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## **Development of Energy Certification in Dwelling Buildings in Moscow**

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ABOK

(Session 2A, 15:30-15:50)

### Vadim Livchak, D.Sc.

Vadim Livchak graduated from the Moscow Engineering and Construction Institute, as specialist in heat, gas supply and ventilation. He is the Doctor of Science in Engineering, Assistant Professor. Mr. Livchak has worked in construction field, participated in the installation of engineering equipment in Kreml Congress Hall in Moscow, equipment of district boiler plant in Afghanistan, later he has worked in bureau, which has specialized in adjustment of HEVAC systems in existing and new exceptional objects.

He worked 25 years as a Director of Sector of heating supply of residential districts and public buildings in Science department of Research Institute of Standardized and Experimental Design of Engineering Systems of Buildings. Later he worked in as Vice-director of Moscow Agency of Energy Efficiency in Residential and Communal Sector. Today he is the Chief of Department of Energy Efficiency in Construction in Expert Group of Moscow Government. He combined his work with tasks of Assistant Professor in All-Union Engineering and Construction Institute of Correspondence Education.

He is the author of 150 publications, about 10 inventions, participated in development of the Federal Construction Norms SNIP "Heating Networks", "Thermal Protection of Buildings", "Guide for Design of District Heating Substations", Moscow City Norms "Energy Supply in Buildings", the number of standards of ABOK. He is a member of working groups on energy supply in departments of the Moscow Government: Fuel and Energy Services; Construction Complex; a member of editorial board of ABOK, and "Energosnabzhenie", Vice-President of Russian Association of Engineers for Heating, Ventilation, Air-Conditioning, Heat Supply and Building Thermal Physics, Laureate of Prize of Council of Ministers of the USSR

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### Development of Energy Certification in Dwelling Buildings in Moscow

The Government of Moscow has adopted the Decree "The Priority Tasks of Energy Saving in Moscow" in the end of 2006. The topicality of the Decree is also a result of the first case of deficit of electrical power in Moscow in 2006. The deficit has motivated to improve efficiency of use of fuel and energy resources. One of the tasks for achievement of this goal is the implementation of Energy Certification of dwelling buildings for more accurate verification of heat load of buildings' heating, ventilation systems and water use and subsequent implementation of the energy efficiency measures.

ABOK (Russian Association of Engineers for Heating, Ventilation, Air-Conditioning, Heat

Supply and Building Thermal Physics) has foreseen the changes and developed the new special standard Guide for Calculation of heat consumption of buildings (ABOK-8-2005). The Guide was done in conformity with the EU Directive.

The Standard introduces the methodology for calculation of the Energy Passport of building, estimated heat consumption for space heating, ventilation and domestic hot water supply considering actual and given heating specifications of buildings, external envelope of building, number of people living in the building, rates of air exchange, estimate of heating from sun radiation and heat sources inside buildings and from condition automated control of heating system.

The methodology introduced in the Guide gives possibility to estimate influence of each element of building's envelope in heat consumption and influence of changes in the envelope to heat consumption, which helps to set the priorities of implementation of energy efficiency measures. The Guide allows calculating the limits of energy demand for heating, ventilation and domestic hot water; the demand of specific heat consumption of building and compare it to the standard, which sets the Class of Energy Efficiency and sets the priority of implementation of energy efficiency measures.

The calculations made according to this methodology allows define precisely the energy demand for heating, ventilation of the building. A heating energy meter registers the energy consumption, but the readings from the meter do not prove that this is the energy demand of the building, even if there are the comfort indoor temperatures. The indoor temperature is not an indicator of conformity between the heat energy demand and consumption in case of high demand of heating energy, because the inhabitants opens window to cool the premises so part of the energy is wasted via open windows. The practical measurements have proved this fact.

The Energy Audit has to be done before making of the Energy Passport.

The inspection of possible places of heat losses must be done for the planning of measures for reduction of energy consumption. It is important to fix in time shortcomings in operation of the systems, because energy efficiency is interconnected to removing of heat surplus what can result local deviations in providing of required parameters. Before the energy saving measures these parameters were covered by excessive heat consumption by building.

Additional thermal insulation of existing buildings according to the today's norms will reduce calculated energy use for heating more than 1,6 times and during the heating season 2 times. Implementation of these measures requires high investments.

Even more effective energy saving measures per investment costs is automatic control of heating system. For existing buildings with sectional space heating connection scheme (serial connection of space heating radiators) it is first of all temperature control of heating sections. This measures have good energy efficiency effect and is quite cheap because does not require welding works in apartments for installation of thermostatic valves on radiators.