



# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT





## RCEPB PROGRAM of the X<sup>th</sup> edition - detailed version

**WEDNESDAY, June 6<sup>th</sup>, 2018**

### WELCOME DINNER

from 8 PM till 11 PM, MERCURE UNIRII HOTEL

**THURSDAY, June 7<sup>th</sup>, 2018**

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
OPENING CEREMONY	Sorin BURCHIU Cătălin LUNGU	08:45	 <b>Iohan NEUNER</b> <i>UTCB Senate President</i>	30	09:15		Opening ceremony & welcome speeches of RCEPB organisers
			 <b>Sorin BURCHIU</b> <i>Dean of FII-UTCB AIIR president</i>				
			 <b>Cătălin LUNGU</b> <i>Vicedean of FII-UTCB AIIR &amp; REHVA vicepresident</i>				

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
Session 1 - FESTIVITY HALL	Karel KABELE Session Chair  Christian INARD  Rodica FRUNZULICA	09:15	 <b>Andy LEWRY</b> United Kingdom BREEAM  Expert in Carbon and Energy Management with 20 years varied technical, marketing and management experience preceded by a further 10 years similar experience within various parts of the Environmental and Construction Sectors. He has in-depth knowledge of sustainability issues.	40	09:55	Designing The “Mind the Gap” project – Investigating the difference, in performance, between design and the building “in-use”	We have the ability to design good buildings and the knowledge to operate them in an effective and efficient manner – so why doesn't it happen? The “Mind the Gap” project intends to collect evidence from exemplar office buildings with a range of performance; investigate the reasons for their performance; determine the underpinning causes; and then present practical solutions to solve any underperformance. The first phase will to produce a methodology based on the learnings from the trial buildings. This will be streamlined with the process then rolled out in a second phase over a larger number of buildings to produce a statistically significant sample which covers office buildings with a full range of servicing and age.
		09:55	 <b>Tüba Bingol ALTIOK</b> Turkey TTMD  Member of the Board of Directors of TTMD	20	10:15	TTMD is 25 years old	TTMD has been founded in 1992 to develop the services given by Mechanical Engineering in heating, refrigerating, ventilating, plumbing, insulation and fire extinguishing fields. Currently TTMD is one of the biggest non-governmental organizations (NGO) in Turkey having approximately 2000 professional members of designers, representatives, manufacturers, implementers, academic personel etc. TTMD is member of ASHRAE, REHVA and CLIMAMED.
		10:15	<b>Dorin ŞALAMAC</b> General Manager <b>ATREA Romania</b>	15	10:30	The new level of commercial kitchen ventilation	This presentation contains the newest and up-to-date principles of the kitchen ventilation basics; plus it thoroughly describes ATREA's innovative approach and solutions.
		10:30	 <b>Cătălin LUNGU</b> RO-EPB Consortium  Vicedean of FII-UTCB AIIR & REHVA vicepresident	20	10:50	Mc001 recast and the guide for the optimum cost calculation	4 universities and 2 professional associations have been working in the last year for recasting Romanian methodology Mc001 which gives the new calculation procedures for the energy performance of buildings; on the other hand they transposed the EU delegated regulation 244/2012 establishing a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings. The authors inform about the state-of-the-art situation for the both topics.

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
Session 1 - FESTIVITY HALL	Karel KABELE Session Chair	10:50	<b>Irina ODOR</b> <i>Commercial Director</i> <b>CELCO SA</b> A graduate in economics, Irina Odor has more than 14 years of experience in the national construction materials industry.	15	11:05	AAC masonry – innovation for efficient homes	AAC contributes to a better living environment and manufacturers keep improving and innovating AAC to become THE solution for energy efficiency and sustainable buildings. Unfortunately, due to the lack of update on the Romanian norm on thermotechnical calculation in construction, manufacturares face many hurdles trying to market the new solutions.
	Christian INARD  Rodica FRUNZULICA	11:05	<b>Cristina STĂNIȘTEANU</b> <i>ASRO expert</i> <b>Romanian Standards Association (ASRO)</b>	10	11:15	The new set of EPB standards	All standards in the new EPB set have been adopted as national standards by the publication of the Romanian version. Most standards will be referenced in the new edition of the Methodology for the calculation of energy performance of buildings Mc001. To make the standards fully applicable, a national annex should be developed for each standard.
COLUMNS HALL		11:15	COFFEE BREAK	30	11:45	COFFEE BREAK	
Session 2 – FESTIVITY HALL	Cătălin LUNGU Session Chair	11:45	<b>ROUND TABLE</b> (debate in Romanian language)  <b>Bogdan ROGIN</b> -State Conselor of the PM <b>Ciprian ROȘCA</b> -Secretary of State,MDRAP <b>Mihaela TOADER</b> -Secretary of State, MFE <b>Cristian ERBAȘU</b> - FPSC <b>Michaela GAFAR</b> - OAR	75	13:00	Simplification of the Romanian legislation in the construction field in order to fasten up the absorption of EU funds	<ul style="list-style-type: none"> <li>• What are the Government preoccupations regarding this issue?</li> <li>• What is the absorption stage of the EU funds in general and for specific programs dealing with energy &amp; construction fields?</li> <li>• What are the proposals of the different actors on the market (authorities,beneficiaries,patronage&amp;professional associations...)?</li> <li>• What are the perspectives for the construction legislation?</li> <li>• Exemples of Romanian projects financed from EU funds. etc.</li> </ul>
	Raluca TEODOSIU  Eugen VITAN		<b>TECHNICAL VISITS FOR THE INTERNATIONAL SPEAKERS</b>			-	EFDEN & FII Laboratories
COLUMNS HALL		13:00	LUNCH & Speeches (by invitation only)	60	14:00		Speeches of institutional partners (AIIR-Transilvania Cluj-Napoca, AIIR-Moldavia, AIIR-Banat, AIIR-Transilvania Brasov, AIIRM-Republic of Moldavia...) & SPONSORS

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
Session 3 - FESTIVITY HALL	<b>Manuel Gameiro DA SILVA</b> Session Chair  <b>Mihaela GEORGESCU</b>  <b>Nicolae ANTONESCU</b>	14:00	 <b>Iolanda COLDA</b> <i>FII-UTCB, OAER President</i>  Professor Emeritus, FII-UTCB, working at the university since 1967	20	14:20	Ventilation and air conditioning; the new EPB standards and revised Mc001 methodology	The technical content of the 16798 series standards for ventilation and air conditioning in buildings is presented. The author highlights the complexity and accuracy of the design, installation, operation, maintenance and inspection. She also presents the content of the recasted Mc001 Methodology concerning especially the energy consumption of ventilation and air conditioning systems.
		14:20	 <b>Karel KABELE</b> <i>Czech Republic</i> <i>Technical University in Prague</i>  Head of the Department of Indoor Environmental and Building Services Engineering and Vice-dean at the Faculty of Civil Engineering of Czech Technical University in Prague (CTU)	40	15:00	Indoor environmental quality in energy efficient buildings	Reducing energy consumption of buildings leads to a change in approach to the design and operation of buildings. WHO report and the current EPBD argue that buildings with low energy consumption provide users with greater comfort. To meet these expectations, new aspects need to be taken into account in the design, implementation and operation of buildings. One option is the introduction of a new methodology for assessing the quality of the indoor environment, based on questionnaire survey and data evaluation from building operation systems. The examples illustrate several research projects documenting changes in the quality of the indoor environment due to the introduction of energy-saving measures
		15:00	<b>Horatiu BASA</b> <i>General Manager</i> <b>TESTO Romania</b> Graduated from Faculty of Auto-mation and Computer Science from the Cluj-Napoca Technical University. He has more than 12 years experience in measuring instrumentation business.	10	15:10	TESTO new approach of the instrumentation market	We are part of a worldwide network and have access to more information than ever before. Some decisions touch the safety of a family, the energy supply of a whole neighborhood, or the health of thousands of people. These are the moments when you need certainty, the certainty that foods are safe, that cogeneration plants are running smoothly, or that compliance is met. Measuring instruments and solutions from Testo give you that certainty with precise sensors that you can rely on, with software which makes working more fun and less complex and with services working for you, so you can do your job, so you always know you're making the right decision at the right moment.

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
Session 3 - FESTIVITY HALL	Manuel Gameiro DA SILVA Session Chair  Mihaela GEORGESCU  Nicolae ANTONESCU	15:10	 <b>Francesca Romana D'AMBROSIO</b> <i>Italy</i> <i>University of Salerno</i>  Full Professor of Building Physics at Department of Industrial Engineering in University of Salerno (Italy).	40	15:50	IEQ and energy efficiency	This report aims to provide a general and updated picture of the relationship between energy efficiency and IEQ. In fact, these problems are currently being given more and more attention, due to the importance that the environmental quality of the confined spaces has on occupants' health and well-being and because to achieve high standards of energy efficiency can not ignore the respect of environmental quality requirements. All this is confirmed by the new EPBD recast.
		15:50	<b>Bogdan Dumitru Nasarimba-Grecescu</b> <b>DFR Systems</b> PhD, third degree scientific researcher, over 20 years of experience in projects for water supply and wastewater sewage systems	10	16:00	The forgotten resource—Sustainability without water? Creating sustainable buildings with Vacuum Sanitation Systems	The Vacuum Sanitation presentation wants to give you a proof that buildings do not necessarily have to be caught in the 19th century infrastructure trap, but can be really extremely water saving, flexible for any uses and therefore ready for the future – simply more sustainable.
		16:00	 <b>Yves FAUTRELLE</b> <i>France,</i> <i>Grenoble Institute of Technology</i>  Yves is Emeritus Professor at Grenoble Institute of Technology. He has a scientific consultant activity in Electromagnetic processing of Materials for metallurgy industry.	40	16:40	Improvement of the properties of micro-nanocomposite materials: myth or reality?	According to recent studies, the addition of micro-nanoparticles (MMC) in solid materials (polymers or metal alloys) gives them interesting properties in terms of thermal conductivity, electrical conductivity and mechanical resistance. These properties open new perspectives in terms of environmental consequences. They allow for example to lighten structures while improving their mechanical characteristics, to increase the performance of electrical conductors by reducing energy losses. A review of the nanotechnology-based materials used in building industry is also presented, as well as their areas of application in this field (such as thermal insulation and UV protection, paints, adhesives, sealants and other construction materials, lighting and electric systems and components, HVAC systems - filters, water treatment systems, purifiers).
		16:40	<b>Adrian MOISA</b> <i>General Manager</i> <b>JETRUN</b> Graduate in foreign trade (ASE REI) and with	10	16:50	The case for high efficiency, high quality HVAC solutions – practical solutions.	High efficiency, high quality HVAC solutions reduce energy and maintenance costs and improve the quality of the working environment inside the building and the availability of the systems. All this at an initial capital expenditure just slightly higher than for a

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Session	Moderators	START	Speaker	Min	END	TITLE	Summary
			an MBA from St Gallen (HSG), member of the Royal Institution of Chartered Surveyors, experienced in high efficiency HVAC systems and co-generation including biogas co-generation in waste water treatment plants.				'regular' building. So, how can we see more of this in the buildings of today and tomorrow?
Session 3 - FESTIVITY HALL	<b>Manuel Gameiro DA SILVA</b> Session Chair  <b>Mihaela GEORGESCU</b>  <b>Nicolae ANTONESCU</b>	16:50	 <b>Raluca TEODOSIU</b> FII-UTCB  Lecturer at the Thermo-Hydraulic and Protection of the Atmosphere Systems Department (FII-UTCB).	20	17:10	Online EPC pre-check tool IN ROMANIA	Energy performance is one of the main keys of reducing household emission gas. In order to correctly guarantee qualitative services related to buildings refurbishment it is important to help building owners through an Energy Performance Contracting. The main concepts of EPC are the right planning, financing, implementation and maintenance of a set of technical measures meant to assure important energy consumption decreases. GuarantEE program fosters the use of Energy Performance Contracting in the public and private sector across Europe by especially developing innovative EPC solutions for rented facilities, making EPC more flexible to better serve private sector clients, supporting EPC pilot projects with experienced facilitators. The GuarantEE project is being funded by the Horizon 2020 research and innovation program.
		17:10	<b>Octavian Șerban GRUNDFOS</b> BS Sales Engineer, with a engineering and MS degree; he has a wide expertise in turn-key projects for water supply and waste water systems and also for Office Building HVAC projects.	10	17:20	Reducing the prime costs: case story a production facility.	Grundfos will show how important is to work together with designer and beneficiary in order to find the best solution for a production facility. By changing the design and the pumping technology system, the energy costs can be reduced significantly
FESTIVITY HALL & COLUMNS HALL		17:20	Cocktail & awards (by invitation only)	100	19:00	Entertainment program & cocktail & awards ceremony   	

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

## 23<sup>rd</sup> CONFERENCE OF THE BUILDING SERVICES ENGINEERING FACULTY FRIDAY, June 8<sup>th</sup>, 2018

Session	Moderators	START	Speaker	Min	END	TITLE	Summary
Session 4 - FESTIVITY HALL	Francesca Romana D'AMBROSIO Session Chair	08:45	 <b>Iolanda COLDIA</b> <i>FII-UTCB, OAER President</i>	20	09:05		 Opening speeches of RCEPB organisers
	Iolanda COLDIA Tiberiu CATALINA	09:05	 <b>REHVA</b> Federation of European Heating, Ventilation and Air-conditioning Associations <b>REHVA Student Competition-Romanian Team presentation</b> Alexandra ENE Claudiu STANCIU				Traditional experimental models for evaluating the air permeability of a building involve large, expensive, weather-dependent or time-consuming equipment. On the other hand, predicting models or simulation programs could provide results leading to errors up to 159%. Thus, through this paper we aim to bring forward a novel innovative approach for a fast and simple estimation of the air infiltration through a building's façade and especially through window's joints. We established an experimental correlation between sound and air transfer. Finally, we have determined a nomogram which describes the evolution of the airtightness of a building based on the difference between outdoor and indoor sound pressure levels.

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

## Session 4 - FESTIVITY HALL

**Francesca Romana D'AMBROSIO**  
Session Chair

**Iolanda COLDIA**

**Tiberiu CATALINA**

09:20	 <b>Ilinca NĂSTASE</b> <i>FII-UTCB</i> Associate Professor at the FII-UTCB & CAMBI research centre. She is the director of the UTCB doctoral school. Her research interests are related to IEQ and thermal comfort in particular, experimental fluid mechanics, optical methods, PIV, DIC, LDV, flow visualization.	20	09:40	Thermal comfort – changing the paradigm for energy efficiency	At CAMBI research center we are focusing on the development of combined adaptive and personal models. We believe that the set point should be dictated by the comfort level of the occupants by “changing the conditions to accord with comfort and changing comfort temperature to accord with the prevailing conditions”. The adaptive comfort approach may take credit for widening the range of acceptable comfort temperature, which makes it possible to claim more energy savings in buildings designed using this approach than those design using Fanger’s approach for instance.
09:40	<b>Dan MORARU</b> <i>General Manager</i> <b>ALLBIM NET</b>	10	09:50	Why use BIM for the energy performance of buildings?	The new requirements of the EU directives and the complexity of design projects need a very precise calculation of all energy calculation parameters. BIM (building information modeling) simplifies the work of auditors. Allplan integrates all project data, including building energy analysis, allowing auditors to create multiple computational variants and compare them.
09:50	 <b>Christian INARD</b> <i>France,</i> <i>University of La Rochelle</i> Professor at La Rochelle University since 1998. Since 2011, he is Dean of Faculty of Sciences and Deputy Head of the Institute for Research on Urban Sciences and Techniques.	40	10:30	Development of a multiobjective optimization procedure dedicated to district energy system design	The district scale offers significant potential for improving energy efficiency, particularly at the early stages of the design. Thus, a transversal approach to the optimization of the district energy system design was adopted. It was undertaken using the DIMOSIM (District MOdeller and SIMulator) simulation platform, which provides a detailed analysis of a configuration. The energy, economic and environmental aspects were combined to obtain the best overall performance. The multiobjective optimization procedure is multi-level and includes direct search and the NSGA-II evolutionary algorithm to deal with the specificities of this particular problem. This article describes the complete optimization procedure that was developed to solve this complex problem. A case study on the design of an eco-district illustrates the possibilities offered by this type of approach to obtain the best design solutions

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Session 4 - FESTIVITY HALL	Francesca Romana D`AMBROSIO Session Chair	10:30		<b>Jaap HOGELING</b> <i>Netherlands</i> <i>International projects and standards at ISSO</i>	40	11:10	The role of standards in the new EPBD, what can we expect? Given the built-in flexibility of the set of EPB standards.	Current status of the set of EPB standards and the revised EPBD 2018. The main changes in the EPBD related to the EPB standards are reported. The expected implementation in the various EU MS's and the role of the flexible structure of the EPB standards to facilitate EU wide implementation via the Annex A/B approach is explained. The follow-up of the standard development and the need to organise feedback from the users of the standards via the EPB Center is explained. This EPB Center is an initiative from REHVA and ISSO and is expected to provide stakeholders and interested parties with technical support to support the implementation and dissemination of information on the set of EPB standards at national and regional level. While providing this support, also aiming to assist formulating the needs in order to support further develop, maintain and improve the set of EPB standards.
	Iolanda COLDA		Manager international standards at ISSO, Chair CENTC 371 Program Committee on EPBD, Member ISO/TC 163/WG 4: Joint Working Group (JWG) between ISO/TC 163 and ISO/TC 205: Energy performance of buildings using holistic approach, Director EPB.Center					
	Tiberiu CATALINA							
COLUMNS HALL		11:10	COFFEE BREAK		20	11:30	COFFEE BREAK	
Session 5 - FESTIVITY HALL	Yves FAUTRELLE, Session Chair	11:30		<b>Manuel Gameiro DA SILVA</b> <i>Portugal</i> <i>REHVA</i>	40	12:10	Development of tools and key performance indicators for the long term evaluation of indoor environmental quality in buildings	Software tools and hardware systems developed to monitor Indoor Environmental Quality conditions in buildings are presented. The case study dealing with the IEQ monitoring of the town hall building of a Dutch municipality is addressed. The measuring system, the two developed software tools and the results of a virtual visit to the building data base are presented passing through the different windows available in the visualization software. Long term thermal comfort KPIs are explored, comparing those suggested in ISO7730 standard with new indicators suggested by the authors.
	Andrei DAMIAN		Full Professor at the Department of Mechanical Engineering, Faculty of Science and Technology of the University of Coimbra. REHVA vice-President and Chair of the Education Committee.					
	Florin BĂLTĂREȚU	12:10		<b>Horia PETRAN</b> <i>URBAN-INCERC</i>	20	12:30	Innovative training schemes for retrofitting to nZEB-levels- the Fit-to-nZEB Initiative	The paper presents the preliminary developments of the FIT-TO-NZEB project, which aims at increasing competence and skills of the building professionals in the field of retrofitting to NZEB-levels. Following the developments of Train-to-nZEB project, the learning outcomes for deep energy renovation programs are presented together with plans for the introduction of nZEB renovation related educational content in the curricula at all levels (universities, professional colleges, vocational training centres).
				Head of the Centre for Energy Performance of Buildings, within „URBAN-INCERC”.				

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

## Session 5 - FESTIVITY HALL

**Yves FAUTRELLE,**  
Session Chair

**Andrei DAMIAN**

**Florin BĂLTĂREȚU**

12:30



**Andrei LIȚIU**  
Sweden,  
KTH Royal Institute of  
Technology

Energy management & indoor environment quality advisor, conducting research on behaviour and energy performance of buildings.

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12:50

The digitalization of residential building services: comfort, convenience and control - a Romanian case study

The effects of an increasingly digitized world are now reaching into every corner of our lives. Residential building services make no exception. The futuristic perceived concept of smart home is already a reality today. This case study illustrates the out-of-the-box capabilities of devices available today on the market that control, automate and monitor the operation of building services. The presented building is a duplex i.e. two attached single-family houses. Elgato Eve accessories (Apple HomeKit compatible) have been installed for controlling, automating and monitoring the operation of the heating, cooling, ventilation and garden lighting systems. Furthermore, the Eve app provides a 'building services-user' interface through which the users can visualize the state of building services as well as monitored energy use and indoor environment quality data, manually control the building services, define timers and rules for the automated operation of building services and have remote access to the building services.

12:50



**EfDEN**  
Mihai Băiceanu

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13:00

EFdeN Signature – a solar sustainable house for the Solar Decathlon Middle-East 2018 Dubai

A solar, sustainable, smart and user centered house built by students from Romania and Dubai for the international solar houses competition, Solar Decathlon Middle East 2018 Dubai

13:00



**Ioan Silviu DOBOȘI**  
AIIR

Associate professor at the Faculty of Architecture from the „Politehnica” University of Timisoara since 1993. Prime Vice President of AIIR.

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13:20

HVAC systems according to destination of spaces and rooms for hospitals

The paper aims at presenting the HVAC systems for a hospital building respecting the standards in force, especially with regard to aseptic regime according to the purpose of the rooms. It is necessary to observe the ventilation flows and the regime of thermal comfort in both winter and summer conditions. In rooms with a high aseptic degree as well as in the hotel area of the hospital, the installation of low temperature 7/12°C equipment was avoided, in order to avoid formation of condensation that may favor the appearance of the Legionella.

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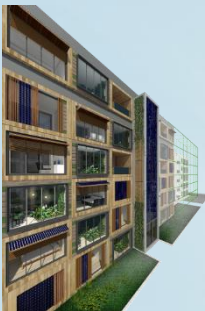


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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

Session 5 - FESTIVITY HALL	Yves FAUTRELLE, Session Chair  Andrei DAMIAN	13:20	 <p><b>Denys VOLCHOK</b> Ukraine Prydniprovsk State Academy of Civil Engineering and Architecture Dnipropetrovsk</p> <p>Associate Professor at the Structural Mechanic and Strength of Material department and Deputy Dean at the faculty of Civil Engineering of PSACEA.</p>	10	13:30	Estimation of maximum displacements of a truss node under conditions of strength and fuzzy goal of volume	The purpose of this paper is to represent the influence of undefined data of design goal of volume on the results of rod systems displacement. We propose to use fuzzy sets as kind of uncertainty.
		13:30	 <p><b>Project OVER4</b></p> <p>Cătălin Sima Ștefan Epure Daniel Butucel</p>	10	13:40	Over4 Renovation through Transformation	According to Romania's National Renovation Strategy, issued in 2014, the residential buildings sector in our country is composed mainly of buildings built during the communist period and based on to the current comfort requirements, they are unfit for housing. Moreover, about 80% of them will still be inhabited in 2050. Current renovation projects focus only on the building's thermal envelope reducing in the first phase the energy consumption. Baseline technology used in current renovation initiatives lacks the holistic approach, execution is unregulated and often poorly elaborated. As a result, an immediate new approach for renovation is needed.
	Room P12	13:40	End of RCEPB 2018 Student Competition	20	14:00	RESULTS & awards ceremony	
COLUMNS HALL		13:40	LUNCH for INTERNATIONAL SPEAKERS & SPONSORS (by invitation only)	50	14:30	CONCLUSIONS & awards ceremony	

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# INNOVATIVE AND CLEAN SOLUTIONS FOR THE BUILT ENVIRONMENT

**Friday-Sunday, June 8-10<sup>th</sup>, 2018**

## TRIP TO DANUBE DELTA

from 3 PM on June 8 till 12 AM on June 10

## RCEPB institutional partners

**ACR** – ROMANIAN ASSOCIATION OF CHIMNEY SWEEPERS  
**AFCR** – REFRIGERATION AND CRYOGENIST ASSOCIATION OF ROMANIA  
**AGFR** – THE ROMANIAN GENERAL ASSOCIATION OF REFRIGERATION  
**AICPS** – ASSOCIATION OF STRUCTURAL DESIGN CIVIL ENGINEERS  
**AICVF** – FRENCH ASSOCIATION OF VENTILATION AND COOLING ENGINEERS  
**AIIR** – ROMANIAN ASSOCIATION OF BUILDING SERVICES ENGINEERS  
**AIIRM** – ASSOCIATION OF BUILDING SERVICES ENGINEERS FROM THE REPUBLIC OF MOLDOVA  
**AMR** – ROMANIAN ASSOCIATION OF MUNICIPALITIES  
**ANRE** – PUBLIC AUTHORITY FOR ENERGY REGULATION  
**ANRSC** – NATIONAL REGULATORY AUTHORITY FOR LOCAL PUBLIC SERVICES  
**APMCR** – ROMANIAN ASSOCIATION OF CONSTRUCTION MATERIALS PRODUCERS  
**ARACIS** – AGENCY FOR QUALITY ASSURANCE IN HIGHER EDUCATION  
**ARACO** – ROMANIAN ASSOCIATION OF CONSTRUCTION ENTREPRENEURS  
**ARISI** – ROMANIAN ASSOCIATION OF FIRE SAFETY ENGINEERS  
**ASPIR** – PROFESSIONAL ASSOCIATION OF SPECIALISTS IN PRESSURE EQUIPMENT AND HOISTING  
**ASRO** – ROMANIAN NATIONAL BODY FOR STANDARDIZATION  
**BPIE** – BUILDINGS PERFORMANCE INSTITUTE EUROPE

**CNRI** – ROMANIAN NATIONAL COMMITTEE ON ILLUMINATION  
**CPEREE** – CENTER FOR RENEWABLE ENERGY PROMOTION AND ENERGY EFFICIENCY, ROMANIAN ACADEMY  
**FII** – FACULTY OF BUILDING SERVICES ENGINEERING  
**ISC** – STATE CONTROL INSPECTORATE FOR CONSTRUCTION  
**ISCIR** – STATE INSPECTION FOR CONTROL OF BOILERS, PRESSURE VESSELS AND HOISTING  
**MDRAPFE** – MINISTRY OF REGIONAL DEVELOPMENT, PUBLIC ADMINISTRATION AND EUROPEAN FUNDS  
**MENCS** – MINISTRY OF NATIONAL EDUCATION AND SCIENTIFIC RESEARCH  
**OAER** – ROMANIA ENERGY AUDITORS CHAMBER  
**OAR** – ROMANIAN ORDER OF ARCHITECTS  
**PSC** – EMPLOYERS ASSOCIATION FOR CONSTRUCTIONS COMPANIES  
**REHVA** – FEDERATION OF EUROPEAN HEATING, VENTILATION AND AIR-CONDITIONING ASSOCIATIONS  
**SRG** – ROMANIA SOCIETY GEOEXCHANGE  
**SRT** – ROMANIAN SOCIETY OF THERMAL SCIENTISTS  
**UAUIM** – "ION MINCU" UNIVERSITY OF ARCHITECTURE AND URBANISM  
**UNDP** – UNITED NATIONS DEVELOPMENT PROGRAMME  
**URBAN** – INCERC - NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBAN PLANNING AND SUSTAINABLE TERRITORIAL DEVELOPMENT "URBAN-INCERC"  
**UTCB** – TECHNICAL UNIVERSITY OF CIVIL ENGINEERING BUCHAREST

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