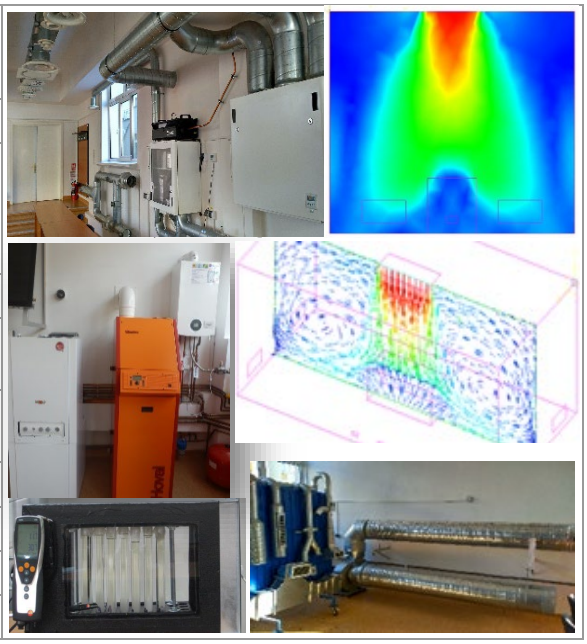
SYSTEMS FOR PROVIDING INDOOR COMFORT IN ENERGY EFFICIENT BUILDINGS RESEARCH GROUP

Contact details

Name	**Systems for Providing Indoor Comfort in Energy Efficient Buildings Research Group**
Acronym	**SICEEB**
Logo	
Site	
Address	B-dul 21 Decembrie 1989, nr. 128-130, Cluj-Napoca, România
Faculty Department	**Faculty of Building Services** **Department of Building Services Engineering**
Telephone	+40 264 202502
Fax	+40 264 410179
Director	Assoc. Prof. Dr. Eng. Florin DOMNIŢA
e-mail	florin.domnita@insta.utcluj.ro



Areas of expertise

Heating ventilation and air conditioning (HVAC): Thermal analysis on heating and cooling units**;** Air distribution in ventilation systems; Systems for providing indoor air quality; HVAC systems for passive houses and near zero energy buildings (nZEB); Life Cycle Assesment (LCA), Carbon Footprint analisys.
Indoor air quality (IAQ): air cleanness; chemical composition of indoor air; indoor air movement.
Thermal comfort: indoor air parameters; outdoor-indoor heat exchange, finite element thermal analysis.
Energy efficient systems: - air to air heat recovery; ground to air and water to air heat exchangers; heat pumps.
Renewable energies: Photovoltaic (PV) panels with crystalline and amorphous layers; Vacuum tube and thermal solar collector; geothermal energy sources; wind turbines.

Thermal storage: Latent heat thermal energy storage; phase change materials; cold storage for free cooling; thermal storage in hot and cold-water tanks.

Team

Assoc.Prof.Dr.Eng. Florin DOMNIŢA, Assoc.Prof.Dr.Eng. Dorin BEU, Assoc.Prof.Dr.Eng. Carmen MÂRZA, Assoc.Prof.Dr.Eng. Ciprian BACOŢIU, Assoc.Prof.Dr.Eng. Ancuţa ABRUDAN, Assoc.Prof.Dr.Eng. Eugen VITAN, Assoc.Prof.Dr.Eng. Călin CIUGUDEANU, Lect.Dr.Eng. Gelu CHISĂLIŢĂ, Lect.Dr.Eng. Teodor CHIRA, Lect.Dr.Eng. Raluca MOLDOVAN, Lect.Dr.Eng. Georgiana CORSIUC, Lect.Dr.Eng. Tania RUS, Lect.Dr.Eng. Roxana MARE, Lect.Dr.Eng. Octavian POP, Lect.Dr.Eng. Constantin CILIBIU, Lect.Dr.Eng. Horaţiu ALBU, Lab.Eng. Liviu DODEA, Lab.Eng. Angel CÂMPIANU.

Representative projects

1. **Support of higher education system in a context of climate change mitigation through regional-level of carbon footprint caused by a product, building and organization - Hi-EduCarbon -** Grant No. 2021-1-SK01-KA220-HED-000023274, 2021-2024;
2. **BIM4Energy**, Grant Erasmus+ - Project ID: 2023-1-ES01-KA220-HED-000156652, 2023-2024;
3. **Energy efficiency of air-cooling systems by using phase changer materials**, CICDI 2017, nr.2013/12.07.2017;
4. **Meeting of Energy Professional Skills (MEnS) - Energy analysis techniques and practices for implementing near zero energy buildings (nZEB),** Project HORIZON 2020-EE-2014-2015, nr. 649773/30.03.2015; 2015-2017;
5. **Energy Efficient Technologies for a Green University**; CICDI 2014, nr. 29223/05.12.2014, 2014-2015;
6. **Optimized system for the production of thermal energy from renewable energy sources using heat pumps**, PNCDI2 OPTHP 22-128, 2010.

Significant results

The most representative publications of the past 5 years:

1. Albu Horaţiu, Beu Dorin, Rus Tania, Moldovan Raluca, Domniţa Florin, Vilcekova Silvia - Life cycle assessment of LED luminaire and impact on lighting installation - A case study; *Alexandria Engineering Journal*; Elsevier, vol. 80; pp. 282-293; DOI: 10.1016/j.aej.2023.08.068; ISSN: 1110-0168; WOS**; IF 6,8**/ 2023;
2. Kapalo Peter, Domniţa Florin, Bacoţiu Ciprian, Albu Horaţiu, Chvatal Martin - How much air is needed to ventilate the gym? - case study; *Journal Of Applied Engineering Sciences*; Sciendo; vol. 13/2; pp. 231-236; DOI: 10.2478/jaes-2023-0029; ISSN: 2247-3769; eISSN: 2284-7197; WOS Q4; **IF 1,1**/2023;
3. Tania Rus, Raluca Moldovan, Horatiu Albu, Dorin Beu; Impact of Pandemic Safety Measures on Students' Thermal Comfort-Case Study: Romania; *Buildings*; MDPI; vol. 13; DOI10.3390/buildings13030794; WOS; **IF 3.8**/2023;

4. Roxana Mare, Codruta Mare, Adriana Hadarean, Anca Hotupan, Tania Rus; COVID-19 and Water Variables: Review and Scientometric Analysis; *International Journal Of Environmental Research And Public Health*; MDPI, vol. 20, Issue 2; DOI10.3390/ijerph20020957; WOS; **IF 4,799**/2023;
5. Octavian Pop, Alexandru Dobrovicescu, Alexandru Serban, Mihaela Ciocan, Anass Zaaoumi, Mugur Balan, C.Analytical modelling of food storage cooling with solar ammonia-water absorption system, powered by parabolic trough collectors. Method; *Methodsx,* Elsevier, vol.10, DOI10.1016/j.mex.2023.102013, eISSN: 2215-0161, WOS, **IF 2**/2023;
6. Octavian Pop, Charles Berville, Florin Bode, Cristina Croitoru; Numerical investigation of cascaded phase change materials use in transpired solar collectors; *Energy Reports*; Elsevier; vol. 8, pp. 184-193; DOI10.1016/j.egyr.2022.06.114; ISSN 2352-4847; WOS; **IF 5,6**/2022;
7. Rus Tania, Cruciat Gheorghe; Nemeti Georgiana; Mare Roxana; Muresan Daniel. Thermal comfort in maternity wards: Summer vs. winter conditions. Journal Of Building Engineering. Volume 51. DOI10.1016/j.jobe.2022.104356. 2022; WOS; **IF 7.144**/2022;
8. Kapalo Peter, Vojtasko Lubos, Vasilisin Daniel, Domnita Florin, Bacotiu Ciprian, Kandrac Robert, Batorova Michaela. Investigation of the influence of the level of physical activity on the air exchange requirements for a gym. Building And Environment. Volume 204. DOI 10.1016/j.buildenv.2021.108123. 2021; WOS**. IF 7.093**/2021;
9. Rus Tania, Nemeti Georgiana, Domnita Florin, Goidescu Iulian, Muresan Daniel. Indoor thermal environment evaluation of postpartum patients in a tertiary level maternity in Romania during summer. Science and Technology for the Built Environment. Volume 27. Issue7. DOI 10.1080/23744731.2021.1906084. 2021. **IF 1.99**/2020;
10. Kapalo Peter, Vilcekova Silvia, Meciarova L'udmila, Domnita Florin, Adamski Mariusz. Influence of Indoor Climate on Employees in Office Buildings-A Case Study. Sustainability. Volume 12. Issue 14. DOI 10.3390/su12145569. 2020. **IF 3.251**/2020;
11. Kapalo, P., Domnita, F., Pop, O., Adamski, M., Voznyak, O. Considerations about the Required Volumetric Air Flow Rate inside an Office Room with one Occupant - Case Study. *Journal Of Applied Engineering Sciences*. Volume 10. Issue 1. DOI 10.2478/jaes-2020-0006. 2020;
12. Peter Kapalo, Ludmila Meciarova, Silvia Vilcekova, Eva Kridova Burdova, Florin Domnita; Ciprian Bacotiu; Kinga-Eva Peterfi, Investigation of CO2 production depending on physical activity of students. Int. Journal of Environmental Health Research, Volume 29, Issue 1, 2019, WOS:000457284700003, ISSN: 0960-3123, **IF 1.465/**2019;
13. Ancuţa Abrudan, Octavian Pop, Alexandru Serban, Mugur Bălan, New perspective on performances and limits of solar fresh air cooling in different climatic conditions. Energies, 2019, 12/11, 2113; ISSN1996-1073, IF 2,67/2018.Florin Domniţa, Peter Kapalo; Inlet device with double exponential profile distributor for indoor air dispensation. *Selected Scientific Papers – Journal of Civil Engineering*, Volume 14, Issue 1, 2019, pag. 103-112, ISSN 1336-9024, DOI: 10.1515/sspjce-2019-0011;
14. Roxana Mare, Adriana Hadarean, Tania Rus, Dana Ilutiu-Varvara, Teodor Chira, Modelling of an Improved Hybrid Cooler Used in Sustainable Buildings, *IOP Conf. Series: Materials Science and Engineering*, 471, 2019, 022032, doi:10.1088/1757-899X/471/2/022032.

Significant solutions:
Indoor CO_2 concentration measurements depending on activities, methods for determining fresh air supply, mathematical model for fresh air flow rate-based on statistics, Life Cycle Assesment (LCA) for products, carbon footprint analisys for building services systems, energy evaluation of ground air heat exchanger, thermal rehabilitation of buildings, mathematical model for latent heat thermal energy storage, accurate modelling of thermo-physical properties of PCM, optimisation of heat pumps with renewable energy sources, mathematical model for hybrid coolers, methodology for evaluation of led luminaires.

Products and technologies:
1. Double-Equal Strength Diffuser for air distribution
2. Efficient hybrid cooler
3. Energy audit of buildings
4. Savonius Turbines
5. Algorithm for selecting phase change materials based on climatic conditions
6. Adiabatic chamber for thermal analysis of LED luminaires
7. Software for evaluating heat gains through opaque building elements in transient sinusoidal regime
8. Carbon Footprint analisys for products, buildings and organizations
9. Life Cycle Assesment (LCA) for products, buildings and organizations

The offer addressed to the economic environment

Research & development	**Research & development in core areas:** Fundamental domain Building Services Engineering – technologies for assuring comfort and IAQ. **Research & development in applied fields:** Life Cycle Assesment, Carbon Footprint; nZEB, thermal energy recovery coupled with renewable sources, Influence of CO_2 concentrations on health and environment, thermal storage. **Development strategy:** National/International research contracts, contracts with third party, article publishing in Journals (WOS, SCOPUS), National/International conference participations, products presentations or technology development in the field of Building Services Engineering.
Consulting	Design, energy audit, consulting, research, product testing, HVAC systems airflow balancing, sound comfort analysis, thermal infrared analysis, evaluation of thermal comfort parameters.
Training	HVAC systems in nZEB, Courses for energy audit, Courses focused on IAQ and renewable energies. Courses about Life Cycle Assesment (LCA), Courses about Carbon Footprint analisys.

Last update on January 2024