



International conference

Energy
Management in
Cultural Heritage

6-8 April 2011, Dubrovnik, Croatia

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The Hotel Excelsior is wheelchair accessible.

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The Croatian Chamber of Architects (CCA) introduced the Conference to their educational programme. Consequently, all members of the CCA who will attend the conference will receive a total number of 12 points for their participation, 4 of which will be assigned to the area of legislation.

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1 Introduction

Dear Participant,
I am delighted to welcome you to our conference, "Energy Management in Cultural Heritage."

Energy management in cultural heritage is a unique and innovative subject in the field of sustainable development. Until recently, the renovation and adaptation of historical buildings in order to preserve their cultural heritage has taken place with only minimal attention to energy efficiency and environmental protection. This conference aims to show that it is possible to achieve both aims. It sets out to explain how to link advanced technology in the field of energy efficiency to that governing the preservation of historical buildings, and to share success stories with a diverse group of professionals: conservers, architects, engineers and local government officials, investors and building end-users.

Cooperation across these different vocations is indispensable to balance the imperatives of energy efficiency and building conservation. Building a bridge between the two requires creative and advanced technological solutions and tools, comprehensive education and training, a change in behaviour of the buildings' occupants, and adequate building management: in short, a multidisciplinary approach.

It is helpful to see the conservation of heritage and a reduction in energy consumption as two faces of sustainable development. We need to cherish and preserve the cultural legacy of the past, but we need also to be prepared to meet the challenges of the future, including the threat of climate change. The conference will show that a balance can be struck, particularly when the leading experts in different disciplines put their heads together to build innovative solutions. This conference provides an ideal forum, gathering nearly 300 participants from over 20 countries to share knowledge and experience.

Sustainable development is the heart of UNDP's global mission, and UNDP Croatia is delighted to be leading the organization a conference on this theme. We are not alone in recognizing the importance of balancing cultural heritage and energy efficiency, and I would like to extend warm thanks to our many co-organizers and partners who have helped to bring the conference together in so many ways.

I wish you every success in your work and trust that this conference will be a source of both information and inspiration. I am sure you will enjoy fruitful dialogue with many fellow professionals. As to the beautiful city of Dubrovnik, I am sure you will find your visit an unforgettable experience.



Louisa Vinton
*United Nations Resident Coordinator and UNDP Resident
Representative in Croatia*

2 Programme summary

Wednesday, 6th April 2011

14:00-18:00

Registration - Hotel Excelsior

19:00-21:30

Welcome drink - Knežev dvor/Rector's Palace

Welcome speeches:

Louisa Vinton, UN Resident Coordinator and UNDP Resident Representative in Croatia

Andro Vlahušić, Mayor of the City of Dubrovnik

Thursday, 7th April 2011

Conference venue - Hotel Excelsior

07:30-09:00

Registration - Hotel Excelsior

09:00-09:45

Conference opening session

Moderator: Mislav Togonal

Introductory and welcome remarks

Kori Udovički, UN Assistant Secretary-General and UNDP Assistant Administrator and Regional Director

Engelbert Ruoss, Director of UNESCO Venice Office

Zlatko Ivaniš, Director of Environmental Protection and Energy Efficiency Fund of Croatia

Nataša Vujec, State Secretary, Ministry of the Economy, Labour and Entrepreneurship of Croatia

Representative of the Ministry of Economic Development of Italy

Representative of the German Government

Jasen Mesić, Minister, Ministry of Culture of Croatia

09:45-11:15

Opening session - P1: Energy efficiency in cultural heritage - wishful thinking or reality?

Moderator: Mislav Togonal

Energy efficiency and building conservation are two important aspects of sustainability. The key lies in balancing the historical value of the building, implementing efficient energy consumption and satisfying the needs and comfort of the occupants. The implementation of energy efficiency measure within cultural heritage requires creative and advanced technological solutions, new tools, education and training, a change in behaviour of the various building occupants, adequate building management, and a multidisciplinary approach. Cooperation among key stakeholders, such as building owners, engineers, architects and conservers, is a must. The proof that energy efficiency in cultural heritage is indeed possible is seen in a number of excellent examples that will be presented at the conference.

Opening address:

Vlasta Zanki - *Energy efficiency and energy management in cultural heritage public buildings*

Keynote speakers:

Nicholas Heath - *Energy efficiency and microgeneration in historic buildings in Edinburgh's UNESCO World Heritage Site*

Joseph King - *The role of conservation departments in the process of restoration and application of energy efficient technologies in cultural heritage buildings and old city centres*

Livio de Santoli - *Energy efficiency in historical building and European directives*

Paolo Snidero - *Financial instruments for local development and urban regeneration*

Panel discussion

11:15 - 11:45 **Coffee break**

11:45-13:15 **Plenary session - P2: Introducing new technologies and scientific tools to improve energy efficiency of historical buildings and old city centres**

Moderator: prof. Dušan Gvozdenac

There is no one single solution for improving energy efficiency in cultural heritage buildings. However, there are many new technologies and scientific tools that could be used, including innovative heating systems, smart energy management, the use of various renewable energy sources, building simulations to identify the risks of damage, and infrared thermography. Engineers, architects, conservers and building owners need to be aware and actively seek new technological solutions when tackling building restoration.

Keynote speaker: Günter Pfeifer - *The cybernetic principle -the other method of energy efficiency*

Alexandra Troi - *Historic buildings and city centres - the potential impact of conservation compatible energy refurbishment on climate protection and living conditions*

Blanda Matica – *Case study for Veliki Tabor Croatia*

Marino Grozdek - *Heat pump systems with renewable energy sources*

Panel discussion:

Francesca Becherini, Torun Widström, Gianni Pietrobon, Michele Sbrissa, Ivanka Boras, Andrea Bondi

13:15 - 14:15 **Lunch**

14:15-15:45 Parallel sessions S1a and S2a

Parallel session S1a: Energy management plans and energy efficiency in old city centres

Moderator: Engelbert Ruoss

City management plans can provide a sustainable framework for the protection of cultural heritage and the implementation of energy efficiency measures and improved energy management. It can also improve the quality of life in historical centres, as well as provide a powerful tool for economic and social development. This session will present efficient and sustainable energy strategies for the revitalization of historical centres and their implementation.

Introductory speeches:

Anđelka Visković, Deputy Mayor of the City of Split

Luigi Bassetto, Institutional Affairs Director of the City of Venice

Ivanka Jemo - *Energy Saving Through the Restoration Projects of Dubrovnik*

Goran Nikšić - *Conservation and Management of the Historic Core of Split*

Aleksandar Bogdanović - *Beautiful Cetinje*

Luka Vidović - *Increasing Energy Efficiency of Cultural Heritage Buildings within Historic Core of Split by Improving Current Management System and Implementing Revitalization Project*

Greg Keeffe, Tom Jefferies - *Future Heritage: is Carbon neutrality possible in historic neighbourhoods?*

Panel discussion:

Aitziber Egusquiza, Matteo Bertoneri, Dragica Arnautović-Aksić, Anna Paraskevopolou

Parallel session S2a: Energy efficiency in cultural heritage buildings: presentation of case studies

Moderator: prof. Tonko Ćurko

This session will present successful cases in implementing EE technologies in cultural heritage buildings.

Keynote speaker: Britta von Rettberg -

„Viewing, understanding and applying successfully“

Marcello Gusso - *Restoration of St. Claire's Former Convent in Gorizia*

Alexandra Troi - *Ansitz Kofler in Bolzano/Italy: Energy retrofit to near passive house standard and towards zero emission for heating and cooling*

Igor Skelin - *Hi-VRV III - High Energy Efficient Cooling And Heating System In Cultural Heritage Buildings*

Panel discussion:

Francesca Brancaccio, Marko Križanec, Birgit Dulski, Fausto Bisi

15:45 - 16:00

Coffee break

16:00-17:30 Parallel session S1b and S2b

Parallel session S1b: Renewable energy sources and energy efficient lighting in old city centres

Moderator: Marko Križanec

This session deals with the implementation of renewable energy sources in cultural heritage buildings and urban areas, as well as energy efficient lighting solutions that contribute to the visual identity of old city centers, all done in a sustainable way.

Francesco Simonetti - *Tenuta dello Scompiglio, a large utilization of renewable energy sources in the heart of Tuscany*

Gordana Lučić - *ESCO projects in the old city centers - public lighting*

Senka Ibrišimbegović - *Energy efficient architectural lighting in promoting cultural heritage in Bosnia and Herzegovina*

Panel discussion:

Pierluigi Fecondo, Daniela Bosia, Marko Križanec, Vladimir Kocet, Gabriele Landi, Diana Galić

Parallel session S2b: Energy efficiency in cultural heritage buildings: presentation of case studies in the planning phase

Moderator: Marino Grozdek

This session will present case studies in the planning phase in implementing EE technologies in cultural heritage buildings.

Emir Kahrovic - *Reconstruction and conversion of "Tvornica duhana Zagreb" into Croatian History Museum*

Anders Brüel - *Energy conservation in a historic building in practice*

Maja Popovac - *The Captain's Tower in Bihac*

Ana Paula da C. Esteves, Louise Land Bittencourt

Lomardo - *The façades technological updating of an icon of Brazilian modernist architecture: the case of the IRB headquarters building*

Vladimir Turina - *The application of energy-efficient technologies-Viessmann*

Dino Juriša - *The application of energy-efficient technologies - Bosch*

Panel discussion:

Barbara Kulmer, Viktor Kushnirenko, Siniša Cvijić, Tijana Glamočić, Walter Sedovic, Jill H. Gotthelf

20:00-23:00 Energy dinner - Revelin Fortress

Welcome speeches:

Alessandro Liberatori, ICE - Italian Trade Commission

Francesco Fiermonte, OICE

Hrvoje Hrabak, Croatian Architects' Association

GIZ representative of GIZ

Friday, 8th April 2011

08:00-09:00 **Registration - Hotel Excelsior**

09:00-10:00 **Parallel session S2c and S2d**

Parallel session S2c: Energy efficiency in cultural heritage buildings: how to improve the building envelope

Moderator: prof. Branimir Pavković

In most cases, the concept of the building envelope in cultural heritage buildings is the most important part of building conservation. This session will feature examples of implementing new technologies in respect to the building envelope without violating the historical character of cultural heritage buildings.

Roger Curtis - Improving Energy Efficiency in Traditional Structures: Work by Historic Scotland

Daryl Gambarana - Historic Royal Palaces Insulation Project

Aleksandar Terer - History has a Future

Panel discussion:

Alan Braun, Iva Muraj, Žarko Španiček, Željka Perković, Araceli Salto Saura, Lluís Balart

10:00 - 10:15 **Coffee break**

Parallel session S2d: Energy efficiency in cultural heritage buildings: Prevention of moisture in historical buildings and traditional architecture

Moderator: Silvio Novak

The installation of HVAC systems and the over-sealing of cultural heritage buildings can lead to considerable condensation problems. Various solutions proved to be effective in improving the quality of life in cultural heritage buildings without compromising the historical character of the building. One can implement EE measures within traditional homes and still maintain their historical value. The same can also be converted and utilized for a different purpose (e.g., tourism) by implementing new EE technologies and simultaneously preserving the buildings' traditional values. Traditional architecture indeed provides excellent examples of good building practice that could help design future sustainable buildings.

Escobar González, A. - Three different approaches for patios in urban palaces and changes in their hydrothermal performances

Fodil Fadli - Retrofitting Heritage Buildings in the Middle East & North Africa Integrative Passive Design Solutions in Heritage Cities

Panel discussion:

Bojan Milovanović, Escobar González, Dragana Petrović, Jelica Jovanović, Mladen Divković, Zora Salopek Baletić, Sanela Klarić, Jacqui Donnelly

10:15-11:45 Plenary session S2e: Energy efficiency in cultural heritage buildings: improving heating and cooling systems

Moderator: Goran Čačić

Thermal comfort measures the level of satisfaction with the indoor climate. The main task of energy efficiency in cultural heritage buildings is to maintain adequate thermal comfort while lowering energy consumption. This session will feature examples that show improvement in energy efficiency whilst providing thermal comfort.

Keynote speaker: Winfried Brenne - Energetic refurbishment of monuments in Berlin

Bernard Franković, Marko Franković - Energy efficient HVAC system of the Croatian national theatre building in Rijeka

Jan Holmberg, Bengt Kylsberg, Per Nelander - Improving the energy efficiency in an 800-year-old building

Branimir Pavković - Improving energy efficiency of the art school in Dubrovnik

Renato Kriškić - KNX Standard Enables Significant Energy Savings

Dinko Stipaničev - LG way in energy efficiency

Panel discussion:

Haris Lulić, Marino Grozdek, Magdalini Makrodimitri

11:45 - 12:45 Lunch

12:45-14:45 Plenary session S3: Legislation and education

Moderator: prof. Livio de Santoli

The standards of energy efficiency in cultural heritage buildings must be improved in order to meet the demands of sustainable development and fight climate change. Experience from some countries shows that approximately 25% of the building stock is under the conservers' protection. This session will discuss in detail the implementation of existing and the application of new standards and guidelines in cultural heritage buildings. Education plays a key role in implementing energy efficiency in cultural heritage buildings, and as such it has an essential role in sustainable development as well.

Keynote speakers: Wolfgang Karl Göhner - The impact of EU-Legislation on Cultural Heritage – Observatory Function of EHLF and implementation in Member State Law

Marie- Noël Tournoux - Heritage and sustainable development: drawing insights (or key issues) in managing resources and energy from global to local scale

Johannes Sima - *Lessons Learned from the Austrian Experience of a European Problem: Energy Management at Cultural Sites*
Giovanni Cafiero - *Legislative framework, role and education of Conservation departments, rules and planning experiences in Italy for historical centres and rural settlements*
Margareta Zidar - *Integrated approach to energy efficiency in cultural heritage buildings*
Silvio Bašić - *Architectural policy*

Panel discussion:

Giovanni Cafiero, Anaïs Cloux, Sanda Zenko, Marcello Gusso, Milenko Stanković, Srđan Stanković

14:45 - 15:00 **Coffee break**

15:00-16:15 **Plenary session S4: How to finance EE project in cultural heritage buildings**

Moderator: Davide Poletto

Implementing energy efficiency in cultural heritage buildings may not be as complex and financially burdening as it might seem at first glance. However, the restoration of cultural heritage buildings does generally require significant funding. The EE facet ought to be considered while preparing a building's restoration project. In this session, various models of funding EE projects in cultural heritage buildings, including budgeting, loans, ESCO models, etc., are presented. In addition, several European projects that tackled the various modes of implementing EE measures in cultural heritage buildings will also be presented.

Siniša Šešum - *UNESCO Venice Office actions towards Energy Efficiency in cultural heritage*

Mirna Sabljak - *The financing of the cultural property protection and preservation programme*

Jadran Antolović - *Monument annuity – the Croatian experience*

Andrea Baggioli, Massimiliano Condotta - *SPINE: SPIN-Energy Efficiency & Urban Development Planning. Case studies for energy efficiency in historical buildings*

Panel discussion:

Gordana Lučić, Irena Dubravec, Ioannis Poullos, Alexandra Troi, Roberto Lollini

17:00-19:30 **Conference boat excursion and reception**

Saturday, 9th April 2011

10:00-11:00 **Dubrovnik sightseeing (optional)**

3 About the conference

Background

The principles and standards of cultural heritage protection are fully implemented in building restoration projects. However, the challenge remains on how to harmonize the interests and requirements of cultural heritage protection with the demand for increased energy efficiency, i.e. a reduction in the costs of maintaining cultural heritage buildings and in the effects on the environment. Modifications to buildings must be kept to a minimum in order to preserve their historic value, but certain improvements must be made to enable a pleasant heating temperature for the people in these buildings.

The many cultural heritage buildings in Croatia make energy efficiency in cultural heritage buildings a particularly pertinent subject. The link between improving energy efficiency on the one hand and protecting cultural heritage on the other is a topic that is both familiar to the countries of the region and to the rest of the European Union.

Consequently, all new findings and information gathered through completed projects of this kind allow for more insight in what has been accomplished so far and what is yet to be done.

The project Removing Barriers to Energy Efficiency in Croatia (the EE Project) is a joint project of the Ministry of the Economy, Labour and Entrepreneurship (MELE) and the United Nations Development Program (UNDP) in Croatia, implemented with support from the Environmental Protection and Energy Efficiency Fund (FZOEU) and the Global Environmental Facility (GEF). The main goals of the project are the application of a continuous and systematic model of energy management, strategic energy planning and sustainable energy resources management in cities and counties, and in the state administration of the Republic of Croatia. The EE Project embraces the project Systematic Energy Management in Cities and Counties of the Republic of Croatia (SEM), focusing on the buildings of local and regional self-government, and the House in Order (HIO) programme, whose aim is to increase energy efficiency in state administration buildings.

Examples of completed energy efficiency projects

Projects will be presented at the conference where a successful compromise has been reached between the requirements of conservation departments and the need to improve energy efficiency in buildings that take into account global trends and the legislation in force. These projects show that energy consumption has been reduced and energy efficiency improved by applying the best available solutions.

Conference goals:

- promotion of best practice and standards in the field of energy infrastructure reconstruction, upgrading and energy efficiency in general in cultural heritage buildings;
- raising awareness of contemporary ways of protecting and restoring cultural heritage;
- education on efficient maintenance of cultural heritage buildings and increasing their energy efficiency;
- linking concepts in the field of energy efficiency, energy management and environmental protection with cultural heritage protection;
- sustainable cultural heritage management;
- disseminating information on new materials and technologies in the field of protecting cultural heritage buildings, by taking into consideration sustainable development and energy protection;
- promotion of cultural heritage protection and energy efficiency as a resource in economic development;
- preparation of guidelines for the future restoration of cultural heritage buildings, urban sections and old city centres.

Within the Conference...

...exhibitions!

Companies providing products and services that have recently been applied to successfully increase energy efficiency will exhibit what they have to offer - obtain first-hand information on what has just been applied in practice!

...invited speakers!

Unique topics in the field will be presented, and your questions answered by experts in charge of energy management projects in cultural heritage buildings, implemented in Croatia and abroad - with an explanation of the technical background in each project, the legislative and financial framework, and ways of planning and implementing similar projects based on personal experience.

...presentations!

What do decision makers, including mayors, leaders of local and regional self-government, investors, architects, engineers in the construction industry and other stakeholders in energy management in cultural heritage, need in order to properly identify, plan and implement energy-efficiency projects in cultural heritage buildings? The technical part of the Conference, consisting of invited speakers and professional workshops will provide you with precise hands-on knowledge necessary for further work in the sector of energy management in cultural heritage.

Overview of Conference topics

The Conference will provide an overview of activities necessary for energy management in old city centres and cultural heritage buildings, from energy audits and establishing the exact condition of the building, to developing measures to increase energy efficiency and to finance and apply these measures.

Technologies and services used will be discussed, ranging from simple solutions to complex energy management systems. The topics include:

Historical buildings

- examples of best practice in increasing energy efficiency in cultural heritage buildings;
- implementation of renewable energy sources in cultural heritage buildings and old city centres;
- energy audits of cultural heritage buildings;
- energy certification of cultural heritage buildings;
- application of superior technologies in the measurement and analysis of existing conditions of cultural heritage buildings (such as thermography);
- improvement of conditions - increasing thermal comfort in cultural heritage buildings (installation of heating, ventilating and air-conditioning systems) - problems and challenges;
- implementation of automation systems in cultural heritage buildings;
- mounting of modern installations, heating and cooling systems in cultural heritage buildings;
- application of new materials in the restoration of cultural heritage buildings.

4 About the organizers



UNDP Croatia

UNDP is the UN's global development network, an organization advocating change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in 166 countries, working with them on their own solutions to global and national development challenges. By connecting people with knowledge and sharing global experience, UNDP builds partnerships and helps mobilize resources, while at the same time assisting Croatia in sharing its own development experience and expertise with others.

The House in Order Programme (HIO Programme) of the Government of the Republic of Croatia is implemented within the national project Removing Barriers to Energy Efficiency in Croatia (the EE project) with the aim of sending a message to the public that energy efficiency is not intended for someone else, but that the state administration is focused and ready to reduce energy consumption in its buildings, i.e. to reduce costs, which directly results in saving taxpayers' money. It is estimated that the potential for financial savings from energy and water in state administration buildings amounts to at least 10% without additional investments, and 20-30% with minor investments. The resources saved can then be redistributed to other priority areas of general public interest.

In addition to its programme in energy efficiency, UNDP in Croatia focuses on environmental protection (particularly on the Dalmatian coast), local development (particularly in war-affected areas), support to social inclusion, and improving human security and enhancing the efficiency of the judicial system. All of these initiatives are structured to support Croatia's efforts to prepare for European Union membership.

www.undp.hr



Venice Office
Regional Bureau for Science
and Culture in Europe

UNESCO

UNESCO works to create the conditions for dialogue among civilizations, cultures and peoples, based on respect for commonly shared values. It is through this dialogue that the world can achieve global visions of sustainable development encompassing observance of human rights, mutual respect and the alleviation of poverty, all of which are at the heart of UNESCO's mission and activities.

www.unesco.org



*Bosnia and
Herzegovina*

UNDP Bosnia and Herzegovina

Bosnia and Herzegovina (BiH) is a country with great human capital and valuable natural resources. Many of today's development challenges in BiH are the direct consequence of the country's recent past. However, the country shares a common vision of a future in the European Union, and steady progress towards this goal is being made. BiH's commitment to EU accession is generating the necessary momentum for political, economical and social reforms.

UNDP builds and fosters partnerships with other development actors, and at the same time supports BiH to share its own development experience and expertise with others. UNDP is assisting the country in its efforts to become a member of the European Union, and focuses on local socio-economic development, the inclusion of vulnerable groups, support to judicial reform, and environmental management and energy efficiency.

www.undp.ba



Open Regional Fund (ORF-E)



Federal Ministry
for Economic Cooperation
and Development

GIZ Open Regional Fund (ORF-E) with the German Federal Ministry for Economic Cooperation and Development

Established on 1 January 2011, GIZ brings together under one roof the long-standing expertise of the Deutscher Entwicklungsdienst (DED) GmbH (German Development Service), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation) and Inwent - Capacity Building International, Germany. As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Working efficiently, effectively and in a spirit of partnership, GIZ supports people and societies in developing, transition and industrialized countries in shaping their own futures and improving living conditions. This is what the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is all about.

Most activities are commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). GIZ also operates on behalf of other German ministries – in particular the Federal Foreign Office, the Federal Environment Ministry and the Federal Ministry of Education and Research – as well as German federal states and municipalities, and the public and private sector.

GIZ operates in more than 130 countries worldwide. In Germany it maintains a presence in nearly all the federal states. Its registered offices are in Bonn and Eschborn. GIZ employs approximately 17,000 staff members worldwide.

*www.gtz.de
www.bmz.de*

ICE - The Italian Institute for Foreign Trade

The Italian Institute for Foreign Trade (ICE, Istituto nazionale per il Commercio Estero) is the Italian government agency entrusted with the promotion of trade, business opportunities and industrial co-operation between Italian and foreign companies. It supports the internationalization of Italian firms and their consolidation in foreign markets.

ICE can provide information and assistance to foreign companies that wish to develop business with their Italian counterparts. ICE also carries out an intense training activity for Italian and foreign managers operating on international markets, fostering the promotion of made-in-Italy products. Located in Rome, the Head Office operates in connection with a wide network of offices in Italy and abroad to guarantee global support to Italian firms.

www.ice.gov.it - for Italian companies. It contains information on foreign markets, ICE activities, assistance and promotional services.

www.italtrade.it - the Made in Italy Official Portal for foreign companies. It contains information on Italian production and a databank of Italian exporting companies [the Made in Italy Business Directory].

www.italtrade.com

Ministry of Economic Development of the Republic of Italy

The Italian Ministry of Economic Development includes Productive Activities, International Trade, Communications and Cohesion Policies. It is the Administration reference for important sectors of the Italian economy, both in the promotion and development of the competitiveness of the national production system, and in terms of the harmonization and monitoring of the internal market.

The Ministry has responsibility for planning, coordination, implementation and monitoring of interventions for development and economic, social and territorial cohesion, with particular emphasis on under-utilized areas.

The Ministry puts in place policies to support the competitiveness of large enterprises in strategic sectors, and implements policies for industrial districts, for the development of technological innovation, and for the re-industrialization and reconversion of industrial areas affected by crisis. The Ministry also sets policies for the industrial development of small and medium-sized enterprises. It elaborates the lines of national energy policy and coordinates activities related to the interventions of national and regional planning in energy and mining. It is also active in telecommunications, international trade, the promotion and protection of industrial property, and in monitoring actions to combat counterfeiting and to protect intellectual property.

www.sviluppoeconomico.gov.it



OICE

OICE is an employers' association, belonging to Confindustria (the Confederation of Italian Industry), which represents Italian engineering, architectural and technical economic consulting organizations. Founded in 1965, OICE unites all major Italian engineering companies and most of the best qualified small and medium firms in the sector.

OICE operates in 4 major areas: representing and safeguarding category interests, promoting the culture of organized engineering, providing services for members, and promoting the internationalization of Italian engineering.

www.oice.it

Croatian institutions



**MINISTARSTVO GOSPODARSTVA,
RADA I PODUZETNIŠTVA**

Ministry of the Economy, Labour and Entrepreneurship of the Republic of Croatia

The Ministry of the Economy, Labour and Entrepreneurship conducts an active policy of employment and administrative and other work concerning industry, except the food and the tobacco industry; shipbuilding; energy; mining; crafts; cooperatives, except agricultural cooperatives; small and medium enterprises; trade; trade policy; national production protection policy; economic cooperation with foreign countries; involvement in European economic integration; coordination of activities concerning Croatia's membership in the World Trade Organization and participation in multilateral trade negotiations within the framework of this organization; export and foreign investment promotion; the establishment and development of enterprise zones and free zones, analysis of the situation on the market; supply and prices; consumer protection; strategic commodity reserves; privatization of shares and stakes in companies owned by the Republic of Croatia; restructuring and recovery of legal entities.

The Ministry conducts work concerning: the promotion and systematic enhancement of crafts, cooperatives, except agricultural cooperatives, small and medium enterprises; the effects of economic instruments and economic policies and measures for the development of crafts, cooperatives, small and medium enterprises and business activities of craftsmen and entrepreneurs; international cooperation, implementation of special programmes of the Government of the Republic of Croatia in the area of crafts, cooperatives, small and medium enterprises.

www.mingorp.hr

Ministry of Culture of the Republic of Croatia

The Ministry of Culture of the Republic of Croatia performs administrative and other tasks in the area of culture related to: the development and enhancement of culture, cultural and artistic creativity, cultural life and cultural activities; founding of institutions and other legal entities in culture; promotion of cultural ties with other countries and international institutions; expert and administrative tasks for the Croatian UNESCO commission; administrative tasks in the area of informing the public; stimulation of cultural needs programmes of Croatian people living abroad; ensuring financial, material and other prerequisites for practising and developing cultural activities, especially museums, galleries, libraries, archives, theatres, musical and theatrical performances, publishing, fine arts and film.

The Directorate for Cultural Heritage Protection and the Directorate for Archives and Archaeology within the Ministry of Culture are the competent bodies for performing administrative and expert duties connected with the protection and preservation of cultural goods.

www.min-kulture.hr

Environmental Protection and Energy Efficiency Fund of Croatia

The Environmental Protection and Energy Efficiency Fund is an extra-budgetary fund and legal entity vested with public authority, which was established in 2003 by the Government in order to perform its politics and activities with responsible ministries MEPPPC and MELE. The Fund is a major financial institution within Croatia that supports programs, projects and other activities involving legal entities and persons. It subsidizes interest rates, it provides financial aid and grants, it acts as a National EE Agency along with MELE, all according to the Act on the End-use of Energy Efficiency, and it's an intermediate body for projects financed by EU structural funds. Until 2010, the Fund approved over EUR 55,9 million for 1,204 projects EnU and OIE use, of which EUR 12,6 million financed UNDP Croatia's implementation of the Project "Removing Barriers to Improving Energy Efficiency in the Residential and Service Sectors" – Information Campaign, including the Project "Systematic energy management in cities and counties" as well as the Program "Bringing Own House in Order".

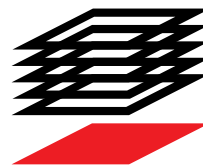
www.fzoeu.hr



Croatian Architects' Association

The Croatian Association of Architects (CAA) is a national organization aimed at coordinating the interests of professional architects on Croatian territory, and establishing relations with other related national and international organizations. The objectives of the CAA are: the development and promotion of Croatian architecture and urbanism, a commitment to a diverse and continuous development of Croatian architecture, the development and promotion of the architectural profession, the promotion of modern architecture, maintaining the reputation of architects, participating in environmental protection, fostering connections with other areas of human creativity and protecting its members.

www.uha.hr



Croatian Chamber of Architects

The Croatian Chamber of Architects was established as the successor to the tradition and heritage of associations and organizations of architects, and it continues the sequence of organized vocational associations of architects in Croatia. In accordance with the Constitution, regulations and Statute, the Code of Professional Ethics, the Ordinance on Prices of Services and other bylaws of the Chamber, the Chamber promotes architecture as the expression of the identity of the people and the culture of building, and it improves architectural activity with the goal of protecting public interest and the interests of third parties.

The Chamber protects the reputation of the vocation, the honour and rights of authorized architects, promotes and ensures the conditions for the correct performance of the tasks of authorized architects, and determines the fundamental principles and rules of conduct towards society, the vocation, clients and its employees during the performance of the obligations of authorized architects.

The Chamber is a legal person with public authorization with its seat in Zagreb, Ul. grada Vukovara 271. A member of the Chamber is a person who has acquired the right to use the vocational title of "authorized architect".

www.arhitekti-hkaig.com



The Zagreb Architects' Society

The Zagreb Architects' Society (ZAS) is one of the most influential societies of architects in Croatia. Its long history dates back to 1878. Its main objectives are the development, conservation and recognition of Croatian architecture, urban planning and conservation of the environment.

ZAS has more than 1,000 active members, which include prominent architects, urban planners, engineers in landscape architecture, and interior designers. Through its various activities, ZAS promotes the interests of its members - it organizes and conducts competitions in the field of architecture and urban planning, it organizes and prepares educational programmes, and contributes to the drafting of laws and regulations that impact on the boundaries of architectural creativity.

www.d-a-z.hr



The City of Dubrovnik Development Agency

The City of Dubrovnik Development Agency is a local company with the aim of promoting and improving all the prospective projects of the city of Dubrovnik, so as to facilitate the creation of development management mechanisms, and to create a favourable entrepreneurial climate.

The City of Dubrovnik Development Agency operates with the aim of achieving balanced economic development of the city of Dubrovnik, and coordinates existing development activities in compliance with regional needs.

Its vision is to take the lead in the strategically sustainable and carefully thought-out development of the city of Dubrovnik, by being innovative, creative and entrepreneurial.

Its goals focus on:

- enhancing small and medium enterprises in accordance with national needs and EU requirements
- planning future economic development with neighbouring regions
- the development of human resources and education
- the creation of new employment, encouraging economic development
- attracting domestic and foreign investment in the region

www.dubrovnik.hr



The German Croatian Chamber of Industry and Commerce

The German Croatian Chamber of Industry and Commerce (DKIHK) is a member of the German Chamber Network (AHKs) with 120 locations in 80 countries around the world. DKIHK has the function of an official representative of German industry and commerce, it is a member of the organisation and it provides a wide range of services to companies from Germany and Croatia.

kroatien.ahk.de

5 Partner cities

Dubrovnik – a European Cultural Centre

The millennial history of Dubrovnik, the Pearl of the Adriatic, comes alive in every nook and cranny of this museum city, a perfect cross between the past and present. A UNESCO World Heritage Site since 1979, its main attraction is the unique medieval ramparts surrounding the city.



Its rich history, geographic location, mild climate, traditional hospitality and excellence make Dubrovnik a recognizable brand. Dubrovnik is Croatia's undisputed convention centre with more conventions, congresses and corporate incentive programmes than any other location in the country. The city is a destination of culture, as witnessed by its many festivals, prestigious art exhibitions and major open-air events, and of course, its magnificent architectural heritage.

Sixty years of the Dubrovnik Summer Festival, ten years of the Julian Rachlin & Friends Chamber Music Festival, the world-renowned Libertas Film Festival and the excellent Early Music Festival add to this testimony. The Festivity of St. Blaise, honouring the city's patron saint for already over a thousand years, is now on the UNESCO list of intangible heritage.

Dubrovnik is easily reached from all major European cities. It is a destination that will leave you enchanted, and one you will surely come back to...

The City of Venice, Italy

Venice is the regional capital of Veneto, one of the richest and most economically dynamic regions of Europe. In National and European contexts, Venice could be considered a medium-sized city based on its territorial surface area (413 km², of which 253 km² are constituted by its lagoon) and based on its population (270,900 residents, 31/01/2011 – source: City of Venice – Department of Statistics).



Venice is the centre of a metropolitan area which includes 25 municipalities with over 700,000 inhabitants who have strong and frequent relations with the regional capital, whether for work or studies, business, tourism or shopping. The city area, or "Comune" of Venice, includes the historical centre of Venice, the Lido island, the islands of the Lagoon (Murano, Burano and other smaller islands), as well as the urbanised mainland areas of Mestre and Marghera.

Porto Marghera, one of Europe's largest industrial coastal areas, is currently experiencing a deep economic, employment and environmental crisis and is in urgent need of new development projects.

Among the several international activities and projects carried out by the municipality, Venice has put forward its city and the North East territory as candidate for the European Cultural Capital in 2019.

The City of Split

Split is the economic and administrative centre of Central Dalmatia, with about 200,000 inhabitants.

The site was first settled when, at the end of the third century AD, the Roman Emperor Diocletian built his palace there.

The importance of Diocletian's Palace greatly transcends local significance due to its level of preservation and the buildings



of succeeding historical periods built within its walls, which form the very heart of the old town of Split today.

Many of Split's historical and cultural buildings can be found within the walls of Diocletian's Palace. In addition, numerous museums, the National Theatre, as well as old churches and other archaeological sites in the Split region make it an important cultural attraction. In 1979, the historic centre of Split was included in the UNESCO list of World Heritage Sites.

The city of Split has been actively involved in the implementation of the Energy Management project, and was among the first to sign the Energy Charter. This Charter is a UNDP-sponsored commitment undertaken by representatives of local and regional government to manage energy efficiently. The city of Split has set as a priority the environmental and rational management of resources for the benefit of local communities and all citizens.

6 The organizing committee

Louisa Vinton, UNDP Croatia
Alessandro Fracassetti, UNDP Croatia
Zoran Morvaj, PhD, UNDP Croatia
Sandra Vlašić, UNDP Croatia
Sandra Magajne, UNDP Croatia
Vlasta Zanki, PhD, UNDP Croatia
Zoran Bogunović, UNDP Croatia
Nina Zatezalo, UNDP Croatia
Sanja Horvat, UNDP Croatia
Mislav Kirac, UNDP Croatia
Anamarija Brstilo, UNDP Croatia
Grga Mirjanić, UNDP Croatia
Sunčana Ljubičić-Matić, UNDP Croatia
Lana Dolenec, UNDP Croatia
Engelbert Ruoss, UNESCO - Venice Office
Davide Poletto, UNESCO - Venice Office
Alessandro Liberatori, ICE Zagreb
Francesco Fiermonte, OICE
Ettore Santi, ICE-OICE
Hartwigg Rupp, GIZ Office Sarajevo
Dubravka Bosnjak, GIZ Office Sarajevo
Toni Jukić, GIZ Office Zagreb
Nikolina Mijatović, GIZ Office Zagreb
Igor Raguzin, Ministry of the Economy, Labour and Entrepreneurship
Irena Dubravec, Environmental Protection and Energy Efficiency Fund
Goran Vukmir, UNDP Bosnia & Herzegovina
Biserka Simatović, City of Dubrovnik
Vera Đokaj, City of Dubrovnik Development Agency
Hrvoje Hrabak, Croatian Architects' Association
Damir Ljutić, Zagreb Architects' Society
Mirna Sabljak, Ministry of Culture

7 The programme committee

Vlasta Zanki, PhD, UNDP Croatia

Zoran Morvaj, PhD, UNDP Croatia

Mislav Kirac, UNDP Croatia

Iva Nekić, UNDP Croatia

Vanja Lokas, UNDP Croatia

Engelbert Ruoss, UNESCO – Venice Office

Davide Poletto, UNESCO – Venice Office

Siniša Šešum, UNESCO - Antenna Office Sarajevo

Prof. Tonko Ćurko, PhD, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb

Prof. Branimir Pavković, PhD, Faculty of Engineering, University of Rijeka

Marino Grozdek, PhD, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb

Nada Marđetko Škoro, MSc, Ministry of Environmental Protection, Construction and Physical Planning

Marko Križanec, MBA, Energo

8 Detailed overview of the conference sessions with papers' summaries and authors' CV's

Thursday, 7th April 2011

9:45-11:15

Opening session - P1: Energy efficiency in cultural heritage - wishful thinking or reality?

Moderator: Mislav Togonal

Energy efficiency and building conservation are two important aspects of sustainability. The key lies in balancing the historical value of the building, implementing efficient energy consumption and satisfying the needs and comfort of the occupants. The implementation of energy efficiency measure within cultural heritage requires creative and advanced technological solutions, new tools, education and training, a change in behaviour of the various building occupants, adequate building management, and a multidisciplinary approach. Cooperation among key stakeholders, such as building owners, engineers, architects and conservers, is a must. The proof that energy efficiency in cultural heritage is indeed possible is seen in a number of excellent examples that will be presented at the conference.

Opening address:

Vlasta Zanki - *Energy efficiency and energy management in cultural heritage public buildings*

Keynote speakers:

Nicholas Heath - *Energy efficiency and microgeneration in historic buildings in Edinburgh's UNESCO World Heritage Site*

Joseph King - *The role of conservation departments in the process of restoration and application of energy efficient technologies in cultural heritage buildings and old city centres*

Livio de Santoli - *Energy efficiency in historical building and European directives*

Paolo Snidero - *Financial instruments for local development and urban regeneration*

Panel discussion



Vlasta Zanki

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Presentation title

Energy efficiency and energy management in cultural heritage public buildings

Presentation resume

The Governmental programme „Bringing your own house in order” was launched and implemented in Croatia over two years ago to improve energy efficiency in government-owned buildings. A significant number of buildings are under the protection of conservers either as individually protected building or as part of an entire protected old city centre. Approximately 3000 buildings and office spaces are currently under revision. They are located on 2, 21 mil square meters in more than 240 municipalities throughout Croatia. The buildings’ annual consumption is estimated at 435 million Kuna (58,8 million EUR). Extensive analysis has shown that protected buildings and buildings located within protected old city centres account for approximately 230 million kWh of the total yearly energy consumption, their emissions amount to 67 thousand tCO₂, and

they cost 105 million Kuna per year (14,2 million EUR/year). This paper elaborates on the energy performance of a specific group of buildings, and on their condition regarding the building envelope and the HVAC systems. Furthermore, the energy efficiency measures that could be implemented take into account the buildings’ level of preservation. Although protected buildings are excluded from numerous regulations regarding energy efficiency, significant savings could be obtained by implementing specific energy efficiency measures, proper energy management and a change in the occupants’ behaviour.

Biography

In 1998, Vlasta Zanki was awarded a degree in mechanical engineering with a specialization in process energy engineering from the University of Zagreb. In 2002, she attained a Master of Science and in 2006, a Technical Doctorate in energy engineering with a specialization in energy efficiency from The Royal Institute of Technology, Stockholm, Sweden. As a young researcher, for ten years she worked in the Faculty of Mechanical engineering and Naval Architecture, at the University of Zagreb. In 2006, she joined UNDP’s Energy Efficiency project as a Project Associate, and in 2008, she was promoted to Project Manger of “Bringing your own house in order,” a governmental programme implemented by UNDP Croatia, whose aim is to improve energy efficiency in government-owned buildings. She leads a team of some 100 staff members, assistants and project experts. She is the author of a number of professional and scientific papers related to energy efficiency in HVAC systems and renewable energy sources. She is also the co-author and editor of 5 publications that delve into energy efficiency and energy audits. She has extensive international experience. She was a guest lecturer at The Royal Institute of Technology for four years.

Presentation title

Energy efficiency and renewable energy in Edinburgh's UNESCO World Heritage Site

Presentation resume

The historic centre of Edinburgh in Scotland is a UNESCO World Heritage Site. 75% of its buildings are listed, and the quality of the architecture draws thousands of visitors to this capital city every year. However, many of these buildings have very poor energy efficiency and high CO₂ emissions. This places many residents at high risk of fuel poverty. Local sustainable development organisation Changeworks has been carrying out research and demonstration projects in this World Heritage Site for many years. Working with key partners in Scottish building conservation, they have installed sensitive and groundbreaking energy efficiency measures into listed Georgian (1820s) buildings, together with microgeneration technologies to allow these valuable buildings to generate their own clean, sustainable energy. They have also published comprehensive best practice guides on energy efficiency and microgeneration in historic buildings. Changeworks' projects have won national awards, and led to planning policy changes across the capital city.

Biography

Nicholas joined the Scottish sustainable energy organisation Changeworks in 2006, and has developed and led award-winning retrofit projects in traditional and historic

Nicholas Heath

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buildings. These have included urban and rural properties, listed and unlisted, communal and individual, and properties sited in conservation areas and UNESCO World Heritage Sites. As Senior Project Officer, his primary role is to develop innovative projects, solutions and guidance focusing on carbon and fuel poverty reduction in hard-to-treat existing housing across the UK and further afield. His remit includes education and dissemination of project findings, and training and lecturing form a core element of this work. Nicholas has a background in social housing and sustainable energy. He wrote his MSc thesis on environmental sustainability in Scottish social housing, and has a particular interest in the environmental sustainability of older, traditionally-built housing, and in the significance of behaviour in realising truly sustainable energy.

Presentation title

The role of conservation departments in the process of restoration and application of energy efficient technologies in cultural heritage buildings and old city centres

Presentation resume

Climate change is one of the biggest tests that mankind will face in the next century. All sectors of the government and private enterprise, from industry to education to construction, will need to adapt their thinking and the ways they carry out their work, in order to reduce their use of energy to more sustainable levels. Many of us in the heritage field argue that we are dealing with special places and that the same overall levels of energy efficiency should not be applied to the heritage. One of the key challenges for heritage institutions is not just to ensure that heritage values can be conserved at a time when other sectors are reducing their consumption, but that the conservation of the cultural heritage can play a positive role in promoting overall energy efficiency and savings. Only by showing that we can be part of the solution to the problem, rather than an exception that needs to be accommodated, will we be able to make ourselves relevant actors in future society.

Joseph King

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Biography

Joseph King received a degree in Architecture from the University of Maryland and a Master of City Planning and a Master of Science in Historic Preservation from the University of Pennsylvania. He later attended the Architectural Conservation Course at ICCROM. He is currently the Unit Director of the Sites Unit at ICCROM, responsible capacity building programmes for the conservation of immovable cultural heritage around the world. He also leads a team of professionals in all aspects of ICCROM's role as an Advisory Body to the World Heritage Committee. Previously at ICCROM he was a Senior Project Manager working on the AFRICA 2009 programme. He was also involved in the development of the first Integrated Territorial and Urban Conservation course. From 1987 to 1990 he worked on a UNESCO project to develop an urban conservation plan for the Old Town of Mombasa, Kenya. From 1999 – 2002 he served as Secretary-General of the ICOMOS International Training Committee.



Livio de Santoli

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Presentation title

Presentation resume

The Italian Ministry of Heritage and Culture promoted the elaboration of "Guidelines for the efficient use of energy in cultural heritage". They provide guidelines for assessing and improving energy performance in protected cultural heritage, referring also to Italian regulations on energy conservation and the energy efficiency of buildings. They are intended to provide guidance not only to project designers but also the regional offices of the Culture Ministry. The former are given guidelines for assessing the existing energy performance of historical buildings and for designing interventions to improve energy efficiency, conceptually similar to those for unlisted buildings, but tailored to the needs

and specificities of cultural heritage. In addition, the Culture Ministry's regional offices for the protection of cultural heritage are given guidelines for assessing, as objectively as possible, both energy efficiency and the degree of conservation guaranteed by the intervention.

Biography

Full professor at University of Rome La Sapienza, (HVAC in Buildings), <http://w3.uniroma1.it/desantoli>; Former Dean of the Faculty of Architecture Valle Giulia, Sapienza University of Rome, 2009-2010

Energy Manager of University of Rome La Sapienza, Responsible of Energy Agency of the University (SAE) <http://sae.amm.uniroma1.it/sae>; Director of Department CITERA (Territory, Buildings, Restauration, Environment at University La Sapienza, <http://w3.uniroma1.it/citera>; President of Course Degree -Project Management-, Facoltà of Architecture, University La Sapienza, www.gestionedelprocessoedilizio.it; Director of the Master Course "Management of public Real Estate", Sapienza University of Rome; Professor of "HVAC in Historical Buildings" at PostGraduate School of Cultural Heritage Restauration; Member of International Advisory Board of the Journal Building Services Engineering Research & Technology (UK); Energy Consultant for Italian Parliament and the City of Rome (delegate of the Mayor); Vice President and Chairman of Technical Committee of REHVA (Federation of HVAC National Association), 1997-2002.



Paolo Snidero

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Presentation title

"Financial instruments for local development and urban regeneration"

Presentation resume

The new strategy action plan named EUROPE2020 and the reform of the Regulation EU N.539/2010 of the European Parliament of June 2010, have expressed the need to begin a joint environmental policy, using new financial instruments, created by International Financial Institutions and European Commission, aimed at identifying co-funds to be used in integrated projects of Urban Regeneration and Local Development, within which "Energy management and Cultural heritage" have been included. The limits of the Stability Pact and the increasing limitation of public financial resources for investments

have motivated local governments to seek new ways of cooperation with private entities within integrated projects for local management and cultural heritage development. In this direction go JESSICA (Joint European Support for Sustainable Investment in City Area), ELENA (European Local Energy Assistance), JEREMIE (Joint European Resources for Micro and Medium Enterprises), Global Facility Structure, initiatives developed by the European Commission with European Investment Bank and European Investment Fund, who promote the development of financial engineering mechanisms.

Biography

He is born at Udine (Italy), where started his career as a professional football player, continuing it in USA in mayor legas, at the same time implementing his studies and knowledge in the field of international cooperation with developing countries, finally becoming an expert in European Policies, acting in Bruxelles under the Italian Government since 1990. Nowadays he is the adviser for European Policy of the Minister for Government Program of Italian Presidency of Council, besides be CEO member of Consulmarc Sviluppo S.r.l., consultancy company working in the field of European affairs, with offices in Bruxelles and other pre-adhesion countries. He has been included in PON ATAS Experts Team of the Italian Government as well, assisting Regions ob.1 in managing ERDF and International Financial Institutions fund schemes, in urban regeneration and local development integrated projects.

11:45-13:15

Plenary session - P2: Introducing new technologies and scientific tools to improve energy efficiency of historical buildings and old city centres

Mediator: prof. Dušan Gvozdenac

There is no one single solution for improving energy efficiency in cultural heritage buildings. However, there are many new technologies and scientific tools that could be used, including innovative heating systems, smart energy management, the use of various renewable energy sources, building simulations to identify the risks of damage, and infrared thermography. Engineers, architects, conservers and building owners need to be aware and actively seek new technological solutions when tackling building restoration.

Keynote speaker: Günter Pfeifer - *The cybernetic principle -the other method of energy efficiency*

Alexandra Troi - *Historic buildings and city centres - the potential impact of conservation compatible energy refurbishment on climate protection and living conditions*

Blanda Matica – *Case study for Veliki Tabor Croatia*

Marino Grozdek, Vladimir Soldo, Miroslav Ruševljan, Tonko Ćurko, Leon Lepoša - *Heat pump systems with renewable energy sources*

Panel discussion:

Adriana Bernardi, Francesca Becherini, Favaro Monica, Luc Pockelé, Sandro De Grandi - *Adaptation of new technologies developed in the EU project MESSIB for cultural heritage applications*

Torun Widström, Magnus Mattsson - *Whole building simulation and damage risk assessment in historical buildings*

Gianni Pietrobon, Michele Sbrissa, Ricardo Stocco - *S.M.A.R.T. approach for energy efficiency in cultural heritage: the monumental complex of Saint Anthony of Padua*

Srećko Švaić, Ivanka Boras, Mirela Hiti - *Infrared thermography and numerical methods in civil engineering*

Andrea Bondi, Giovanni Zarotti, Tommaso Marella - *The redevelopment of the northern part of the historic Venice Arsenal*

Moderator:

Prof. Dr Dušan Gvozdenac is the professor at the University of Novi Sad and has been teaching at the Faculty of Technical Sciences for more than 30 years. He has also been involved as a consultant in projects in the energy field in several countries of Europe, Africa, Far, Middle and Near East for almost 25 years. The projects concerned United Nations Development Program (UNDP), United Nations Industrial Development Organization (UNIDO), several programs for the European Union (EU), German Association for Technical Cooperation (GTZ), etc. For the needs of the Serbian Government and the Province of Vojvodina, he has been engaged in the preparation of several strategic documents. In the period from 2002 to 2003, he was the first director of the Energy Efficiency Agency of the Serbian Government and then he became the founder and director of the Provincial Energy Efficiency Centre in Novi Sad.

The professor is the author of numerous articles published in international and domestic journals, editor of international conference digests and author of several training manuals. He has also been either a team leader or a team member in more than 200 energy audits in industry and buildings and has gained valuable practical experience partially presented in five textbooks published so far.

Dušan Gvozdenac

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Prof. Günter Pfeifer

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Presentation title

The cybernetic principle – the other method of energy efficiency

Presentation resume

All available building materials have extensive energy potential to begin with. The qualities of the material, construction and zoning exhibit how the climatic conditions of a site are embedded into the very building under consideration, its floor plan and capacity. From all these elements, an “Energy Fingerprint” can be created and serve as the foundation for a new kind of intervention. This intervention would make use of passive technologies, the capabilities of materials to collection, distribution, storage, protection and discharge absorb, distribute, collect, discharge and protect solar and geothermal energy. The strategy of linking these features is based upon the principle of cybernetics applied to architectural measures. A trans-disciplinary process of working, which is accompanied and tracked with thermodynamic simulations, can

be used to optimize a building to be highly energy efficient. Historically preserved structures and culturally defined building elements remain untouched and even contribute to the actual potential of the energy enhancement.

Biography

1943 Born in Schopfheim, Germany
1963 – 1967 Architectural studies at Staatliche Werkkunstschule Kassel
1975 to present Architecture bureau in Lörrach und Freiburg
1984 to present Numerous awards for architectural achievement (60 in total)
1987 – 1993 Cooperation with F. O. Gehry, Zaha M. Hadid, T. Ando, A. Siza
1992 to present University Professor
Technische Universität Darmstadt, Department 15 Architecture
1997 to present Author of numerous architectural publications
2001 Pfeifer Roser Kuhn Architects Freiburg
2005 to present Pfeifer Kuhn Architects Freiburg
2009 Gottfried Semper Architecture-Award from the Sächsische Akademie der Künste
2010 E-Picentro – Exhibition at the 12th Architecture Biennale Venice in cooperation with the Università di Roma Sapienza about the typologic-energetic rebuilding of the city of L’Aquila, Italy
2011 Foundation Cybernetic in cooperation with Prof. Dr. Annette Rudolph-Cleff. Pool for sustainability research Technische Universität Darmstadt



Alexandra Troi

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Presentation title

Historic buildings and city centres – the potential impact of conservation compatible energy refurbishment on climate protection and living conditions

Presentation resume

Is it reasonable to invest - thoughts and money - in the energy refurbishment of historic buildings? This paper quantifies the potential impact in terms of climate protection and enhanced living conditions - looking not only at exemplary listed buildings, but more generally historic -cityscapes-. Statistics reveal that 14% of EU-27 building-stock dates

before 1919, other 12% between 1919 and 1945 (with considerable national differences), corresponding to 30 resp. 55 million dwellings and 120 million Europeans living there. With information on climatic regions and building performance a heating-demand of 855 TWh corresponding to more than 240 Mt CO₂ can be estimated. Refurbishment can save 180 Mt CO₂ within 2050 (3.6 % of 1990-s EU-27-emissions), while bringing indoor comfort increases (higher surrounding temperatures, less draughts, ...) and energy-costs decrease. Finding conservation-compatible solutions enhances therefore long-term-conservation and sustainable management of our towns.

Biography

Since 1999 at EURAC, since 2005 Vice head of the new established Institute for renewable energy – which was built-up together with Wolfram Sparber from a start-up size of 5 collaborators to a group of currently more than 30 researchers. Development and management of national and international projects, development and coordination of the strategic research programme, representation of the institute in international associations and European Technology Platforms (ESTTP, ECTP FACH), external consultancy. Special expertise on Modelling and simulation, Monitoring of energy systems, Energy related question in historic buildings. More than 15 lectures, among them a invited lecture at the Getty Conservation Institute, and more than 30 publications and contributions to international conferences and workshops.

Presentation title

Case study for Veliki Tabor

Presentation resume

Energy efficiency was achieved by the rational use of given available historic conditions such as thick walls and ceilings, wooden roof and an effective heating system placed beneath the mortar. Such a system heats the surrounding walls increasing thus the heated surfaces and giving a feeling of warmth although the heating temperature is not above 15 degrees Celsius.

The ventilation system of the space was installed through the old chimney and enabled the control of humidity within the space according to preset parameters for museum space of 50-60%.

Biography

Born on June 15 1954 in Slavonski Brod

Education

1980 – Graduated from the Faculty of Architecture of the University in Zagreb

1969 -1973 – Attended and graduated from secondary school in Slavonski Brod

Professional Career

Since 2008 – Director of the Directorate for the Protection of Cultural Heritage in the Ministry of Culture

Blanda Matica

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2007 - 2008 Head Conservator in the Directorate for the Protection of Cultural Heritage and Head of the Conservation Department in Krapina
2005 - 2007 Head of the Conservation Department in Rijeka
1997 - 2005 Head of the Service for Immovable Cultural Monuments and leader of numerous demanding projects in the Croatian Restoration Institute
1981 -1997 Began working in Croatian the Restoration Institute as a trainee, then associate, Senior project engineer, head of the Department for built heritage and adviser.

Presentation title

Heat pump systems with renewable energy sources

Presentation resume

Heat pump systems with renewable energy sources are increasingly more applied for the purpose of cooling and heating of buildings. Lower running costs and emission of greenhouse gases favours application of the heat pump technology over conventional heating systems (electric boilers, oil or gas fired furnaces). However, correct sizing of the heat pump systems and ensuring its optimal performance is of utmost importance from an economic perspective due to higher capital costs of heat pump systems over conventional heating systems. Inexpert design of heat pump systems are associated with reduced system efficiency, running cost savings and increased carbon dioxide emissions. In this paper overview of the heat pump technology with renewable energy sources is given with respect to design and economic aspects for three typical heat pump system arrangements; air to water (with air as a heat source), ground water to water (with ground water as a heat source) and ground coupled heat pump systems with borehole heat exchangers.

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Biography

Bachelor's degree, received 2001 at University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia. PhD degree, received 2009 at Royal Institute of Technology (KTH), Department of Energy Technology, Division of Applied Thermodynamics and Refrigeration, Stockholm Sweden. Thesis title: „Load Shifting and Storage of Cooling Energy through Ice Bank or Ice Slurry Systems - modelling and experimental analysis“. Currently he is employed as a research assistant at Department of Thermodynamics, Thermal and Process Engineering, Faculty of Mechanical Engineering and Naval Architecture in Zagreb. Professional interests are in field of refrigeration and heat pump technology, energy storage and transportation technologies, HVAC systems, energy management in buildings and industry.



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Presentation title

Adaptation of the new technologies developed in the EU project MESSIB to Cultural Heritage applications

Presentation resume

The EU MESSIB (Multi-source Energy Storage System Integrated in Buildings) project addresses the development, evaluation and demonstration of an affordable multi-source energy storage system integrated in buildings, based on new materials, technologies and control systems, for significant reduction of its energy consumption, improvement of energy management in terms of quality, security and indoor environment.

The application of this new system in historic buildings will be also evaluated, based on the state of art that consists mainly of general principles and methodologies of conservation, due to the difficulty to establish strict rules in Cultural Heritage field. The

identification of the strong and weak points, the technical and non-technical barriers and possible solutions to the application in Cultural Heritage buildings will be performed through an European analysis of the energy behavior of chosen European historical buildings.

The S. Croce complex (Museum and Church) in Florence has been selected as a case study in Italy, where a new technology based on PCMs (Phase Change Materials) is being tested.

Biography

Francesca Becherini graduated in Physics at the University of Padua and got her PhD in Science for Conservation of Cultural Heritage from University of Florence. Since 2002 she has carried on her research activity at the CNR-ISAC, Padua. Her research interests are in the field of Microclimatology applied to the Conservation of Cultural Heritage: environmental non-invasive monitoring in order to evaluate the effects of microclimate variability on movable and immovable Cultural Heritage assets indoor and outdoor; microclimate field surveys, developing and testing of sensors for diagnostic and control of Cultural Heritage and environmental monitoring; research of sustainable solutions to preserve Cultural Heritage. She has been member of the team of several national and European projects. Presently she is involved in the on-going VIIIFP projects TeACH "Technologies and tools to prioritize Assessment and diagnosis of air pollution impact on immovable and movable Cultural Heritage" and MessIB "Multi-source Energy Storage System Integrated in Buildings". She is also taking part in the monitoring programme of the Lascaux Caves and of the Santiago de Compostela Cathedral.



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Presentation title

Whole building simulation and damage risk assessment in historical buildings

Presentation resume

When simulating historical buildings, available tools tend to be intended for simulations of either of two kinds: whole building simulations of energy-/moisture performance, from which we can determine general conditions that may give an indication of potential damage risks, though unspecific, or detailed simulations that look into what takes place at specific points/materials, which provides us with knowledge about the specifics but

without much context. Both are efficient scientific methods, but when dealing with reality we need both perspectives simultaneously. This presentation describes multi-criteria simulations that take this into account, using a new tool integrating display of specific moisture-connected risk-factors into whole building simulations, providing a coherent basis for decision-making when retro-fitting, and compares the results to case-study measurements.

Biography

Architect, graduated from KTH, The Royal Institute of Technology in Stockholm with a diploma work focusing on sustainable building in urban environment. Since 1988 mainly active in renovation and refurbishment of older and historic buildings, in Sweden, Denmark and Germany. Have kept a keen interest in energy and sustainability issues combined with a curiosity in learning more about historic materials and techniques in buildings of the cultural heritage. One special interest is how energy enhancement strategies and historic techniques influence each other. Since 2009 PhD-student at KTH, on the subject Enhanced Energy Performance in Historic Buildings with the aim determine simulation tools and methods that enable facilitated decision-making on retrofitting strategies. The project is financed by the Swedish Energy Agency's research program Energy Enhancement in Historic Buildings.

Presentation title

Infrared thermography and numerical methods in civil engineering

Presentation resume

Infrared thermography became very effective, as a thermal NDT method, in the determination of building thermal insulation quality, thermal bridges and wet spots on building envelopes. Beside that, a very significant field of application is finding and estimation of damage in the building envelope and flat roofs. Both are very important for defining financial plans and timing of reconstructions. When cultural heritage buildings are investigated, infrared thermography can be successfully applied to determine the structure of building walls below the plaster without destroying the existing state of the building. The paper presents the possibilities to apply thermography, combined with numerical methods, for the estimation of the type and grade of building envelope defects, as well as to determine specific elements in building wall structure.

Biography

Ph.D. Ivanka Boras works at the Faculty of mechanical engineering and naval architecture, Department of Thermodynamics, Thermal and Process Engineering as an associated professor. The fields of interest are technical thermodynamic: heat transfer, numerical calculation, pressure equipments and infrared thermography. She has published 9

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scientific papers in national and international journals, over 40 papers at international conferences, 4 papers at national scientific meetings, the results of many research projects and expertises and one book about infrared thermography. Actively participates in teaching Thermodynamics and exercises in the Laboratory at the Faculty of Mechanical Engineering and Naval Architecture in Zagreb. She had also participated in teaching in graduate studies, Faculty of Philosophy in Zagreb, Department of History of Art course in methods of preservation of cultural heritage with the theme: infrared thermography - application for the preservation of cultural heritage. She has the Certificate for level III of infrared thermography, HRN EN 473.

Presentation title

The redevelopment of the northern part of the historic Venice Arsenal

Presentation resume

The redevelopment of the northern part of the historic Venice Arsenal (covering an area of 20 hectares) required respect for the value of this extraordinarily important architectural complex as a historic monument, while ensuring high levels of efficiency and flexibility for the strategic activities that the area will host. This presentation discusses the re-use of buildings dating from the sixteenth to nineteenth century, including the restoration of the original edifices and the installation of new interior infrastructure for offices, laboratories and control rooms; particular attention is given to energy efficiency and environmental sustainability. Furthermore, technical solutions for the central plant that serves the entire area, which makes use of energy from renewable sources such as lagoon water, will be presented.

Biography

Andrea Bondi holds a degree in Civil Engineering obtained at University of Padua in 1991. He joined Thetis in 1992, covering the role of designer and acquiring significant expertise particularly in the planning and design of interventions for the restoration and infrastructuring of Venice historic "Arsenale" (16th-19th century). Since 2004 he has been responsible for the coordination of the team for the supervision and relevant support services for the construction of the mobile floodgate system in Venice - MOSE System.

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Since 2007 he is the Technical Director and Manager of the "Civil Engineering Department, grouping about 50 employees, thus developing and coordinating all design and supervision of construction activities, particularly in the maritime and coastal engineering fields.

He is also Technical Director of "Lotti-Thetis Engineering Services S.C.a R.L."

14:15-15:45 Parallel session S1a and S2a

Parallel session S1a: Energy management plans and energy efficiency in old city centres

Moderator: Engelbert Ruoss

City management plans can provide a sustainable framework for the protection of cultural heritage and the implementation of energy efficiency measures and improved energy management. It can also improve the quality of life in historical centres, as well as provide a powerful tool for economic and social development. This session will present efficient and sustainable energy strategies for the revitalization of historical centres and their implementation.

Introductory speeches:

Andelka Visković, Deputy Mayor of the City of Split

Luigi Bassetto, Institutional Affairs Director of the City of Venice

Ivanka Jemo - *Energy Saving Through the Restoration Projects of Dubrovnik*

Goran Nikšić - *Conservation and Management of the Historic Core of Split*

Aleksandar Bogdanović - *Beautiful Cetinje*

Luka Vidović - *Increasing Energy Efficiency of Cultural Heritage Buildings within Historic Core of Split by Improving Current Management System and Implementing Revitalization Project*

Greg Keeffe, Tom Jefferies - *Future Heritage: is Carbon neutrality possible in historic neighbourhoods?*

Panel discussion:

Aitziber Egusquiza - *Energy efficiency strategies for the historic city*

Franco Rocchi, Matteo Bertoneri - *Energy planning in the Eastern Ligurian landscape*

Jasna Guzijan, Dragica Arnautović-Aksić - *Application of principles of energy efficiency in the renewal of towns and cities with preserved historical and cultural complexes: a case study of Trebinje*

Anna Paraskevopolou - *The Medieval City of Rhodes Management Plan 2007-2027*

Moderator:



Engelbert Ruoss

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Biography

Ruoss (Switzerland) took up his duties of Director of the UNESCO Venice Office in 2006. Since then he has led a team of 37 people in Venice, Sarajevo, Tirana, Ankara, Skopje and Podgorica. Ruoss is a Licentiate and holds a PhD in Biology, as well as a diploma in Museology. From 1986 to 2001, he held the position of Curator and Vice-Director of the Natural History and Archaeology Museum in Luzern Kanton, Switzerland. 1998-2005, he led the establishment of the Entlebuch Biosphere Reserve in Switzerland. From 2001-2006, he also consulted for EU and SDC regional sustainable development programmes. His other accomplishments include membership in the Swiss National Commission for UNESCO since 1995, being the President of the Natural Sciences Section and chairing the Task Force on Quality Economies of UNESCO's MAB. Further, Ruoss has been a board member of numerous national and international scientific committees and organizations, including the Swiss Academy of Sciences.

Presentation title

Sustainable Growth: Linking Cultural Heritage with Resource Efficiency

Presentation title

Elements of energy saving in the restoration projects

Presentation resume

The cultural entirety of Dubrovnik is the area of the historic city centre with its close surroundings. It is placed on the UNESCO world heritage list in 1979. In the same year the city was badly damaged by the earthquake of intensity 7° MCS scale. Due to the severe damages of monuments and the need for their long-lasting renovation, the Institute for Restoration of Dubrovnik was founded as an institution that would organize the restoration of the cultural heritage of Dubrovnik and take care of the preservation of its genuine urban, architectural and cultural values.

We emphasize the aspect of energy efficiency in the first restoration projects done in the period from 1980 till 1990. The complete renovation was performed on the most valuable monuments, mainly public buildings. The contemporary solutions and installations were projected on them and installed.

Biography

Ivanka Jemo was born in 1949 in Perušić, Croatia. After primary and secondary schools she graduated from the Faculty of Architecture in Sarajevo. From 1976 she worked as an urban and regional planner in the Department for Construction in Dubrovnik in the Department for Urban Planning.

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Since 1984 she is employed in the Institute for Restoration of Dubrovnik as an architect and urban planner in the Department for preparing and consulting and was promoted into the Head of the Department in 1994. She participated as a lecturer in many national and international conferences presenting methods of preservation, the use and renovation of the architectural heritage.

Her professional and scientific interest is concentrated on documentation of the renewal of Dubrovnik and the study on the development of the City.

Since October 2007 Ivanka Jemo has been the Director of the Institute for Restoration of Dubrovnik.

Presentation title

Conservation and Management of the Historic Core of Split

Presentation resume

Conservation rather than restoration, the use of traditional materials and techniques, emphasizing the maintenance of properties and reconstruction of urban infrastructure are some of the basic principles of the recent conservation practice in the historic centre of Split. Restoration of key buildings has being used as good practice examples.

A Management Plan for the historic core has recently been produced in order to improve the planning and coordination of activities which aim at better quality of life of its inhabitants, while securing the long-term, sustainable protection of cultural values of the place. The objective is to preserve the spirit of the place by minimizing conflicts between cultural values and stakeholders' interests, with a need for development and change. In line with its Action Plan, the City has launched several projects, some of which deal with the improvement of infrastructure and with the enhancement of energy efficiency in historic buildings.

Biography

As a conservation architect with the Ministry of Culture of Croatia produced architectural surveys and managed restoration projects for a series of historic buildings and complexes of the highest value throughout Dalmatia, including the cathedrals of Korčula, Hvar,

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Split, Trogir and Šibenik. Published articles in specialized journals on the most important conservation projects and on local architectural history.

Since 2006, as Head of the Service for the Old City Core managed a number of planning, restoration, rehabilitation and maintenance projects for the Municipality of Split. Recently initiated and supervised the preparation of the Management Plan for the Historic Core of Split (World Heritage Site since 1979).

MA dissertation on Post-war Reconstruction of Croatian Architectural Heritage at the Centre for Conservation Studies, York, England. Lecturer on Architectural Conservation at the Restoration Department of the Academy of Fine Arts, University of Split. ICOMOS expert for sites on the World Heritage List.



Aleksandar Bogdanović

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Presentation title

Beautiful Cetinje

Presentation resume

Old Royal Capital Cetinje, in cooperation with UNDP, initiated the project "Beautiful Cetinje". The project plans to make buildings of public importance through the reconstruction of facades more energy efficient. With this project Old Royal Capital Cetinje will represent itself as environment friendly city, create jobs for the disadvantaged, encourage the development of local construction companies and, finally make city more attractive. In the first phase, project plans to cover the buildings of the former embassies, cultural institutions, hospital Danilo I, municipal building and other structures of importance to the Old Royal Capital Cetinje. This project will also include renovation of other private buildings and residents located in the historical core of Cetinje.

Biography

Born on March 11, 1977 in Cetinje. Aleksandar Bogdanovic graduated high school in California, USA, graduated at the Faculty of Management in Belgrade, Serbia and currently is finishing his PhD studies at the University of Bologna, Italy. He is fluent in English and Spanish, and can communicate in German too.

Mr. Bogdanovic worked as spokesman and advisor to Minister at the Ministry of Economy from 2000 to 2005. From there he went to be advisor to the President of Montenegro for economic relations and in 2009 he became a MP in the Parliament of Montenegro. From December 2010 he is city mayor of Old Royal Capital Cetinje.

Besides being city Mayor, Mr. Bogdanovic is member of Committee for security and defense, member of Committee for international relations and European integrations in Parliament of Montenegro. He is also member of the Senate of Old Royal Capital Cetinje, member of Board and Supervisory Board of DPS Montenegro.



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Presentation title

Increasing Energy Efficiency of Cultural Heritage Buildings within Historic Core of Split by Improving Current Management System and Implementing Revitalization Project

Presentation resume

Historic core of Split (on UNESCO-s World Heritage List since 1979; area: 216.613 m², closed space: 170.607 m²) is faced with poor general condition of cultural heritage buildings, with trend of further deterioration, due to inadequate management system and lack of long term revitalization strategy. Energy efficiency, as global imperative in creating sustainable society, is also an important objective of sustainable development and integral conservation, both of which are indispensable building blocks of any modern

revitalization strategy and historic core management system. Taking above into account, possibilities for increasing energy efficiency of cultural heritage buildings, within Historic core of Split, by improving current management system and implementing revitalization project were analysed, and new management system was modelled.

Biography

In 2006 graduated from American College of Management and Technology (ACMT), Dubrovnik, Croatia, Division of Rochester Institute of Technology (RIT), Rochester, NY, USA.

In 2011 received Master degree from Faculty of Economics, University of Split, Croatia, Postgraduate university specialist study of Business economics. Final paper title: Improving Management System of Protected Cultural Heritage Sites on Example of Historic Core of Split.

From 2006 employed by technical consulting company ROTERM Ltd., Split, Croatia. Currently holds Project manager and Executive Board Member positions.

In 2009 founded OLD CITY CORE Ltd., a cluster company that provides business and technical consulting services in management and revitalization of cultural heritage sites. Five years of intensive project management, project coordination and team management experience, working as a leader of multidisciplinary project teams, and as a member of international project teams. Co-author of several technical studies in domain of historic urban centres.

Presentation title

Future Heritage: is Carbon neutrality possible in historic neighbourhoods?

Presentation resume

Nelson Lancashire UK is dying. Its heritage, championed by Prince Charles and English Heritage has constrained development to such an extent that nothing can be changed. It is losing population at an alarming rate, and those remaining are ageing and racially entrenched. This paper describes an ambitious attempt to create a 21st century carbon-neutral future within a very regulated aesthetic.

Nelson has no public space, and the housing is mainly terraces without gardens. The brief was to make difference without changing the historic character of the area. The competition-winning scheme for the Whitefield ward by CityLab and Maccreanor-Lavington Architects, starts with the insertion of a much-needed public space; this has several functions: It links the town with the canal; provides a pedestrian link to school and creates an edge to the town centre.

Biography

Greg Keeffe is the Downing Professor of Sustainable Architecture, Leeds School of Architecture, Leeds UK. Greg Keeffe is an academic and practitioner who has 25 years experience in sustainability, energy use and its impact on the design of built form and urban space. Previously he was the Head of Design at the Manchester School of

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Architecture. Over the past 20 years he has sought to develop a series of theoretical hypotheses about sustainability. Most of his work comes out of a free-thinking open-ended discussion about how things should be. Greg has extensive experience of working closely with architects and planners to develop exciting ways of re-invigorating the city through innovative sustainable interventions, informing his work on the sustainable city as synergistic super-organism. He is author of the book 'Means Means Means'; which develops a model of a new city, as an bio-econose, of mutually compatible functional elements.

Presentation title

Energy efficiency strategies for the historic city

Presentation resume

In order to ensure the maintenance of our urban historic heritage, urban policies should aim at improving quality of life in historic centres, facilitating the sustainable development and focusing on protecting not only the physical fabric but also the social context. Consistent with this ideal, this work points at recommending energy efficiency strategies for the historic city. E2CH project arises from the concept that historical cities could be handled as a reference model for contemporary urban development. One of its main goals is to improve knowledge of energy performances within the historic centre as a system, studying the efficiency and adaptability of traditional buildings to the environment. The project has developed a comprehensive methodology and different tools for the diagnosis, the decision making, the implementation of solutions and the subsequent management of energy at urban-scale. The case study of this project is Santiago de Compostela.

Biography

Aitziber Egusquiza studied Architecture at the High School of Architecture of San Sebastian with a post degree in Restoration and Rehabilitation of the historical architecture at the University of Navarra. She holds a master degree in Urban Management and Valuation at the Technical University of Catalonia and currently is studying for a PhD in Architecture on the subject of energy efficiency in historic centres. Since 2007 she has been working

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as researcher and project manager at Cultural Heritage Department of Tecnalia Research & Innovation, developing research projects on built heritage conservation including diagnosis, decision making and subsequent management, with special attention to habitability, accessibility and energy efficiency solutions in historic centers.

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Presentation title

Energy planning in the Eastern Ligurian landscape

Presentation resume

Under the concept of sustainability the building rules have evolved, defining ways to build an energy-efficient cities, beyond the concept of building individually sustainable, and preserving the history, culture and landscape beauty contained in each country. These principles were applied to the City of Sestri Levante, near Genoa, that spread along the coast in a only flat stretch, enriched by an old town full of buildings of considerable merit. The aim of our work was to find the right balance between inclusion in the urban context of the most innovative technologies available in the energy field and protecting the architecture of the place, starting from the identification of applicable techniques of bio-architecture and use of common renewable sources.

Biography

Member of EFCA Sustainable Development Task Force.

Technical expert in environmental law reference and methodology of assessment, he coordinates and directs several design teams on complex projects relating to Energy Planning, Environmental Impact, IPPC. In detail his experience are :

Energy: Technical expert in energy planning, analysis and definition of the energetic state of the building structures, in the evaluation of projects related to the production of energy. develops the advice to public and private administration, also dealing with the design and teaching in specific training courses for trade associations and professional bodies. Noise, Vibration, ECM : Assessment of exposure in work and life places, analysis of impact produced by machines, facilities and transport infrastructure (roads, railways, etc..). Remediation projects for machinery and equipment, technical advice and assistance aimed at the isolation of impact.

Integrated Pollution Prevention: He takes care also of the design of its improvement plans and integrated environmental monitoring.



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Presentation title

Application of principles of energy efficiency in the renewal of towns and cities with preserved historical and cultural complexes – example Trebinje

Presentation resume

Historical urban complexes represent the most prominent remains of the past. As such, they are significant elements of culture. Building heritage is a non-renewable resource and urban renewal is the best way to preserve it. The principal objectives of urban renewal concern improving the quality of life and work in towns and cities and a better exploitation of all available resources, ranging from man-made environment to energy.

This research focuses on the town of Trebinje as a historical and cultural urban complex whose preserved urban matrix dates back to the 17th century. An analysis of the overall complex as well as individual buildings should provide an answer to the question of what principles of energy efficiency upgrade are applicable in regions featuring a Mediterranean climate. The case study will focus on one typical building in Trebinje, which ought to serve as a pilot project for Trebinje's town administration, and at the same time be a project allowing multiplication in the future.

Biography

Dragica Arnaudović-Aksić, M.A, B.Arch.

She completed postgraduate studies preservation and protection of heritage with her master thesis „Wooden church of the Diocese of Banja Luka, by mentor prof. Nada Kurtović-Folić, Ph. D. in architecture. Now, she is working on Ph.D thesis at Faculty of Architecture, University of Belgrade. She has participated in several scientific and professional conferences at home and abroad with lecture on energy efficiency in buildings. She has involved in realisation of Initial National Communication on Climate Change, particularly related to building and land use.

She is a member of the Council on Climate Change of Banja Luka, and the Committee on Energy Efficiency of Republic of Srpska. She is a president of Association of Architects of Republic of Srpska and chief editor of science and professional magazine for architecture and civil engineering „Prostor S“.

14:15-15:45

Parallel session S2a: Energy efficiency in cultural heritage buildings: presentation of case studies

Moderator: prof. Tonko Ćurko

This session will present successful cases in implementing EE technologies in cultural heritage buildings.

Keynote speaker: Britta von Rettberg -

„Viewing, understanding and applying successfully“

Marcello Gusso - *Restauration of St. Claire's Former Convent in Gorizia*

Alexandra Troi- *Ansitz Kofler in Bolzano/Italy: Energy retrofit to near passive house standard and towards zero emission for heating and cooling*

Igor Skelin - *Hi-VRV III - High Energy Efficient Cooling And Heating System In Cultural Heritage Buildings*

Panel discussion:

Francesca Brancaccio, Didier Repellin - *Best practice in improving energy efficiency in a cultural heritage urban scale building: the Real Albergo dei Poveri in Naples, Italy*

Duško Radulović, Marko Križanec - *Sustainable energy for public buildings: the example of the city of Rijeka*

Birgit Dulski, Michiel Haas, Anke van Hal, Niek Stukje - *Energy saving in historical school buildings: mission impossible?*

Walter Baricchi, Fausto Bisi - *Modern comfort in historical buildings*

Moderator:

Tonko Ćurko

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Biography

Full professor in the scientific and R&D field applied thermodynamics, in charge for subjects Principles of Refrigeration and HVAC&R process modelling, involved in professional and contractual cooperation with enterprises. Member of Croatian Society of the Mechanical Engineers and Technicians, ASHRAE Atlanta USA, International Institute of Refrigeration, IIR Paris France, Croatian Society for Regulating and Measuring Techniques.



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Presentation title

European Competence Centre for the Energy-saving Renovation of Old Buildings and the Preservation of Monuments, Benediktbeuern

Presentation resume

In times of rising energy prices, growing ecological consciousness and climate change the saving of energy is becoming more and more important. How can we save energy in historical buildings without detriment to their historical value?

The Competence Centre Benediktbeuern of Fraunhofer Institute of Building Physics was founded with the idea of providing answers to these important questions. As an information centre providing expert advice it will deal with topics related to the

renovation and preservation of historical buildings and monuments. The various problems and applications will thus be demonstrated directly on the building - Alte Schäfflerei itself; different heating systems and interior insulation will be realized and compared; regular exhibitions will take place on site. The scope of activities of the Competence Centre includes not only the model renovation of a significant historical building, but also micro-climate measurements, research on building services and materials as well as independent counseling on preservation and energy-efficient retrofitting.

Biography

1993-2001 Studies of art history, European ethnology and archaeology at the Ludwig-Maximilians-University Munich and Preservation of Culture Heritage at the Otto-Friedrich-University Bamberg. 2006 PhD with "Topography and preservation of the City Freising in the 19th and 20th century" (University of Bamberg). 2006-2008 Assistance-Curator at the Prussian Palaces and Gardens Foundation Berlin-Brandenburg. Since 2009 at the Fraunhofer Institute of Building Physics IBP Holzkirchen, Germany and head of the European Competence Centre for the Energy-saving Renovation of Old Buildings and the Preservation of Monuments Benediktbeuern, Lectureship at the University of Bamberg for preservation of Cultural Heritage.



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Presentation title

Restauration of St. Claire's former Convent in Gorizia, Italy
 Cultural Heritage & Energy Efficiency

Presentation resume

Scope of the work was the restauration, reconstruction and completion of the St. Claire's former Convent, with an overall budget of 5,000,000 euro within the Program for the Thousand-year-celebration of the city of Gorizia. Main activities regarded the overall convent facility restauration, the reconstruction of the electrical and mechanical systems, the seismic and functional adaptations. The new building use addresses to University courses and Research activities for Cultural Heritage Operators of the Liberal Arts School of Udine, for the Librarianship Preservation Laboratory and for Translators Schools. The paper highlights the integration between the restauration works and the HVAC systems used to meet the best energy efficiencies and savings.

Biography

Born in Rome on 1957, Ing. MARCELLO GUSSO has a degree with Honours in Mechanical Engineering University of Florence. Experiences abroad in USA, Germany, Belgium, Switzerland, Brazil, Libya, Malta, Holland, Spain. Expert on bioclimatic and mechanical engineering design, has made deep studies on fluid dynamics and bioclimatic for several project. The most important project he participate are: Würth Italia in Rome/Egna, Corinthia Hotel Tripoli (27 storeys), restoration of Bard Fortress designing vertical and inclined lifts that is one of the most important in Europe, the rehabilitation of the Former -Tornerie- Building in Turin, the new Emergency - Intensive Care Unit of Catania Polyclinic., Saint James Hospital in Malta, the new IHCP and IES laboratory and office buildings in Joint Research Centre of Ispra, the new Scandicci Center (in cooperation with Richard Rogers and Partners) and many others.

Presentation title

Ansitz Kofler in Bolzano/Italy: Energy retrofit to near passive house standard and towards zero emission for heating and cooling.

Presentation resume

In 2007 the orangery of -Ansitz Kofler- (listed building dating 1749), was refurbished - both aesthetically towards historic roots and energetically to low energy building. Applying efficient insulation (internal and external - meeting preservation of monuments- demands), windows with passive-house-standard, ventilation with heat-recovery and geothermal heat-exchanger, and avoiding thermal bridges, the design heating-demand was lowered from 450 to 30 kWh/m²a (CasaClima-Certification A+). A pellets-boiler satisfies the remaining demand without CO₂. EURAC monitors the building's energy-consumption, indoor-comfort and hygrothermal-wall-behaviour since October 2008 with 70 sensors. The measured heating-demand is slightly higher than calculated (also due to user influence), but still at absolute low values. Indoor climate has proven comfortable with warm surfaces and without need for active summer-cooling. Finally, the monitored wall profiles confirm good hygrothermal performance.

Biography
see page 38.

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Presentation title

Best practice in improving energy efficiency in a cultural heritage urban scale building:
The Real Albergo dei Poveri in Naples building: The Real Albergo dei Poveri in Naples

Presentation resume

The Real Albergo dei Poveri (Naples) is one of the hugest XVIII century hospice in Europe. Its owner, the Municipality, is restoring it as an "Ecobuilding". An European team was charged to restore it, using environmental management, in order to make it energy efficient.

The priorities: Respect the ancient building. Employ traditional techniques and materials. The goals: Natural lighting (passive solar design). Water recovery (underground rainwater storage). Thermal mass consideration. Reduction of consumptions in lighting, heating and cooling systems (high performance technologies). Natural ventilation (manual devices). Integration of renewable energies (rebuilding the roof with semi-transparent PV modules). The project was considered by the UNESCO delegation as "best practice".

Biography

Francesca Brancaccio (Naples 1969), is an architect, Ph.D. in History of Architecture and Town Planning, Master in Restoration of Monuments, European Master in History of Architecture, International Master in Economics and Management of Cultural Heritage. She is visiting professor in many European Universities and Institution and she publishes regularly on scientific reviews and magazines. On November 2005 she founded in Naples, Italy, together with the civil engineer Ugo Brancaccio, the society of engineering B5 S.r.l., being the administrator and the technical director of this society. B5 srl is actually running out many activities of consultancy, planning and direction of

consolidation and restoration working, in Italy and abroad, on many cultural heritage buildings. International projects: i.e. Carebuk, restoration of Medersa Rachid, in Bukhara, Uzbekistan, the consolidation and restoration of the Real Albergo dei Poveri, Naples, with RTP Croci Repellin, Professor Giorgio Croci and Didier Repellin ACMH.

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Presentation title

Sustainable energy for public building – example of the City of Rijeka, Croatia

Presentation resume

Sustainable energy development becomes one of the crucial issues for every municipality. Preservation of local cultural heritage and local architecture recognition could be in danger by non organized investments in “green” technology. Simultaneously, overprotected and overregulated reconstruction of cultural heritage buildings usually

do not lead to diminishment of energy consumption. Authors of this paper analyzed recent sustainable energy project in the city of Rijeka Municipality building, which was originally built in 1915. Although Municipality building is located in the center of the city and protected as cultural heritage, Conservatory department in Rijeka and Municipality, together with investor Energio Ltd. created solutions which have satisfied all included parties. In the year 2009 first photovoltaic power plant of 9.9 kWp has been installed and put in service on the upper terrace of the building. Next year, City of Rijeka accepted Sustainable energy action plan (SEAP) and started with implementation of smart metering in that same building. Further analyses of those projects lead to conclusion that similar investments could be carried out in order to match energy sustainability and economic feasibility in cultural protected buildings.

Biography

see page 52.



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Presentation title

Energy saving in historical school buildings – mission impossible?

Presentation resume

Many Dutch cities have ambitious climate protection plans. In order to encourage owners of monumental buildings to realize energy saving measures, municipalities aim to play an exemplary role with their own historic buildings. School buildings form a special challenge: The wish to preserve historic values in combination with the need to improve the ventilation in the class rooms and to reduce the energy loss by façades and roofs and single glazing is already extremely difficult. In addition, the financial resources for school buildings are very limited. This combination seems to result in an impossible challenge. In the city of Hilversum, the potentials for energy saving measures in six historical schools were studied. The experiences of this study were combined with the knowledge of a Dutch network where local governments and the State Agency for the Cultural Heritage participate. This led to innovative technical and process related solutions for historical school buildings.

Biography

Birgit Dulski MSc studied architecture at the University of Kaiserslautern (D) and the Delft University of Technology (NL). She combines her function as senior researcher at the Nyenrode Business University with a career as senior consultant at the Dutch Institute for Building Biology and Ecology (NIBE). At NIBE she was closely involved in the research ‘Sustainable Cultural Heritage’, commissioned by the Governments Building Agency (Rgd), the State Service for Cultural Heritage and the Foundation for Buildingresearch (SBR). She leads various Dutch projects, initiatives and research surrounding the sustainable preservation of historic and characteristic buildings. She is also involved in other research projects of the Cfs and in architectural contests where sustainability plays an important role. She previously worked at BOOM-Maastricht, office for environmental research and architectural design.

Presentation title

Modern comfort in historical buildings

Presentation resume

In this occasion we will present some reflections upon the use of heating facilities in monumental buildings, especially in buildings that fall into special categories such as churches, castles, convents, old school buildings, etcetera.

This kind of buildings were realised when the comfort standards of its visitors and inhabitants were not as high as they are today. Now that standards have been raised generally, these buildings need to be equipped with installations that satisfy modern demands and that are capable of minimizing energy consumption, whilst raising the environment quality of its inside spaces.

Case studies will be illustrated, explaining technologies that have been experimented in some historical buildings in the region of Emilia-Romagna: the Parish churches of St. Valentine (Castellarano) and St. Michael (Pieve Modolena, Reggio Emilia); the Castle of Viano; the historical village of Riverzana.

Biography

Fausto Bisi graduated at the Institute for Architecture of Venice in 1984 and is registered since 1989 in the Architects Association of the District of Reggio Emilia. His training as

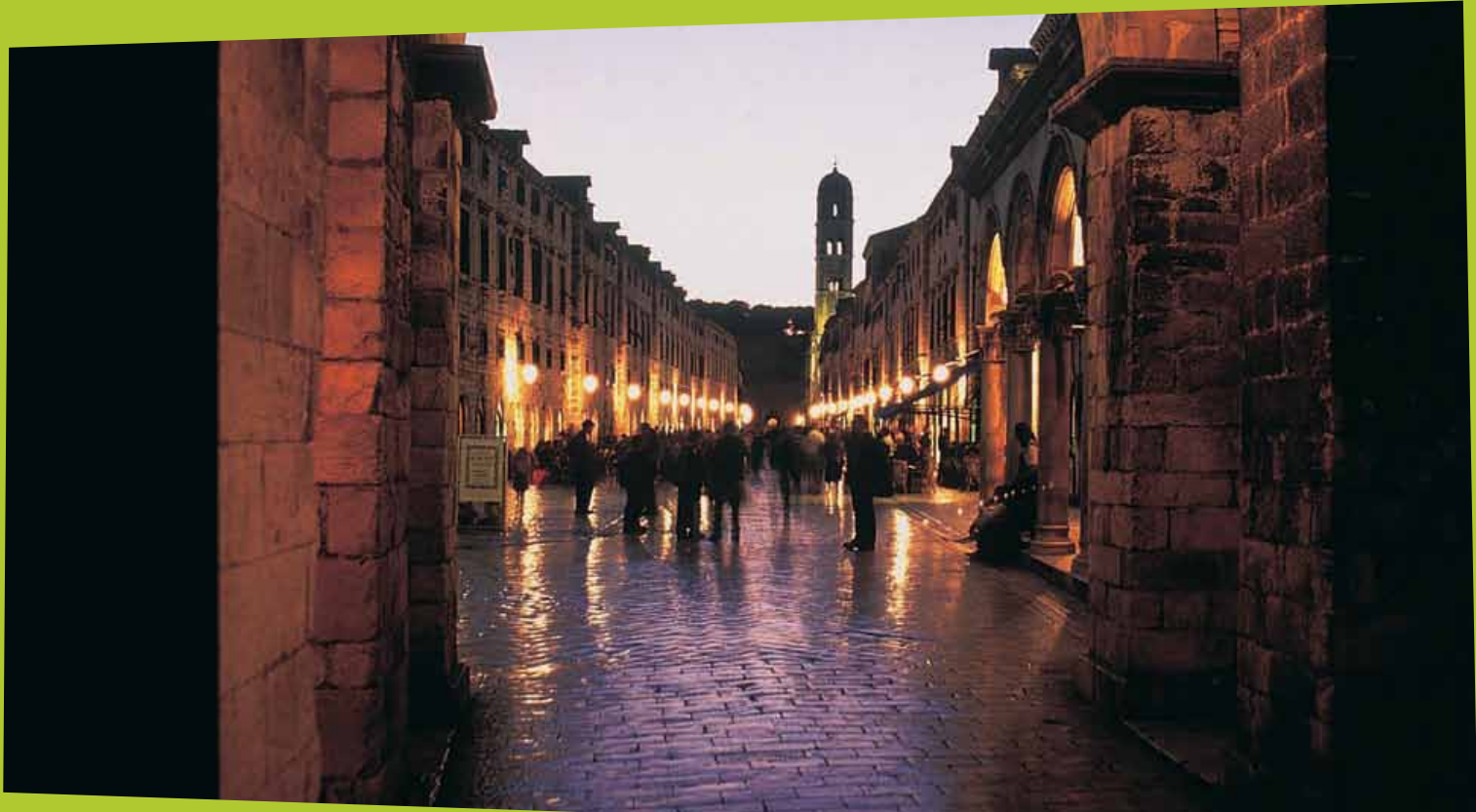
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an architect was followed up with several courses in conservation of buildings in seismic areas and structural consolidation. He has led prestigious projects such as the restoration of the medieval castle of Rossena, Palazzo Santini-Sinz in Ferrara, the Romanesque churches of San Valentino and Toano. After the seismic events in 1996 and 2000 in the province of Reggio Emilia, he has been occupied with the reconstruction and structural improvement of many damaged monumental buildings.

Besides his large experience in the field of restoration and architecture for community facilities, he also has been involved in strategic planning for the conservation of cultural heritage and has a strong interest in all aspects of urban design.



16:00-17:30 Parallel session S1b and S2b

Parallel session S1b: Renewable energy sources and energy efficient lighting in old city centres

Moderator: Marko Križanec

This session deals with the implementation of renewable energy sources in cultural heritage buildings and urban areas, as well as energy efficient lighting solutions that contribute to the visual identity of old city centers, all done in a sustainable way.

Francesco Simonetti - *Tenuta dello Scompiglio, a large utilization of renewable energy sources in the heart of Tuscany*

Gordana Lučić - *ESCO projects in the old city centers - public lighting*

Senka Ibrišimbegović - *Energy efficient architectural lighting in promoting cultural heritage in Bosnia and Herzegovina*

Panel discussion:

Pierluigi De Berardinis, Pierluigi Fecondo - *Architectural integration of solar systems: evaluation criteria and intervention strategies for minor historical centres*

Daniela Bosia - *Energy behaviour and renewable energy in traditional rural architecture*

Marko Križanec, Marko Bačić - *Lighting of protected historic city centres*

Vladimir Kocet - *Contemporary urban lighting and the lighting of old city centres and historic sites*

Gabriele Landi - *Energy efficiency in public lighting systems*

Diana Galić - *The light design project of Dubrovnik's ancient city core*

Moderator:



Marko Križanec

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Education

1990 – 1996 Faculty of Electrical Engineering and Computing, Ljubljana, Slovenia - program: Electrotechnics, Automation, Process informatics

Work experience

1996 – 1998 Ina inženjering d.o.o. Rijeka
Assistant Designer, low voltage electrical installations
1998 – 2002 Municipality of Rijeka, Public lighting Office
Head of Office
2002 - now Energo d.o.o.
2002 Head of Public lighting department
2005 Head of Automation and IT department
2009 - now NPO Ceaser Assotiation President

Presentation title

Tenuta dello Scompiglio, an utilisation of renewable energy sources in the heart of Tuscany

Presentation resume

The antique buildings were constructed during epochs in which fossil fuels were not used as energy sources. With contemporary restoration projects we must aim to reach modern standards of comfort while keeping the production of harmful CO₂ gases to a minimum. The Scompiglio estate is composed of the main villa, dating from the 17th century, eight auxiliary buildings and a 160 hectares of land with olive groves, vineyards, wooded foothills, mountainous areas, vegetables gardens and orchards. The property was transformed, in 2003, into a research project with the goals of conservation and rehabilitation of the ancient agricultural uses and restoration of the buildings for residential use and as a setting for a cultural center that promotes the arts. The goal of the project has been to make the estate self-sufficient using only renewable energy sources. The energy cycle is fully supplied by pruning and regular forest maintenance and is CO₂-neutral.

Biography

Born in Sassari, Italy, the 17th April 1975

Bachelor Of Structural Engineering, Pisa University, Italy, Cum Laude
2003 – present Project manager at Studio Techné, Lucca, Italy

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Principal Restoration Projects

- Principal engineer of a villa complex from the 16th century restoration, with emphasis on masonries features.
- Principal engineer for the renovation of an agricultural building, converted for private theatre and art-gallery.
- Project manager of a 70 ha winery estate restoration. Restoration of the winery complex consisting of a series of old stone masonry buildings.

Research Projects in collaboration with the University of Pisa

- Finite Elements Analyses a medieval bridge called "Ponte della Maddalena", with emphasis on historical research and structural masonry analyses.
- Comparative research of cost analyses and effective results of the application of new techniques in the restoration of Concrete elements.

Presentation title

Experience in the performance of ESCO projects in old parts of town

Presentation resume

HEP ESCO Ltd is an energy service-providing company which develops, executes and finances energy efficiency projects on a commercial basis. As such, HEP ESCO is a Croatian leader in energy efficiency projects with over 50 implemented projects in fields of buildings, public lighting, industry and energy supply systems.

ESCO projects include modernization, reconstruction and refurbishment of existing plants and facilities. Within those project HEP ESCO has always taken into consideration increasing energy efficiency in cultural heritage.

Biography

Gordana Lučić, M.Sc.M.E. studied at the University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture. She works as director for almost 8 years in HEP ESCO Ltd. She previously worked as the head of the office for planning and control power plants construction in Croatian Power Utility company (HEP). As a director of HEP-ESCO, she played a leading part in preparation of the National energy efficiency Project in

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Croatia. She is also involved in cooperation with international institutions (IBRD, EBRD) and consultants on various projects regarding to Master Plan of electrical system, Tariff System, Loans and reconstruction transmission and distribution network, and also on planning of construction of hydro and thermo-plants in Croatia.



Senka Ibrišimbegović

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Presentation title

Energy efficient architectural lighting in promoting cultural heritage in BiH

Presentation resume

Consequently, sustainable and ecological growth is sought to make the city more pleasant to live in and find the harmony between architecture, the street grid, open spaces, cleanliness and environmental quality. Therefore, identity, personality, cultural and historical heritage, energy efficient living and environmental quality are the most important issues for our rapidly changing cities. The outlook for the global economy continues to deteriorate and create new environmental changes.

Implementation of the energy efficient architectural lighting by promoting cultural heritage buildings in Bosnia and Herzegovina should be a part of the principles and standards of cultural heritage protection. It is important to educate people who make

decisions of the importance of promoting the cultural heritage buildings as a resource in economic development.

Biography

BIRTH: January 22, 1979. in Travnik, BiH
LANGUAGES: Bosnian, German, English, French, Italian, Spanish
EDUCATION: 1992-1997: Kantonschule (Highschool) Zug, Switzerland. 1997-2003: Architecture Faculty, University of Sarajevo, BiH. 2003-2004: Master 2nd level Univerista di Siena; Politecnico di Milano, IT
PRACTICE: December 2007 - present. Teaching Assistant at the Faculty of Architecture, Sarajevo. September 2006 – "Studio Idea"; TARGETTI POULSEN illumination, architectural design. 2004.-2006. Renzo Piano Building Workshop for the ARS Aevi – Centre/Museum of contemporary world art in Sarajevo
PROJECTS and WORKSHOPS: -"Architecture within context" (MIT), Cambridge, USA and Yildiz. Technical University, Istanbul, Turkey -"8th Workshop & Symposium" Mostar 2004 -June 2003."Biennial of young artist in Athens, Greece Athens. -May 2003.-Dec. 2003.: „GO EAST- Vienna meets Sarajevo", Vienna -1st prize -"Alpbach Forum 2003" in Alpbach, Austria.-May-July 2006. Lighting Academy - Florence, Italy . -May 2008.13th Biennale of young artists in Bari, Italia . -November 2008–May 2010.– project Airport Shopping Centre, Sarajevo .



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Presentation title

Architectural integration of solar systems. Evaluation criteria and intervention strategies for minor historical centres.

Presentation resume

Initiatives and proposals to allow from one hand to overcome the emergency state in the after-quake city of L'Aquila and its surroundings and from other hand to promote and start up an integrate development of territory to be rebuilt, request clear and effective answers about "how to do"; at the same time is still open the debate about a strategic plan for retrofit, even more in historical context, where the values to be protected assume a primary relevance.

The presentation aims to identify, also through case studies, methods and criteria for

evaluation and intervention strategies for architectural integration of solar systems, and in particular photovoltaic systems, in minor historical centres, according to assumptions of environmental, structural, morphological and constructive compatibility of "active conservation" or "controlled transformation", in compliance with transformation levels suitable for historical heritage.

Biography

Pierluigi Fecondo was born in Lanciano (CH) November 8, 1975. He graduated in Building Engineering in 2001 at University of L'Aquila and obtained Ph. D. in Civil and Mechanics Engineering in 2007 at University of Cassino.
He got a Master in Energy Management in 2008 at the University of L'Aquila.
Adjunct Professor of Building Materials Production and Conservation Techniques and Tutor of Technical Architecture II, at Degree Course in Building Engineering-Architecture EU, at the University of L'Aquila.

The research activity is focused on technological innovation for sustainability in architecture, with particular interest on building simulation tools applied to bioclimatic and energy saving features, architectural integration and optimization of renewable energies systems in new buildings and recovering projects, energy management strategies in urban areas.

Presentation title

Energetic behaviour and Renewable Energy in traditional rural architecture

Presentation resume

The paper aims to present recent guidelines to improve energetic behaviour and Renewable Energy in rehabilitation works of traditional rural architecture. The guidelines are referred in particular to the G.A.L (Local Actions Groups) of Mongioie and Langhe & Roero sites in North Italy. Those rural areas are involved in the Italian Tentative Lists, submitted for inscription on the Unesco's World Heritage List. Both "Guides" can be configured as recommended standard instruments and were drawn up on the basis of study of the construction traditions and characteristics of the landscape in the reference area, which is largely mountainous and hilly. In both cases, the projects were carried out within the Plans for Local Development founded by Regional Rural Development Plan.

Biography

Architect graduate of the Polytechnic of Turin, Ph.D. in Building and Environmental Renewal, is Associate Professor in Technology of Architecture and teacher at the II Faculty of Architecture of the Polytechnic of Turin.

Her fields of research are mainly the architectural and technological rehabilitation concerning traditional and contemporary buildings, the conservation of Modern Movement architecture and the "modern materials". On these topics she has published numerous texts and presented at international conferences. In the last years she has

developed the research in the field of rehabilitation and energy refurbishment of traditional buildings on the point of view of environmental sustainability.

She has conducted research in the definition of operating guides for the maintenance and recovery of the traditional building and she was the project leader of the research Current Architecture and Landscape between Tradition and Innovation funded by the European Commission as part of the Community Culture 2000 Project.

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Presentation title

Lighting of protected historic city centers

Presentation resume

All cities are different, but when it comes to the lighting of their protected historic centers, with its cultural and historical sites, such as monuments, city walls, cathedrals and other valuable objects, their needs and wishes are similar. They all seek for lighting solutions which contribute to visual identity of the city and make their citizens proud, but at the same time preserve protected cultural heritage and environment. When implemented correctly, such lighting solutions provide distinctive night appearance of the city and help its touristic promotion. These solutions are quite different from usual lighting techniques used for roads. Criteria which designers should follow are: creation or improvement of city center's visual identity, emphasis of historic amenities, temperature of light, appearance of light source, reduced maintenance possibilities, energy efficiency and lighting pollution.

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Biography
see page 52.



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Presentation title

Contemporary urban lighting and lighting of old city centres and historic sites

Presentation resume

In the history of lighting design, there are classic shapes that cannot possibly be suppressed, like the typical lighting poles with glass lanterns from the old photographs of every city, and they are present in personal memories and part of the urban décor itself. With this paper we present the renovation of urban lighting, using new technologies to

improve efficiency lighting and energy savings, in order to preserve the infinite charm of the old city centres, and facades of monuments and monumental architecture, using modern optics to reduce light pollution environment and protect the night sky, and Innovative white light and LED light lamps, thereby taking into account that the design of lighting installations remain inconspicuous, with maximum functionality.

Author's biography

2000. graduate at University of Zagreb, POLYTECHNICUM ZAGREBIENSE, electrical engineer, department of electrical engineering, power engineering orientation. Ten years of experience in lighting design, also the preparation, organization and execution of various activities connected with electrical profession, and the presentation and sale of electrical equipment. Member of the »Croatian Society for lighting (HDR)« national committee of the International Commission for the lighting of CIE (the International Commission on Illumination - Commission Internationale de l'Eclairage). Member of the »Green Building Council of Croatia (GBCC)« affiliate member of World Green Building Council and initiator of linking the council in its neighborhood (CEE and SEE). Certified Energy Consultant; project promoting energy efficiency in Croatia within the project Energy Management (SEM) in the cities and counties. KNX partner, from 2006.



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Presentation title

Energy efficiency in public lighting systems

Presentation resume

The public lighting systems sector is at the beginning of important technological changes, due to economic and environmental sustainability reasons.

The public decision makers have to make choices involving energy and maintenance savings, environmental sustainability, public security and safety, aesthetic improvement of the cities.

The main technical matters are the light sources (efficient lamps and modern LEDs) and automatic light control systems. The implementation can be retro-fitted on the existing installations as it's easy to reach the necessary compromise between the conservation requirements of historical urban sections and the sustainable development.

The main purpose is the requalification of the whole city lighting plants, or of a large amount of them such as the historical sections.

The financial instruments are promoted from the Directive 2006/32/EC on energy end-use efficiency and energy services, using private capitals (Energy Service Companies – ESCo).

Author's biography

Gabriele Landi is an electrical engineer with extensive expertise in planning and supervision in the field of electrical installations in residential and industrial buildings, special electrical equipment and building automation, interior and exterior lighting. He has been a speaker at such conferences as:

- "Regulation and Supervision on installations for buildings: open systems BMS for the regulation and supervision of climatic comfort HVAC systems, electrical systems, and special security";
- "Energy-efficient lighting and sustainable development in environmental enhancement".

He's the author of publications such as:

- "The future of the installer through the use of software applications" - "ELECTRO" Review, New Techniques Edition, September 2003;
- "Building Management System" - OICE Magazine, July 2007.

He's vice-president of "TECHNEPROGETTI S.r.l. Engineering Society", a company composed of all the professionals needed to fully develop the various phases of a project, from conception to direct control of its implementation, so as to ensure high profile professional results.

Presentation title

Light Design Project of Dubrovnik Ancient City Core

Presentation resume

Dubrovnik Old city, "the Pearl of the Adriatic", has preserved its beautiful Gothic, Renaissance and Baroque churches, monasteries, palaces and fountains, as well as the city walls that encircle the Old city, giving its characteristic appearance. This precious cultural heritage, inscribed on the UNESCO World Heritage List from 1979., is the subject of the complex light design project. It implements the newest lighting technology in order to achieve the best lighting effects, as well as energy efficient solutions by which the energy consumption is reduced by 40% (comparing to the old one). The 1st phase of the project (lighting of the city walls) was finalized in 2009., followed by 2nd phase: architectural and public lighting inside the Old City.

Biography

Diana Galic is the light design department manager in Nova-Lux, and an author of numerous light design projects in Croatia and abroad. Although dealing with both interior and exterior lighting, she is specialized in architectural lighting. She has a Master degree in light design (gained on the Instituto Europeo di Design in Milano in 2009.), as well as in Economics (gained on the Faculty of Economics in Osijek in 1995.), and has

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a course degrees in Light Design in City Beautification and Urban lighting (attended in France and Belgium). She is a professional member of the Professional Lighting Designers' Association – PLDA, an international independent light designers organization (since 2010), a president of the Croatian Lighting Association – HDR (since 2007), president of the Croatian National Committee of the International Commission on Illumination – CIE (since 2007), and the general secretary of EURA - Association of Energy Efficiency in Urban Lighting (since 2007).



16:00-17:30 **Parallel session S2b: Energy efficiency in cultural heritage buildings: presentation of case studies in the planning phase**

Moderator: Marino Grozdek

This session will present case studies in the planning phase in implementing EE technologies in cultural heritage buildings.

Emir Kahrović - *Reconstruction and conversion of "Tvornica duhana Zagreb" into Croatian History Museum*

Anders Brüel - *Energy conservation in a historic building in practice*

Maja Popovac - *The Captain's Tower in Bihać*

Ana Paula da C. Esteves, Louise Land Bittencourt Lomardo - *The façades technological updating of an icon of Brazilian modernist architecture: the case of the IRB headquarters building*

Vladimir Turina - *The application of energy-efficient technologies-Viessmann*

Dino Juriša - *The application of energy-efficient technologies - Bosch*

Panel discussion:

Barbara Kulmer, Darja Radović Mahečić, Sanja Štok - *The "green" castle: a cultural heritage revitalization challenge in the age of a sustainable future*

Oksana Kozynkevych, Mykola Hayda, Viktor Kushnirenko, Oleh Gvozdevych, Myroslav Podolskyy - *The concept of the complex programme of the preservation and use of the landscape and architectural complex "Pidhoretskyy Castle" (Lviv region, Ukraine)*

Siniša Cvijić, Milovan Kotur, Tijana Glamočić - *Facsimile reconstruction of the Villa Bozic in Banja Luka by using energy efficiency methods*

Walter Sedovic, Jill H Gotthelf - *Paradox to paradigm: the sustainability and Performance of heritage buildings*

Moderator:



Marino Grozdek

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10 000 Zagreb, Croatia
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Bachelor's degree, received 2001 at University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia.

PhD degree, received 2009 at Royal Institute of Technology (KTH), Department of Energy Technology, Division of Applied Thermodynamics and Refrigeration, Stockholm Sweden. Thesis title: „Load Shifting and Storage of Cooling Energy through Ice Bank or Ice Slurry Systems - modelling and experimental analysis“.

Currently he is employed as a research assistant at Department of Thermodynamics, Thermal and Process Engineering, Faculty of Mechanical Engineering and Naval Architecture in Zagreb.

Professional interests are in field of refrigeration and heat pump technology, energy storage and transportation technologies, HVAC systems, energy management in buildings and industry.

Presentation title

Reconstruction and conversion of “tvornica duhana zagreb”
into croatian history museum

Presentation resume.

Approach, activities and program of measures for increased energy-efficiency during reconstruction and conversion of Tvornica duhana zagreb (Tobacco Factory Zagreb) into Hrvatski povijesni muzej (Croatian History Museum) with reference to the requirements of the future users and rational exploitation of the building.

Biography

Born in Sarajevo 1979. Graduated at Faculty of Architecture, University of Zagreb in 2006. Assistant at scientific project Atlas hrvatske arhitekture 20 stoljeća (Atlas of 20th Century Croatian Architecture) 2005-2007. Fellow assistant at Faculty 2008.-2010. Works at architecture office Odak and Siladin 2007-2008. Since 2009. works in an architectural office Poligon projekt.

In 2009. with Andrej Uchytel and Zrinka Barišić Marenčić published Leksikon arhitekata atlasa hrvatske arhitekture XX. stoljeća (Lexicon of Architects from the Atlas of 20th Century Croatian Architecture) for which they received Državnu nagradu za znanost (State award Croatian Parliament for Science) in 2010.

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Presentation title

Energy conservation in a historic building in practice

Presentation resume

Realdania Byg has studied the limits to energy preservation measures set by the historical settings of a specific, listed 18th C property. The findings of that study are currently being carried out in practice. In collaboration with the Danish Heritage Authorities Realdania Byg organized a series of workshops where all possible technical solutions were discussed. In the end a combination of simple, low-tech solutions and some high-tech consumption control systems were chosen. Altogether, the measures taken will reduce the CO2-emission by around 23%. Most of these measures are economically realistic and can thus be replicated by others. The project has been selected as a case study in 3ENCULT, an EU 7th Framework Programme entitled “Efficient Energy for EU Cultural Heritage”.

Biography

Conservation architect (Royal Danish Academy of Arts, 1990)

Postgraduate studies in Housing Studies and Energy and Environment Studies (Architectural Association, London, 1992)

Own architectural consultancy practice since 1993, works in Denmark and Greece

Employments at the Danish Heritage Agency (2000 – 2003), the Danish Palace and Properties Agency (2004), and since 2005 working with Realdania Byg, the property development subsidiary company of the Realdania Foundation, as project manager responsible for several conservation and rehabilitation projects in Denmark and abroad.

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Presentation title

Project for reconstruction of Captain's tower in Bihać, BiH

Presentation resume

Captain's Tower in Bihać requires serious reconstruction of stone walls. Current condition shows that damage is result of aggressive atmospheric water. After the consolidation of the walls from both sides and injection works, it will be possible to prevent leaks into the structure. Air-conditioning unit will require air throttles made under the crown of the wall, as well as some strengthening of the structure for the main unit weight. Roof covering should be replaced by traditional chestnut shingles. Thermal insulation should be placed in upper floor ceiling should be made with three layer glass (Low e + argon filling). Electric installations should go through telescopic pipe by the staircase.

Ventilation will be very important in this facility – because of assurance of its longevity as well as because of the valuable artefacts. Unit place under the roof will provide necessary air exchange in entire building. Main source of energy would be water-water heat pump.

Biography

January 25th 1973., Mostar, BiH
1995–1998: Faculty of Architecture, Czech Technical University, Prague, Cz, BSc
1998–2000: Faculty of Architecture, Czech Technical University, Prague, Cz, MSc
2001–2007: Faculty of Architecture, Czech Technical University, Prague, Cz PhD
(Department for History of Architecture and Monument Preservation)
2005: License for self employment (Architecture, Urban Planning)
2000: General Engineering, Firenca, Italija
Old Bridge Reconstruction Project
2000 – V. 2002: Aga Khan Trust For Culture / World Monument Fund, Mostar Numerous Rehabilitation and Reconstruction Projects and Supervision,
V. 2002–VII. 2003: ER-BU, Mostar, BiH Old Bridge Reconstruction, UNESCO
since 2003: Center for peace and multiethnic cooperation, Mostar, BiH Old Bridge – a Peace Monument, Exhibition
2003–2008: GD „Arhitekt“ Mostar, BiH, Reconstruction of Cejvan Cehaja Hamam, Mostar, UNESCO . since 2000: Self employed in various projects of buildings, houses, interior designs, reconstructions. . . since VIII. 2008: University "Dzemail Bijedic" Mostar, Faculty of Civil Engineering, Docent, Teaching, Reconstruction and Architectural projects, Supervision . Vice-rector for International Cooperation.



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Presentation title

The facades technological updating of an icon of Brazilian modernist architecture: the case of the IRB headquarters building.

Presentation resume

The Brazilian Reinsurance Institute building, an icon of modernist architecture in Brazil, projected by MMM Roberto, is legally protected. Its facades had passed by some interventions which will be presented in this article.

The present work aims not only at observing the energy consumption, as a result of the last year building renovation, but also at suggesting and comparing materials that could be applied to constitute a true technological retrofit in order to promote energy efficiency increase as well as better indoor environmental comfort too.

This work briefly describes the history of preservation of the Brazilian modernist architecture and analyses the first Brazilian official regulation to assess the building electric efficiency level.

Biography

Graduate at Architecture and Urbanism from Federal Rio de Janeiro University (1995) and student of the post-graduation from Federal Fluminense University. Has experience in Architecture Design, acting on the following subjects: bioclimatic architecture, building energy efficiency, heritage cultural and retrofit of buildings. She is a researcher of the LabCECA/UFF (Laboratory for Energy Conservation and Environmental Comfort).

Barbara Kulmer

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Presentation title

The "green" castle: Cultural heritage revitalization challenge in the age of sustainable future

Presentation resume

The Cernik project is a complex, comprehensive green urban development project that starts with a single sustainable preservation story - that of the Cernik castle. This project seeks to change the current practice, or lack thereof, with regards to cultural heritage preservation, existing legislation, green solutions implementation, and future experience. We are looking to instigate a positive economic outcome through allotting to the castle its natural role of local economy generator and to benefit the local community through green thinking, communication, education, general cooperation and any potential further growth and development. The project also requires strong governmental and institutional support and is attempting to actively address this issue as it is one of the critical points currently standing in the way of effective preservation, sustainability and an overall positive economic outcome.

Biography

Barbara Kulmer is a Savannah College of Art and Design (SCAD) graduate with a masters degree in architecture. She has also majored in interior design, German and linguistics (Faculty of Philosophy, Zagreb) and has worked in various fields such as real estate, legal, interior design, education and cultural management. She is currently living and working in Zagreb where she works on cultural team projects involving exhibitions, architectural theory research, preservation and building management.

Barbara Kulmer has also been a real estate business owner since 1998 and is a recipient of several scholarships such as: Francis Larkin McCommon Portfolio Scholarship, SCAD International Baccalaureate Scholarship (Savannah, GA), and state sponsored International Baccalaureate Scholarship in Zagreb, Croatia.

Presentation title

The Concept of the Complex Program of Preservation and Use of the Landscape and Architectural Complex "Pidhoretskyy Castle" (Lviv region, Ukraine).

Presentation resume

The landscape and architectural complex "Pidhoretskyy Castle" was one of the first museum complexes which started to develop in the 18th century on the territory of Ukraine. Owing to the convenient location and valuable collection of artworks, the castle became well-known in the countries of Eastern Europe in the 19th and first half of the 20th centuries.

The restored and adapted complex sites, the regenerated park ensemble, the arranged territory of the ancient fortified town of Plisnesko, well preserved picturesque landscapes of outskirts serve as a basis for creation of the international museum and tourism-recreation center.

The report presents the Concept of the complex program of preservation and use of the landscape and architectural complex "Pidhoretskyy Castle" (the Concept), which includes conduction of scientific researches, elaboration of the general plan, creation of museum and ethnographic exhibitions and tourism-recreation objects as well as proper transport and tourism infrastructure which will boost investment projects.

Victor Kushnirenko

Found "Pidhirtci castle"

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Pidhirtci@yahoo.com



Biography

Occupation: The Charity Foundation "Pidhoretskyy Castle"

Position: The Chairman of the Board of Management

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Place of Work: Ukraine 79000 Lviv City, Kopernika str., 15.

Name of Department and Higher Educational Establishment that gave Diploma:

Historical Department of Lviv State University named after Ivan Franko

Date of Graduation: 1997

Speciality: Historian

Siniša Cvijić

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Presentation title

Facsimile Reconstruction of Villa Bozic with the Application of Energy Efficiency Measures

Biography

Villa Bozic was built in 1912. in Banja Luka by prominent Croatian architect Rudolf Lubynski. It was heavily damaged by earthquake in 1969. and completely demolished in 2002. The paper concerns the reasons for applying facsimile reconstruction and using of energy efficiency methods in this villa preserving.

In case of complete physical reconstruction of villa, its historical value, possibility of changing function and using modern materials that allow less energy consumption, have been taken into account. On the villa are applied the installation of thermal insulation, LED lightening and geothermal heat pumps. Using the software were simulated results of the energy consumption structure. Bearing in mind the application of methods, the results have been compared with results obtained without the use of these methods.



Walter Sedovic

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Jill H Gotthelf

Presentation title

Paradox to paradigm: sustainability and performance of heritage buildings

Presentation resume

A veritable sea change in attitude about the performance of heritage buildings and systems has placed them prominently into the sustainability equation. Far from their maligned reputation as “energy hogs,” our historic buildings are increasingly recognized for their inherent energy efficiency—thermal mass, durability, indigenous materials, passive systems, integrated landscapes, embodied energy and regional design distinctions. The key lies in holistically identifying, then fine-tuning, existing elements within systems, buildings and communities that affect energy consumption, coupled with data collection of actual performance to prove out results. The authors will demonstrate through case studies a significant reduction in the cost and scope of interventions, along with greatly enhanced appreciation and operation of historic buildings, ultimately benefiting economy, environment and community.

Walter Sedovic FAIA LEED, Principal & CEO at Walter Sedovic Architects, is dedicated to historic preservation and sustainable design. His work and firm are recognized as representing the vanguard of infusing preservation projects with green building approaches and ideologies, resulting in enriched educational and cultural opportunities, and strong community ties. Walter is a sought-after speaker nationally and internationally on the subject of Sustainability and Preservation and is the Guest Editor of the Association

for Preservation Technology International's special edition Bulletin on Sustainable Preservation. His firm has won virtually every national preservation award; recently he has been elevated to the American Institute of Architects' College of Fellows.

Authors' biographies

Jill H Gotthelf AIA, Principal at Walter Sedovic Architects, sets a prodigious standard for the open exchange of ideas among peers, clients & constituents, resulting in projects, workshops, presentations & publications that embody the essence of sustainable preservation. Ms Gotthelf embraces a holistic view of sustainability, pushing beyond the limits of the traditional definition to establish a balance between economics, environment, social and cultural equity, authenticity, and education. Under her distinctive leadership as Chair of APTI's Technical Committee on Sustainable Preservation, APTI has become pivotal in collecting & disseminating cutting edge philosophy, technology & tools for sustainable preservation. Ms Gotthelf has lectured and published widely on the subject of preservation and sustainability.

Friday, 8th April 2011

09:00-10:00 Parallel session S2c: Energy efficiency in cultural heritage buildings: how to improve the building envelope

Moderator: prof. Branimir Pavković

In most cases, the concept of the building envelope in cultural heritage buildings is the most important part of building conservation. This session will feature examples of implementing new technologies in respect to the building envelope without violating the historical character of cultural heritage buildings.

Roger Curtis - Improving Energy Efficiency in Traditional Structures: Work by Historic Scotland

Daryl Gambarana - Historic Royal Palaces Insulation Project

Aleksandar Terer - History has a Future

Panel discussion:

Alan Braun, Zoran Veršić, Tomislav Vidović - *The reconstruction of the French pavilion at the student centre in Zagreb from the aspect of energy efficiency*

Iva Muraj, Zoran Veršić, Dunja Mandić - *energy efficiency improvement of cultural heritage buildings: problems and challenges of modern movement public buildings*

Žarko Španiček - *Traditional or modern carpentry in cultural monuments*

Željka Perković - *Fortresses: heritage in new functions*

Araceli Salto Saura, Lluís Balart - *Adaptation of the former courthouse building*

Moderator:

Biography

Professor of refrigeration at Faculty of Engineering in Rijeka. Focus of interest is refrigeration, heat pump systems' design and applications, energy efficiency. Team leader of several scientific projects financed by Croatian government. Author of more than 80 scientific papers and several chapters in books. Active in the professional work as the designer of installations and HVAC and heat pump systems, author of several EE studies. Member of Croatian solar energy association, Croatian Chamber of Mechanical Engineers (president of commission for international relations and representative in REHVA and member of REHVA TRC), International Institute of Refrigeration – IIR (member of commission E1 – Air Conditioning), American Society of Heating, Refrigerating and Air-Conditioning Engineers – ASHRAE, International Institute of Ammonia Refrigeration – IIR, Eurammon.

Branimir Pavković

Faculty of Engineering

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Roger Curtis

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Presentation title

Energy Efficiency in Traditional Structures: Work by Historic Scotland

Presentation resume

Traditional and historic buildings are under significant pressure to reduce the carbon emissions associated with their operation, and Historic Scotland is taking a lead in the provision of guidance and advice for traditionally built structures of all type in Scotland. Following the established principles of traditional construction, its programme of

research has looked at the thermal performance of the traditional building envelope and how it can be improved by sensitive and appropriate intervention; key processes and initial findings for each fabric element are presented and the savings achieved in selected pilot projects are discussed. Other related factors such as passive benefits and sustainability issues are discussed in the site context together with an outline of the future research programme.

Biography

After military service he joined the conservation contractors Cumming & Co, based in Perth, initially as a driver, and latterly as a project and training manager with additional responsibility for Health & Safety. During this time he completed an MSc in Building Conservation at Heriot Watt University in Edinburgh. Work with the company ranged from castle consolidation and restoration to upgrading of domestic buildings, churches and associated facilities with a focus on mass masonry and limeworks. He joined Historic Scotland in Feb 2006 as Conservation Resource Manager, and is presently Head of The Technical Research Unit, managing a diverse mix of research strands that include energy efficiency in traditional buildings, properties and behaviours of traditional materials and historic ventilation and heating techniques.



Daryl Gambarana

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Presentation title

Historic Royal Palaces

Presentation resume

Rockwool worked in partnership with British Gas to undertake a project to insulate the three main UK historic royal palaces, The Tower of London, Kensington Palace, and Hampton Court Palace. The Objective of the project was to reduce the carbon emissions from the palaces, reduce running costs and to improve the indoor climate conditions through the installation of both traditional roll and blown loft granulate insulation. Discussions on the project began in late 2009 and were completed in November 2010; most of this time was spent in the planning and technical assessment phase. The scope of this project was very ambitious. Initially the team were looking to supply and install approximately 6,514 rolls of Rockwool insulation. This amount of insulation would cover about 11,478 square metres. It would involve about 1,900 hours of labour which would equate to a four man team working about 60 days.

Biography

Daryl joined the Wall systems department of Rockwool in 2006, before working in the marketing department developing products & business solutions for British Gas. After spending 3 years developing products and solutions on behalf of British Gas, he entered into a strategic programme, heading a project to develop a partnership with British Gas, and provide them with a platform to train and develop domestic refurbishment insulation installers, in the range of loft, retrofit cavity and external wall insulation systems (ETICS). Daryl currently holds the dual role of Project Manager, managing a range of projects and programmes, as well as Partnership Manager of the British Gas relationship for Rockwool.

Presentation title

The History has a Future

Presentation resume

Historical heritage is unvaluable to every nation. To preserve the historical monuments for the coming generations we have to protect them good, and those still used for the living, adapt to the needs of the today's users.

The application of new materials and technologies in the projects regarding the protection of cultural monuments is unavoidable and may render excellent results under the condition that a whole spectrum of experts are included, from art historians, curators and architects to producers and work performers.

High quality windows made of new materials are for a good reason no longer a taboo in this field: they are characterised by high quality thermal insulation, longevity, by being economical and easily maintained, and the design does not disturb the original style of historical buildings, thus significantly contributing to the preservation of the facility and its content.

Aleksandar Terer

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Biography

He was born 25 of October 1962 in Pakrac, Croatia.

Married, father of two children.

He started his career in a state company «Elektra» d.d. In order to join the defensive forces of THE Republic of Croatia, he left the company. After being wounded and after the taken rehabilitation he left abroad where he stayed until 1997. After that he came back to Croatia and took the position of CEO at Profine Croatia d.o.o. where he still works. Winner of several social recognitions.

Alan Braun

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Presentation title

The Reconstruction of the French Pavilion at the Student Centre in Zagreb from the Aspect of Energy Efficiency

Presentation resume

The exhibition pavilion of the Republic of France was built in 1936 and 1937 in Zagreb according to the design of the French architect Robert Camelot and the civil engineer Bernard Lafaille. The French Pavilion represents a unique engineering innovation, since a thin steel shell was applied for the first time as a load-bearing structure in high-rise building. Therefore, it is a building of exceptional cultural and historical, as well as technical and technological value. The reconstruction design envisages that the Pavilion will keep its original use. In order to enable the use of the Pavilion all year round, it was necessary to adapt the Pavilion appropriately to contemporary standards, but also to correct some flaws in the original design. In this process, special attention was given to energy efficiency with a contemporary treatment of the perimeter elements of the Pavilion structural system, which did not damage the originality of its idea and design in any segment.

Biography

Alan Braun, M.Sc., Dipl.Eng.Arch. is employed at the Department of Theory and History of Architecture at the Faculty of Architecture in Zagreb since the graduation in 1994. He received his master degree in 2001 with the thesis "Zagreb - the City and its Architecture in the Eighteen Eighties".

Alan Braun is the head of several obligatory and electoral courses at the Faculty of Architecture. He is the head of the Institute for Built Heritage (Faculty of Architecture), president of the Cultural committee for protection and preservation of cultural assets of the city of Rijeka and managing editor of the scientific journal "Prostor".

In addition he is the author of many designs and realisations in the field of built heritage and contemporary architecture.



Iva Muraj

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Presentation title

Energy Efficiency Improvement of Cultural Heritage Buildings:
Problems and Challenges of Modern Movement Public Buildings

Presentation resume

The energy index of modern movement public buildings is much higher in comparison to today's standard for new houses. Better energy efficiency can be achieved only by physical change to the building fabric. Differences in applying renovation measures result from the level of building conservation.

Biography

Iva Muraj, PhD, Dipl.Eng.Arch., graduated in 1996 from the Faculty of Architecture, Zagreb University, where she has been employed as senior teaching assistant for the courses Architectural Structures and Building Physics since 2000.



Žarko Španiček

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Presentation title

Traditional or modern carpentry on cultural monuments

Presentation resume

The author is presenting problems related to the usage of different types of window and door casings on the historical buildings in the western part of Croatian region of Slavonia. The Institute for Cultural Heritage Protection from the town of Požega has recently been

faced with the demands for the replacement of traditional wooden carpentry on cultural monuments with the modern carpentry. Those demands have most often been motivated by practical reasons such as simpler maintenance or for improved thermal and sound insulation. There is a wide scale of demands for the application of modern carpentry: from classical wooden windows to modern plastic and wooden-aluminum windows and doors with one of two insulation chambers. The article presents recent examples from the conservation practice of this region which are attempting to explain the guidelines which are used as the starting point in the search for solutions.

Biography

1984. B. A. (ethnology and philosophy), Faculty of Philosophy in Zagreb.

1992. M. A. 2001. Ph. D. from the same faculty.

1999. Head of the Department in the Ministry of Culture. In this position I had the opportunity to arrange the restoration of numerous monuments in Slavonia.

2009. participated in the preparation of the large exhibition Slavonija, Baranja i Srijem – vrela europske civilizacije (Slavonia, Baranja and Srijem – sources of European civilization) as an editor for the ethnology.

Published three books and dozens of articles in local and international publications.

Main areas of professional interest and scientific research: folk architecture, popular piety, intangible cultural heritage.

Presentation title

Fortresses- heritage in new functions, preservation of heritage, identity, environment

Presentation resume

The Fortresses in Slavonski Brod and Stara Gradiska, with their border positions, represent remarkable monuments of baroque architecture. They were built as a part of system of the fortresses on the frontier towards Ottoman Empire. The aim of this work is to present informations about fortresses, to restore and improve architecture that was meant for the war into the architecture of peace - to reconcile the past and future and to applicate knowledge of energy management. Nowadays we have to care about our cultural heritage and preserve it in optimal form by implementing suitable new functions. Also in this time of crisis in the field of construction and investment it is the best time for analizing the current situation and planning activities to create the pre-conditions for stable development and growth in the future by implementing efficient technologies, especially those which will be better, the best possible for our environment.

Biography

Željka Perković: Rođena u Županji 25. kolovoza 1957., živi i radi u Slavonskom Brodu
Radno iskustvo: Od 2007. Pročelnica u Ministarstvu kulture, Konzervatorskom odjelu u Slavonskom Brodu , od 1994. -2007. stručni suradnik i koordinator u gradskom

Željka Perković

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poglavarstvu grada Slavanskog Broda u odjelu za graditeljstvo i prostorno uređenje te na obnovi kulturnih dobara, od 1982. -1994. u Projektburo-u samostalni projektant
Školovanje: Pohađa završni semestar poslijediplomskog studija Organizacija i Management, Sveučilište u Zagrebu, Arhitektonski fakultet, Gimnazija i OŠ I.G.Kovačić u Slavonskom Brodu

Vještine i kompetencije: Strani jezici, engleski aktivno, njemački pasivno, tehničke vještine, rad na računalu, word, autocad...,umjet. vještine, slikanje, akvarel
Stručni radovi i članci: Objavljeni radovi u Godišnjaku Matice Hrvatske, Vjesniku Muzeja Brodskog Posavlja, Hrvatskom časopisu za javno zdravstvo...

Presentation title

Adapting of the building "Antiga Audiència"

Presentation resume

The City Council of Tarragona has this building in the upper part, where several activities take place. The intense use of this building by the residents and municipal services, requires a permanent maintenance of the facilities and especially to ensure the comfort and security of the building.

Problems addressed

The reason for the action is to adapt the facilities to existing uses and improve the facilities relating to fire protection, air conditioning, removal of architectural barriers...
Pointing out the intervention actions. Signalling pathways evacuation improving signage and graphic emergency lighting. Remove barriers to the installation of a lift. Building ramps and placement of handrails and railings protection.

Araceli Saltó

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Biography

Academic degrees

1986 BSc. in Education Sciences (University of Barcelona)

1999 BSc. in Law (UNED)

2010 Master in Politic Sciences and Public Administration (UOC)

Professional experience

1995-2000 Head of Building Licenses department at the municipality of Tarragona

2000-2001 Technician at the UE twinning program for municipal reconstruction in Kosovo (UNMIK)

From 2001 current professional activity as follows

Current professional activity

Head of Culture and Heritage area at the municipality of Tarragona.

09:00-10:00 **Parallel session S2d: Energy efficiency in cultural heritage buildings: Prevention of moisture in historical buildings and traditional architecture**

Moderator: Silvio Novak

The installation of HVAC systems and the over-sealing of cultural heritage buildings can lead to considerable condensation problems. Various solutions proved to be effective in improving the quality of life in cultural heritage buildings without compromising the historical character of the building. One can implement EE measures within traditional homes and still maintain their historical value. The same can also be converted and utilized for a different purpose (e.g., tourism) by implementing new EE technologies and simultaneously preserving the buildings' traditional values. Traditional architecture indeed provides excellent examples of good building practice that could help design future sustainable buildings.

Escobar González, A. - *Three different approaches for patios in urban palaces and changes in their hydrothermal performances*
Fodil Fadli - *Retrofitting Heritage Buildings in the Middle East & North Africa - Integrative Passive Design Solutions in Heritage Cities*

Panel discussion:

Bojan Milovanović, Dunja Mikulić - *Assessment method for combined heat, air and moisture transfer in building components*
Arroba Fernández, M., Segovia Pinacho, R., Grau Enguix, J., Ramírez Masferrer, J.A., Escobar González, A., Martín Blanco, M.A. - *Heating and condensation in buildings whose walls present some type of patrimonial protection*
Dragana Petrović, Mila Pucar, Jelica Jovanović - *Bioclimatic sanitation of protected residential areas: a case study on the possible renewal of the Bač Fortress Suburbium*
Mladen Divković - *Architecture created without architects*
Zora Salopek Baletić - *The Lesic-Dimitri Palace in Korcula*
Sanela Klarić, Azra Korjenic - *The traditional Bosnian house in compliance with current energy efficiency requirements*
Jacqui Donnelly - *Energy efficiency in traditional buildings: recent developments in Ireland*

Moderator:

Silvio Novak

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Professional career

2001. – TERMIKA d.o.o. Novi Marof (since 2007. – KNAUF INSULATION d.o.o.)
1997. – 2001. – CONING GROUP VARAŽDIN
1995- 1997. Croatian Institute for bridges and constructions
Professional activities
- From the very beginning of the professional career involved in designing and executing numerous demanding facilities in Croatia. The author of numerous articles and lectures on the application of thermal, acoustic and fire insulation. Lecturer at the Physics Department building at the Faculty of Civil Engineering Split. Professional speaker in the training of Architects and Engineers - Society of Civil Engineers and Technicians of Zagreb, Faculty of Architecture Building in Split, Croatia UNDP, the Chamber of Architects, the Chamber of Construction Engineers. Professional speaker on the topic of thermal insulation on the civil engineering faculties in Zagreb, Osijek and Split, and a number of vocational schools in Croatia.



Presentation title

Three different approaches for patios in urban palaces and changes in their hygrothermal performance

Presentation resume

Segovia (Spain) has been declared by UNESCO World Heritage Site, 1985. The urban palaces built in Segovia, between the 15th and 18th centuries, are functionally distributed around interior patios with galleries on three or four sides. In view of the current purpose of the buildings, some modifications might be needed, this can be done in three different ways: Partial closure of the gallery with windows, new structures covering the whole patio or no modification at all (open patio). Discussion addressing the three different approaches and their implications regarding heritage and hygrothermal performance will be presented.

Biography

Ana Escobar. Date of birth: July 29th, 1965. Place of birth: Valladolid (Spain)
Master's of Architecture and Urban Planning at Universidad de Valladolid. Graduation date: March, 1996
Postgraduate education in Cultural Management and Heritage Restoration.

Professional Activities

1998-2004 High School Plastic Arts teacher

1997-2003 Freelance at Architecture office

2004-Current Architectural Restoration and Heritage at Castilla y León Local Government. Supervision and reporting of historical monuments restoration in the city of Segovia (World Heritage site from 1985)

Ana Escobar

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Presentation title

Retrofitting Heritage Buildings in the Middle East & North Africa-MENA- Integrative Passive Design Solutions in Heritage Cities

Presentation resume

Traditional buildings are rich in sustainability concepts. Investigating these ingenious buildings allows architects and designers to learn from the past in order to sustain buildings of the present in the uncertain future. Based on recent research projects conducted by the author in the MENA region, this paper aims to shed light on the different types of passive design devices (heating, lighting and ventilation systems) adopted in vernacular structures of the North African and Mediterranean city; "the medina". These structures consist mainly of courtyard houses, masjid (mosques), suqs (markets) and public amenities such as madrassas (schools), bimaristans (hospitals) and hammams (bathhouses). Different passive design devices are analysed, and then re-adapted by retrofitting heritage buildings. The paper finally concludes by adopting design guidelines which aim to help develop sustainable future adaptive (re)use scenarios of „historic-buildings by integrating new technologies based on past concepts for the benefit of contemporary and future use.

Biography

Dr. Fodil Fadli is an assistant professor at Qatar University. He is an architect, academic and researcher in Architecture and Urban Design. Fodil received a degree of -Architecte d'état- (MArch) from EPAU-Algiers. He obtained his PhD from the University of Huddersfield

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(UK), with special expertise in - sustainability assessment in architecture-. Dr. Fadli worked in academia where he contributed to large research projects in Ulster University and Liverpool University. He was involved in architectural practice and construction industry as a sustainability housing consultant in Leeds (UK). His research spans sustainable architecture, sustainability assessment models, adaptability/mitigation and complexity in BE, historic buildings restoration and retrofitting, adaptive reuse, and tourism & cultural heritage. He has published and contributed in leading journals and conferences and is a regular reviewer for well-established journals, book publishers and funding bodies (JAC, BAE, Ashgate,). Fodil enjoys designing in dynamic environments (i.e. ship design and earthquake architecture).



Bojan Milovanović

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Presentation title

Assessment Method for Combined Heat, Air and Moisture Transfer in Building Components

Presentation resume

The present state of knowledge, concerning heat, air and moisture (HAM) transfer through construction elements demands updating. The standardized Glaser method for calculation, prediction and evaluation of moisture performance is frequently used to assess the moisture safety of structures but is considered as rarely applicable. The method has a lot of limitations and as a result, construction elements that are qualified as good moisture design may in reality, due to built-in moisture, precipitation and air

exfiltration face many problems. With the recent advances in analytical and experimental knowledge, the prediction of the HAM response of structure has come closer to reality. In this article a review of the acceptable tools based on HAM transfer is made.

Biography

Since 2007, Young researcher at the Department of materials, Faculty of Civil Engineering, University of Zagreb.

Fields of interest: Building physics, Infrared thermography, moisture, durability of structures, young hardening concrete properties, material testing and modeling of material performance.

Certified thermographer Level II, Module 2 Certificate in inspection of energy performance of buildings.

Representing Faculty of Civil Engineering in the Intelligent Energy Europe Project titled INTENSE (Intelligent energy saving measures for municipal housing in Central and Eastern European countries).

Member of: Croatian society for Infrared thermography, Croatian society for nondestructive testing,

Since 2008, involved into the work of Croatian standards institute, Technical committee 163 – Thermal insulation



Dragana Petrovic

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Presentation title

Bioclimatic sanitation of the protected residential areas – case study on possible renewal of Bac fortress suburbium

Presentation resume

Results presented in this paper refer to possibility of bioclimatic and energy sanitation of law protected residential areas. Research involved investigation of traditional build principles in Vojvodina, as well as identifying the best methodology in terms of allotment reorganization, installation of sanitation facilities in residential and auxiliary facilities, with special attention to energy efficiency and usage of renewable energy. The inhabitants of the Suburbium are facing difficulties and struggling to meet the demands of the heritage protection services while trying to improve the quality of life in houses that are in bad condition, compromised by moisture, improper repairs and years of neglecting caused by the poverty of their owners. Since the

services in charge are under-staffed, the idea of public-private partnership emerged, in order to conduct this research study and come up with the best possible solutions to the burning problems of the community.

Biography

Currently student of Doctorate studies at Vienna University of Technology, at the Institute of Building Physics and Building Ecology, by doctorate advisory of Prof. Dr Ardeshir Mahdavi. Graduated at Faculty of Architecture - University of Belgrade, elective course: Bioclimatic design in Architecture. Graduated on project: Student campus in Coimbra, Portugal (helped by Prof. Dr Helder Goncalves, LNEG and Prof. Fernando Branco, TU Coimbra). Founder and member of various student (national and international) organisations: BEST (Board of European students of technology), SUAF, KMA (Club of young architects – former member). Worked on several workshops at Faculty of Architecture (2005-2010), and several international workshops in BEST organization (2005-2010). Trainee of Belgrade Open School. Co-author of Summer School of Architecture in Bac 2010. Former employer: Serbian Academy of Sciences and Arts (Archaeological Institute), worked on Roman City Viminacium excavations. Founder of NGO, the Group of Architects.

Presentation title

Lešić Dimitri Palace at Korčula

Presentation resume

The Palace is complex consist of two parts, historically and structurally different, four storey Palace and the addition of five monocellular derelict houses, originally evolved as part of Korcula Island old city medieval urban matrix.

It was decided that a full restoration of the complex would be carried out in a way as to restore the structural integrity of the buildings to the highest standard, preserve all existing features, maintain the existing plan, and present the intrinsic qualities of the buildings. The aim of the conversion was to create a comfortable facility fully equipped with infrastructure usually present in luxury tourist facilities out of an old and damaged building lacking any infrastructure.

The reconstruction proved that old houses can have top quality equipment and comfortableness if they are equipped and managed as a five star hotel. Only that type of tourism can be sustainable for historic island towns like Korčula.

Biography

1970 born in Petrinja, Croatia
1988-1994 studies in University of Zagreb, Faculty of Architecture
1994-2006 architectural practice in Arhigrad and Wizard,
2006- partnership in architectural office matrica arhitektura
2010- Principal of architectural office Arhitekti Salopek

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The work mainly consists of public housing, private individual houses and interiors. Beside that field, matrica arhitektura is mainly focused on the demanding restorations of the historical buildings. Arhitekti Salopek is mainly focused on restorations of the old wooden vernacular architecture.

Among the other architectural works ZSB is also the author of the POS building in Karlovac and the Trsje Villas in Zagreb, both with Bojan Baletić. She is the author of the project Palace Lesic Dimitri which was highly commended from Europa Nostra 2010., nominated for the award Bernardo Bernardi 2009. and got the award on the portal World Arch Community 2010. Currently works on restoration of the Veliki Kaptol, Sisak and Hotel Jurjevac, Turropolje.

Presentation title

Traditional Bosnian House in Compliance with the Current Energy Efficiency Requirements

Presentation resume

This paper presents the results of research conducted to date regarding the possibilities of the revival of the traditional individual Bosnian dwelling unit. The architectural design, spatial organisation, use of local natural materials and connection with the natural environment makes it a valuable example of residential architecture. This study illustrates in view of the increasing need to save energy, that in using natural materials and integrating sustainable design into architectural design processes, our contemporaries are utilising the best the past has to offer to the future, coupled with the best modern methods. By using the "BuildOpt_VIE" dynamic thermal simulation software to find optimal solutions in building physics, the study arrived at adaptations of traditional Bosnian dwellings which met energy efficiency requirements. Several variations were derived for new buildings and reconstruction of existing buildings. The study shows that it is possible to sustain traditional architecture while achieving state of the art energy efficiency.

Biography

I have completed a significant number of architecture and interior design projects in BiH,

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with an increasing focus on design for sustainable development.

In 2009, I completed the final design project for my first low energy house '0 House' (as part of my academic research on low energy housing). I am currently working on a number of new designs for low energy houses. I am a member of a team in the Institute of Architecture, Sarajevo, designing a residential building, containing 80 apartments, applying green design principles including utilising renewable energy resource. I also actively promote sustainable building more widely in BiH: A Member of the organising committee of the annual Green Design Week festival in Sarajevo, Bosnia and Herzegovina. President and founder of a new CSO - "Green building council - GREEN", that will promote sustainable built development in BiH.



Jacqui Donnelly

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Nonetheless, many owners understandably wish to reduce energy consumption and increase comfort levels in their historic buildings. This paper looks at the steps taken in Ireland to provide guidance on best practice. The Department of the Environment, Heritage and Local Government, which legislates for heritage protection and building standards, recently published '*Energy Efficiency in Traditional Buildings*' to provide practical advice on appropriate upgrading measures. The guidelines support conservation practitioners and decision-makers in meeting standards for retro-fitting while protecting the heritage.

Biography

Architectural Conservation Advisor with the Department of the Environment, Heritage and Local Government in Ireland. She is a graduate of the School of Architecture, University College Dublin and the Institute of Advanced Architectural Studies, University of York and worked as an architect in private practice in Ireland and England on a number of conservation and new-build projects before joining the public service in 2000. Co-author of the Architectural Heritage Protection Guidelines for Planning Authorities published in 2004. Currently the co-ordinator and series editor of the Advice Series for owners of historic buildings including the recently published *Energy Efficiency in Traditional Buildings* (2010). She is a member of the executive board of ICOMOS-Ireland.

Presentation title

Energy Efficiency in Traditional Buildings: recent developments in Ireland

Presentation resume

Historic buildings deal with climatic conditions differently to modern structures and ill-considered alterations to improve energy efficiency can cause irreparable damage to the architectural heritage. In transposing the EU Energy Performance of Buildings Directive into Irish law, protected structures were exempted from the new requirements.

10:15-11:45 Plenary session S2e: Energy efficiency in cultural heritage buildings: improving heating and cooling systems

Moderator: Goran Čačić

Thermal comfort measures the level of satisfaction with the indoor climate. The main task of energy efficiency in cultural heritage buildings is to maintain adequate thermal comfort while lowering energy consumption. This session will feature examples that show improvement in energy efficiency whilst providing thermal comfort.

Keynote speaker: Winfried Brenne - Energetic refurbishment of monuments in Berlin

Bernard Franković, Marko Franković - Energy efficient HVAC system of the Croatian national theatre building in Rijeka

Jan Holmberg, Bengt Kylsberg, Per Nelander - Improving energy efficiency in an 800-year-old building

Branimir Pavković - Improving energy efficiency of the art school in Dubrovnik

Renato Krikšić - KNX Standard Enables Significant Energy Savings

Dinko Stipaničev - LG way in energy efficiency

Panel discussion:

Haris Lulić - Improving the energy efficiency of the city hall in Sarajevo

Marino Grozdek - Improving the energy efficiency of Marin Getaldić Elementary School in Dubrovnik

Magdalini Makrodimitri, Spyridon Papavasileiou, James W.P. Campbell, Koen Steemers - Heating historic structures. A review of heating systems in historic church buildings and implications related to conservation and comfort. The case of four historic churches in Cambridge

Moderator:

M.Sc Goran Čačić currently holds a position of Project Manager at the United Nations Development Programme (UNDP) in Croatia implementing projects “Energy Management System in the Cities and Counties in Croatia” and “Energy Management Information System” for the Ministry of economy, labour and entrepreneurship.

He is experienced in energy auditing, energy management, technical evaluation and quality assurance of energy audits and setting up organisational structures needed for continuous, active and sustainable energy management.

He was born in Zagreb in 1979., finished primary and high school in Sisak and received M.Sc (dipl.ing.) degree in mechanical engineering in 2004 at the Faculty of Mechanical Engineering and Naval Architecture in Zagreb (Power Engineering Department/Power Plants Technology). During studies he received a state scholarship and finished studies with excellent final grade. In 2007 he enrolled the doctoral study at the Faculty of Electrical Engineering and Computing (Electrical Engineering/Electric Power Engineering).

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Presentation title

Energetic reinforcement of monuments in Berlin

Presentation resume

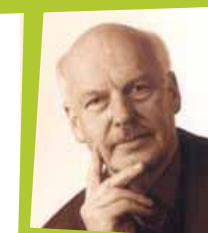
Heritage pursues the objectives permanently preserving the cultural identity of a society by tangible and sensuous historical evidence and preservation of the quality of life. This aspect requires in due consideration of permanent conservation to lead monuments to utilisation. The utilisation shall and will increase the value of the monument. However the user is required to make modification to a certain extent for an appropriate use. Concomitant monuments are subject to further social and governmental objectives, legal regulations, injunctions, permissions or restrictions. One of severest governmental objective in contrary to heritage is climate protection and all regulatory actions of reducing of carbon dioxide emissions. As well is a building to be considered as a resource of its material value. This value should be used, utilized or recycled. “Recycling of buildings – sustainable building culture”, we named a lecture when the word of life circle assessment was still unknown.

Biography

Winfried Brenne, Dipl.-Ing. Architect BDA/DWB 1942, study Architecture in Wuppertal and Berlin, since 1978 free-lanced architect priority focus on Ecological und resource-efficient construction, Conversation and conservation of existing buildings, Energetic restoration of residential buildings and museums. 1990-92 lecturer at the department of architecture, TFH Berlin, 1996-99 member of federal state monument council, 1995-99 member of reconstructing council Bauhaus Dessau, 2000-02 chairman Berlin heritage foundation, Since 1993 member of DOCOMOMO GROUPE GERMANY, Since 2000 member of German National Committee ICOMOS, Since 2006 member of Academy of the Arts Berlin Important realized projects: Ecological new residences Heinrich-Böll-Estate, Berlin-Pankow; conception, supervising of the reconstruction of the world heritage: Six housing

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estates in the Berlin modern style; restoration Schönhausen palace in Berlin-Pankow, conversation of Zeughaus/DHM Berlin, reconstruction of Kaiser-Wilhelm-Museum in Krefeld, ehem. Bundesschule des ADGB in Bernau, Meisterhaus Muche-Schlemmer in Dessau (world heritage), energetic restoration of Bauhaus Dessau, restoration of Academy of the Arts Berlin.



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Presentation title

Energy efficient HVAC system of the Croatian national theatre building in Rijeka Croatia

Presentation resume

The Rijeka's national theatre I. Zajc, built in 1885 in neo renaissance and partly in late baroque style, is registered as cultural heritage monument. During the renovation period in 1970/82 the new HVAC system was not completed. At that period it was provisionally connected to the boiler-station of the nearby factory. The complete HVAC system design was started in 2003 and construction of the new cooling station was placed next to the boiler station. The design includes the cooling system powered by natural gas. Absorption

cooling units function all year round, connected by the existing pipeline. The applied system of gas absorption devices represents a simple, modern, energy efficient technical solution, financially supported by the national Environmental Protection and Energy Efficiency Fund. The newly constructed cube, with cooling tower built on the place of old oil reservoir, is a simple architectonic solution, appropriate for the future new urban area.

Biography

Prof. Bernard Franković, born in Rijeka in 1946, completed his undergraduate studies, master of sciences and doctoral thesis in the field of mechanical engineering at the University of Zagreb. In 1981. he was Fulbright scholarship holder. Since 1972 he has been teaching Thermodynamics at the Faculty of Engineering of the University of Rijeka. For two turns (1998-2002)) he was dean of the Faculty and today he is Head of Department of Applied Thermodynamics and Energy. For 15 years he has been the president of Organizing Committee of International Congress Energy and Environment which biannually takes place in Opatija. He is full member of Croatian Academy of Technical Sciences, member of the Maritime Council and Energy Council of the Croatian Academy of Science and Art, member of the Croatian Solar Energy Association, member of the Int. Solar Energy Association-ISES Europe and Int. Inst. of Refrigeration IIR, Paris.

Jan Holmberg

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Presentation title

Improving the energy efficiency in an 800 year old building

Presentation resume

Due south of Uppsala, there are three buildings, the Skokloster church built 1230 by the Cistercian order and the "old stone-house", built on top of the old brick kiln used for the construction of the church. But the dominant building is Skokloster palace.

The stone-house has been rebuilt several times. The present building lay out dates from 1740. During the 20th century the old stone-house was heated to human comfort by electric heaters.

The aim of this paper is to describe the different alternatives for replacing the electric heating system with a more energy efficient and sustainable system. The alternative finally chosen is described. It is a heat-pump system with bore holes in rock as heat source and traditional water heating system with radiators as heat-sink.

The energy certification for the stone-house gives a consumption of 94 kWh/m² and standard year to be compared with the government request of max. 110 kWh/m².



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Presentation title

Energy Efficiency Measures for Music School "Luka Sorkočević" in Dubrovnik

Presentation resume

The paper deals with energy efficiency measures for music school "Luka Sorkočević" in Dubrovnik. The protected building situated in the old part of the city occupies the sites of two former nunneries. Up today electric resistance heating has been applied. Hourly

simulations of all year round energy consumption of the building have been performed in order to define optimal replacement system. High temperature heat pump combined with existing electric boiler has been analyzed, as well as replacement of radiator heating system with variable refrigerant flow heat pump system. Variable refrigerant flow heat pump system which gives high level of the comfort has been chosen, giving lowest energy costs as well the lowest CO₂ emissions compared to other systems including conventional gas or oil heating as well. Other energy efficiency measures were window sealing, lighting improvements by introduction of CFL and introduction of saving mode for office equipment.

Biography

see page 63.

Presentation title

Energy efficiency improvement of the City Hall in Sarajevo

Presentation resume

The present work addresses energy efficiency measures planned within the reconstruction project of the City Hall building in Sarajevo. Built in 1896, completely devastated in 1992, the building, widely regarded as one of the landmarks of the City, is now being fully reconstructed to house a variety of office, educational, and public spaces. Here we present energy efficiency measures undertaken within various technical subsystems of the building, which are designed under constraints of preserving its original appearance, while providing for contemporary comfort conditions. The work treats measures for improvement of thermal performance of the building envelope along with the energy-efficiency improvement of the lighting system taking into account the decorative and functional roles of illumination. The work includes appropriate tables and diagrams showing the energy efficiency improvement and cost effectiveness of the proposed measures.

Biography

Haris Lulić graduated in 1998 from the Faculty of Mechanical Engineering, University of Sarajevo. He obtained his masters degree in 2005 in the field of experimental techniques in solar-thermal energy. Currently he is completing his doctoral dissertation in the field of solar cooling techniques. Since 1998 he has held several positions at the Faculty of Mechanical Engineering, University of Sarajevo, teaching various subjects in fields of

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HVAC&R, renewable energy technologies and energy efficiency. He has taken part in a number HVAC&R and renewable energy projects as a consultant and leading designer. For a number of years he is serving as a secretary of the HVAC Society of Bosnia and Herzegovina. He is currently serving as a minister in the Ministry of Transport of the Government of Canton Sarajevo.



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flat plate solar thermal collectors and photovoltaic panels were proposed. All of the considered systems were mathematically modelled while their behaviour was simulated through-out the year. The results of this study indicate that replacement of a current electric heating system with an air to water heat pump system and retrofitting of the light bulbs are the most prominent energy saving measures.

Presentation title

Improving The Energy Efficiency In Elementary School Marin Getaldić In Dubrovnik

Presentation resume

Techno-economic feasibility study on refurbishment of elementary school Marin Getaldić in Dubrovnik old city center is made in order to find economically acceptable measures which would allow reduction of annual energy and water consumption. Retrofitting of present heating and lighting systems was considered whereas implementation of

Biography

see page 58.



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for comfort however, has made the introduction of heating to churches a requirement. The presentation will look at how today's elevated comfort thresholds threaten the conservation of the historic fabric and artefacts in these buildings. The conclusions of this study should hopefully provide valuable guidance for the adoption of energy-efficient and preservation-friendly heating of churches and other similar types of buildings, where problems are less pronounced.

Biography

Magdalini Makrodimitri is a 2nd year Ph.D. researcher at the University of Cambridge, Department of Architecture. Her research interests lie in the field of Sustainability and Heritage Conservation. Her research project deals with the assessment of environmental conditions, energy consumption and conservation of historic buildings, focusing on the implications of heating in historic churches.

Magdalini holds an MSc degree in Environmental Design and Engineering, awarded by the Bartlett school of Graduate studies, University College London in November 2009. She also graduated from the School of Architectural Engineering of National Technical University of Athens, where she completed her undergraduate degree in July 2008.

She has participated in a number of seminars and conferences, where she has presented her research in both oral and poster presentations.

Her publications include papers on the energy efficient refurbishment of existing housing stock in the UK and Sustainability, energy management and preservation of historic buildings of the public sector.

Presentation title

Heating historic structures. A review of heating systems in historic church buildings and implications related to conservation and comfort. The case of four historic churches in Cambridge.

Presentation resume

This presentation will include the preliminary findings of research currently being undertaken at the Department of Architecture of the University of Cambridge. The research focuses on heating historic large hall structures and in particular, the heating of historic church buildings, considered a significant type of historic structure safeguarded for its association with cultural heritage, still in regular use and with particular conservation problems raised by the recent application of heating systems within them. Most historic churches were not designed to be heated. Contemporary demand

12:45-14:45 Plenary session S3: Legislation and education

Moderator: prof. Livio de Santoli

The standards of energy efficiency in cultural heritage buildings must be improved in order to meet the demands of sustainable development and fight climate change. Experience from some countries shows that approximately 25% of the building stock is under the conservers' protection. This session will discuss in detail the implementation of existing and the application of new standards and guidelines in cultural heritage buildings. Education plays a key role in implementing energy efficiency in cultural heritage buildings, and as such it has an essential role in sustainable development as well.

Keynote speakers: Wolfgang Karl Göhner - *The impact of EU-Legislation on CH – Observatory Function of EHLF and implementation in Member State Law*

Marie- Noël Tournoux - *Heritage and sustainable development: drawing insights (or key issues) in managing resources and energy from global to local scale*

Johannes Sima - *Lessons Learned from the Austrian Experience of a European Problem: Energy Management at Cultural Sites*

Giovanni Cafiero - *Legislative framework, role and education of Conservation departments, rules and planning experiences in Italy for historical centres and rural settlements*

Margareta Zidar - *Integrated approach to energy efficiency in cultural heritage buildings*

Silvio Bašić - *Architectural policy*

Panel discussion:

Giovanni Cafiero - *Energy management in cultural heritage sites, coastal landscapes and protected areas: opportunities and guidelines for sustainable local development*

Anaïs Cloux - *Diagnosis and improvement of the energy efficiency of cultural heritage buildings*

Sanda Zenko - *Appearance of cultural heritage buildings in energy audits, and the application of new materials in cultural heritage buildings*

Marcello Gusso - *International Institute of Traditional Knowledge at the Gualchiere di Remole, medieval architectural complex in Florence*

Milenko Stanković, Srđan Stanković - *New educational profile of builders in Banja Luka – the established through construction of a school based on the principle of a passive and intelligent house*

Moderator:

Biography

Full professor at University of Rome La Sapienza, (HVAC in Buildings), <http://w3.uniroma1.it/desantoli>; Former Dean of the Faculty of Architecture Valle Giulia, Sapienza University of Rome, 2009-2010; Energy Manager of University of Rome La Sapienza, Responsible of Energy Agency of the University (SAE) <http://sae.amm.uniroma1.it/sae>; Director of Department CITERA (Territory, Buildings, Restoration, Environment at University La Sapienza, <http://w3.uniroma1.it/citera>; President of Course Degree -Project Management-, Facoltà of Architecture, University La Sapienza, www.gestionedelprocessoedilizio.it; Director of the Master Course "Management of public Real Estate", Sapienza University of Rome; Professor of "HVAC in Historical Buildings" at PostGraduate School of Cultural Heritage Restauration; Member of International Advisory

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Board of the Journal Building Services Engineering Research & Technology (UK); Energy Consultant for Italian Parliament and the City of Rome (delegate of the Mayor); Vice President and Chairman of Technical Committee of REHVA (Federation of HVAC Nationalk Association), 1997-2002.



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Presentation title

The Impact of EU-Legislation on CH – Observatory Function of the EHLF and Implementation in Germany

Presentation resume

Directive 2010/31/EU on the energy performance of buildings constitutes the legal basis for the implementation of energy efficiency regulations in the EU. It sets a groundbreaking example for the way European Law can affect CH regardless of the lack of EU authority on cultural matters. Since all Member States are obliged to transform this directive into national law till July 2012 a “CH-friendly” implementation on EU, national and regional level has to be achieved. Based on the EU Treaties it must be the aim to combine different domains like Energy Efficiency and CH successfully.

To take influence in these legislative processes and give CH an adequate voice in EU

Legislation the European Heritage Legal Forum (EHLF) was found in 2008 in Brussels by representatives of cultural protection administrations from the EU-/EEA-Member States. Working closely with national decision makers common initiatives are successfully launched to contribute to the adoption of exemption clauses for CH, inter alia, in the field of energy efficiency and the marketing of construction products (repeal Directive 89/106/EEC).

Biography

1989–94: Legal Consultant, Bavarian State Ministry for Food, Agriculture and Forest,
1994–96: Head of the Department for Environmental and Communal Affairs, Freising County Council,

1996–98: Chancellor, Ingolstadt University of Applied Science,
1998–2002: Executive Director, Prinzregententheater Munich,
since 2002: Permanent Legal Adviser & Coordinator for International Affairs of the Bavarian State Conservation Office, since 2002: Vice-President & Executive Secretary of the Working Group on Law and Taxes of the German National Committee on the Protection of Monuments, since 2002/2009: Secretariat Member and German Representative in the European Heritage Legal Forums (EHLF), since 2010: Member of the German Mirror Committee “Protection of Cultural Heritage” (CEN/TC 346) of CEN, since 2008: Lecturer of the Otto-Friedrich-University Bamberg, since 2010/2011: Honorary Judge of the Munich Administration Court, Munich Fiscal Court, since 2002: Lecturer of national and international legislation and law.

Marie-Noël Tournoux

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Presentation title

“Heritage and sustainable development: drawing insights (or key issues) in managing resources and energy from global to local scale”.

Presentation resume

A revised approach to defining heritage, its function and role as a public good and a resource. How to integrate heritage values and components into resource management and planning and development policies.

What new paradigms and approaches can be developed to encompass the dire necessity to consider culture and heritage (be it cultural, natural, tangible or intangible) as a vital asset?

The heritage and development issue is too often limited to a dual opposition, which sometimes finds relief in a tourism development strategy, whereas we too often forget that cultural factors and attributes have historically been part of development stories, what we truly need to reinvent is a new development culture.

This presentation aims to present some key issues via specific and practical examples.

Biography

Art and architecture historian.

For the past 10 years has been working for the World Heritage Center on cooperation projects mostly related to urban conservation (supported by the French government) and has recently joined the World Heritage's Center Cities Team and is involved in the Historical urban Landscape Recommendation initiative.

Presentation title

Lessons Learned from the Austrian Experience of a European Problem: Energy Management at Cultural Sites

Presentation resume

In the field of monument preservation we are faced with two major but apparently irreconcilable problems – the legal requirement to preserve monuments in an authentic manner on the one hand and the high targets of reducing energy consumption on the other. Is it possible to preserve the Austrian monument landscape in a genuine manner while reducing energy consumption? The Federal Office for the Preservation of Monuments is currently faced with this question and together with partners from the fields of science and politics is paying great attention to this matter.

In the preservation of monuments measures have to be taken, with regard to energy efficiency, which use the existing fabric, such as drying, optimised interior insulation or heating of building components be used. Only in this way can the level of knowledge and wealth of experience grow continually and preserve our monumental heritage from irreversible damage.

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Biography

Johannes Sima, undergraduates and post graduates studies of architecture at the Vienna University of Technology; worked in architectural offices, then as a free-lance architect; Assistant Professor at the Institute of History of Art and Restauration, in 1993 started work at the Federal Office for the Protection of Monuments, Head of the Department of Architecture and Structural Engineering, active in the research of and preservation of monuments throughout Austria; lectures on the redevelopment of existing buildings at the Vienna University of Technology; Member of ICOMOS-Austria.

Presentation title

Legislative framework, rules and planning experiences in Italy for environmental and energetic management of historical centres and rural settlements

Presentation resume

Legislative framework and policies in Italy for urban energetic efficiency: general overview

Urban planning for historical centres and cultural heritage: the case of Ravenna
Energy management and rules for small settlements and farms in rural and protected areas: the case of the National Park of Alta Murgia in Puglia

Biography

Giovanni Cafiero was born in Rome on the 28th June 1961. He graduated in Architecture in Rome and obtained a Master's degree in Environmental Economics at Siena University. During last years he specialized himself as a supporter for public agencies and institutions, as a:

Coordinator for scientific researches and projects in the following area: urban and territorial planning and management system development according to environmental sustainability criteria. Expert in protected area planning and management;

Expert in landscape planning

Expert in agricultural area planning;

Expert in the definition and application of development sustainability strategies; expert in urban and environmental project quality valuation.

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In 2010 he worked as the Italian coordinator in *RenovEnergie* Project – Research in Energy redevelopment in private residential building trade in Italy, France, Switzerland, Spain and Germany.

Giovanni Cafiero is now president and chief executive officer of Telos Ltd in Rome.



Margareta Zidar

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Presentation title

Integrated approach to energy efficiency in cultural heritage buildings

Presentation resume

According to Croatian legislation cultural heritage buildings are not obliged to provide an energy certificate and to improve energy efficiency. The experience has shown that approximately 25% of public buildings are in the category of cultural heritage facing complex set of problems in energy efficiency and protection perspective. This paper shows, through some examples the importance for integrated approach and balancing of energy and protection requirements, towards reduction of maintenance costs and the carbon footprint in the heritage buildings. The survey of energy efficiency improvement in cultural heritage buildings is based on energy audit methodology and use of infrared thermography measurement. Suggestion of appropriate energy efficiency measures according to construction period and appreciation of possible energy savings is given.

Biography

Margareta Zidar is an architect, with 4 years of experience in building design and urban planning. Currently she is employed in Energy institute Hrvoje Požar as researcher in the field of energy efficiency and use of renewable energy sources in buildings. In the last 4 years she has gained experience in energy auditing of buildings, energy concepts modelling for new buildings, heat energy demand calculations, infrared thermography measurement and energy certification of buildings. She is experienced in assessment of spatial planning documents for the possible integration of renewable energy sources, in the scope of feasibility studies for wind and solar power plants. She is also involved in international cooperation and research programs and management of these projects. She is lecturer in expert courses on energy efficiency and renewable energy sources.



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Presentation title

Architectural policy

Presentation resume

In the broadest sense, architecture represents the whole of the human creatively made environment including the buildings, structures, outer spaces, infrastructure and landscape.

Architectural policy is a document that expresses the public interest in the quality and value of the physical framework for development and accordingly becomes a part of

the overall policy of the state and a catalyst in the process of sustainable development, concern for the public space, the advancement of formal values founded on local specificities, the protection of health, the climate and security.

Architectural policy is used to define and advance the overall culture of construction, it supplements the principle of sustainable development for a high quality, safe and healthy environment, raises the awareness of the public concerning the importance of the quality of the built environment and fosters transparency and interaction among all the parties interested in the process of its shaping.

Biography

Born 1965, in Zagreb, graduated 1989. at Architectural faculty – University of Zagreb. Attended postgraduate studies - Spatial planning, urbanism and landscape architecture 2003. – 2006. at Architectural faculty – University of Zagreb.

Senior lecturer at the Faculty of Civil Engineering: Elements of Building Construction, Traffic Buildings and Introduction to Architecture.

From 1991 to 2003 worked in the City Office for Urban Planning and Environmental Protection of Zagreb.

Member of croatian chamber of architecture.

Presentation title

Access and control of energy efficiency for cultural heritage building

Presentation resume

Trough following subheadings, exposure gets the review of existing regulations and access to the application requirements for energy efficiency by design activities in conservation projects for cultural heritage buildings:

Basic requirements for energy efficiency - laws and regulations in Croatia

Guidelines for projects and intervention in cultural heritage buildings with energy efficiency aspect

Facility assignment - the importance of proper choice and opportunity for change

Project application – required quality and comfort selection in buildings

The issue of purpose/ facility assignment and design requirements are particularly highlighting as well the recommended steps for managing projects / interventions in cultural heritage buildings with the impact on energy efficiency.

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Biography

Sanda Zenko, B. Sc. Arch. (Zagreb, Croatia)

work experience: 23 years architectural design (APZ Arhitektonski projektni zavod, Zagreb) management and coordination of investment projects (Pliva Engineering): development projects coordination and monitoring of external services (design and execution) architectural design for new or existing facilities urban planning and land escape interior design protection of cultural heritage (Ministry of Culture, Conservation Department Krapina)

Presentation title

New educational profile of builders in Banja Luka – established through constuction of school based on the principle of passive and intelligent house

Presentation resume

Work establishes the long-term effort of the “school of builders” in Banja Luka to form a new profile of a modern engineer and a building worth both time and space, based on the principle of “passive and intelligent house”. Mission and vision is to improve the identity of school with energy efficient systems, using renewable sources and sound technologies, with the affirmation of climate and culture. The needs of a modern man initiate the harmonization of architecture and life. Sensual architecture and intelligent installations connect space, matter and time into single dimension, i.e., they foster “a sense of” comfort and sensuality. The imperative is to create innovative and sensual school space, which combines identity and senses through artistic experience, that is, with its being and body it encourages students to be creative, to trace, to model and to experiment.

Biography

He graduated from the Faculty of Architecture and Town Planning in Sarajevo in 1982, and received a degree in architecture (B.Arch), as architectural designer..He defended his master thesis entitled ‘Traditional Architecture in Western Krajina in Republica of Srpska (Late 19th and early 20th century),’ and his doctoral dissertation: ‘Wooden Profane and Religious Architecture in Western Krajina (Republic of Srpska)’ at the Faculty of Architecture in Belgrade.

He has gained substantial experience of planning, design, construction, outlining

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concepts preparation and implementation of national and international projects in the area of building.

He has published one hundred eight research and professional papers. He has mentored 173 students` graduation papers/designs, 17 member of commissions for master theses and 14 doctoral dissertations.

He is currently Architectural Design at the Faculty of Architectural and Civil Engineering in Banja Luka, where he also holds office of Dean.



Anaïs CLOUX

The French national association of towns and regions of art and history with protected areas (ANVPAH & VSSP)
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Presentation title

From the energy expert opinion of cultural heritage buildings to the transfer of knowledge: methodology and cases of rehabilitation in French towns with protected areas

Presentation resume

One third of the housings in France are old housings (built before 1948) and most of them are concentrated in old centres. These buildings are more energy efficient compared to 70's buildings, but their energy consumption has never really been studied and residents often feel discomfort.

The French National Association of towns and regions of art and history and towns with protected areas is in partnership with the Ministry of Ecology and with the Caisse des Dépôts, in order to advise local authorities who want to commit themselves into a project of old areas rehabilitation. The first step towards a project of rehabilitation is an architectural and energy audit. The ANVPAH & VSSP writes guidelines and specifications together with the CETE de l'Est (technical services of Ministry of Ecology) for local authorities who want to make an energy audit of an old protected area. The second step is the transfer of knowledge in order to raise awareness among all the local actors involved in energy rehabilitation.

Biography

Anaïs CLOUX is a graduate in Land Settlement and Sustainable Territorial Development, and a postgraduate in Human Ecology on the environmental issues of production and consumption activities, from the University of Bordeaux 3.

Main professional activities :

Since 2010 - ANVPAH & VSSP : Heritage and sustainable development policy manager
2008/2010 : Bayonne, Anglet, Biarritz Metropolitan Area – Sustainable Development Mission

- Development of the Climate Plan operationnel program
- Project leader – Monitoring and conducting of an energy survey on the existing housing stock of the area.

15:00-16:15

Plenary session S4: How to finance EE project in cultural heritage buildings

Moderator: Davide Poletto

Implementing energy efficiency in cultural heritage buildings may not be as complex and financially burdening as it might seem at first glance. However, the restoration of cultural heritage buildings does generally require significant funding. The EE facet ought to be considered while preparing a building's restoration project. In this session, various models of funding EE projects in cultural heritage buildings, including budgeting, loans, ESCO models, etc., are presented. In addition, several European projects that tackled the various modes of implementing EE measures in cultural heritage buildings will also be presented.

Siniša Šešum - UNESCO Venice Office actions towards Energy Efficiency in cultural heritage

Mirna Sabljak - The financing of the cultural property protection and preservation programme

Jadran Antolović - Monument annuity – the Croatian experience

Andrea Baggioli, Massimiliano Condotta - SPINE: SPIN-Energy Efficiency & Urban Development Planning. Case studies for energy efficiency in historical buildings

Panel discussion:

Gordana Lučić - ESCO model of financing

Irena Dubravec - Financing of energy efficiency measures in cultural heritage buildings through FZOEU

Ioannis Poullos - Renewable energy investments, historic environment and local communities: lessons from the Greek experience

Alexandra Troi, Roberto Lollini - Interdisciplinary research: the FP7 project "3ENCULT - Efficient Energy for EU Cultural heritage"

Moderator:



Davide Poletto

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Davide Poletto is an expert in international cooperation and sustainable development affairs. He graduated in Political Sciences at the University of Padua and is a former Marie Curie fellow at the University of Keele in UK. He holds a European PhD in analysis and governance of sustainable development from the School for Advanced Studies in Venice (SSAV). He joined UNESCO in 2009 and started to collaborate with the Venice Office from 2006.

Presentation title

UNESCO Venice Office actions towards Energy Efficiency in cultural heritage

Presentation resume

Presentation is focused on UNESCO action toward promotion of energy efficiency within its projects and programmes in South Eastern Europe. Through the presentation a focus is being given to the following UNESCO activities:

UNESCO support to EE in general

Lightning system of the Old Bridge in Mostar

Heating of the Cevan Cehaja Hammam in Mostar

Lightning system for the Museum of Herzegovina in Trebinje

Biography

Joined UNESCO in 1996 and since that being, due to its civil engineering background involved in preparation and implementation of various UNESCO programmes and projects in the field of Cultural Heritage within South Eastern Europe. It was involved in coordination of UNESCO activities within the project of reconstruction of the Old Bridge in Mostar, Restoration of the Ancient Reserve of the Old City of Plovdiv, Restoration of Historic zone of Gjirokastra.

Through overall programmes of UNESCO actively involved in the projects related to the improvement of management of cultural heritage sites in SEE.

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Presentation title

Financing of the Cultural Property Protection and Preservation Programme

Presentation resume

Preparation of the Cultural Property Protection and Preservation Programme; Usual data necessary for the drawing up and registration of the programme to be funded from the state budget resources; Criteria for the development and evaluation of the Immovable Cultural Property Protection and Preservation Programme; Criteria for the development and evaluation of the Movable and Intangible Cultural Property Protection and Preservation Programme; The criteria will prove that there is no particular energetic efficiency but there are other priorities of great importance to the protection and preservation of the cultural property.

Provision of the funds for the financing of the Cultural Property Protection and Preservation Programme
from the Law of the Protection and Preservation of the Cultural Property; state budget funds and monument annuity; relations; number of the items of the cultural property restored in the past three years

Biography

Personal details:

Born in Zagreb in 1968

Married, mother of two children (8 and 3 years old)

Work experience:

2007 – Head of Department

2000 – 2007 Department for Immovable Cultural Heritage

1995 - 2000 Architectural Office Domprojekt, AAG, Arhikon

Participate: in organization, preparations and holding of the European Heritage Days

Education:

Graduated Architecture at the Faculty of Architecture of University of Zagreb, Croatia (1996)

Works in Progress: I participated in the team charged with drawing up The Strategy for the Preservation, Protection and Sustainable Development of the Cultural Heritage of the Republic of Croatia



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Presentation title

Monument annuity – Croatian experience

Presentation resume

A building or site of historic character and economic value can be successfully preserved only if the building is well managed, maintained and conserved by the owner. An annuity is a payment for the use of fixed resource, such as land, natural resources or in this case a cultural monument. The monument annuity provides an economic basis for collecting

assets for the consumption of the monument in terms of its attributes and represents a pecuniary equivalent for direct and/or indirect monument consumption. The concept of monument annuity represents an irreplaceable economic instrument through which the economic value of the monument is asserted on the market. The introduction of monument annuity in Croatia has already had a considerable effect on the amount available for expenditure on maintaining the cultural heritage.

Biography

Professor on the College of Business and Management. He was Deputy Minister (2004-2008) at the Croatian Ministry of Culture. He holds Ph.D. degree in economics. He is specialist for economic and law aspects for cultural heritage protection and preservation. During 2007 he provided expert assistance for Ministry of Culture Republic of Slovenia and Hungarian State service for cultural heritage protection in improving cultural heritage laws. He was also special advisor of the Minister of Culture of the Montenegro. Mr Antolovic has published a number of books and research papers. He is a regular member of the ICOMOS International Committee for Legal, Administrative and Economic Affairs.

Andrea Baggioli

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Massimiliano Condotta



Presentation title

SPINE: SPIN-Energy Efficiency & Urban Development Planning. Case studies for energy efficiency in historical buildings.

Presentation resume

The SPINE project aims at the use of energy efficient technologies and materials into the renovation of historical buildings with an eye to the various issues and constraints linked to the preservation of authenticity and artefacts in buildings. In a period of shrinking public budgets, replicable and efficient solutions should be shared among stakeholders of all the countries involved. This contribution will illustrate the first results of the SPINE project and in particular will be illustrated preliminary guidelines and proposals for the renovation of some case study building located in Vladimir (Russia). The description of these preliminary proposals will be associated with the introduction of two different Italian restoration projects which experience has been useful to develop the preliminary restoration hypothesis.

Biography

Dr. Andrea Baggioli is Unioncamere del Veneto Operations Officer and Analyst in Central-East Europe and Russia area since 2006. He has worked for 10 years in Hungary and Russia with public and private organizations as an expert in Socio-Economic and Private Sector Development field. He graduated in Padua University, Faculty of Political Sciences (2000, November). As a researcher on Central European Privatisation Policies in Hungary, he conducted empirical researches on working organization methods in Hungarian and Italian Food, Textile, Building Construction, Chemical and Heavy Industries. In June 2009 he got an European PhD Degree in Business Administration and Economics at Rey Juan Carlos University Madrid (Spain). Its major subject was the EU-Russia economic and S&T cooperation. Nowadays he is actively involved in Veneto Region SME internationalization process/Regional territorial marketing towards emerging market economies and he is working as Unioncamere del Veneto SPINE (SPIN-Energy Efficiency & Urban Development Planning) project Coordinator.

Biography

Massimiliano Condotta studied architecture at the University IUAV of Venice, Italy, where he received a degree in Architecture in 2002 and now is doing his PhD in "New Technologies and Information for the City, the Territory and the Environment". Freelance architect works as consultant in architectural design and works survey.

Since 2002 cooperates with the research at the IUAV University where he works at various academic and European research projects focusing on the "collaborative e-learning systems", "knowledge management", "historic cities and buildings preservation".

Works as expert of Unioncamere del Veneto inside the SPINE (SPIN-Energy Efficiency & Urban Development Planning) project.



Irena Dubravec

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Presentation title

Activities of the Environmental Protection and Energy Efficiency Fund

Presentation resume

The Environmental Protection and Energy Efficiency Fund is an extra-budgetary fund and legal entity vested with public authority, which was established in 2003 by the Government in order to perform its politics and activities with responsible ministries MEPPPC and MELE. The Fund is a major financial institution within Croatia that supports programs, projects and other activities involving legal entities and persons. It subsidizes interest rates, it provides financial aid and grants, it acts as a National EE Agency along with MELE, all according to the Act on the End-use of Energy Efficiency,

and it's an intermediate body for projects financed by EU structural funds. Until 2010, the Fund approved over EUR 55,9 million for 1,204 projects EnU and OIE use, of which EUR 12,6 million financed UNDP Croatia's implementation of the Project "Removing Barriers to Improving Energy Efficiency in the Residential and Service Sectors"—Information Campaign, including the Project "Systematic energy management in cities and counties" as well as the Program "Bringing Own House in Order".

Biography

Head of the Department for Rational Energy Management and End-Use of Energy Efficiency in the Environmental Protection and Energy Efficiency Fund. Born in Zagreb 1968. Graduated on Faculty of Mechanical Engineering and Naval Architecture (FSB), University of Zagreb in the field of energetic. Working on FSB as a young researcher and scientist, attended postgraduate study of Organizational production, namely Industrial management, working on the Master's thesis. Member of number working groups and commissions of MEPPPC and MELE for preparing bylaws in the fields of environmental protection, waste management, energy efficiency and renewable energy sources use. Member of GEF/IBRD commission in Croatia for preparing RES projects financing by GEF/IBRD Grant. She has actively participated in numerous scientific international and Croatian conferences as author and lecturer. Stipend winner of German scientific organization for student and scientist exchange (Deutscher Akademischer Austausch Dienst) in 2001.



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Presentation title

Energy Investments, Historic Environments and Local Communities: Lessons from the Greek Experience

Presentation resume

Renewable energy investments are high on the political agenda of Greece, in an attempt to comply with the EU regulations and trends and also as a potential outlet from the current financial crisis. However, local communities, especially those in historic environments, keep a negative attitude, often causing the cancellation of major investments. This presentation examines the impact of renewable energy investments to the historic environment in relation to the attitude of the local communities, using a variety of case studies from Greece.

The aim is to provide a theoretical methodology as well as practical steps of a broader applicability on how a renewable energy investment can succeed, respecting the historic environment and engaging the local communities.

Biography

Dr. Ioannis Poullos undertook his PhD on heritage conservation and management at University College London, and attended MBA courses on business strategy and management at London Business School. Ioannis is now a lecturer in the Department of Cultural Heritage Management and New Technologies at the University of Western Greece, and in the Greek Open University, and also collaborates as a heritage consultant with ICCROM.

Presentation title

Interdisciplinary research: the FP7 project "3ENCULT - Efficient Energy for EU Cultural heritage"

Presentation resume

The FP7-project 3ENCULT bridges the gap between conservation and climate protection, which is not an antagonism at all: historic buildings will only survive if maintained as living space – and energy-efficient retrofit can improve structural protection and "comfort", both for users and heritage collections. Reducing the energy demand by Factor 4 to 10 is feasible, if a multidisciplinary approach guarantees high-quality energy-efficiency-solutions, targeted and adapted to the specific case. Twenty-two partners, including conservation, technical and urban development experts, industry partners and stakeholder associations, work on (i) criteria for the assessment of energy-efficiency-measures regarding their conservation-compatibility, (ii) diagnosis, monitoring and control instruments, (iii) passive and active energy-retrofit-solutions, (iv) implementation in urban context and (v) regulation framework. 8 case studies will demonstrate and verify the solutions.

Alexandra Troi

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Biography
see page 38.



9 General information

Social Programme

A number of social events have been organized for the conference participants:

Welcome cocktail on 6th April starting at 19:00 – to welcome conference participants, invited speakers, and co-organizers and partners. The Mayor of Dubrovnik, Andro Vlahušić, and the United Nations Resident Coordinator and UNDP Resident Representative in Croatia, Louisa Vinton, will welcome you to the Conference. The welcome cocktail will include canapés, drinks and entertainment by Klapa Oštro.

Dress code: Formal wear and cocktail dresses.

Energy dinner on 7th April starting at 20:00 – hosted by the organizers, including welcome speeches by our co-organizers from OICE, ICE, GIZ and UHA. This dinner party will give participants an opportunity to converse with experts in cultural heritage and energy efficiency. The buffet dinner will be accompanied by a rich entertainment programme, including the live band XL, and a DJ who will play dancing music after the formal part of the dinner.

Dress code: Formal wear and formal dresses.

Dubrovnik Cruise on 8th April, starting at 17:00 – at the end of the Conference programme participants will have the opportunity to see the unrivalled Dubrovnik walls from the sea and enjoy a beautiful Dubrovnik sunset while sipping a glass of juice or wine. The cruise will last approximately one hour, after which participants will be accompanied to the restaurant Klarisa located in the St.Klara convent where they will be offered hors d'oeuvres.

Dress code: Casual.

Dubrovnik sightseeing tour on 9th April, starting at 10:00 – a unique experience for our Conference participants to explore the magical town of Dubrovnik and its beautiful architecture. An expert guide in English will be provided for this walking tour that will last one hour.

Dress code: Casual.

Organized transport

Hotel Kompas - Hotel Excelsior

For participants who are staying at the Hotel Kompas, the organizers have arranged transportation from the Hotel

Kompas to the Hotel Excelsior, as well as to other social events during the Conference. The official conference bus will depart at the following times:

06.04.2011

18:30h – departure from Hotel Kompas to the Rector's Palace for the welcome cocktail

21:30h – departure from the Rector's Palace back to Hotel Kompas

07.04.2011

08:00h - departure from Hotel Kompas to Hotel Excelsior

17:00h – departure from Hotel Excelsior back to Hotel Kompas

19:30h - departure from Hotel Kompas to the Revelin Fort

23:00h – departure from the Revelin Fort back to Hotel Kompas

08.04.2011

08:30h - departure from Hotel Kompas to Hotel Excelsior

20:00h – departure from Pile (Old Town Dubrovnik) to Zagreb

General info

Dubrovnik Airport

Dubrovnik Airport, also referred to as Čilipi Airport, is the international airport of Dubrovnik, Croatia. The airport is located approximately 20 km (12.5 miles) or 20 min from Dubrovnik city centre.

All airline companies provide airline shuttles to meet regularly scheduled flights. The shuttle bus costs around 5 EUR/person and tickets may be purchased directly on the bus. The shuttle bus goes to Pile Gate and the bus terminal (main bus station). For final destinations that are not near Pile Gate or the bus terminal, participants will need to take a taxi, the local bus, or walk.

The taxi fare from the airport to the city centre is approximately EUR 40.

T: +385 20 773 171

www.airport-dubrovnik.hr

Public transport

Timetable information: 0800 1910

About Croatia

Croatia is located in South-East Europe, between Central Europe and the Mediterranean. Given its geographic position, it is a Central European and Mediterranean or a Pannonian-Adriatic country. Croatia stretches in the shape of an arch from the river Danube in the north-east to Boka Kotarska in the far south and is divided into three large geographic regions: coastal, mountainous and Pannonian.

Croatia is a country with a rich cultural and historical heritage and natural beauty, whose national and natural treasures are not only shown through numerous museums, galleries, churches, national and nature parks, which are monuments of the highest category and examples of exceptional beauty that make up an important chapter in the UNESCO list of world heritage, but are visible almost every step of the way.

The uniqueness of the country lies in the fact that its territory is a gracious intersection of as many as four cultural circles which complement each other – the spirit of Eastern and Western Europe, Central Europe and the Mediterranean. Croatia is a country of an urban culture that counts more towns than any other part of the Mediterranean. With nine of its cultural phenomena, Croatia has become the country with the most protected non-material heritage in Europe. Included on the UNESCO list of non-material heritage are: lace making in Croatia; the two-part narrow interval singing of Istria and the Croatian coastal area; the Festivity of St. Blaise, the patron saint of Dubrovnik; the procession of the cross on the island of Hvar; the skill of making traditional wooden children's toys from the area of Croatian Zagorje; the Sinjska Alka – the knight's tournament in Sinj; the skill of making licitars (decorative souvenirs) from the area of northern Croatia.

About Dubrovnik

www.visitdubrovnik.hr

In the deep south of the Croatian coastline is the Dubrovnik region whose centre, the city of Dubrovnik, bears in Croatia and across the world the title of the "Pearl of the Adriatic". The harmony of the centuries-old buildings and the walls girdling the city are like a fairy tale apparition created for enjoyment. It is hard to say what makes the Dubrovnik area fascinating: its history marked by the centuries in which the city has flown a

flag bearing the word "Libertas" (freedom) or its present day role as a tourist Mecca consisting of a series of picturesque places on the coast and islands, telling their stories and legends to guests and the chance traveller, always ready to walk you through many centuries in just a few short steps. The history of this area lives to this day in the beauty of its buildings and the magnificent artwork left to posterity by renowned sculptors, painters and builders.

Dubrovnik is called the Pearl of the Adriatic above all because of its great wealth of heritage in the arts and in history. Its name is derived from the oak forests that grew nearby, called locally "dubrave". Every historical story and legend has today its traces and inscriptions in the stone facades of the historical core and the paving stones of Stradun, the surrounding streets, the church of the patron saint St. Blaise, the fortresses among which is Lovrijenac that rises on a steep 37 metre high crag and that cost the Venetians great pains as they threatened the freedom of the Dubrovnik Republic, and in the memorials to Dubrovnik's knights and princes, nobles...

But the most identifiable characteristic of this historic UNESCO protected city is its untainted city walls that circle the city in an unbroken line 1,940 metres long. The walls of Dubrovnik are one of the most beautiful and strongest fortress systems on the Mediterranean, full of forts, bastions, towers and separate fortresses. A walk along them offers a real picture of all the stone beauty of the city, dominated by Dubrovnik's best-known street, the Stradun, the shortest path between the city's east and west portals. The clean stone surface of the largest street in the historic core – Stradun – is the venue of large municipal events, among which the best known are the Dubrovnik Summer Festival, but it is also the place for meetings, fun and gathering and spectacular open-air New Year's celebrations.

Hotel Excelsior

Dubrovnik Hotel Excelsior, known as one of the finest hotels on the Mediterranean according to the Sunday Times, is a luxury five-star hotel and a part of the Adriatic Luxury Hotels group.

Situated just a few steps from Dubrovnik's UNESCO protected Old City, overlooking the Adriatic Sea, the Hotel Excelsior's stunning location, its nonchalant elegance and Mediterranean charm make it one of the most beautiful hotels in the world. The Excelsior has a long-standing tradition and has been operating since July 1913. As the Excelsior's reputation

has spread worldwide during its rich 92-year history, many celebrities have visited this luxurious Dubrovnik hotel, such as Queen Elizabeth, Princess Margaret, Margaret Thatcher, King Olaf, Vaclav Havel, Edward Kennedy, Elizabeth Taylor, Richard Burton, Onassis, Francesca von Habsburg with her family, Ivana Trump, Sir Roger Moore, Armand Assante, Martin Sheen, and many others.

Completely refurbished, the Hotel Excelsior reopened its doors in June 2008 as one of the most luxurious hotels in the Mediterranean.

The Hotel Excelsior is wheelchair accessible.



10 Sponsors

GOLDEN PARTNER EXHIBITOR:



Zagrebačka banka d.d.

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Zagrebačka banka has for years been the leading bank in Croatia in terms of the quality of products and services, technical innovations, network of self-service devices and successful business results. In Croatia, the Bank operates with 80,000 corporate clients and over 1.1 million private clients. It has been a member of the UniCredit Group, one of the most successful banking groups in Europe, since March 2002. The Bank accounts for 25% of total assets of the Croatian banking sector, as well as 25% of market share in credit-financing and deposits.

A year ago, Zagrebačka banka launched a new investment model of credit-financing for private and corporate clients encouraging environmental sustainability and raising awareness of the potential growth of energy efficiency based on Croatia's rich array of renewable energy sources. The green loans of Zagrebačka banka are the first such loans in Croatia. More favourable financing for the purchase, construction and remodelling of business premises or housing space raises the clients' interest in dwelling or working in a building of a higher energy-efficiency class, or using renewable solar energy sources that generate their own electrical or thermal energy, in accordance with the European Union's vision on environmental protection.

SILVER PARTNER EXHIBITORS:



BOSCH

Tehnologija za život

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Bosch Thermotechnology GmbH represents the thermotechnological business sector of the Bosch Group and with its international representatives is a leading European manufacturer of products for resource-saving heating and domestic hot water preparation. Bosch Thermotechnology is a systems supplier whose mission is to provide energy-efficient and environmentally friendly heating and hot water solutions, paying equal attention to resource efficiency, system flexibility, and user friendliness for the benefit of our customers.

It is important to note that Bosch Thermotechnology's contribution to the preservation of natural resources is not confined to the development of efficient heating systems. Building on our expertise as a systems supplier, we offer our customers intelligent integrated solutions which not only use renewable energies but also ensure an energy-efficient operation of the heating system at the same time. Bosch Thermotechnology products effectively help households reduce their energy consumption and CO₂ emissions.

Bosch Thermotechnology includes the international thermotechnology brands Bosch, Buderus, and Junkers, as well as nine strong regional thermotechnology brands. Bosch Thermotechnology has a wide portfolio of energy-efficient and environmentally friendly solutions, from floor-standing and wall-hung heating boilers, to heat pumps and co-generation plants, to solar systems and water heaters.

Daikin Airconditioning Central Europe

- representative office in Croatia



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Daikin has a worldwide reputation based on 85 years' experience in the successful manufacture of high quality air-conditioning equipment for industrial, commercial and residential use. Our envied quality simply stems from the attention paid to design, production and testing as well as after sales support. Every component is carefully selected and rigorously tested to verify its contribution to product quality and reliability.

Air-conditioning systems provide a significant level of indoor comfort, making optimum working and living conditions possible in the most extreme climates. Motivated by a global awareness of the need to reduce the burdens on the environment, Daikin has invested enormous efforts in limiting the negative effects associated with the production and the operation of air conditioners. Hence, models with energy saving features and improved eco-production techniques have seen the light of day, making a significant contribution to limiting the impact on the environment.

Daikin was the first European air-conditioning manufacturer to gain ISO14001 environmental certification and all Daikin plants and subsidiaries are now similarly certified. The company's zero waste policy ensures that many of its manufacturing by products can be recycled, reused or recovered. For instance, the sludge recovered from pretreated waste water is used in cement manufacture. The recycling of other types of waste is also supported by investment in returnable packaging.

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www.knaufinsulation.hr

Knauf Insulation is one of the largest insulation manufacturers in the world, and offers a wide range of insulation materials to meet the growing demand for energy efficiency and acoustic performance in new and existing homes, commercial buildings and industrial applications. Its employees are active in more than 35 countries across over 30 manufacturing sites, including an engineering centre, for the production of glass mineral wool, rock mineral wool, wood wool, extruded polystyrene, expanded polystyrene and extruded polyethylene. The company's products offer an unrivalled range for building insulation, technical insulation in industrial use, heating, ventilation and air conditioning applications, and original equipment manufacturing solutions.

In the middle of 2009, Knauf Insulation marketed the formaldehyde-free binder ECOSE® Technology for mineral wool for the first time. The basis is a primarily bio-based binder without the addition of artificial colours or dyes to ensure that the already environmentally friendly mineral wool insulation materials from Knauf Insulation have taken a further step in the direction of improved sustainability. As part of its commitment to more sustainable products, Knauf Insulation has shifted the manufacturing of all glass mineral wool worldwide to this binder.

KNX Croatia



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Whether in a single-family house or in an office complex, the demand for comfort and versatility in the management of air conditioning, lighting and access control systems is growing. At the same time, the efficient use of energy is becoming increasingly important. More convenience and safety coupled with lower energy consumption can however only be achieved by intelligent control and monitoring of all products involved. By correctly adjusting the parameters of heating, lighting, shutter control, etc., and the communication between them, energy consumption can be drastically reduced.

KNX is an energy-efficient buildings design model, with a payback period of 2- 4 years, thanks to significant energy savings. KNX intelligent control gives you an opportunity to achieve maximum savings regardless of the type and construction of the facility. A KNX installation can be easily adapted to new applications and is easily extendable. New components can be easily connected to the existing bus installation.

LG Electronics Magyar Kft.

- representative office in Croatia



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LG Electronics, Inc. is a global leader and technology innovator in consumer electronics, mobile communications and home appliances, employing more than 80,000 people working in over 115 operations around the world. With 2,010 global sales of USD 43.4 billion, LG comprises four business units – Home Entertainment, Mobile Communications, Home Appliance, and Air Conditioning & Energy Solutions. LG is one of the world's leading producers of flat panel TVs, audio and video devices, mobile phones, air conditioners and washing machines. LG has signed a long-term agreement to become both a Global Partner and a Technology Partner of Formula 1™. Within this high-level cooperation, LG acquires exclusive designations and marketing rights as the official consumer electronics, mobile phone and data processor provider of this global sporting event. For more information, please visit www.lg.com.

Rockwool Adriatic d.o.o.

ROCKWOOL®

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www.rockwool.hr

Rockwool Group is the world's leading producer of fire safe, thermal and acoustic stone wool insulation. The Group, founded in 1937 in Hedehusene, Denmark, has headquarters there, employs more than 8,500 people, and operates 25 factories with a worldwide network of sales offices. A long tradition and state-of-the-art production process guarantee high quality products and solutions for all types of buildings and industry. Its factory in Istria is one of the most modern in the world. The investment value is more than EUR 100 million and it is one of the biggest greenfield investments in Croatia. The factory employs around 140 direct and 280 indirect employees. More than 600 insulation products for floors, partition walls, and industrial plants are produced there.

Due to its excellent thermal insulation properties, stone wool keeps out the freezing cold during the winter, and heat in the summer. Apart from saving energy it saves money since usage of insulation reduces the need for fossil fuels. In this way, CO₂ emissions and climate changes are reduced. Its fibre structure makes stone wool an excellent acoustic insulation. Rockwool products are A1 fire class, bearing temperatures higher than 1000°C. They do not burn or spread fire, thus securing precious time for saving lives and evacuation from the fire.

Viessmann d.o.o.

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climate of innovation

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www.viessmann.hr

The Viessmann Group is one of the leading international manufacturers of heating systems. Founded in 1917, the family company is run by a Managing Board under the chairmanship of Dr. Martin Viessmann.

Whether for single or two-family homes, large apartment blocks, commercial and industrial buildings or local heating networks, Viessmann has the right system solution, with heat sources for all fuel types and outputs ranging from 1.5 to 20,000 kW. With 16 factories (in Germany, France, Canada, Poland, Hungary, Austria, Switzerland and China), a network of distributors in 37 countries and 120 sales offices worldwide, Viessmann is an internationally oriented company. It was also the first company in the heating technology sector and only the third company in the Federal Republic of Germany to be awarded the *Eco Audit Certificate*. "With the *Efficiency Plus* model, we want to demonstrate in our facilities what any business and household can actively do to promote climate protection and to reduce its own energy bill. With *Efficiency Plus* at our head office in Allendorf, we are demonstrating that tomorrow's objectives in respect of global warming can be achieved today with technology already on the market", said Dr. Viessmann. Viessmann has been present on the Croatian market for over 10 years through a subsidiary in Zagreb.

BRONZE PARTNER_EXHIBITORS:

HEP ESCO d.o.o.- member of HEP Group



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HEP ESCO d.o.o. is an energy service providing company which develops, executes and finances energy efficiency projects on a commercial basis.

The acronym **ESCO, Energy Service Company**, is recognized worldwide as the name for companies that provide a full range of energy services with repayment through savings. The service includes project development, execution and financing in the manner that savings in energy costs and maintenance are used to achieve investment return.

Projects include modernization, reconstruction and refurbishment of existing plants and facilities.

Areas of business can be divided into public and private sectors, covering buildings, public lighting, industry and energy supply systems.

The company is the **implementing agency for the Energy Efficiency Project Croatia** and is currently the key market creator for energy efficiency projects.

In addition to numerous projects implemented in Croatia and the region, HEP ESCO has participated in key international development projects of the IEE (Intelligent Energy Europe) Programme. These are: GreenBuildingPlus BioSoLESCO and PERMANENT.

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Thinking ahead.

With our successful brands TROCAL, KÖMMERLING and KBE, we have the right profile for every purpose and are the worldwide No. 1 manufacturer of PVC window profiles. The Profine Group takes seriously its pioneering, market-leader role and is a proactive practitioner of the various aspects presented by the global trend towards sustainability.

With our greenline principle, we think ahead and give our customers excellent opportunities: energy-efficient window systems, lead-free stabilizers in the virgin material, and sophisticated recycling schemes carry the added benefit of enhancing sustainability.

Since 2004 we have completely done away with lead in the virgin material for all our brand systems.

Our products meet all the requirements for energy efficiency. They return a sustainable CO₂ balance and a superior price-performance ratio coupled with a long service life. They therefore fulfil and exceed the functional requirements architects, developers, and end-users demand.

We specifically integrate regrind materials in our profiles because our know-how has shown that these lead to better products. Greenhouse gas emissions caused by the recycling of material incorporated in the profile are, on average, about 90% lower than from traditional plastic window materials. Good sense and responsibility – with a clear conscience.

Rudan d.o.o.



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The Rudan Company was established in 1994. The core business of the company is the rationalization of water consumption on the ESCO/WASCO model and installations of AQUACONTROL-telemonitoring systems of water consumption. ESCO comes from the English abbreviation for Energy Service Company, and WASCO derives from the Water Service Company and marks the business model where the company completely finances energy or water saving projects, and charges only from the part of savings, which is achieved through a defined number of years. This means that the company takes on all the risks surrounding the project implementation.

Our clients are the largest Croatian shipyards (Uljanik, 3. Maj, Brodotrogir, Brodosplit, BK Kraljevica), the Port of Rijeka, Croatian Railways, large hotel chains (Istraturist, Adris group, Riviera Holding, NP Brijuni), large municipal companies (Coca-cola, Bauhaus, METRO, Badel) and many others.

In 2005 and 2010 we were declared by the Croatian Chamber of Economy as the best small company in Istria, Croatia. In 2008 we introduced the quality system ISO 9001:2008 for the effective management of energy sources and since 2009 we have been members of the International Water Association (IWA). The headquarters of the company are in Žminj, Istria, but there are also branch offices in Zagreb, Split and Rijeka.