/0010284 Research and development of a mobile condensing mini-power plant based on CHP and resources with built-in heat and electricity accumulation supplemented by an intelligent control system	0	0	0	0	27
MIT	EG17_107/0012468 An air handling unit with thermoelectric heating and cooling	0	0	0	0	13
MIT	EG17_107/0012492 Development of energy-efficient heat recovery	0	0	0	0	10
MIT	FV10397 RENCO Recycled Environmental Concrete for Building Construction	0	0	6	79	81
MIT	FV10685 A flexible construction system on the basis of timber and high-performance concrete structures for energy-efficient residential buildings	0	0	21	82	87
MIT	FV20699 Evolution of intelligent interior partitions	0	0	0	93	99
TACR	TA03010165 Knowledge-based Control of Nystatin Antibiotics Production	29	31	0	0	0
TACR	TH02030649 Environmentally Efficient Construction and Demolition Wastes for Structures	0	0	0	38	40
TACR	TH02030797 Environment- friendly resilient residential buildings	0	0	0	98	117
TACR	TH03030230 Green Roofs and Facades as a Tool for Improving the Thermal and Water Balance in an Industrial Space	0	0	0	0	27
TACR	TJ01000412 Oak fastener in timber structures: materials for normative anchorage	0	0	0	0	29
TACR	TK01020024 Hydronics 4.0	0	0	0	0	78
TACR	TK01020169 Next Generation District - Complex design and control of local distribution networks using advanced control theory and numerical optimization methods	0	0	0	0	13
TACR	TK01030019 Effective and safe energy from biomass	0	0	0	0	18
MI	VH20182020032 Analysis of Security Approaches in the Design of Fire Protection of Buildings and a Solution Proposal for the Czech Republic	0	0	0	0	23
MIT	EG15_019/0004670 A system for early detection of condensation for heat-exchanging surfaces	0	0	0	45	26
MIT	EG15_019/0004685 Protection against electric arc and prevention of fire ignition	0	0	0	63	55

MIT	EG16_084/0010235 Development of a Continual Brazing Furnace with Combined Displacements of Products, and development of an Integrated Energy Center	0	0	0	0	81
Total		**29**	**31**	**61**	**671**	**1092**

3.2.2 Projects supported by a provider from another country

As the beneficiary						
Provider	Project title	Support (EUR thousand)				
		2014	2015	2016	2017	2018
Total		0	0	0	0	0
As another participant						
Provider	Project title	Support (EUR thousand)				
		2014	2015	2016	2017	2018
European Comission	EAC – 2012-0600 European Real Life Learning Lab Alliance - EURL3A	82	0	0	0	0
European comission - Horizon 2020	H20-633447 - MORE-CONNECT Development and advanced prefabrication of innovative, multifunctional building envelope elements for MOdular REtrofitting and CONNECTions		54	100	96	77
ERDF – Interreg Europe	FINERPOL New Growth & Employment policies combining ERD funds with Financial Instruments (FIs) for energy investment in buildings	0	0	35	75	30
Total		**82**	**54**	**135**	**171**	**107**

3.3 Contract research

3.3.1 Research work contracted by a client from the Czech Republic

Client	Research title	Revenues (EUR thousand)				
		2014	2015	2016	2017	2018
ID: 74139827 Ing. Miroslav Šamata	A study of ways to increase the degree of fuel utilization in the customer‘s boilers through the implementation of ORC technologies. A proposal for a technical solution of a hot water boiler for burning round hay bales	18	7	0	12	0
ID: 26758733 C.I.C. Jan Hřebec s.r.o.	Research, development and verification of air handling unit jacket parameters; an analysis of mechanical resistance, tightness and filters	5	5	0	0	0
ID: 62417690 Kronospan, spol. s r.o.	Development of a new OSB with a fire-resistant coating; experimental laboratory measurements of ceiling sound insulation	10	38	6	0	0
ID: 25727133 Nevšímal a.s.	A fire-resistance test on an aluminum glass wall with structural glass	7	0	0	0	0
ID: 00001350 Československá obchodní banka, a.s.	Dynamic simulation of the energy behavior of the new ČSOB building	22	0	0	0	0
ID: 47307218 AF Cityplan s.r.o.	SDH solar system implementation	4	0	0	0	0

ID: 48399043 Fenix Trading s.r.o.	An analysis of measured energy consumption for heating, energy optimization of an administrative building, realization of the OC FENIX Office Building as a Nearly Zero Energy Building (nZEB), a State-of-the-Art Technical Solution	6	25	42	67	0
ID: 61508926 Heberger CZ s.r.o.	Flue gas line analysis	5	0	0	0	0
ID: 75108241 Česká komora lehkých obvodových plášťů	An analysis of the energy requirements for apertures and a light facade module	4	0	0	0	0
ID: 2245344 Skanska Reality a.s.	Capture and use of rainwater for an assessment of solar system installation in apartment buildings	5	0	0	0	0
ID: 72070382 NANOPROGRESS, z.s.	Preparation of coaxial nanofibres using electroblowing; research in the field of ultrasensitive biosensors based on nanofibres; development of second-generation intelligent nanofibers for medical applications	114	0	82	343	178
ID: 26503387 FINEP CZ a.s.	Analyses of buildings in terms of building solutions and energy efficiency	0	7	0	0	0
ID: 42726191 BOVA Březnice spol. s r.o.	An analysis of the shape design of connecting fittings for wooden structures; an analysis of bearing angles for timber constructions, tests and calculations of timber construction joints using yokes and anchoring elements; Execution of tests and calculations of joints for wooden structures, using angles, plates and strips	0	4	9	22	15
ID: 25042050 CzechPAN s.r.o.	Preparation, execution and evaluation of the shear resistance of I-OSB	0	5	0	0	0
ID: 44223161 FENESTRA WIEDEN s.r.o.	Determining the cohesion of a facade element	0	4	0	0	0
The University of Chemistry and Technology Prague	Processing the building energy performance of Ministry of Labour and Social Affairs	0	5	0	0	0
ID: 00014915 Metrostav a.s.	Monitoring the impact of construction work in the reconstruction of the National Museum buildings; A construction-technical survey and design measures for the construction work in the main station building; An analysis of vibrations due to metro traffic on selected buildings; Research on the noise distribution of piping in buildings; Measurements of the laboratory sound insulation of masonry walls	0	23	14	57	0
ID: 27686817 Daisy Care s.r.o.	Redesign of the raspberry PI DaisyCare prototype, and development of a new Rpi base plate	0	25	0	0	0
ID: 61170208 G-MAR PLUS, s.r.o.	Development of a steam reduction station with low power generation	0	5	0	0	0

ID: 00234214 Město Buštěhrad	Innovative conception of the reconstruction of a primary school	0	15	0	4	0
ID: 11363754 Ing. Miroslav Cink	Development of step-up battery chargers for the solar system of SUN RIVER 35	0	4	0	0	0
ID: 00020729 The State Environmental Fund of the Czech Republic,	Optimization of product criteria for support of PV systems in public buildings	0	7	0	0	0
ID: 26781026 Energocentrum Plus, spol s r.o.	Management of a backup power substation in the real conditions of a developing country in Africa; Advanced controllers for pool management; Modeling of the consumption of connected heat meters for the needs of setting up ED Mervis; Modeling of the consumption of small office buildings up to 1000 m2	0	90	0	0	0
ID: 28426525 Glomex MS, s.r.o.	Development of the balance method of evaluation and operational optimization of an energy system	0	11	0	0	0
ID: 46995030 Novibra Boskovice s.r.o.	Development of an electric spindle with magnetic bearings	0	9	0	0	0
ID: 26574519 ENERGOKLASTR, z.s.	Energy-efficient control of large building systems	0	160	0	0	0
ID: 46678468 HOCHTIEF CZ a. s.	An evaluation of the thermal-moisture behavior of the space under a raised floor; Implementation of measurement and control and night monitoring	0	4	0	0	0
ID: 00583171 Šumava National Park Administration	Building-energy optimization of the Březník building	0	6	0	0	0
ID: 24774065 Procusys a.s.	An evaluation of the balance method of internal heat gains from production technology	0	5	0	0	0
ID: 47115645 ÚRS Praha, a.s.	Extension of building budget software to include a mode for calculating the building's carbon footprint	0	10	0	0	0
ID: 00015679 Technical and Test Institute For Construction Prague, SOE	Development of an SB Tool school methodology; An analysis of the mechanical properties of DIAMANT boards	0	4	11	0	0
ID: 29103126 KPCM s.r.o.	A method for evaluating the heat-dampness microclimate in an exposed environment	0	10	0	0	0
ID: 28919807 Architekti Headhand, s.r.o.	An evaluation of the complex quality of buildings for school reconstruction	0	10	0	0	0
ID: 27168204 ProNanoTech s.r.o.	Creation 2 for innovated electrospinning electrodes; a PCL / PVA spinning testing study; release of the results of the study; development of a lightweight design concept	0	7	0	13	15

	to create a controllable level of clean environment; verification of lightweight construction properties to ensure a clean environment for nanofiber production					
ID: 27199321 INC MEDICAL s.r.o.	Optimization of the physicochemical composition of nanofibre foil for use in the food industry	0	10	0	0	0
ID: 24722022 EponaCell, s.r.o.	Tests on the properties and characterization of osteoinductive carriers formed from PCL and composite nanofibres, mainly based on PCL / collagen	0	10	0	0	0
ID: 27452948 CONTI TECH, s.r.o.	Design tables for wooden glued beams with I cross section, design tables for wooden sandwich panels with a polystyrene core	0	11	0	0	0
ID: 63220750 MIKROKLIMA s.r.o.	UI evo1 - long-term testing of temperature drifts; Mark 320 - Modifications of Linx OS for MIKROKLIMA s.r.o.	0	27	0	0	0
ID: 25247581 BIOKYB s.r.o.	Research and development of software modules	0	5	0	0	0
ID: 00484016 J. Seidl a spol., s.r.o.	Development of a new way of fastening tiles and experimental fastening; testing and optimization of ordexal tiles	0	11	21	0	0
ID: 27688097 DFC Design, s.r.o.	Research on motion detection algorithms under dynamically changing scene and lighting parameters	0	6	0	0	0
ID: 28080581 South Bohemian Science and Technology Park, corp. (JVTP)	Preparation of nanofibrous carriers from biomedical polymers using second-generation NanospiderTM technology, and in-vitro testing of the impact of the material on human vaginal pathogens; Design of an ORC device; Measurements of the mechanical strength of nail varnishes for nanofiber functionalization	0	7	0	15	8
ID: 28647475 GGC Energy, s.r.o.	Measurements of the nput and output parameters of a unit	0	4	0	0	0
ID: 61508926 Heberger CZ s.r.o.	Preparation of a methodology for the assessment of steam utilization	0	0	14	0	0
ID: 47906201 CEMEX Sand, k.s.	Proposal of a balance method for energy management evaluation	0	0	34	0	0
ID: 25157922 Schiedel, s.r.o.	Analysis of destruction problems and pressure conditions in a chimney body	0	0	19	0	0
ID: 29396824 BOCHEMIE a.s.	Research on the resistance of impregnated wood, performing an accelerated test of the resistance of the impregnated wood in contact with the ground	0	0	5	4	0
ID: 46515224 Movychem, s.r.o.	An analysis of the fire resistance of a wooden structure - load-bearing walls with an empty cavity, insulation boards made of PU, an analysis of connecting fittings for wooden structures	0	0	8	0	0
ID: 02839571	An analysis of heating system problems in an agricultural area	0	0	4	0	0

Blue Power - Energetické systémy s.r.o.						
ID: 25017098 Technické služby města Varnsdorf, s.r.o.	Analyses for decision-making on the concept of waste management in the Varnsdorf micro-region	0	0	14	0	0
ID: 00063517 Prague 3 - Municipal District of the Capital City of Prague	Elaboration of the Prague 3 study on the way to a Smart City	0	0	14	0	0
ID: 28787803 Schlieger, s.r.o.	Optimization of air-to-water heat pump elements in relation to nominal and operational efficiency with a simplified evaporator defrost model for two power levels	0	0	9	0	0
ID: 49366378 CASRI - Scientific and service workplace of physical education and sport	Design of a surveillance system for monitoring the response of the organism under load	0	0	30	0	0
ID: 27216608 BITEO s.r.o.	Development of software for vibration monitoring in buildings	0	0	11	0	0
ID: 27414957 Len+k architekti s.r.o.	Energy Concept of Buildings – the Broadway complex in Mariánské Lázně	0	0	4	0	0
ID: 45274649 ČEZ, a.s.	Custom heat pump analysis	0	0	5	0	0
ID: 18627757 Honeywell, spol. s r.o.	Hydronic network behavior analysis	0	0	20	0	0
ID: 03656314 CZESCO, s.r.o.	Optimization of membrane cooling for water condensing membranes; technical design of a device for separating solid pollutants from flue gases	0	0	7	12	0
ID: 02413001 BIOPRO PLUS, s.r.o.	Optimization of the biomass system and logistics	0	0	7	0	0
ID: 28875052 Design Development CZ sr.o.	Implementation of Moisture Guard for the Šumava Court project	0	0	8	0	0
ID: 47539801 ITES spol. s r.o.	Development and elaboration of a proposal for the balance method of evaluation for the customer	0	0	12	0	0
ID: 04280342 VESTRA KOGET, s.r.o.	A study aimed at improving the utility parameters of a cogeneration unit	0	0	7	0	0
ID: 61170208 G - MAR PLUS, s.r.o.	Development of equipment for utilizing the steam pressure potential in electricity production	0	0	6	0	0

ID: 00253685 Municipality Postřekov	Methodological concept for a project and project management. Reconstruction of the building of the elementary school and merging the operation of the elementary school and the kindergarten in Potřekov	0	0	4	0	7
ID: 26936364 KRONOSPAN OSB, spol. s r.o.	Fire test composition ceiling; an analysis of the water vapor transmission of OSB	0	0	0	11	0
ID: 28064275 JH SOLAR s.r.o.	Performing an accredited test on the thermal output of a solar thermal collector	0	0	0	9	0
ID: 65276507 PKS okna a.s.	Experimental evaluation of the thermo-moisture behavior of six plastic window connection joint variants in a steady state under winter design conditions	0	0	0	6	10
ID: 26718405 MANDÍK, a.s.	Evaluation of the new construction of the jacket of a ventilation unit, and an analysis of details of the jacket	0	0	0	9	0
ID: 65138708 VISIMPEX a.s.	Elaboration of the energy concept for the Visimpex Exhibition Center	0	0	0	6	0
ID: 25742001 Pivovar Herold Březnice, a.s	Diagnostics and an analysis of energy consumption in the brewery	0	0	0	12	0
ID: 47053925 AMT s.r.o. Příbram	Development of fitting and monolithic concrete with recycled foam glass	0	0	0	6	0
ID: 42196451 The forests of the Czech Republic	An analysis of ways to make greater use of wooden multi-storey buildings and a comparison with multi-storey masonry buildings	0	0	0	62	0
ID: 25105299 Víceúčelová sportovní hala Slaný spol. s r.o.	An analysis of the energy system, optimization of the technology using innovative technologies. and the concept for an investment plan for technology modernization	0	0	0	7	0
ID: 00014915 Metrostav a.s.	Research on extensive green roofs	0	0	0	52	0
ID: 26733102 KAISER s.r.o.	The design of an energy system for streamlining the wood drying process	0	0	0	12	0
ID: 49710371 Řízení letového provozu České republiky, s.p.	Reconfiguration of rhe ATS hall – a study	0	0	0	11	19
ID: 25323601 IP IZOLACE POLNÁ, s.r.o.	Development of an energy management control system for apartment buildings, using a photovoltaic source and controlled appliances for RD and BD	0	0	0	16	0
ID: 00063461 Prague 2 - Municipal District of the Capital City of Prague	Mapping and evaluation of the current state of energy in the city district	0	0	0	6	13
ID: 40612724 CIUR a.s.	Experimental verification of the long-term thermal-moisture behavior of the internal thermal insulation system; an analysis of local investigations and laboratory tests;	0	0	0	15	0

	experimental verification of the applicability of acoustic boards for improving the sound insulation properties of masonry partition walls					
ID: 28651782 VIKYMONT stavby, s.r.o.	Pilot installation and measurements of the Moisture Guard system on selected objects	0	0	0	7	0
ID: 24178586 JMB Aircraft s.r.o.	An analysis of the temperature field of sandwich structures	0	0	0	6	0
ID: 28781481 THERMO INDUSTRY, a.s.	Research and quantification of the effect of thermoactive screed on thermal behavior, and the relation between energy consumption and building heating	0	0	0	14	0
ID: 27211746 BHC Jílové s.r.o.	Processing the complex design of a new type of heat exchanger	0	0	0	13	0
ID: 27230155 ALFA SYSTEM REAL, a.s.	An analysis of the operation of the desorption unit for the use of waste heat to generate electricity	0	0	0	11	0
ID: 25851560 ECOONE CZECH, s.r.o.	Analysis and design aimed at adapting the Querytherm system for industrial plants; elaboration of a proposal for the development of a method for evaluating savings in the heating sector	0	0	0	11	15
ID: 01410806 Pražské silniční stavby s.r.o.	Accredited test on the casing for an air handling unit	0	0	0	5	0
ID: 48135267 CZECH OFFICE FOR STANDARDS, METROLOGY AND TESTING	Co-creation of technical standardization; Elaboration of the proposal for a catalog of secondary raw materials from construction and demolition wastes suitable for use in construction	0	0	0	51	0
ID: 27609731 ADLER PROPERTY, S.R.	Elaboration of a proposal to optimize the operation of a building in terms of energy, air flow and humidity control	0	0	0	10	0
ID: 48290220 EUROMETAX s.r.o.	Determining the performance criteria and assessing the thermal comfort in heating and cooling with large-area systems integrated on the interior wall and ceiling surface	0	0	0	11	0
ID: 25087355 APRITECH, spol. s r.o.	Tests on the RA Store hybrid store photovoltaic system, including the development of the superstructure control algorithm	0	0	0	7	0
ID: 46357301 Teco a.s .	A study of the applicability of BT Gateway technology with selected peripherals	0	0	0	8	0
ID: 00540471 The Czech Gymnastics Federation	Mapping user needs as part of preparations for the National Training Center project	0	0	0	4	0
ID: 28289081 ICE ENERGY, s.r.o.	Performance analysis of the ceiling heating and cooling system	0	0	0	5	0
ID: 29319919 Propasiv s.r.o.	Tests of the anchoring system and calculations of the bearing capacity of the anchoring system	0	0	0	14	0

ID: 25321498 De Heus a.s.	An analysis of energy management and a proposal of measures for the use of energy technologies	0	0	0	8	0
ID: 04473523 POKORNÝ - vodoměry s.r.o.	Development of equipment for electronic reading of water meters	0	0	0	15	0
ID: 26326850 NetPro systems, s.r.o.	Design of an energy system for accumulation of electric energy using a micro-cogeneration plant for biomass combustion	0	0	0	13	0
ID: 03315517 Czech Antartic Foundation	Development of a universal platform for measuring and collecting energy data for the Czech Scientific Station in Antarctica	0	0	0	13	0
ID: 44794258 HAWLE ARMATURY, spol. s r.o.	An analysis of the dyeing and cooling technology for steel fittings	0	0	0	12	0
ID: 28978102 Martin Kožnar Architekt s.r.o.	Elaboration of the static design of the load-bearing structure of three variants of mobile shelters	0	0	0	15	0
ID: 64285103 Ing. Ivo Stolek	Elaboration of the construction and energy concept of an administrative center	0	0	0	10	0
ID: 70883858 Institute of Planning and Development of the City of Prague	Expert analysis and consultations on the TRIANGULUM PILOT PROJECT implementatiton strategy in the SMART HOMECARE AREA	0	0	0	30	0
ID: 24184110 enact s.r.o.	Design of a technical solution for supplying a building with a limited connection to the electricity system	0	0	0	13	0
ID: 02029294 HA-SEC Services s.r.o.	Analysis of the operation, the energy concept and the design of innovative measures for a manufacturing company	0	0	0	38	0
ID: 48546607 The Czech Olympic Committee	Research, development and delivery of the lighting system for two lighting cabins of the Czech Olympic team	0	0	0	19	0
ID: 68378637 Office of the Commissioner General of the Czech Republic's participation in the EXPO General World Exhibition	Development and preparation of an exhibition for EXPO 2020	0	0	0	540	332
ID: 24821471 LOYD GROUP s.r.o.	Monitoring the operation of equipment for utilizing the steam pressure potential for power generation	0	0	0	13	0
ID: 62967983 KAPKA spol. s r.o.	Development of equipment for radio reading of water meters	0	0	0	15	0
ID: 26129205 AR auto s.r.o.	Design and implementation of an energy management system	0	0	0	10	0
ID: 00064581 The City of Prague	A feasibility study for the reconstruction of the Emmaus building into an intelligent building	0	0	0	18	8

ID: 06578705 Czech Standardization Agency	Creation of a technical standardization plan, discussions on international cooperation and preparation of a catalog of products and materials containing secondary raw materials from construction and demolition wastes for use in construction	0	0	0	0	68
ID: 00023884 Nemocnice Na Homolce	Analysis and identification of savings and a definition of investments suitable for implementation in the Na Homolce hospital complex	0	0	0	0	16
ID: 00234877 The municipality of Slaný	Elaboration of an annual energy balance study, including a basic economic analysis and recommendations on reducing energy intensity for the District House in Slaný, and an analysis of optimal energy use	0	0	0	0	11
ID: 26143950 BILBO Invest s.r.o.	Development and design of technology for automated paneling	0	0	0	0	4
ID: 02795281 Operátor ICT, a.s.	Elaboration of a feasibility study for emergency and health care, an assessment of assistive and emergency care	0	0	0	0	11
ID: 03386562 SOLAR HEAT VENTI CZ, s.r.o.	Development and optimization of a hot-air collector with an integrated heat recovery unit	0	0	0	0	7
ID: 24828122 ELEKTRODESIGN ventilátory spol. s r.o.	An analysis of the testing and technical measurement parameters of units	0	0	0	0	6
ID: 00236977 The Municipality of Kralupy nad Vltavou	A study of the annual energy balance, including a basic economic analysis and a proposal for measures to reduce the energy intensity of the brewery malt house building adapted for use as a cultural center in Kralupy nad Vltavou	0	0	0	0	7
ID: 00263958 The Municipality of Litoměřice	Design and optimization of the photovoltaic system on the First Active Public Building Litoměřice (PAVE)	0	0	0	0	5
ID: 00237043 The Municipality of Malý Újezd	Energy calculations and an energy performance certificate for the project to extend the elementary school in Malý Újezd as a passive building	0	0	0	0	5
ID: 26224585 TECHNOFIBER, s.r.o.	An analysis of the luminous properties of the Soft Stop light signaling device for use in urban road tunnels	0	0	0	0	15
ID: 24685381 MORAVOSEED CZ a.s.	Design of an energy-efficient humidity and temperature control system in a storage hall, using renewable energies	0	0	0	0	13
ID: 25727133 Nevšímal a.s.	Performance of fire combustion tests in the framework of introducing an innovative product – a system of fire-resistant modular fire facades	0	0	0	0	34
ID: 28678010 Vršanská uhelná a.s.	An analysis of the functionality and the rectifiability of pipe supports in above-ground construction	0	0	0	0	7

ID: 24736082 DŘEVO NÁRO s.r.o.	Development of a methodology for drying firewood quickly	0	0	0	0	15
ID: 00240478 The Municipality of Mnichovice	Professional supervision and management of the reconstruction of the polyclinic in Mnichovice	0	0	0	0	5
ID: 28353048 M & S fair agency s.r.o.	Conceptual design of the connection of ORC with a piston engine for combined production of electricity and heat	0	0	0	0	15
ID: 04083351 YOUNG4ENERGY s.r.o.	Complex product design of model energy management in connection with biomass production	0	0	0	0	14
ID: 04868161 UrbanAlps Czech s.r.o.	An analysis of ways of generating electricity energy, energy harvesting	0	0	0	0	10
Contractual research subject to confidentiality and business secrets		0	0	82	37	294
Other minor contract research (each below 3 EUR thousand)		30	113	56	115	31
Total		**230**	**709**	**621**	**1900**	**1213**

Note: List and describe contract research work with the revenue for the calendar year in question.

3.3.2 Research work contracted by a foreign client

Client	Research title	Revenues (EUR thousand)				
		2014	2015	2016	2017	2018
NL807.934.562.B.01 Brownline	Development of a localization system for horizontal underground drilling	37	11	0	0	0
Imprägnierwerk AG Willisau	Proposal of innovative solutions for measuring poles for overhead lines with total stations and reflector prisms	0	4	0	0	0
Graz University of Technology	Building operational patterns	0	2	0	0	0
CHE-108.813.148 Holcim Technology Ltd.	Custom Software Development	0	19	16	0	0
DE133566183 Fürstenberg-THP GmbH	Analysis of wooden poles	0	1	0	0	0
BE0413638187 AGC Glass Europe - Technovation Centre	Innovative solution for connected iEQ improvement in renovated residential buildings	0	0	5	0	0
ID: DE129515865 Fraunhofer Wilhelm-Klauditz-Institut, WKI	A Nanoreinforced High Performance Wood Foam Insulator	0	0	0	35	45
DE124001363 Schüco International KG	Window - Condensation test	0	0	0	3	0
Total		**37**	**37**	**21**	**38**	**45**

Note: List and describe contract research work with the revenue for the calendar year in question.

3.4 Revenues from non-public sources (besides grants or contract research)

3.4.1 Overview of revenues from non-public sources raised for the 2014–2018 reporting period

Revenue type	Revenues (EUR thousand)				
	2014	2015	2016	2017	2018
Licences sold	64	0	2	0	7
Conferences, Seminars, Workshops – organization, fees	0	4	69	0	1
Rentals	8	9	23	29	9
Sale of services and goods	0	3	1	27	23
Promotion and advertising	0	3	10	4	0
Activate your own services	0	0	2	1	3
E.ON Award prizemoney	0	11	0	0	0
Total	**72**	**30**	**107**	**61**	**43**

Note: List funds for R&D&I from non-public sources, besides grants or contract research (e.g. licences sold, spin-off revenues, gifts, etc.) in each calendar year.

3.5 Applied research results with an economic impact on society

3.5.1 Overview of applied research results in the 2014–2018 reporting period

List and describe the results that have already been applied in practice, or that will realistically be applied, with an existing or prospective economic impact on society. Under "patents" and "licences sold", list all the results; under other results list a *maximum* of five items. Unless otherwise specified below, the definition of a result must correspond to the definitions under the Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-Tied Aid Programmes, Appendix No 4: Definitions of Types of Results.

Results	Year	Title
European patent		No European patent obtained 2014 - 2018
American patent		No American patent obtained in 2014 - 2018
Czech licenced patent		No Czech patent licenced in 2014 – 2018
Other foreign patents		No foreign patents obtained in 2014 - 2018
Licences sold	2014	A system for measuring biological and technical variables in a natural human environment
	2016	A Light Curtain Wall made from Wood-Based Panels
	2018	A sensor for comprehensive evaluation of indoor air quality IAQ_03
Patent	2016	Connection into the System for Performance Management and Diagnostics of the Heat Exchanger
	2017	A Wing Expander
	2018	A Profile for the Production of Exterior Frames and Frames of Roof Window Casements, and the Use of this Profile
	2018	A Solar Collector for Transforming Solar Radiation into Heat and Electricity with a Flexible Absorber
Prototypes	2014	Envilop - Transparent Module of Curtain Wall
	2014	ORC Device for Waste Heat Recovery

	2015	A Photovoltaic Bench with the Corpus Made from High Performance Concrete
	2016	Combined Water Heat Storage
	2017	Facade Module with a Hybrid Photovoltaic Collector
Significant analyses / surveys / studies	2017	Hygric Properties of Wall Assemblies of Modern Timber Buildings Using Various Thermal Insulation Materials
Other		
Utility Model		
	2014	A system for measuring biological and technical variables in a natural human environment
	2015	A Combined Sensor for Measuring Moisture in Building Structures
	2015	A System for Measuring and Evaluating Particularly Mechanical Stress, Temperature and Moisture in a Beam of Glued Laminated Wood
	2016	Light Curtain Wall Made from Wood-based Panels
	2016	A Prefabricated Non-detachable Facade Module of Lightweight Cladding for a Building with an Integrated Solar Photovoltaic-Thermal Collector
Functional Sample	2016	A Steam Reduction Device
	2016	A GLT Beam with Integrated FBG Sensors for Measuring Mechanical Loads
	2017	A Typical Integrated Module for Rapid Refurbishment of Residential Buildings
	2017	Test Cell for Energy-Active Facade Modules
	2017	An FBG Sensor for Mechanical Strain Monitoring in Concrete Structures
Verified Technology	2018	Water from an Air Extraction Unit
	2018	A Prefabricated System for Fast Complex Building Reconstruction
	2018	Technology for Manufacturing a Glazed PVT Collector Using a Transparent Gel for Encapsulating the PV Cells
Pilot Plant	2018	Heat Recovery and Storage System with a Seasonal Accumulator
	2018	Solar Air Collector Test Loop
	2018	WAVE Micro Power Plant
Software	2016	ConTemp

Note: “Licence” refers to a licence for a result of R&D&I in the broadest sense of the word (licences for patents, utility models, industrial designs; copyright licences for software and other works, and any other licences).

For the purposes of this methodology, a “spin-off” is a juridical person established to commercialise knowledge, usually with the inclusion/transfer of the rights to this knowledge to such juridical person. List all instances of legal persons.

3.6 Significant applied research results with an impact other than an economic one on society

3.6.1 Overview of applied research results for the 2014–2018 reporting period with an impact other than an economic one on society

Result type	Name	Anticipated impact
Book (scientific research) and methodology	SBToolCZ Methodology for School Buildings	SBToolCZ methodology for school buildings - primary and secondary schools, reconstructions and new buildings. The aim of the methodology is to cover aspects of construction quality that are not included in the applicable standards and regulations - so-called soft criteria with a broad social impact. These qualities of school buildings are crucial for the quality of the educational process, are important for the development of a child's personality, are used in building the relationship between family and school and, last but not least, they are used in extracurricular education and in community activities with a wide social reach, and they fulfill the mission of the school as an educational institution. For the methodology of school buildings, quality plays a more important role in terms of social aspects of the educational process. In addition, environmental considerations have become an integral part of education in the 21st century. https://www.sbtool.cz/cs/nova-metodika-sbtoolcz-pro-skolske-budovy
Book (scientific research book)	A Guide to Renovation Package Concepts for Mass Retrofitting Various Types of Buildings with Prefabricated Elements for (N)ZEB Performance	Improving the energy performance of buildings is one of the main tools for mitigating climate change in the construction industry. In order to achieve the EU's ambitious energy and climate goals, it is necessary not only to tighten the legislation on new construction, but also to apply energy-saving measures to the greatest possible extent to the existing building stock. In order to achieve these savings within the desired timeframe, it is essential to introduce new technologies that will enable energy redevelopment of existing buildings at a low price, within a short period of time and on a large scale. This book is one of the outcomes of the H2020 MORE-CONNECT international project (www.more-connect.eu). The book acquaints the wide professional public with the latest technologies and methods in the progressive reconstruction of buildings to energy zero standard. The book provides an overview of the issue, and presents specific examples and unique technical solutions of prefabricated components suitable for automated production, integration of renewable energy sources, and the use of wireless sensors for controlling the quality of the indoor environment. The publication was presented at a number of professional national and international conferences. The book is freely available at https://www.more-connect.eu/wp-content/uploads/2018/12/A-GUIDE-INTO-RENOVATION-PACKAGE-CONCEPTS-FOR-MASS-RETROFIT-OF-DIFFERENT-TYPES-OF-BUILDINGS-WITH-PREFABRICATED-ELEMENTS-FOR-NZEB-PERFORMANCE.pdf
Other result	The Catalogue of Construction Products and Secondary Raw Materials from Construction and Demolition Wastes	The purpose of this handbook is to give information about the utilization of secondary raw materials to contracting authorities, architects, civil engineers and construction companies. The Catalogue is published in two versions: printed and online. The first of its kind, this catalogue summarizes the materials suitable for recycling in the construction industry. It is used by many companies, municipalities and ministries in the Czech Republic, and similar catalogues are now being assembled in cooperation with our partners in Belgium, Germany and Switzerland.
Other result	Financial instruments	Research performed on modern financing of sustainable projects within the Interreg FINERPOL project. The methods are now being implemented in many EU countries, including the Czech Republic.
Other result	Participative design	Method for the participation of citizens in public investment projects (schools, libraries, sport facilities, etc.), which is now used in around 20 public projects every year.

Other result	Best practice in smart city applied research in small and rural municipalities	This document was prepared as part of the initiative Smart Rural Towns: exchange of best practices with a focus on effective cooperation between research and the public sector (SmartREx, reg. no. 7F16039) supported by the Czech-Norwegian Research Programme (CZ09). https://www.uceeb.cz/system/files/souboryredakce/projekty/report_best_practice_in_smart_city.pdf

Note: List and describe a maximum of five results (in line with the Definitions of Types of Results) that have already been applied in practice, or that will realistically be applied. These are typically results from disciplines in the humanities and social sciences, for which you should briefly describe their anticipated impact.

3.11 Recognition in the international R&D&I community

3.11.1 Participation of the evaluated unit's academic staff on the editorial boards of international scientific journals in the 2014–2018 reporting period

Name, surname and title(s) of the evaluated unit's member of staff	Title, publisher, city(-ies) and country(-ies) of origin of the scientific journal
UCEEB as a non-academic university institute without academic accreditation does not have its own academic staff.	

Note: List a maximum of ten examples of academic staff's participation on the editorial boards of international scientific journals (e.g. editor, member of the editorial board, etc.).

3.11.2 The most significant invited lectures by the evaluated unit's academic staff at institutions in other countries during the 2014–2018 reporting period

Name, surname and title(s) of the evaluated unit's member of staff	Invited lecture title	Name of the host institution, conference or other event
UCEEB as a non-academic university institute without academic accreditation does not have its own academic staff.		

Note: List a maximum of ten examples.

3.11.3 The most significant lectures by foreign scientists and other guests relevant to the R&D&I field at the evaluated unit during the 2014–2018 reporting period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title
Ing. Luca Boehme	?? Date of lecture: 2015-12-3	The need to recycle & examples
Dr Shih-Cheng Hu	National Taipei University of Technology, Taipei Date of lecture: 2017-07-04	Opportunities and challenges of energy and indoor air quality (IAQ) for cleanrooms in high-tech fabrication plants (FABS)
Dr Steve Burroughs	University of Canberra MACQUARIE, AUSTRALIA Date of lecture: 2017-10-20	Sunstainbility vs Resilidance
Carolina Tellez	Instituto Politécnico Nacional Gustavo A. Madero, 07480 Ciudad de México, CDMX Date of lecture: 2017-12-19	Lighting in higher education classrooms

Prof. Dr. Wolfgang Feist	Universität Innsbruck Date of lecture: 2018-06-08	Results from 25 years of Passive House Research

Note: Relevant solely for the R&D&I field. List a maximum of ten examples.

3.11.4 The most significant elected membership in foreign of professional societies relevant to the R&D&I field at the evaluated unit during the 2014–2018 reporting period

Name, surname and title(s) of the evaluated unit's member of staff	Name of professional society	Type of membership
doc. Ing. Lukáš Ferkl, Ph.D.	Czech Green Building Council	Member of the Board
Ing. Jakub Maščuch, Ph.D.	The Association of Energy Service Providers (APES) of the Czech Republic	APES Board Member
Ing. Vladimíra Jelínková, Ph.D.	European Geosciences Union (EGU)	individual membership

Note: List a maximum of ten examples.

SUMMARY LIST OF ADDITIONAL DOCUMENTATION IN MODULE M3

Document Title	Criterion	Location (HTML link)