CITIES OF THE FUTURE
ISTANBUL 2016

Laboratory of Building Construction & Building Physics
Department of Civil Engineering,
Aristotle University of Thessaloniki

Katerina Tsikaloudaki
Dr civil engineer, assistant professor
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Description of the Organization

Aristotle University of Thessaloniki (AUTH)

42 Schools
95,000 Students

Department of Civil Engineering

Laboratory of Building Construction & building Physics (L.B.C.P.)

Expertise on:
hygrothermal & energy performance of building envelope; building physics; energy performance; sustainable building retrofitting

Profile of L.B.C.P.

Laboratory of Building Construction & building Physics (L.B.C.P.)

Who we are:

ACADEMIC STAFF

Dimitris Bikas
Emeritus Professor

Dimitris Aravantinos
Associate Professor

Katerina Tsikaloudaki
Assistant Professor

Theodoros Theodosiou
Assistant Professor

Karolos Kontoleon
Lecturer

Christina Giarma
Lecturer

Phd Candidates

Stella Tsoka
Msc Civil Engineer

Dimitra Tsirigoti
Msc Architect

Profile of L.B.C.P.

Laboratory of Building Construction & building Physics (L.B.C.P.)

What we do:

Recent research projects

Monuments; historic buildings

- A study of resolving the moisture problems of the Protato church in Athos, 2006.
- Sustainable development of historic buildings through their renovation with the application of innovative technologies, 2007.
- Study on the restoration and the integration of new buildings in the historic Theological School of Chalki, 2013.

Existing buildings

- Optimizing the energy performance of public buildings and open spaces in the Municipality of Servia, Perfecture of Kozani, 2009.

Building components

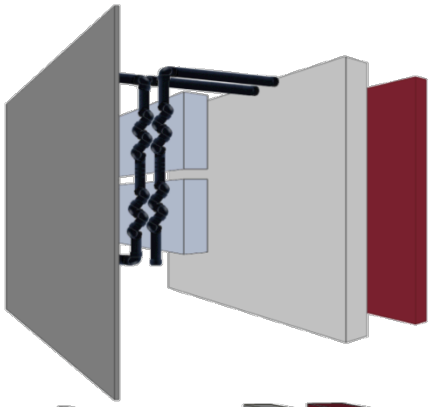
- Optimization of solar control devices for energy saving and comfort in buildings, 2009.
- Window Energy Labelling in Cooling Season. Fenestration & Glazed Structures, 2009.
- SYNERGY: Research and development on a system of high energy efficient building elements, under integrated protection criteria and life-cycle design aspects, 2013-2015.

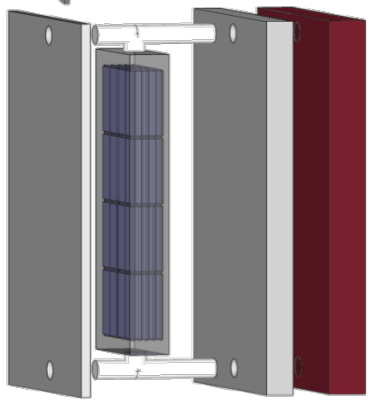
Special building components

- PHOTO-VALUE: Research, development and certification of large dimensioned aluminum structural members with incorporated modern technology photovoltaic elements and innovative grid connected power inverters, aiming to their effective application into building construction, 2006.
- ALUCLADDING, 2011-2012.
- E2VENT, 2015-2018 (EeB2014-Topic2-H2020: Adaptable envelopes integrated in building refurbishment projects).

Profile of L.B.C.P.

The E2VENT system is an external refurbishment solution with external cladding and air cavity that embeds different breakthrough technologies ensure its high efficiency:





- **A Smart Modular Heat Recovery Unit** (SMHRU) for the air renewal allows the heat recovery from the extracted air using a double flux exchanger.
- **A Latent Heat Thermal Energy Storage** (LHTES) based on phase change materials will provide a heat storage system for heating and cooling peak saving.
- **A smart management** that controls the system on a real time basis targeting optimal performances. It will embed new sensors, communicate with existing systems and recover predicted weather.
- **An efficient anchoring system** that limits thermal bridges and allows an easy and durable installation.

http://www.e2vent.eu/

Profile of L.B.C.P.

Laboratory of Building Construction & building Physics (L.B.C.P.)

What we do:

Participation in international research activities

- Construction and City related Sustainability Indicators –CRISP
- LIFETIME- Lifetime engineering of buildings and civil infrastructures
- COST C13: Glass and interactive building envelopes
- COST C16: Improvement of Urban Building Envelopes
- COST C25: Sustainability in Construction
- COST TU0701: Improving the quality of suburban building stocks
- The RTD Initiative in the European Construction Technology Platform
- Leonardo da Vinci European Community Action Programm CONSTRUCT IT Green

Participation in the Regulatory bodies for the Building Energy Performance Regulations

Organization of scientific events

EEB-05-2017:

Development of near zero energy building renovation

A large-scale deep rehabilitation of the residential building stock to match the net-zero energy standards at affordable price must be achieved.
Breakthrough solutions & advanced BEM

OBJECTIVE:

Develop refurbishment solutions for achieving optimum performance, taking into account:

- **Energy performance assessment before and after renovation**
- **Duration of works**
- **Lifecycle analysis**
- **Investment costs and life cycling costs**
- **Social acceptance (users' opinions, district upgrade, etc.)**

What is needed:

Partners with strong expertise on energy & building envelope, services, RES, BEM
Partners with strong experience on software development
Partners with strong experience on business models development.

Buildings for real case demonstrations

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Expected results

- **Energy saving >60% is expected, especially if the examined building is not insulated**
- **Installation time ?**
- **High replicability potential can be achieved if adequate database is built**
- **Affordability ?**
- **New generation of skilled workers and SME contractors ?**

EEB-07-2017: Integration of energy harvesting at building and district level

Integration of different renewable energy sources at building and district scale on a cost effective and easy installation way

OBJECTIVE:

Develop solutions for RES integration at building/district scale, taking into account:

- **Energy performance**
- **Costs (investment costs, maintenance and operation, etc.)**
- **Replicability**
- **Easiness of installation**
- **Modularity**
- **Equipped with monitoring & control systems**
- **Adaptable (?)**

Validation and demonstration in real case retrofitting projects

Our role

- **Holistic integration of RES in building envelope *("cope with different designs and architectural concepts")***

EEB-08-2017: New business models for energy-efficient buildings through adaptable refurbishment scenarios

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Support large scale uptake and business deployment of energy efficient technologies

OBJECTIVES:

Benchmark and assess innovative business models

Evaluation of different refurbishment packages, taking into account:

- **Energy efficiency**
- **User behavior**
- **Geo-clustering**
- **Entire life cycle**

Engagement of Municipalities

Our role

- **Indoor environment**

Katerina Tsikaloudaki

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Recommendations

- The presentation **has to** last up to **4 minutes (maximum)**
- Do not overload your slides
- Provide weblinks to additional material
- Slides should be in English
- Do not use videos etc. – they might be not supported by the Infoday IT system
- Send your presentations in PDF format to: CoF@turkeyinh2020.eu until 23 September 2016.