



LESO LUNCHTIME* LECTURES

renewable energy - building science - urban physics

Friday 9 November 12h20-13h30

EPFL – CM 5

Net Zero Energy Buildings: Up-to-Date Issues

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Summary

To fight energy shortages and green house gas emissions (according to Nature journal), one of the most significant technologies of future is net zero energy building (NZEB).

The lecture discusses actual up-to-date issues in this field such as that of NZEB definition, types of energy consumed by NZEB, NZEB connection to energy network for energy storage, final energy production by NZEB, NZEB impact to the environment, to-be-aware-today future issues when designing a NZEB, NZEB diffusion into the everyday life, and research activities in this field in Serbia and with INSA Lyon.

The NZEB definition should include the clear requirement for energy efficiency. Discussion of energy consumption by NZEB should include embodied energy. The NZEB connection to energy network introduces concerns about a type of network, yearly and daily consumption pick in the network, and DC-to-AC conversion energy losses. The production of energy by NZEB yields the issues of production location. Except solar and wind, other energy sources should be taken into account such as anergy and energy efficiency. The life-cycle NZEB impact to the environment may be evaluated by the amount of avoided consumption of primary energy, fossil fuel energy, exergy, and emergy, and by the amount of avoided CO₂ emission. One should be aware that the investment into energy efficiency is more beneficial than that into renewable energy use. When designing NZEB, the designer should be aware of future climate change, and energy mix change in electricity network and other energy networks. The diffusion of NZEB into public every day life is of primary importance. It depends on the positive consumer opinion based on achieved economics, occupation comfort, and feeling of environmental protection.

The paper also presents the current research activities in the Centre for Heating, Air-conditioning, and Solar energy of Faculty of Engineering at University of Kragujevac in Serbia around the Serbian state project titled "Research and development of Serbian net-zero energy house", and current research collaboration with the department of Civil engineering in INSA, France around indirect heat production by using Trombe walls mounted at Mozart house.

Author

Dr. Milorad Bojic is a Full Professor at Faculty of Engineering, University of Kragujevac, Serbia. Currently, he is a Visiting Professor at INSA Lyon, France from September 2012 until the end of November 2012. He is an editor of Energy International for Energy international journal (Elsevier) in the field of Energy in buildings, and the editorial board member of Renewable energy journal (Elsevier) in the field of Low energy architecture and buildings.



Open to all !

*Presentations are followed by an apéritif, to give the opportunity to guest and speakers to further discuss the topic.