



3<sup>rd</sup> International Conference

# PALENC 2010



## Passive & Low Energy Cooling for the Built Environment

Jointly Organised with:

5<sup>th</sup> European Conference on Energy Performance & Indoor Climate in Buildings (EPIC 2010)

& 1<sup>st</sup> Cool Roofs Conference

29 September - 1 October 2010 | Rhodes Island, Greece

Cooling the Cities - The absolut Priority

program

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## Prologue

The joint 3rd Palenc, 5th EPIC and 1st Cool Roofs Conference focus on the application of passive cooling techniques in the urban environment and in buildings with emphasis on heat mitigation techniques.

During the last 25 years, a serious deterioration of the thermal conditions in the urban environment has been documented. Cities increase their temperature because of the heat island and the global climatic change. Peak electricity used for cooling purposes is increasing seriously while spells of high discomfort conditions are more frequent. In parallel, the increase of the living standards, and non-appropriate architecture design of buildings and urban spaces, has caused a very important penetration of air conditioning in many parts of the world and in particular in zones of hot climates. Low income population seems to be the first victim of this significant climatic change suffering from very high indoor temperatures that put a serious risk in their life.

Intensive research carried out during the last years has permitted to develop new technologies, components, materials and techniques that permit to decrease ambient temperature in cities, improve outdoor comfort and decrease seriously or even eliminate the cooling demand of buildings. Many examples of bioclimatic urban areas have been developed and monitored while very low energy consumption for cooling new generation buildings have been realized and monitored.

The development of cool materials for buildings and urban areas offers a serious instrument to cool down buildings and improve urban microclimates. Cool roofs provide an excellent technique to decrease the cooling load of buildings and improve summer comfort. The European founded COOL ROOF project financed by EACI, as well as the creation of the European Cool Roof Council have promoted seriously the subject in Europe, while in US the issue has gained tremendous acceptance.

The scope of this Conference includes all aspects of technology related to urban and building design, dealing with passive cooling techniques able to improve the environmental performance of urban spaces and buildings. Papers related on urban microclimate ventilation, solar control, thermal mass, thermal comfort, landscaping, cool roofs, low energy architecture, innovative components and materials, standardization and legislation, advanced and alternative air conditioners, demand side management, etc. are welcome.

The main aims are to present and discuss the state of the art of research and applications dealing with application and research on passive cooling technologies for urban areas and buildings.



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## Programm at a glance

Wednesday, 29 September 2010			
07.30		Registrations	
09.00	Hall-A	Session 01	Opening - Welcome Addresses Key Note Lectures
11.00		Coffee	
11.15	Hall-A	Session 02	Progress on Passive Cooling
11.15	Hall-B	Session 03	Passive Cooling at Community Level
11.15	Hall-C	Session 04	Progress on Thermal Comfort
13.40		Lunch	
15.00	Hall-A	Session 05	Progress on Natural Ventilation
15.00	Hall-B	Session 06	Passive Cooling and Sustainability at the Community Level
15.00	Hall-C	Session 07	The Use of Heat Sinks for Passive Cooling
17.30		Coffee	
17.45	Hall-A	Session 08	Progress on Natural and Hybrid Ventilation
17.45	Hall-B	Session 09	Progress on Passive Cooling
17.45	Hall-C	Session 10	Thermal Comfort in Outdoor Environment
20.15		Welcome Reception	

Thursday, 30 September 2010			
08.00		Registrations	
08.30	Hall-A	Session 11	Key Note Speeches
11.00		Coffee	
11.15	Hall-A	Session 12	Progress on Low Energy Design of Buildings
11.15	Hall-B	Session 13	Advanced Materials and Systems for Energy Conservation
11.15	Hall-C	Session 14	EA/ECBCS/Annex 53 "Total Energy Use in Buildings - Analysis and evaluation methods
11.15	Hall-D	Session 14A	Regulations and Legislation
13.40		Lunch	
15.00	Hall-A	Session 15	Progress on Ventilation, Indoor Air Quality and Lighting
15.00	Hall-B	Session 16	Advanced Systems and Techniques for Energy Conservation
15.00	Hall-C	Session 17	Dynastee – Paslink Session on Dynamic Methods for Building Performance Assessment
15.00	Hall-D	Session 17A	Sustainable Green Design of Systems and Outdoor Spaces
17.30		Coffee	
17.45	Hall-A	Session 18	Advanced Systems and Techniques for Low Energy Buildings
17.45	Hall-B	Session 19	Adaptation and Mitigation Technologies for Low Energy Buildings
17.45	Hall-C	Session 20	IEA Annex on Phase Change Materials as a tool towards low energy buildings
21.00		Conference Dinner (optional)	

Friday, 1 October 2010			
08.00		Registrations	
09.00	Hall-A	Session 21	Key Note Lectures
11.00		Coffee	
11.15	Hall-A	Session 22	Cool Roofs Technologies
11.15	Hall-B	Session 23	Green Roofs and Roofing Technologies
11.15	Hall-C	Session 24	Advanced Building Materials, Techniques and Systems for Low and Zero Energy Buildings
13.40		Lunch	
15.00	Hall-A	Session 25	Cool Materials Technologies
15.00	Hall-B	Session 26	Green Roofs and Roofing Technologies
15.00	Hall-C	Session 27	Green Design and Zero Energy Buildings
17.30		Coffee	
17.45	Hall-A	Session 28	Key Note Lectures - Closing

Wednesday, 29 September 2010	
07.30	Registrations
09.00	Session 01: Opening
Hall A	Chairpersons: M.Santamouris
	M.Santamouris: Opening
Keynote lectures	<p><i>F.Nicol: Where are we and where next thermal comfort?</i></p> <p><i>B. Todorovich: Planning improvements of energy performances of existing buildings at the level of the entire town. Predicted interventions and benefits. Example of Belgrade.</i></p> <p><i>H.Akbari: Cooling the globe: One roof and one pavement at a time.</i></p>
11.00	Coffee break
11.15	Session 02: Progress on passive cooling
Hall A	Chairpersons: S.Alvarez and M.Todorovic
Keynote speech	<p><i>S.Alvarez, J.Salmeron, J.Molina, F.Sanchez: Calculation methods as a barrier for the penetration of passive cooling.</i></p> <p><b>L.Terrinoni, P.Signoretti, D.Iatauro, C.Romeo, A.Federici:</b> Summer air conditioning of buildings: Definition, analysis and application of a climatic severity index aimed at zoning the Italian territory.</p> <p><b>U.Dietrich, A.Lydia:</b> Design process for an office building starting with comfort criteria under special consideration of adaptive comfort model according to EN 15251 - teaching method and results.</p> <p><b>J.Salmeron, F.Sanchez, J.Sanchez Ramos, S.Alvarez, J.Molina:</b> Technical fundamentals of a software tool for design passive and hybrid cooling systems in buildings.</p> <p><b>A.Spanaki, T.Tsoutsos, D.Kolokotsa:</b> Parametric study of roof pond with gunny bags in the cooling season.</p> <p><b>A.Spanou, M. Santamouris, L.Kalisperis:</b> Energy performance of the Cyprus presidential palace.</p> <p><b>B.Philipson, N.Couillaud:</b> Energy savings by intelligent solar shading.</p>
11.15	Session 03: Passive cooling at community level
Hall B	Chairpersons: S.Juzuf and X.Cipriano
Keynote speech	<p><i>X.Cipriano, J.Marti, J. Carbonell, D.Perez: Is there any room for action? The effect of energy efficiency improvements in a working-class urban district.</i></p> <p><b>N.Gaitani, M.Assimakopoulos, M.Santamouris:</b> Bioclimatic assessment in designing of open spaces in the historic center of Tirana, Albania.</p> <p><b>N.Wong, S.Jusuf, N.Syafii, Y.Chen, H.Sathyanarayanan, J.Britto, N.Hayadi, Y.Manickavasagam:</b> Evaluation of the impact of the surrounding urban morphology on the building energy consumption of a building.</p> <p><b>M.Romero:</b> Urban microclimate and the residential space configuration of Brasilia.</p> <p><b>M.Stathopoulou, S.Iacovides, C.Cartalis:</b> Quality of life changes using Landsat and socio-economic GIS data</p> <p><b>A.Synnefa, M.Stathopoulou, A.Sakka, K.Katsiabani, M.Santamouris, N.Adaktylou, C.Cartalis, N.Chryssoulakis:</b> Integrating sustainability aspects in urban planning: The case of Athens.</p>
Short presentations	<p><i>K.Limpou: Designing outdoors: Ephemeral &amp; adaptive book shelters in Thessaloniki, Greece.</i></p> <p><i>N.Sanchez Egido, S.Soutullo, R.Olmedo, M.Heras: Monitorization of one evaporative wind tower in an open space.</i></p> <p><i>F.Butera, N.Aste, R.Adhikari, M.Buzzetti, M.Manfren: Building energy performance calculation and distributed generation. Efficient design solutions at building and community level.</i></p>
11.15	Session 04: Progress on thermal comfort
Hall C	Chairpersons: H.Pfafferot and B.Todorovic
Keynote speech	<p><i>N.Rodriguez Munoz, J.Hinojosa Palafox, M.Alpuche, K.Kohlhof, S.Tonn: Study of heat transfer and indoor comfort in model rooms.</i></p> <p><b>T.Karlessi, M. Santamouris, J. Pfafferott, A.Tombazis:</b> Thermal comfort and energy performance of an office building in Greece with low energy cooling: A holistic approach.</p> <p><b>V.Zanotto, S.Ferrari:</b> Adaptive comfort towards energy savings.</p> <p><b>A.Roetzel, A.Tsangrassoulis, U.Dietrich, S.Busching:</b> Occupant's comfort expectations - a thermal lifestyle?</p> <p><b>A.Thewes:</b> Thermal comfort of a new university building in Luxembourg with passive cooling.</p> <p><b>N. Cherry, J. Haig, R. Allen, G. With:</b> The thermal performance of tiled roofs in a range of climates.</p>
13.40	Lunch break

Wednesday, 29 September 2010	
15.00	<b>Session 05: Progress on Natural Ventilation</b>
Hall A	Chairpersons: <b>T.Kurabuchi and M.El Mankibi</b>
Keynote speech	<i>T.Kurabuchi, K.Tsuruta, Y.Kouchi, M.Ohba: Decoupled simulation of cross-ventilated indoor airflow of residential buildings.</i>
	<p><b>M.El Mankibi, L.Bourru, P.Michel:</b> Experimental study and numerical modeling of air flow through windows.</p> <p><b>P.Elias-lopez, V.Garcia, A.Espuna, R.Roux:</b> Naturally ventilation limited by the use of mosquito-net on windows in humid tropical climate.</p> <p><b>M.Elizondo Mata, R.Huerta Sanmiguel, L.Mendoza Perez:</b> Plaza de toros “La petatera” in Colima, Mexico; example of efficiency in buildings natural ventilation in sub-humid warm climate.</p> <p><b>I.Farrou, M.Santamouris, M.Kolokotroni, P.Warren:</b> The Building AdVent Project.</p> <p><b>T.Medinilha, S.Morais, E.Matsumoto, M.Oliveira, L.Labaki:</b> Study of natural ventilation in self built houses through wind tunnel measurements.</p> <p><b>A.Kindinis, R.Cantin, B.Moujalled, G.Guarracino, L.Bourru, J.Burgholzer, T.Marchal, S.Tasca-Guernouti, M.Humbert, F.Janvier, B.Flament, J.Berger:</b> Comparison of long term field measurements with numerical results of a thermo-aeraulic model of historical dwellings.</p>
Short presentations	<p><i>T.Martins, L.Bittencourt, C.Barroso-Krause, L.Bastos: Wind-tower for ventilation in brazilian terrace houses.</i></p> <p><i>K.Sato, T.Kurabuchi, T.Ogasawara, N.Sahashi, S.Ikehara, M.Ohba, S.Iwamoto: A study on convective heat transfer coefficient and thermal resistance of clothing under cross ventilated situation.</i></p> <p><i>K.Tsuruta: Domain decomposition technique applied to evaluation of cross-ventilation performance of various opening conditions of a building.</i></p>
15.00	<b>Session 06: Passive cooling and sustainability at the community level</b>
Hall B	Chairpersons: <b>M.Tzanakaki and N.Wong</b>
Keynote speech	<i>M.Ignatius, N.Wong, S.Jusuf: Influence of urban morphology on air temperature within central business district and commercial area in Singapore.</i>
	<p><b>M.Clementi, G.Scudo:</b> Solar radiation mapping at the micro-urban scale using GIS.</p> <p><b>P.Caputo, G.Costa, M.Manfren:</b> Energy simulations at community levels; a new methodological approach for a new model.</p> <p><b>H.Coch, A.Curreli:</b> Solar access in the compact city: A study case in Barcelona.</p> <p><b>N.Gaitani, A.Spanou, M.Saliari, M.Santamouris, F.Xyrafi:</b> Strategies for microclimatic modifications in the urban spaces-a case study in the area of Marousi, Greece.</p> <p><b>A.Kantzioura, P.Kosmopoulos, S.Zoras:</b> Urban surface temperature and microclimate measurements in Thessaloniki.</p> <p><b>T.Stasinopoulos:</b> Blending Green &amp; Black: Cool urban design in Athens.</p>
15.00	<b>Session 07: The use of heat sinks for passive cooling</b>
Hall C	Chairpersons: <b>U.Eicker and J.Garcia Chavez</b>
Keynote speech	<i>U.Eicker, A.Dalibard, S.Buttgenbach, S.Fiedler, J.Cremers: Low energy cooling of buildings with radiative cooling using hybrid PVT collectors.</i>
	<p><b>C.Barbosa Teixeira, L.Labaki:</b> Study of evaporative cooling roofing in sub-tropical climate.</p> <p><b>E.Kruger, E.Gonzalez Cruz, B.Givoni:</b> Predicting the use of an indirect evaporative cooling for hot-dry conditions.</p> <p><b>C.Farnahm, M.Nakao, M.Nishioka, M.Nabeshima:</b> Simulation and Validation of mist cooling with fire dynamics simulator.</p> <p><b>J.Garcia Chavez, B.Givoni:</b> Application of an indirect evaporative cooling system in a hot humid climate using embedded tubes.</p> <p><b>E.Gonzalez Cruz, E.Kruger, B.Givoni:</b> Application of a predictive method for assessing indoor temperatures in an indirect evaporative passive cooling system.</p> <p><b>R.Serra, J.Marin, J.Roset, A.Isalgue, H.Coch:</b> A daytime passive cooling radiation system.</p>
17.30	<b>Coffee break</b>
17.45	<b>Session 08: Progress on natural and hybrid ventilation</b>
Hall A	Chairpersons: <b>N.Gaitani and O.Irulegi</b>
Keynote speech	<i>F.Tucci: Technologies for natural cooling in the experimentation of eco efficient housing in the Mediterranean.</i>
	<p><b>D.Fidaros, C.Baxevanou:</b> Numerical study of the natural ventilation in a dwelling with a solar chimney.</p> <p><b>G.Chiesa, R.Ramponi, R.Adhikari:</b> Energy impact of ventilation in building design - A literature review.</p> <p><b>O.Irulegi, R.Hernandez:</b> Energy efficiency of ventilated active facade in office buildings in Spain.</p>

Wednesday, 29 September 2010	
	<p><b>N.Khan, Y.Su:</b> Performance of monodraught natural ventilation and cooling systems.</p> <p><b>D.Serghides:</b> Ventilation and Infiltration in the zero energy house.</p>
17.45	<b>Session 09: Progress on passive cooling</b>
Hall B	Chairpersons: <b>L.Pagliano and T.Ogasawara</b>
Keynote speech	<b>P.Zangheri, P.Lorenzo:</b> <i>Methodology for design and evaluation of zero energy buildings in mediterranean climate. Application to a Passivhaus with EAHE.</i>
	<p><b>T.F.Asmussen, P.Foldbjerg:</b> Efficient passive cooling of residential buildings in warm climates.</p> <p><b>C.Ganem, H.Coch:</b> Solar and heat protection techniques. Evaluation and design recommendations for different types of fabric awnings.</p> <p><b>M.Mandalaki, K.Zervas, T.Tsoutsos, A.Vazakas:</b> Assessment of shading devices with integrated PV for efficient energy use.</p> <p><b>T.Kurabuchi, K.Tsuruta, T.Ogasawara, Y.Jino:</b> Observation of environmental control behavior in elementary school classrooms equipped with air-conditioning systems and ceiling fans for cooling.</p> <p><b>A.Sakka, A.Wagner, M.Santamouris, L.Iro:</b> Thermal comfort and occupant satisfaction in residential buildings - Results of field study in residential buildings in Athens during the summer.</p> <p><b>C.Pina Santos, M.Rebelo, L.Matias, A.Santos, S.Almeida:</b> Development of sustainable thermal and visual comfort models.</p> <p><b>S.Pieri, P.Pieris, K.Sfakianaki, K.Vasilakopoulou, M.Santamouris:</b> Prototype zero energy tourist settlement.</p>
17.45	<b>Session 10: Thermal comfort in outdoor environment</b>
Hall C	Chairpersons: <b>E. Ng and L.Labaki</b>
Keynote speech	<b>Y.Ng, V.Cheng:</b> <i>Urban human thermal comfort in hot and humid Hong Kong.</i>
	<p><b>V.Dessi, G.Andreini:</b> Thermal comfort in urban greenways: Climatic mitigation strategy in Milan.</p> <p><b>A.Prata-Shimomura, L.Marques Monteiro, A.Barros Frota:</b> PET and TEP indexes: Applicability to the evaluation of thermal comfort in external environments.</p> <p><b>M.G. C. Fontes, C.L. B. Bartholomei, C.Dacanal, M.Nikolopoulou, L.Labaki:</b> Thermal comfort in open public spaces: Studies in woody areas in cities of the Sao Paulo State, Brazil.</p> <p><b>M.Tsitoura, T.Tsoutsos, D.Kolokotsa:</b> Comfort conditions in urban open spaces in Crete.</p> <p><b>C.Spataru, M.Gillott:</b> Temperature distribution and comfort responses as a result of the climate change impact on buildings.</p>
20.15 - 21.15	<b>Welcome reception</b>

Thursday, 30 September 2010	
08.00	<b>Registrations</b>
08.30	<b>Session 11: Plenary</b>
Hall A	Chairpersons: <b>G. Guarracino and A. Papadopoulos</b>
Keynote lectures	<p><b>O.Seppaenen:</b> <i>Technical regulations to control energy efficiency of buildings in some EU Member States.</i></p> <p><b>A.Thiemann:</b> <i>Approaching future cities by sustainable energy performance in built environment.</i></p> <p><b>T.E. Kuhn:</b> <i>Active solar facades (PV and solar thermal).</i></p> <p><b>J.Stoops, R.Rooth:</b> <i>Measurement is critical to understanding.</i></p> <p><b>A.Battisti, F.Tucci, F.Cipriani:</b> <i>Eco-efficient and sustainable settlement experimentation in Mediterranean housing.</i></p>
11.00	<b>Coffee break</b>
11.15	<b>Session 12: Progress on low energy design of buildings</b>
Hall A	Chairpersons: <b>I. Meir and L.Fais</b>
Keynote speech	<b>I.Meir, J.Golding:</b> <i>Green or Gray? Implications of green lip service in a hot dry climate.</i>
	<p><b>A.Kashkooli:</b> Re-usability of high-rise buildings: the case of Arts Tower, Sheffield, United Kingdom.</p> <p><b>S.Cardoso Silva, H.Coch:</b> Collective dwelling.</p> <p><b>N.Aste, C.Del Pero, R.Adhikari:</b> Development of a methodology for energy diagnosis and performance assessment of office buildings.</p>



Thursday, 30 September 2010	
	<p><b>F.Vagi, A.Dimoudi:</b> Investigation of energy and comfort conditions in Greek primary schools.</p> <p><b>L.Fais:</b> Skyscraper, a power plant in the inner city.</p> <p><b>A.Gavalas:</b> Acrobat on a thin rope - A sustainable house in Athens.</p> <p><b>T.Karlessi, M.Santamouris, T.Kuhn:</b> Analyzing the profile of high rise buildings in Greece: Actions and recommendations for improving their performance.</p> <p><b>I.Tzouvadakis, D.Batsos, A.Sotiropoulou, E.Trianti:</b> Climatic responsive architecture through the upgrading of the existing buildings' stock (The Bioclimatic Metro system).</p>
<i>Short presentation</i>	<i>V.Assimakopoulos, I.Tsiros, L.Shashua-Bar, M.Hoffman, A.Efthimiadou: Microclimatic conditions in the Athens urban clusters.</i>
<b>11.15</b>	<b>Session 13: Advanced materials and systems for energy conservation</b>
<b>Hall B</b>	Chairpersons: <b>A.Battisti and S. Chadiarakou</b>
<i>Keynote speech</i>	<i>T.Salem:</i> Impact of facade-integrated solar thermal collectors on the indoor environment of buildings.
	<p><b>L.Mavromatidis, P.Michel, M. El Mankibi, M.Santamouris:</b> Investigation of the sensibility of Multi-foil insulations using the guarded hot plate and the guarded hot box test methods.</p> <p><b>S.Chadiarakou, G.Guarracino, M.Santamouris:</b> Clustering analysis and determination of typical building.</p> <p><b>A.Michael, M.Eftychi, F.Bougiatioti:</b> Brick transformation: A bioclimatic design approach.</p> <p><b>S.Mofidi:</b> Cooling by daylighting for sunny regions: An ecotourism attraction.</p> <p><b>B.Mohd Noor, A.Zain-Ahmed, M.Abidin, W.Wan Daud, S.Jahaya, K.Wok, S.Tahiruddin:</b> Thermal performance of a novel roof insulation material made from "oil palm empty fruit bunch (OPEFB)" fiber.</p> <p><b>F.Palacin, C.Monne, S.Alonco, J.Heredero, J.Jzquierdo:</b> Experiences on heat rejection sinks of a solar absorption cooling system.</p> <p><b>A.Pezzi:</b> Design of performative double layered facade systems in the Mediterranean area: Palenque business centre in Seville, Spain.</p> <p><b>A.Spanou, K.Vasilakopoulou, M.Santamouris:</b> Energy performance and lighting design of an historic building in Greece.</p>
<b>11.15</b>	<b>Session 14: EA/ECBCS/Annex 53 total energy use in buildings - Analysis and evaluation methods</b>
<b>Hall C</b>	Chairpersons: <b>H. Yoshino and J. Lebrun</b>
<i>Keynote speech</i>	<i>H. Yoshino: Overview of IEA/ECBCS/Annex 53 total energy use in buildings - analysis and evaluation methods.</i>
	<p><b>B.Olesen, R.Andersen:</b> The influence of human behaviour on the energy consumption in buildings.</p> <p><b>S.Corgnati, V.Fabi, M.Filippi, N.Tala:</b> Statistical analysis methods to investigate energy use in buildings.</p> <p><b>P.Andre, S.Bertagnolio, J.Lebrun:</b> Analysis of influencing factors and evaluation of performance indicators on total energy use in buildings.</p> <p><b>S.Porrirt, L.Shao, P.Cropper, C.Goodier:</b> Ranking of interventions to reduce dwelling overheating during heat waves.</p> <p><b>J.Schnieders, L.Rongen, W.Feist:</b> Passive houses in warm and hot climates.</p> <p><b>P.Silva, S.Silva, M.Almeida, L.Braganca, V.Mesquita:</b> Portuguese building stock indoor environmental quality "In-Situ" assesment.</p> <p><b>Y.Tripanagnostopoul, A.Sakka:</b> Holistic energy saving aspects of buildings.</p>
<b>11.15</b>	<b>Session 14A: Regulations and legislation</b>
<b>Hall D</b>	Chairpersons: <b>A. Tsagrassoulis and K. Sfakianaki</b>
<i>Keynote speech</i>	<i>M.Athanasaki, A.Papadopoulou: Legal issues when implementing energy renovation measures in multi-family buildings.</i>
	<p><b>S.Ferrari, V.Zanotto:</b> EPBD implementation: Comparison of different calculation methods among EU countries.</p> <p><b>A.Drakou, I.Ridley:</b> Applicability of the Passivhaus standard to Greek climate.</p> <p><b>M.Laskari, M.Papaglastra, M.Santamouris:</b> Better summer comfort and efficient cooling by EPBD implementation.</p> <p><b>A.Tsangrassoulis, L.Doulos, F.Topalis, A.Roetzel:</b> Comparison of lighting energy savings methodologies due to daylight with EN 15193.</p> <p><b>P.Kosmopoulos, L.Bourikas, A.Kantzioura, P.Fragidou, D.Georgiadou, T.Zoras:</b> Pan-Hellenic Research on the R.E.S. application : A social survey of the cognitive level and the attitudes of the Greek people.</p> <p><b>K.Sfakianaki:</b> Energy consumption variation due to different thermal comfort categorization introduced by EN 15251 for new building design and major rehabilitations.</p>

Thursday, 30 September 2010	
	<b>F.Nicol, L.Cunill:</b> Rethinking the comfort limits for free-running buildings in EN15251.
<b>13.40</b>	<b>Lunch break</b>
<b>15.00</b>	<b>Session 15: Progress on ventilation, indoor air quality and lighting</b>
<b>Hall A</b>	Chairpersons: <b>D. Sergidhes and A. Tsagrassoulis</b>
<b>Keynote speech</b>	<b>M.Sleiman, H.Destailats:</b> <i>Evaluating the performance of photocatalytic oxidation (PCO) for indoor air cleaning: Challenges and perspectives</i>
	<p><b>C.Georgakis, S.Zoras, M.Santamouris:</b> Neuro-fuzzy models for air flow predictions in canyons.</p> <p><b>D.Serghides:</b> The dynamics of the building envelope - Fenestration, the human factor, indoor comfort and energy efficiency.</p> <p><b>N.Stathopoulos, P.Michel, M.El Mankibi:</b> Experimental approach for natural ventilation performance characterization.</p> <p><b>K.Tsukamoto, M.Ohba, T.Kurabuchi, T.Endo, T.Nonaka:</b> Building simulation on reduction of cooling loads for detach house in intermediate and raining seasons by cross-ventilation in Japan.</p> <p><b>I.Venetis, I.Tzouvadakis, A.Stamos:</b> Some quality information of an internal incompressible flux field through two vent-holes for the cooling of buildings.</p> <p><b>G.V.Maragno, H.Coch:</b> Integrated environmental response of shaded transitional spaces in hot climates: The design of the Brazilian veranda.</p> <p><b>K.Tsikouloudaki, K.Laskos, A.Karaoulis, A.Chatzidimitriou:</b> Optimizing the energy performance of lightweight prefabricated dwellings.</p>
<b>Short presentation</b>	<b>A.Belonia, E.Sklavou, M.Xenakis, I.Tzouvadakis:</b> <i>The effect of air quality in health care environments.</i>
<b>15.00</b>	<b>Session 16: Advanced systems and techniques for energy conservation</b>
<b>Hall B</b>	Chairpersons: <b>M.Almeida and T.F.Asmussen</b>
<b>Keynote speech</b>	<b>J.Pfafferott, D.Jacob, D.Kalz, G.Salvalai:</b> <i>Evaluation of a low-energy cooling concept using a coupled building and plant simulation model.</i>
	<p><b>M.Fanny, N.Milad, G.Kanarachou, S.Kanarachos, J.Petrou:</b> Development of an integrated low energy building design methodology for the Mediterranean region.</p> <p><b>C.Aparecida Silva, J.Lebrun, J.Hannay:</b> Building renovation; Example of preliminary study performed with the help of an engineering equation solver.</p> <p><b>J.Llorente, F.Palacin, F.Serna, L.Guiral, M.Lozano:</b> Viability study of a solar thermal system with seasonal storage in Zaragoza.</p> <p><b>G.Loehlein:</b> Middle East: sustainable University City Campus in a desert environment.</p> <p><b>T.Le Phan, H.Yoshino:</b> Survey on energy consumption of residential buildings in Vietnam.</p> <p><b>S. De Bruycker:</b> Building envelopes in a holistic perspective : a plea for fit for purpose approach.</p> <p><b>R. Matzig:</b> Insulation first!</p>
<b>15.00</b>	<b>Session 17: Dynastee - Paslink session on dynamic methods for building performance assesment</b>
<b>Hall C</b>	Chairpersons: <b>H. Bloem and D.Pahud</b>
<b>Keynote speech</b>	<b>S.Ferrari, V.Zanotto, :</b> <i>Assessing building envelope's dynamic thermal performance through simplified parameters</i>
	<p><b>J.Salmeron Lissen, J.Sanchez Ramos, F.Sanchez De La Flor, J.Molina Felix, S.Alvarez:</b> Numerical and experimental analysis of downdraught evaporative cooling systems at Seville.</p> <p><b>D.Pahud, M.Belliardi, P.Caputo:</b> Geocooling potential of borehole heat exchangers in low energy office buildings analysed with dynamic system simulations.</p> <p><b>N.Losurdo, F.Iannone:</b> Energy efficiency and thermal comfort of a residential complex for the elderly in Andria (Italy). A numerical and experimental approach for performance evaluation in summer regime in a Mediterranean climate.</p> <p><b>S.Boemi, T.Slini, A.Papadopoulos:</b> A statistical approach to the prediction of the hotel stock's energy performance.</p> <p><b>J.Cipriano, J.Olivera, J.Carbonell, J.Marti, D.Chemisana:</b> Discrepancies between predicted and measured performance of high innovative low energy buildings: Two case-studies in Spain.</p> <p><b>T.Daras, D.Kolokotsa, M.Efpaxia, I.Apostolakis:</b> Examination of parameters for the energy performance of school buildings in the region of Chania.</p> <p><b>M.J. Jimenez, R. Enriquez, M.Heras:</b> System identification applied to energy analysis in a bioclimatic office building in semidesertic weather in the south of Spain.</p> <p><b>H.Bloem:</b> Dynamic methods for building performance assesment.</p>

Thursday, 30 September 2010	
15.00	Session 17A: Sustainable green design of systems and outdoor spaces
Hall D	Chairpersons: E. Coch and A. Mingozi
Keynote speech	<i>E.Tzanakaki, M.Kikira, E.Alexandri: Microclimate design in energy efficiency policies for Greek cities.</i>
	<b>L.Abreu, L.Labaki:</b> Specific radius of influence on microclimate provided by different arboreal species.
	<b>H.Fadaie, M.Mofidi:</b> Iranian garden as a microclimate in Arid regions.
	<b>V.Lytra:</b> Exploration of self-shaded forms in London climate.
	<b>A.Mingozi, S.Bottiglioni:</b> Environmental, energy retrofitting and enlargement of an hypermarket: An integrated approach towards sustainability.
Short presentations	<i>M.Nakao, M.Nabeshima, M.Nishioka, T.Hasegawa: Continuous moving measurement method of urban environment.</i>
	<i>C.Yousif, C.Perez Garcia, F.Rey Martinez: Energy performance of residential buildings in Malta.</i>
	<i>H.Sacht, L.Braganca, M.Almeida: Facades modules for eco-efficient refurbishment of buildings: glazing thermal performance analyses to Coimbra and Faro.</i>
	<i>A.Kilaire, N.Khan: Double skin facade low energy cooling and natural ventilation.</i>
	<i>P.Ilia: Thermal evaluation of retrofitting methods: Conversion of the 'Spierer' tobacco warehouse in Volos, Greece.</i>
	<i>K.Gobakis, G.Stavarakakis: Simplified building thermal capacitance modeling and control using Matlab/Simulink.</i>
	<i>J.Garcia Rodriguez, H.Becerra Santacruz, D.Altan: Alternative cover for better thermal performance for residential buildings in a temperate climate zone of Mexico.</i>
	<i>J.Ferdyn-Grygierek, A.Baranowski: Numerical analysis of the energy consumption in the office building.</i>
	<i>N.Aste, D.Marini, R.Adhikari: Comparative performance of different types of heat pump technologies in a low energy building.</i>
	<i>N.Aste, M.Buzzetti, R.Adhikari: Evaluation of energy rehabilitation strategies for a historical courtyard building.</i>
	<i>K.Pavlou, F.Ntousikou, A.Vousvounis: "Energy Building 2010", validation's outcomes.</i>
17.30	Coffee break
17.45	Session 18: Advanced systems and techniques for low energy buildings
Hall A	Chairpersons: A. Dimoudi and A.Papadopoulos
	<b>L.Beis:</b> "Terpsithea" Sustainable housing project in Porto Rafti, Greece.
	<b>C.Cabello Matud, H.Coch:</b> Architectural repercussions of the air conditioning installations.
	<b>T.Stefou, A.Dimoudi:</b> Energy performance assessment of urban block apartments.
	<b>I.Diaz Regodon, F.Manteca, M.Sampedro, F.Palacin, M.Pascual, E.Zubiri:</b> CE3X method for the certification of energy performance for existing buildings in Spain.
	<b>N.Avgerinos, A.Dimoudi, P.Kosmopoulos:</b> Energy performance of secondary school buildings.
	<b>Y.Dutil, D.Rousse:</b> A review of active solar cooling technologies.
	<b>J.Fletcher:</b> The influence of the surrounding urban system on cooling loads.
	<b>A.Seng, S.Mok, N.Wong, E.Tan, S.Jusuf:</b> Passive designs of zero energy building in Singapore.
17.45	Session 19: Adaptation and mitigation technologies for low energy buildings
Hall B	Chairpersons: P. Kosmopoulos and M. Karageorgas
Keynote speech	<i>O.Morck, K.Thomsen: Demonstrating cost-effective low energy buildings-Results from the EU Concerto project Class1.</i>
	<b>M.Karagiorgas, D.Galanos, M.Michael, K.Vrellis:</b> Free and solar cooling based energy upgrade of the MMM building, Greece.
	<b>A.Al-Musaed, A.Almssad:</b> Passive and low energy housing in the context of "Archi-Metrics" concept.
	<b>M.Palme, A.Isalgue, H.Coch, R.Serra:</b> Relevant factors in Spanish buildings energy certification process.
	<b>G.Papadimitriou, T.Nikolaou, D.Kolokotsa, P.Skittides, G.Stavarakakis, T.Tsoutsos:</b> The benchmarking of Greek office buildings using clustering techniques.
	<b>N.Papamanolis, K.Oungrinis, M.Liapi:</b> Environmental Responding Architecture. Methods for addressing the diverse environmental behavior in Greece for energy efficient buildings.
	<b>S.Chadiarakou, A.Papadopoulos:</b> Comparison of the old and new thermal insulation regulation in Greece

Thursday, 30 September 2010	
17.45	<b>Session 20: IEA Annex on phase change materials as a tool towards low energy buildings</b>
Hall C	Chairpersons: <b>F. Haghighat and A. Synnefa</b>
	<p><b>A.De Gracia, K.Menoufi, A.Castell, L.Cabeza, D.Boer:</b> Life cycle assessment of phase change materials (PCM) in brick construction systems.</p> <p><b>A.Tokuc, G.Kokturk:</b> A proposal to improve tinaztepe campus by use of renewables and energy storage technologies.</p> <p><b>C.Barreneche, A.Fernandez, A.Castell, L.Cabeza:</b> PCM in building envelopes for energy efficiency: experimental results and new concepts.</p> <p><b>J.Borderon, S.Clouseau, R.Cantin, J.Virgone:</b> Simulation of a building equipped with a PCM/air heat exchanger.</p> <p><b>G.Susman, L.Li, S.Craig, Z.Dehouche:</b> Development of passive and active PCM 'sails' for low energy cooling.</p> <p><b>T.Karlessi, M.Santamouris, P.Didaskalopoulos, K.Apostolakis:</b> Incorporating phase change materials (PCMs) in building coatings: A study of their thermal performance for the mitigation of urban heat island.</p> <p><b>S.Oguta, Z.Dehouche:</b> Experimental assessment of phase change material for summer cooling.</p>
Short Presentation	<b>Z.Gkouskos, G.Limnaios, T.Tsoutsos:</b> Simulation of PCMs in building applications.
21.00	Conference dinner ( optional )

Friday, 1 October 2010	
08.00	<b>Registration</b>
09.00	<b>Session 21: Plenary</b>
Hall A	Chairpersons: <b>H. Yoshino and F. Haghighat</b>
Keynote lectures	<p><b>R.Portsmouth:</b> <i>The cool roof market from an industry viewpoint.</i></p> <p><b>R.Giridharan, M.Kolokotroni:</b> <i>Micro scale geographical study of urban heat island within London.</i></p> <p><b>H.Akbari:</b> <i>Global cooling updates: Reflective roofs and pavements.</i></p> <p><b>Y.Wang, Y.Ng:</b> <i>Parametric study on microclimate effects of different greening strategies in high density city.</i></p>
11.00	<b>Coffee break</b>
11.15	<b>Session 22: Cool roofs technologies</b>
Hall A	Chairpersons: <b>E. Bozonnet and D. Kolokotsa</b>
Keynote speech	<b>E.Bozonnet, M.Doya:</b> <i>Cool roofs impact on building thermal response - a French case study.</i>
	<p><b>C.Herrmanns, H.Poersch-Panke, J.Rokowski:</b> Reducing over-heating in buildings by use of white reflective roof coatings.</p> <p><b>M.Kolokotroni, M.Santamouris, A.Synnefa, H.Akbari, M.Zinzi, D.Kolokotsa, P.Perdikis, J.Kolokotsa:</b> Cool roof technology in Europe: Description of a handbook.</p> <p><b>D.Kolokotsa, S.Papantoniou, C.Diakaki, A.Vlissidis:</b> On the application of cool roofs technology in a laboratory building at Iraklion Crete Greece.</p> <p><b>A.Libbra, A.Muscio, P.Tartarini:</b> Actual solar reflectance of roof surfaces and standard energy performance of Italian buildings in summer.</p> <p><b>S.Sakai, M.Nakamura, K.Furuya, J.Nakata, M.Onishi, I.Iizawa, K.Yamaji, R.Asano, K.Tamotsou:</b> Sierpinski's forest: New technology of cool roof with fractal shapes.</p> <p><b>T.Jeannette, J.Menard, J.Pellise:</b> Efficiency assessment of Materis paints' cool roof.</p> <p><b>A.Synnefa, M.Santamouris:</b> Implementation of an action plan for the promotion, policy development, market transformation of cool roofs technology.</p> <p><b>G.Peacock:</b> Cool metal roofing in Europe</p>
11.15	<b>Session 23: Green roofs and roofing technologies</b>
Hall B	Chairpersons: <b>E. Erel and S.Chadiarakou</b>
Keynote speech	<b>O.Schweitzer, Y.Waisel, E.Erel:</b> <i>Evaluation of green roofs in a water-scarce environment.</i>
	<p><b>M.Ibiapina, V.Gomes Da Silva, M.Ilha, D.Kowaltowski:</b> Rainwater retention capacity of green roofs in Campinas - Brazil.</p> <p><b>C.Bueno, K.Chvatal, J.Rossignolo:</b> Influence of expanded clay on thermal performance of flat roof systems.</p>

Friday, 1 October 2010	
	<p><b>D.Fidaros, C.Baxevanou, T.Bartzanas, C.Kittas:</b> Estimation of the reduced cooling needs from a typical green roof.</p> <p><b>A.Figueroa, G.Castorena:</b> The effect of sun shading screen on roofs for naturally acclimatized houses in warm conditions: A case of study in Cuernavaca, Mexico.</p> <p><b>G.Kotopoulos:</b> Implementation of an Extensive Green Roof on the New Building of the Bank of Greece in Thessaloniki, Northern Greece. A paradigm of an efficient Mediterranean green roof.</p> <p><b>G.Kotsiris, A.Androutopoulos, P.Nektarios:</b> Thermal performance of semi-intensive type, planted roofs in Greece.</p> <p><b>M.Doya, E.Bozonnete, F.Allard:</b> Benefits of cool facades in dense urban environment.</p>
<b>11.15</b>	<b>Session 24: Advanced buildin materials, techniques and systems for low and zero energy</b>
<b>Hall C</b>	Chairpersons: <b>H.Akbari and T. Karlessi</b>
<b>Keynote speech</b>	<b>A.Chida, S.Tagawa, C.Reinert:</b> <i>Zeffle infrared reflective coatings.</i>
	<p><b>M.Zinzi, M.Santamouris, A.Synnefa, E.Carnielo:</b> The database of cool roof materials: products, testing procedures and results.</p> <p><b>S.Arsenault, R.Wayne Skilton, K.Wood, R.Levinson:</b> Expanding the palette of “cool colors” with highly weatherable topcoat technology.</p> <p><b>J.Pascual, M.Casanova, D.Tavan, D.Perez, E.Mitre, B.Tena:</b> Multidimensional performance analysis of office buildings with highly glazed facades. How do they perform in a Mediterranean climate?</p> <p><b>D.Da Silva, M.Brancaccio, B.Duplessis, J.Adnot:</b> Room air conditioner load control under summer comfort constraint.</p> <p><b>I.Tzouvadakis, A.Stamos, A.Sotiropoulou:</b> Design of structural coating material for summer-time solar protection and cooling of buildings.</p> <p><b>A.Al-Musaed, A.Almssad:</b> Biophilic habitat (Environment adaptability in context of bio-ecological architectural conception).</p>
<b>Short Presentations</b>	<b>N.Aste, C.Del Pero, R.Adhikari, M.Manfren:</b> <i>Methodology for energy loads assessment and CHCP system application for a commercial complex.</i>
<b>13.40</b>	<b>Lunch break</b>
<b>15.00</b>	<b>Session 25: Cool materials technologies</b>
<b>Hall A</b>	Chairpersons: <b>M.Kolokotroni and A.Synnefa</b>
<b>Keynote speech</b>	<b>A.Yoshida, S.Kinoshita, K.Minobe, S.Wada, Y.Shimazaki:</b> <i>Evaluation of outer structure on solar reflection characteristics of high reflectivity material in consideration of human thermal sensation.</i>
	<p><b>M.Kolokotroni, B.Gowreesunker, R.Giridharan, :</b> Cool roof technology in London: An experimental and modelling study.</p> <p><b>D.Kolokotsa, A.Pouliezos, M.Zinzi, A.Synnefa, M.Santamouris:</b> Development of a toolkit for the evaluation of energy performance of cool materials in the EU region.</p> <p><b>J.Maxted:</b> Beyond the rainbow: Reflectance and radiative property control in coil coating systems.</p> <p><b>R.Portsmouth, D.Robb, D.Edwards, R.Tonkin:</b> Is white the best solution for cool roofs?</p> <p><b>A.Synnefa, M.Saliari, M.Santamouris:</b> Experimental and numerical assessment of the impact of increased roof reflectance on a school building in Athens.</p> <p><b>H.Takebayashi, T.Sugihara, M.Moriyama:</b> Study on the cool roof effect of Japanese traditional tiled roof. No.2 Numerical analysis of solar reflectance of unevenness tiled surface and heat budget of typical tiled roof system.</p> <p><b>M.Zinzi, C.Romeo, E.Marinelli:</b> Energy and comfort benefits of a cool roof application in a not-residential building. A Sicilian case study.</p>
<b>15.00</b>	<b>Session 26: Green roofs and roofing technologies</b>
<b>Hall B</b>	Chairpersons: <b>T. Salem and E. Vardoulakis</b>
<b>Keynote speech</b>	<b>M.Sleiman, T.Kirchstetter, P.Berdahl, H.Gilbert, D.Francois, M.Spears, R.Levinson, H.Destaillats, H.Akbari:</b> <i>Development of an accelerated soiling method that mimics natural exposure of roofing materials.</i>
	<p><b>M.Ampatzi:</b> Optimal roof configuration for seaside resorts on greek islands.</p> <p><b>H.Kinoshita, H.Miyazaki, Y.Tamai, Y.Yuda, K.Higashisaka, T.Kato, Y.Fujinami:</b> The proposal for improving the thermal performance of the tiled roof - based on the historical changes in the traditional tiled roof in Japan.</p> <p><b>Y.Yuda, Y.Tamai, H.Miyazaki, H.Kinoshita:</b> Thermal effects of air layers under roof tiles - proposal for thermal improvement of traditional tile roof method.</p> <p><b>A.Spanaki, T.Tsoutsos, D.Kolokotsa:</b> Review of the parameters affecting the selection of a roof pond variant for cooling purposes.</p>

Friday, 1 October 2010	
	<p><b>E.Vardoulakis, D.Karamanis, P.Mihalakakou, M.Assimakopoulos:</b> Moisture sorption properties of modified porous clays for roof evaporative cooling applications.</p> <p><b>E.Vazquez, E.Gonzalez Cruz, M.Elizondo Mata:</b> Shaded roof pond for hot dry climate: Experimental optimization.</p> <p><b>M.Zinzi, S.Agnoli, G.Fasano:</b> Cool and green roofs. A comparison among passive cooling and mitigation urban heat island techniques in the mediterranean region.</p> <p><b>D.Kolokotsa, L.Hilditch:</b> What the policy can do for Cool Roofs?</p>
<b>Short presentations</b>	<p><b>K.Masumoto, Y.Furuici, M.Sonoyama, A.Kato, T.Orita, H.Goda, N.Nishimura:</b> The application of a low cost hydroponic roof planting by sweet potato for mitigating urban heat island in summer.</p> <p><b>A.Efthimiadou, I.Tzouvadakis:</b> The role of green roofs in big cities. Are green roofs a solution for better climatic conditions? Case study: Athens.</p>
<b>15.00</b>	<b>Session 27: Green design and zero energy buildings</b>
<b>Hall C</b>	Chairpersons: <b>V. Da Silva Leal and M. Almeida</b>
<b>Keynote speech</b>	<b>M.Kapsalaki, V.Da Silva Leal:</b> An assessment of the influence of the climate in the design of net zero energy buildings.
	<p><b>V.Zanotto, S.Ferrari:</b> Performances of external walls with different heat capacity: experimental tests in climatic chamber.</p> <p><b>J.Garcia Chavez:</b> Low embodied energy construction system applied in an educational building for improving comfort in a hot Humid climate.</p> <p><b>S.Monteiro Da Silva, M.Almeida:</b> Optimization of the indoor environmental quality of buildings.</p> <p><b>A.Almssad, A.Al-Musaed:</b> Green housing (The optimal solution to combat the negative effects of global climate change).</p> <p><b>S.Pieri, M.Xenakis, A.Xinos, I.Tzouvadakis:</b> Minimizing the CO2 footprint of buildings through the use of materials and techniques.</p> <p><b>M.Todorovic, O.Ecim:</b> Multidisciplinary engineering assessment to aproach sustainable ZE - Eco- Settlement.</p>
<b>Short presentation</b>	<b>D.Damas de Oliveira, L.Labaki:</b> Green walls and influence in the built environment: Case study.
<b>17.30</b>	<b>Coffee break</b>
<b>17.45</b>	<b>Closing Session</b>
<b>Hall A</b>	Chairpersons: <b>R. Bird and A. Thiemann</b>
	<p><b>Best Paper Award</b></p> <p><b>Best Students Papers Awards</b></p>
<b>Keynote lectures</b>	<p><b>N.Fintikakis:</b> Energy Architecture and Quality of Life</p> <p><b>M.Santamouris:</b> Cooling the Cities - The Absolute Priority</p>

### Previous conferences

#### 1st International Conference Palenc 2005

Passive and Low Energy Cooling  
19 - 21 May 2005, Santorini island, Greece

#### 2nd International Conference Palenc 2007

Advances in Building Low Energy Cooling and  
Advanced Ventilation Technologies in the 21st Century  
27 - 29 September 2007, Crete, Greece

### Conference Venue

Rodos Palace  
Luxury Convention Resort

#### Address

Trianton Ave. Ixia P.O.Box 121  
85100 Rhodes, Greece

#### Phone

+30 22410 25222

#### Fax

+30 22410 25350

#### E-mail

[info@rodos-palace.gr](mailto:info@rodos-palace.gr)

#### Website

[www.rodos-palace.com](http://www.rodos-palace.com)

### Conference secretariat

#### Heliotopos Conferences

#### Address

45, Michalakopoulou str.,  
GR-115 28, Athens, Greece

#### Phone

+30 210 9730697

#### Fax

+30 210 9767208

#### E-mail

[palenc2010@heliotopos.net](mailto:palenc2010@heliotopos.net)

#### Website

<http://palenc2010.conferences.gr>

