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ATHENS GREECE

Technopolis

Cultural Center of the City of Athens
100, Piraeus str., 118 54, Athens, Greece

Book of Abstracts

2008



Programme des Grands témoignages et des Ateliers parallèles SB08MED
(langues: français, anglais)

SB08MED Keynote speeches and Parallel Workshops Programme
(languages : french, english)

Saturday 12 January 2008

Samedi 12 Janvier 2008

08h45-10h40 pm, **Auditorium, Radio "Athina 9,84"**

Grands Témoins, Keynote speeches

Rapporteur : **Richard WITT**, Vice Président de SD-MED, SD-MED Vice-President



08.45-09.00

Georges Prevelakis, Professeur, Université Paris I, Panthéon- Sorbonne
« Athènes : L'évolution d'une métropole méditerranéenne »

Short Bio for Georges PREVELAKIS

Georges Prevelakis studied Architecture at the Athens Technical University and Geography and Planning at the Sorbonne. Between 1978 and 1984, he served as an Urban Planner at the Greek Ministry of Physical Planning and taught at the Technical University and at Panteion University in Athens. In France since 1984, he has taught at the Sorbonne and at Sciences Po in Paris. His courses cover a large field, ranging from Greek Physical Planning to the Geopolitics of Europe through the History of Modern Architecture and Urban Planning, the Theory of Political and Cultural Geography and Balkan Geopolitics. He has also taught in the USA: at the Johns Hopkins University, at Boston University and, during two academic years, at Tufts University where he occupied the Constantine Karamanlis Chair in Hellenic and Southeastern European Studies (2003-2005). His research focuses on Political and Cultural Geography theory, Urban Planning, Diasporas, European and Eastern Mediterranean Geopolitics.

Abstract:

From the point of view of energy consumption, Athens was, until the 1970s, a very efficient city. The high densities and the centralized urban structure offered many advantages, ranging from limited heat loss during winter to an economical transport system based on buses. This situation started changing dramatically in the late 1960s, with the massive introduction of the private car, followed by suburbanization, chaotic decentralization and serious traffic congestion. This process of urban crisis, still developing and extending in space, led to today's inefficient energy behavior. On the surface, these problems result from lack of physical planning. However, it is necessary to search the reasons of the failure deeper, in the modern Greek political and cultural characteristics, common among most Mediterranean countries. They have to do with attitudes towards land use and property, stances in respect to time scales, political patronage, ostentatious consumption etc. The Greek experience, with its positive and negative aspects can therefore be very useful for other Mediterranean cities that are going through stages of growth characteristic of previous decades in Greece. Its study can contribute in better understanding the role of culture and values in energy management and the complexity of the processes that determine collective successes or failures in the effort to combine development with sustainability. As a conclusion, the struggle for a low carbon city has to do at least as much with culture as with technology. The Mediterranean cities, as they modernize, abandon their traditional urban cultures without being able to fully understand and integrate the western cultural patterns that they adopt. Unless we cope with this problem, no technical solutions will be able to bring about results.



09.00-09.15

Serge Salat, Professeur, CSTB, FR

“The Mediterranean urban civilisation: a lesson of sustainability for the world. A comparative analysis of Mediterranean and world cities ecological, energy and carbon footprints”

Short Bio for Serge SALAT, Architect, Urban Planner, Director Sustainable Cities Centre

Serge Salat is an architect and has designed large-scale buildings worldwide. He has published more than 20 books on art and architecture theory. He is Professor of Sustainable Design at Ecole Nationale des Ponts and Ecole Nationale des Mines in Paris. He is Director of the Sustainable Cities Center, and Chief Architect and Urban Planner of CSTB (French Scientific Centre for Building). Before graduating as an architect, Serge Salat graduated from Ecole Polytechnique, from Institut d' Etudes Politiques de Paris and from Ecole Nationale d'Administration. He also holds a Ph D in economics. Serge Salat has had a long-term creative relationship with China including in 2002 a large-scale urban project in Tianjin and in 2006 the publication of an important book, *The Sustainable Design Handbook for China*, published in Chinese by Tsinghua University Press. Serge Salat is currently developing research work on comparative Chinese cities morphologies with Tongji University.

Abstract:

In a planet where 1 billion people are urbanized every 10 years, which represents a factor 100 in the intensity of urbanization, the urban transition is the most important driver of Climate Change. Rural people in developing countries use less than 0.8 ha of biosphere per inhabitant. Urban dwellers use between 12 ha (USA) and 6 ha (Europe, Japan). This urban transition is the main reason of the ecological footprint overshoot, i.e. the fact that mankind uses 1.4 planets Earth now and will need 3 planets Earth by 2020. Both deeply rooted in rural traditions and the most ancient urban civilization, the Mediterranean area comprises many cities which are great lessons of sustainability: the historical parts of Roma, Venezia, Firenze, Athens, Barcelona, Marseilles, Tunis, Istanbul for example blend a subtle mixture of understanding of Mediterranean climatic conditions and great lessons of urban composition. Thira on Santorini island or the traditional Arabic cities are all wonderful examples of bioclimatic cities. A simple reason of its sustainability is that the Mediterranean urban civilization has been developed before the industrial revolution and the massive use of fossil fuels. As the most advanced urban culture and as parts of a politically very fragmented area, Mediterranean cities succeeded to offer a high level of urban life while sustaining themselves in equilibrium with their close environment. **Cities in general and Mediterranean cities in particular are complex systems whose metabolism blends physical and human elements.** The aim of this presentation is to determine **the specificity of the Mediterranean city as regards sustainability and the lessons for the world of the Mediterranean cities forms and integration with their environment.**



09.15-09.30

Bidou Dominique (CIDB, FR)

“Quartiers durables, éco-quartiers, écopolis...: Quels enjeux à l'issue du Grenelle de l'environnement ?”

Short Bio for Dominique BIDOU

Dominique BIDOU, Engineer and Expert Demographer, Ancient Director of the French Ministry of Environment, is Founder and Honorary President of the French HQE Association (Haute Qualité Environnementale), pioneer in sustainable development and construction issues in France. He has been for years member of the CGPC (Conseil Général des Ponts et Chaussées) of the French Ministry of Infrastructure, Head of the “Environment and Spatial Planning” Section and ex.Director General of the French National Council for Sustainable Development (CNDD). Co-founder, since 2001, together with Stella KYVELOU of the informal and later (2004) formal SD-MED Network, he's now President of the International SD-MED Forum. Dominique Bidou is also presiding the CIDB (Centre d'Information et de Communication pour le Bruit). He's the author of two books on sustainable development : « Tous gagnants, la dynamique du développement durable », published on Ibis Press (2004) and "Coup de shampoing sur le développement durable", Ibis Press (2007) and of numerous articles.

Abstract

A défaut de parvenir rapidement à rendre les villes toutes entières durables, il doit être possible de créer les extensions urbaines selon les règles du développement durable. Telle est l'hypothèse qui a provoqué la naissance en Europe tout d'abord, et en France plus récemment, de plusieurs quartiers regroupant toutes les qualités environnementales et sociales imaginables. On les trouve à Londres (Bedzed), Copenhague (Vesterbro), Stockholm (Hammerby), Malmö (BO01), à Fribourg (Vauban), à Hanovre (Kronsberg), à Helsinki (Vikki), et bien d'autres villes, essentiellement du Nord de l'Europe. Il s'agit le plus souvent d'anciennes friches industrielles

ou portuaires, sur lesquelles ont été édifiées des quartiers neufs.

En France, plusieurs grandes villes ont lancé, plus récemment, des projets de ZAC destinées à accueillir des quartiers durables ou de haute qualité environnementale. Citons Poitiers, Grenoble, Rennes, Narbonne, Châlons-sur-Saône, Angers, et il y en a bien d'autres. Le niveau des ambitions affichées est variable, et comme pour les opérations européennes, chaque expérience est un cas d'espèce.

Il n'y a pas de règle commune, au-delà de recours à des techniques environnementales performantes pour les équipements et les infrastructures, comme pour les constructions (habitat, tertiaire). Une tentative de clarification des objectifs et d'élaboration d'une méthode est en cours, à l'initiative de l'association HQE, pour des ZAC ou des lotissements, dans le prolongement de l'approche environnementale de l'urbanisme (AEU) de l'ADEME. Une démarche et des objectifs ont été définis, dans l'esprit de la démarche HQE des bâtiments, resitués à l'échelle d'un aménagement urbain, et intégrant les thèmes de vie urbaine en général. Elle est en cours de test sur une dizaine d'opérations. Conclusions attendues pour 2009. Malgré un réel retard en France, de nombreuses villes de tailles très différentes ont pris la mesure des enjeux, et tentent d'y faire face, et on observe un effort intéressant sur la méthode.



9.30-9.45

Charles LE CŒUR, Professeur, Université Paris I, Panthéon- Sorbonne

« **Ville et changement climatique : Quels enjeux ?** »

Short Bio for Charles Le Cœur

Born in 1948, agregation of geography 1972. Professor in the Department of Geography, University of Paris 1 (Panthéon-Sorbonne). Director of the Laboratory of Physical Geography (CNRS Meudon) since 2000.

Research :

After a PhD thesis on the geomorphology of the Mourne Mountains (Northern Ireland) and a thèse d'Etat on the landscape evolution of the Inner Hebrides (Scotland), my research subjects has widen toward the uneven responses to environmental changes :

- Studies are undertaken on impact of climatic change on mountain slope processes (Alps and NW Europe) ;
- one research program is focuses on responses to change in river use (derelict dam and levee, water mills,...) and evolution of river management (heritage, environment, hazard) on N France river systems ;
- Urban environment as major change in natural dynamics, as social representations, and as management stake.

Major questions are set on local response to global or regional change (climatic effects or social land use effects. Environmental management and political decision.

Teaching :

- Physical geography as a study of natural dynamics changing in conjunction to changing social activities.
- Environment and geopolitics pointing out : the use of natural questions as metaphoric topic for political debate ; the part of image as a tool for lobbying in environment ; the intrusion of environmental questions into political discussions at different scale (local, national, international) ; the evolution of major environmental questions (local to global) within last 30 years ; the direct and indirect effects of public policy on environment.

Sommaire

La question du changement climatique implique de comprendre les impacts locaux de modifications globales avec d'importantes différenciations régionales et des rétroactions complexes.

Les villes sont ajuste titre considérées comme des lieu de forte émission de dioxyde de carbone dans l'atmosphère (habitat, transports, industrie). Leur devenir constitue donc un enjeu important. Les effets du changement pourraient être accentués du fait même de la structure urbaine : le réchauffement local des températures est de 1 a 2°C en ville par rapport aux campagnes environnantes ; les canicules sont plus marqués du fait de forte albédo et de la faible évapotranspiration de la végétation ; les orages y sont plus marqués en raison des convexions et des poussières.

La question de l'environnement global fait partie des enjeux urbains affichés. Mais le paradoxe est complexe : L'étalement urbain implique des coûts de construction de dessertes et de transports importants dans un espace régional diffusant les pollutions. A l'inverse une agglomération dense réduit les budgets énergétiques (destinés au transports) mais réduit également les surfaces végétales ; elle concentre les flux et les besoins en eau et énergie un agglomération dense réduit les budgets énergétiques (destinés au transports) mais réduit également les surfaces végétales ; elle concentre les flux et les besoins en eau et énergie ; d'où une plus grande vulnérabilité.

Le changement climatique apporte également une dimension de risque « naturel » sur les villes. Une bonne partie des villes est construite en bord de rivière. Le contrôle hydrologique est particulièrement délicat dans les villes à saison pluviométriques contrastées (régions tropicales et méditerranéennes). La gestion des rivières devient un enjeu majeur qui n'implique pas seulement la surface

urbanisée mais l'ensemble du bassin versant. Les villes situées sur le littoral ou dans les plaines côtières devront sans doute affronter une lente montée du niveau de la mer, un accroissement des tempêtes (pour lesquelles les aménagement ne sont pas toujours suffisants) et parfois la subsidence du sol sous l'effet des pompages destinés à l'alimentation en eau.

Ainsi les problèmes globaux rencontrent directement les enjeux de gestion locale, et les représentations environnementalistes peuvent intervenir dans les choix de politique urbaine.



9.45-10.00

Lau Stephen*, (China SB07, Hong Kong)

“The study of Heat Island, Built Form and Fabric in a Densely Built Urban Environment- Compact Chinese Cities: Hong Kong and Guangzhou”

* with Wang J., Tai J., Wu X.L

Short Bio for Stephen LAU

Stephen Lau teaches architectural and environmental design at the Department of Architecture, Hong Kong University. He is an Associate Professor. His administrative portfolio includes Chairman of Faculty Board of Architecture (2006-present), Associate Dean (1998-2006), Director of Research Postgraduate Students, M Arch Coordinator, and Director of the Centre of Architecture and Urban Design for China and Hong Kong. He graduated from the Bartlett School of Architecture, University College, London University (1980) with a Master of Science Degree in Architecture specializing in *Environmental Controls and Psychology*; Bachelor Degree of Architecture (1979), Bachelor of Arts in Architectural Studies(1977) from the University of Hong Kong.

He is an Adjunct Professor of the Tongji University and the Southeast University, China.

He obtained his architect's registration with the Hong Kong Government since 1983. In 2005, Mr. Lau obtained the qualification of Class 1 Registered Architect in Mainland China. He is a Fellow and Founding Member of the Hong Kong Institute of Acoustics; Fellow of the Hong Kong Institute of Architects (HKIA); the Vice Chairman (2005-6) of the Hong Kong Professional Green Building Council (Founder Member), and Chairman of the Committee on Environment and Sustainable Development of the HKIA (2005-6). In research, Mr. Lau is the member of the Board of Directors of the International Initiative of Building Environment iiSBE based in Ottawa, Canada, a world wide research network of sustainable building. He is also the Coordinator of Mega-cities Research at HKU; Coordinator of the International Council of Building Innovation and Construction (Rotterdam) CIB Task Group "TG43: Mega-cities". He has been in charge of over 15 external and internal competitive research projects as principal investigator. Currently, he conducts research on **Environmental Integrated Design Process (EIDP)** for buildings and urban study (environmental technologies for sustainable building, and sustainable urban planning "C day lighting and green features, and heat island mitigation) with specific reference to Asian cities. He had been a reviewer of the Revision of the Hong Kong Building Environmental Assessment Method (HKBEAM), and a Noise Expert for the Hong Kong Government green building evaluation tool CEPAS.

He has published over 30 academic refereed journal papers, 14 book chapters, 12 keynote speeches, 12 public lectures and organizer to over 15 international conferences. He has been paper reviewer for a number of academic journals in the UK and Australia, and research institution in Hong Kong. He has visited and lectured in over 20 universities in Europe (UK, the Netherlands), S. America (Brazil), Asia (Thailand, Japan, Indonesia, Singapore, Mainland China, Taiwan and Australia)

Abstract:

The Mediterranean cities are experiencing unprecedented demographic challenges, with an estimated urban population growth of 4 million per year based on a mean yearly increase of about 2.5% in the southern and eastern Mediterranean countries.

According to the Mediterranean Institute, the levels of urbanization in these countries are expected to increase from 64% in 2004 to about 75% in 2025. Multiple and intensive land use (MILU) is one sustainable way of dealing with the increased need for housing and infrastructure provision. MILU has been in relative long practice in many Chinese cities which are characterized by high-rise and high-density. Despite the many benefits brought along by an intensified land-use approach, the increased canyon geometry of built form and fabric modifies the urban microclimate and contributes to the heat island intensity (UHI). In this study, field measurements of temperature, relative humidity and wind velocity were taken at strategic outdoor locations of tall residential developments in Hong Kong and Guangzhou during the summer months of 2006. This paper considers the consequences of design-related variables of urban spaces and their effects on outdoor thermal environment in a high-rise, high-density urban setting. Although Hong Kong and Guangzhou have a sub-tropical climate, they share similar high temperatures (different relative humidity) during the summer months as many Mediterranean cities. The findings from the case studies discussed in this paper sheds some light on making design decisions at micro-urban and urban scales for more sustainable communities.



10.00-10.15

Larsson Nils, iiSBE

“Sustainability issues facing the construction sector in the 21st Century”

Short Bio for Nils Larsson

Nils Larsson is an architect and is Executive Director of the *International Initiative for a Sustainable Built Environment* (iiSBE), an international non-profit organization. While working with the Canadian government, he developed a demonstration program for commercial buildings with energy consumption 50% of current standards and, as part of this work, developed a formal implementation of the *Integrated Design Process* (IDP), which has been widely emulated around the world. Mr. Larsson is also the main organizer of *Sustainable Building Challenge* (SBC), an international project of iiSBE, whose aim is to develop and test new methods of assessing the environmental performance of buildings. On behalf of iiSBE he also led the development of a web-based multi-lingual information system. He has published many peer-reviewed papers, served as a juror on three architectural competitions in Europe and Montreal, and is Chair of the Regional Committee for the global SB08 Melbourne conference.

Abstract:

The effects of climate change include increases in global mean temperatures, increase in storm events, sea level rise and changes in precipitation. There are other major issues that will also have to be faced, including scarcity and high cost of fuels and materials. These issues may seem far removed from the mundane concerns of construction, but they will provide a context for construction that will become increasingly difficult during the 21st Century. Other pressures will also make the lives of investors designers and builders more difficult. There are no simple solutions, but rapid action on a broad front can at least reduce the negative impacts.



10h15-10h30 Joshua L. Arnord (US)

“The Green Strategy for Strategic Local Climate Solutions”

Speaker short biography:

Joshua L. Arnold, JD, MBA, LEED AP, is the founder and principal sustainability consultant of 360GREEN, Inc., an international consulting firm dedicated to making the business case for sustainable development. Mr. Arnold consults with the U.S. Green Building Council, major energy utility programs, and businesses of all sizes that seek to implement sustainable business operations. He has consulted on over 200 projects worth over \$3 billion (USD), ranging from single family homes to mixed-use urban neighbourhood redevelopment.

Summary :

This presentation includes the latest information from the U.S. Green Building Council, including LEED programs and advocacy campaigns for Homes, Schools, and Local Governments. We will also be outlining a new resource for city and neighborhood planning called: The Green Strategy for Strategic Local Climate Solutions. The website provides local governments with tools and resources to rapidly advance green buildings, neighborhoods and infrastructure. Strategic action in these sectors promotes economic development, builds healthier communities, strengthens energy independence, and supports climate protection. Outline of the new resource: www.greenplaybook.org

10h30-10h40 Break, Pause

16h30-17h15 , Salle D12

SEANCE PLENIERE 4 : Bâtiments publics durables, espaces publics durables : De l'idée à l'usage
PLENARY SESSION 4 : Green public buildings, Green public spaces : From concept to practice
 Chairman, Président : **Stéphane BUGAT**, journaliste

Castagna Gennaro, Barrois Serge (FR)

“Pôle administratif des Mureaux, Première opération HQE certifié: un an après...”

Abstract:

La ville des Mureaux (France) a fait construire un nouveau pôle administratif d'une surface de 4437 m², comprenant 168 bureaux et 6 salles de réunion pour 200 occupants. En 2005, le bâtiment a été certifié « NF Bâtiment Tertiaire Démarche HQE® ».

Dans le cadre de la Démarche HQE®, le Maître d'Ouvrage (MO) a défini son profil environnemental de l'opération, avec pour ambition de disposer d'une installation énergétique Très Performante.

Après avoir réduit la demande énergétique par la conception architecturale (isolation, maîtrise des apports solaires...), le MO a choisi un système énergétique performant par Pompe à Chaleur eau/eau sur nappe pour le chauffage et le rafraîchissement, 8 m² de capteurs solaires pour la production d'eau chaude sanitaire et une gestion centralisée comprenant 135 points de commande et de contrôle pour réduire la consommation d'énergie et les pollutions associées. De plus, une récupération d'eau de pluie permet d'alimenter les chasses d'eau des sanitaires.

EDF R&D a assisté le MO en amont dans le choix des systèmes énergétiques et réalise un suivi énergétique du bâtiment depuis sa mise en service, ce qui lui permet à ce jour, de cumuler 2 années d'exploitation.

Ce suivi de l'installation permet d'obtenir les consommations et les coûts énergétiques par usage d'une opération HQE® durant sa phase d'exploitation, d'analyser l'impact environnement du bâtiment au niveau des émissions de CO₂ et de comparer un bâtiment HQE® avec d'autres sites non HQE®.

L'article présentera les consommations énergétiques obtenues depuis 2005, sous forme de ratios (kWh/m².an) et part usages : chauffage, rafraîchissement, ventilation, Eau Chaude Sanitaire par panneau solaire, éclairage... La performance du bâtiment sera comparée au parc existant.

Un retour pourra être réalisé sur la récupération d'eau de pluie pour les sanitaires (WC uniquement).

L'analyse de ces résultats permet d'afficher la Tonne de CO₂ émis par an et économisée par rapport à une chaufferie gaz.

Stella Kyvelou (EL) : “Sustainable rehabilitation of public and municipal buildings in Greece : From concept to practice”

Abstract:

Οι σύγχρονες μορφές οικολογικής διακυβέρνησης στις πόλεις, είναι σήμερα περισσότερο από ποτέ στο επίκεντρο του ενδιαφέροντος, σε διεθνές επίπεδο. Αν και αυτό που η πράσινη πολεοδομία επιβάλλει είναι εξελισσόμενο και φαίνεται μερικές φορές ακαθόριστο, μέσα από τα προγράμματα, τις πολιτικές και τις ιδέες δημιουργικού σχεδιασμού που συναντάμε σε πολλές Ευρωπαϊκές πόλεις αρχίζουμε να οξύνουμε την αντίληψη για το τι μπορεί να είναι εφαρμόσιμο. Οι προσπάθειες των Ευρωπαϊκών πόλεων κλιμακώνονται από δημιουργικές προσεγγίσεις εκτίμησης της βιωσιμότητας (όπως λ.χ οι δείκτες βιωσιμότητας), μέχρι σε τεχνικές για τη δόμηση των αποφάσεων στο μέλλον (όπως ο οικολογικός τρόπος προϋπολογισμού), εκτείνονται δε μέχρι μια ποικιλία περισσότερο ειδικών δράσεων, προγραμμάτων και πολιτικών που σχεδιάστηκαν για να μειώσουν τις περιβαλλοντικές επιπτώσεις. Η οικολογική προμήθεια, τα περιβαλλοντικά δημόσια οχήματα και η **διαχείριση των δημοσίων και δημοτικών κτιρίων μέσω μάλιστα της συνεργασίας δημόσιου και ιδιωτικού τομέα είναι κάποιες απ' αυτές τις ειδικές δράσεις**. Η παρουσίαση αυτή εξετάζει την πολιτική που ασκήθηκε στον τομέα των δημοσίων κτιρίων στην Ελλάδα, τα εμπόδια και τις δυσκολίες που αντιμετώπισε και τις προοπτικές για μια επανατοποθέτηση με βάση τα νέα δεδομένα που επιβάλλει η κλιματική αλλαγή.

Abstract:

Les formes modernes de gouvernance écologique aux villes, sont aujourd'hui plus que jamais à l'épicentre de l'intérêt,

à niveau international. Bien que ce que l'urbanisme vert impose soit en train d' évoluer et paraisse parfois abstrait, à travers les programmes, les politiques et les idées de planification créative que nous rencontrons dans de nombreuses villes européennes nous commençons à aiguïser la perception sur ce qui peut être applicable. Les efforts des villes européennes sont intensifiés par approches créatives d'estimation de la durabilité (comme par exemple les indices de durabilité), jusqu'à des techniques pour la formulation des décisions à l'avenir (comme le « budget écologique »), s'étendent jusqu'à une variété d'actions plus spéciales, de programmes et de politiques qui ont été conçues pour qu'ils diminuent les répercussions environnementales. L'approvisionnement écologique, les véhicules publics environnementaux et la gestion des bâtiments publics et municipaux via même la coopération du secteur public et privé sont quelques-unes de ces actions spéciales. Cette présentation examine la politique qui a été exercée sur le secteur des bâtiments publics en Grèce, les obstacles et les difficultés auxquelles fait face et les perspectives pour une nouvelle prise de position basé sur les nouvelles données qu' impose le changement climatique.

Mattithiahu Kones (IL): “Green Public Buildings : Design and Application, Principles and case-studies in a semi-arid urban region in Israel”

During the past 30 years of practicing architecture and planning according to our ecological approach (ecotectura) in Israel we have succeeded in designing and building several public buildings of different sizes and functions.

The basic principles we used were:

1. Adapting the plan to the site rather than adapting the site to the plan.
2. Using passive solar architectural means for saving energy; good insulation; appropriate orientation and means for solar radiation and natural ventilation control, such as calculated overhangs above windows, clerestory windows, positioning of windows etc.
3. Using mainly natural building materials, massive construction with external insulation and double glazing windows lightly tinted for desert glare control.

In cases where hot water was needed, solar water heaters were installed on the roof.

In our last and largest project, a technical high school and college in Beersheba, in the south of Israel (31 30 N.L.), we tried to integrate photovoltaics for solar electricity production directly into the public electricity network but because of lack of funding the plan was not realized. All the preparations are ready for their installation, integrated with the building, in the future.

We planned solar air-conditioning, which after the feasibility study was cancelled, again because of budget limitations (the cost was three times more than conventional air-conditioning). In any case our climate appropriate design resulted in lower cost sizing and installation and consequently, future energy savings when used along with the changed standards for cooling (24-25 c) and heating (20-22 c).

Conclusions:

Designing green public buildings is a very efficient way to propagate the message of doing something realistic against the greenhouse effect. These public buildings may serve as good examples for the applications of this approach and impact the private sector.

Designing "green" educational buildings helps their users, the students, become personally aware, and they can deliver the message ever further throughout their lives wherever they will be as future decision makers and owners of buildings. Facing budget problems, it is important for architects to pre-design future installation of energy saving and production means, integrated both functionally and aesthetically in the presently constructed buildings.

Projects in slide presentation:

1. Daily care center for the aged and handicapped people in Yeruham (1981-83).
 2. Public library in Metar (2001-2003)
 3. College and high school for technological education in Beersheba (2001-2007).
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10h40-12h25
Auditorium, Radio "Athina 9,84"

ATELIER 1 : Concepts, initiatives, politiques, stratégies et outils pour une ville sobre en carbone
WORKSHOP 1 : Concepts, initiatives, policies, strategies and tools for a low-carbon city
 Chairmen, Présidents : **Dominique Bidou** (FR), **Richard WITT** (UK, SD-MED) , **Auditorium de la Radio « Athina 9,84 »**

10h40-10h55 **Katsibardis Konstantinos** (EL)

"Adapting to climate change: the emerging EU strategy"

Abstract:

Over the past years climate change has already influenced a number of natural systems, but also human systems (disastrous hurricanes, deadly heat waves). With climate change already happening, states, societies and human settlements worldwide face two major challenges: *Mitigating* climate change and *Adapting* to its impacts. Although mitigation policies (including economic instruments) and law (e.g. the UN/FCCC) are in place for more than fifteen years, the "adaptation pillar" has been unreasonably delayed.

The European Union is taking on the great challenge of adaptation, since the effects of climate change in Europe are already measurable and not at all insignificant. Some of the most vulnerable areas in Europe are coastal zones as well as the Mediterranean basin, due to the increase of temperatures, sea level rise and water scarcity. Human settlements are also growing more and more vulnerable. The combination of urbanization, poverty increase and vulnerability to climate change impacts raises the issue of *human security*. Recent disasters such as the 2005 "Katrina" hurricane in New Orleans, or the 2007 forest fires in southern Greece indicate that, even in developed states, preventive mechanisms are not at all efficient, while adaptation policies need to be rapidly formed, coordinated and supported by flexible funding mechanisms.

The evolution of an EU adaptation strategy is underway with its official kick-off being the Green Paper titled: "Adapting to climate change in Europe – options for EU action". This adaptation initiative is followed by an ongoing regional stakeholder's consultation process and backed by thematic policies and legal instruments (such as the new Directive on the assessment and management of flood risks). The Green Paper suggests a number of methods to address the problem: improved disaster management and development of national adaptation strategies. It also calls for regional and local action. However, much more needs to be done and the EU seems to be the ideal forum for this (social, economic and institutional) effort.

Aim of the proposed paper is to assess the first steps of the EU adaptation strategy in comparison with the adaptation policy framework under the international climate change regime.

10h55-11h10 **Tzanakaki Evi** (EL)

"Planning, initiating and following-up local actions for low-carbon, sustainable energy cities: the 3-nity project applied in 21 municipalities in the Athens area"

Abstract:

Low-carbon, sustainable energy communities are emerging all across Europe while several cities are willing to commit to this aim. A key issue in many cities is how to get started, and, once first steps are made, how to keep going. The European Intelligent Energy project 3-NITY ("3-fold Initiative for Energy Planning and Sustainable Development at Local Level") suggests a multi-level procedure for aiding local authorities to establish commitment, plan and set targets, apply measures and constantly improve their effectiveness. This is applicable by measures adapted to communities of various levels of sustainability (advanced, medium, basic) and aimed at enabling them to reach a higher one. Meanwhile, local authorities are learning from each other to how integrate sustainable energy in their practice and are lead to follow a sustainable excellence procedure including several organisational measures to improve energy efficient behaviour in the public and private realm. The main assumption in this direction is that any

city can become a sustainable energy city, by mobilising local politicians, market actors and citizens. This approach is being applied in 21 Local Authorities of the Athens Prefecture, under the auspices of 21OTA (their coalition for Sustainable Development) with the guidance of the Centre for Renewable Energy Sources. Ongoing actions in this direction include:

- committing to a sustainable energy vision and developing a plan for energy efficiency and implementation of renewable energy sources in Municipal buildings and open spaces
- dissemination events and open discussion with citizens and local market actors, for identifying barriers and opportunities, and changing citizen attitudes and behaviour
- informing and activating citizen groups and pupils in schools
- assessing and improving their efforts in sustainable energy excellence in the areas of leadership, policy and strategy, people, partnerships and resources, processes, results with respect to citizens and society, and performance indicators.

11h10-11h25 **Mas Michel, Siatitsa Dimitra** (FR, EL)

“Le Projet MED Eco-quartiers - INTERREG III B- MEDOCC ”

Abstract:

Le projet Med Eco-quartier (juin 2006 – mai 2008) regroupe les villes de Pézenas (chef de file, France, éco-quartier Saint-Christol de 29 ha pour 1700 habitants), Dos Hermanas (Espagne, éco-quartier Montequinto pour 12.000 habitants), Faenza (Italie, éco-quartier San Rocco pour 1.000 habitants), Cosenza (Italie, régénération urbaine), Elefsis (Grèce, éco-quartier de 3 ha pour 88 logements) ainsi que l'Organisme du logement ouvrier grec (OEK, maître d'ouvrage du projet sur Elefsis) et des partenaires techniques : AFNOR (France, organisme de normalisation), Néopolis (France, organisme de formation dans la construction durable), l'Université de Gênes (Italie, laboratoire d'Architecture), la Fundación Laboral de la Construcción Andalucía (Espagne, organisme professionnel), MedSOS (Grèce, association de défense de l'environnement).

Notre travail commun a permis de créer 4 outils de travail, depuis la conception jusqu'aux réalisations pratiques.

- Outil : Med Eco-urbanisme

Il s'agit d'une grille d'aide à la décision et au pilotage du projet. L'approche globale et transversale des différents thèmes d'urbanisme durable permet de fixer les objectifs fondamentaux du projet. L'étude des préconisations « recommandées » ou « incontournables » de l'outil Med Eco-urbanisme permet de préciser les caractéristiques du futur quartier.

L'outil Med Eco-urbanisme donne un cadre de réflexion et d'action aux politiques publiques d'aménagement.

- Outil : Med Eco-constructibilité

Cet outil permet de déterminer précisément les critères de performance environnementale, économique et sociétale du futur bâtiment et d'évaluer la contribution de chacun de ces critères à la viabilité de la construction.

L'outil propose une approche technique du bâti en intégrant les éléments du site de la construction (ressources naturelles, interdépendances, impacts...) et permet de contribuer à la réussite du futur quartier de ville.

- Outil : Med Eco-gouvernance

Cet outil guide les villes dans l'élaboration d'un projet partagé avec les parties prenantes et notamment la population. L'outil Med Eco-gouvernance permet d'utiliser les éléments de dialogue et de les adapter au contexte du projet.

- Outil : Med Eco-sensibilisation

Cet outil a pour but de sensibiliser et d'informer les élus, les personnels des collectivités publiques et les partenaires privés aux problématiques de l'urbanisme durable et de l'éco-constructibilité.

11h25-11h40 **Gonzalez Diaz Maria Jesus, Garcia Navarro Justo, Van Dorst Machiel** (ES)

“The impossible myth of the vernacular city as a paradigm for optimising resources”

Abstract:

Vernacular architecture has been considered an ideal way to understand design, as an example of simplicity and the conservation of resources, specifically energy. Along these same lines, urbanism was the most suited expression of humanity's habitat in a specific geographical surrounding.

However, the application of vernacular architecture and urbanism as a model no longer works, and is an unreachable myth. The current systems of construction have made the vernacular model of architecture impossible: we must reinvent the paradigm and admit that processes and society have changed, making current vernacular architecture meaningful only as a focus of study. The same research studies on favourably valued buildings with current methods of environmental evaluation reflect this situation: they can not be identified within their own geographic context.

In order to analyse this situation, certain conditions and basic elements have been schematically and generally

identified that have allowed for the creation of vernacular architecture, including production methods, social structure, user participation in the process, etc. With this data, a fundamental framework for comparison has been established. This framework for comparison has been applied, first, to the social structures that have allowed for what is considered a vernacular urban model, and second, to an urban structure considered as contemporary. And obviously, this has concluded that the criteria under which this architecture have been conceived are not applicable, thus not to be repeated.

This paper highlights the importance of the problem originated by the wrong management of the waste produced in the processes of construction and total or partial demolition of buildings.

At the same time, in spite of some of the effort carried out by some European countries to adopt several measures so as to improve the management of the construction and demolition waste, there are other countries –basically the Mediterranean countries—which have not yet incorporated any of these measures, or some of them are being very slowly implemented. This is due to the fact that environmental and social interests have to be considered together with large economic interests. If these measures performed in some European countries are having a good result, why not adapting them to the legislation of other countries?

Additionally, this paper presents a number of measures to improve the management of construction and demolition waste since not only the governments should enforce the different legal regulations, but also the different agents included in the construction process should involve themselves in this process. The aim is to prevent the generation of waste whenever possible, reuse and recycle the materials and energetically valorize this waste. Obviously, the final disposal in dumps or landfill should be the last option to be considered.

These measures are grouped in two main groups: on the one hand, the ones prior to obtaining the working permit. And on the other hand, good practice measures involving all the agents included in the construction and building process: designers, construction works director, on site manager, developers, contractors, subcontracts, insurance agents, etc.

11h40-11h55 **Kefala Anna** (UK)

“The potential of implementing a Masdar or similar initiative in the Mediterranean region in the efforts of achieving a low carbon urban environment”

Abstract:

During the past decades, environmental issues have increasingly become too important to ignore and thus the need for applicable solutions to the variety of problems caused by the use and abuse of energy sources is immediate. The energy use of buildings in specific, is responsible for a great percentage of carbon dioxide emissions to the atmosphere.

The move of a great amount of the rural and agricultural population from their place of origin and work to the urban centres, has constituted the latter among the largest consumers of energy and natural resources. Even though the built environment as an industry has contributed greatly to the economic development of societies, the procedures, techniques and technology involved in building construction have had considerable (mostly negative) environmental effects.

The turn towards quality of life and sustainable development that the Mediterranean countries are eager to make, is a challenge that has as its core parameter the reduction of carbon dioxide emissions. The basic parameters of a low carbon city are *the reduction of waste production, the increase of recycling rates, the preservation of natural resources, the saving of energy, the investment in renewable technologies*; all of the above culminate in the creation of accessible cities for all

The aim of this project is the identification of the causes that have created a negative environmental impact and deteriorated the environmental conditions in relation with the built environment. What will also be identified are the best possible solutions for the restoration of the relationship between human activity and natural environment. The proposal of a set of guidelines based on the improvement of energy performance of buildings and the responsible disposal of construction/ demolition waste is also pursued, along with the feasibility examination of a Masdar or similar initiative in the Mediterranean region.

Topics that will be analysed and are necessary to create a new perspective of modern urban cities, include:

- the promotion of systematic public awareness
- the need for the promotion of energy standards for buildings
- the importance of environmental education
- the creation of an economy based on new technologies and emission trading

11h55-12h10 : **Olander Yehuda** (IL) : **“Israeli Initiative for a sustainable Built Environment”**

12h10-12h25 **Flourentzou FI., Roulet Yves (CH) : “Est-ce la société de 2000 possible pour les bâtiments scolaires de l'état de Vaud ?”**

Abstract:

The “2000 W society” as it is called in Switzerland, or “Facteur 4 society” as it is called in France, may guarantee a high degree of national independence and a long-term robust sustainable national economy. Such energy intensity makes possible to humanity a fair resource distribution and to biosphere a sustainable equilibrium. It does not compromise current generation comfortable and happy living conditions and future generation provision of sufficient energy resources. The question is: is this dream possible? And if yes, what is the price and what are the consequences on the other aspects of sustainable development ?

Theoretical scenarios in Switzerland situate this energy performance somewhere near the year 2050. At this time, the majority of the existing buildings will still exist and the ones build or renovated today should still be in use without yet a major modification. The lifespan of a building construction or refurbishment in Switzerland is higher than 40 years. To be in the year 2050 ready, action in the building sector must start today.

The SIA (Swiss architects and engineers association) prepared a document benchmarking the 2000W society energy performance for existing and new buildings. The paper presents the results of a project estimating the potential of possible actions to bring to these standards 408'000 m² of school buildings owned by the Vaud State. The 36 MWh of the current primary energy consumption to heat the buildings should be reduced down to 12 MWh. Refurbishment of the building envelope according to the current insulation techniques gives a reduction potential of 16 GWh. Wood energy, heat pumps, advanced control of natural ventilation and heat recovery may reduce the energy consumption to the threshold of 100 MJ/m²y of primary energy for heating and hot water. The paper shows the potential and the problems of each solution.

Albatros method supported the analysis of the consequences of a 2000W scenario of the Vaud school buildings on the other aspects of sustainable development, especially cultural patrimony, and economical rationality.

The study showed that it is possible and affordable for the state budget to reach the 2000 W thresholds for heat energy in a sustainable way. This action will be realised in the Agenda 21 of the Vaud Canton. Unfortunately it showed that with the current way of living, and the current state of technical knowledge, the consumption of 38 MWh of primary energy to produce the used electricity may not be reduced to 13 MWh for the 2000W society.

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Saturday 12 January 2008

10h40-12h25
Salle D10, niveau 1

ATELIER 2 : Innovation pour un environnement bâti, sobre en carbone
WORKSHOP 2 : Innovation for a low-carbon built environment
Chairmen, Présidents : **Maria Jesus Gonzalez Diaz (ES), Georgios Patelis (EL)**

10h40-10h55: **Kitsutaka Y., Ishino H., Kobayashi K., Sasaki T. (JP)**

“Façade Design for Activation Renewal of Buildings Addressing Various Thermal Environments in Japan”

Abstract:

In the field of architecture, the control of heat loss through exterior walls and windows of buildings has been recognized as an effective measure for energy conservation and regarded as an essential item at the time of refurbishment. In Japan, where the thermal environments widely vary, the establishment of environment control techniques suitable for regional characteristics is vital for the future standardization of activating renewal methods for buildings. This paper analyzes the way the periphery of a building should be from multiple viewpoints of equipment, materials, design, and planning to summarize the key points of peripheral design. Buildings in four cities located in three regions, specifically, a cold region, warm region, and region with high temperature and high humidity, were selected as subjects of research. Based on the investigation into individual buildings, four points of peripheral design were summarized such as the periphery of a building should be

recaptured as a zone with a depth of the exterior wall, peripheral design should be considered carefully in consideration of localized environmental conditions, local materials and global technology are combined, design techniques suitable for the environment should be proposed based on the rating of the exterior of an individual building.

10h55-11h10: **Trypanagnostopoulos Yannis, Trypanagnostopoulou Maria(EL)** “**Building integrated solar collectors and photovoltaics, an energy solution with aesthetic and environmental benefits**”

Abstract:

Solar energy systems as thermal collectors and photovoltaics can be applied in a very harmonic way on buildings to cover the heating, cooling, electricity and lighting needs of them. Every type of building should be designed according to the principles of bioclimatic architecture for the minimization of the energy needs and the environmental impact, improving the energy behaviour of it and saving more than 50% of the energy consumption of the standard types. In this way the installation of thermal collectors and photovoltaics is useful and efficient, considering the total energy consumption. Taking as example a Mediterranean country like Greece, we present a study for a wide application of solar thermal collectors and photovoltaics, aiming to energy saving and reduction of CO₂ from the conventional energy sources in the built sector. The work gives a figure of the contribution of the solar energy systems to the energy demand of buildings, including issues regarding architectural designs and sustainability requirements.

Building integrated solar thermal collectors and photovoltaics can be grouped into façade and roof integrated systems and should be installed in the right way to adapt building architecture, improving also thermal insulation and reducing building heating and cooling demand. For the aesthetic building integration of solar thermal collectors and photovoltaics, it is important to think about the form and the available surface areas on façade and roof of the building, in combination with the colour, the form and the performance of thermal collectors and PV modules considering local architecture and climatic conditions. Studying the application of solar thermal collectors, it is important to integrate collectors of high aesthetics because they are directly visible as they constitute a large part of building external surface. These collectors can cover domestic hot water and heating/cooling building demand and should be cost effective with advanced aesthetics. Regarding photovoltaics, they should be combined with a suitable PV cooling mode to keep electrical efficiency at an accepted level and additionally, they could have an effective use of the extracted heat for the thermal building needs.

In this article the potential for a wide application of thermal collectors and photovoltaics in Greek buildings is reported. The innovative solar energy devices that have been designed and developed at the University of Patras are briefly described and aspects regarding aesthetics and potential of the integration of them into the buildings are discussed. The studied systems include ICS solar water heaters, solar collectors with colored absorbers, CPC type collectors, booster reflectors, PV/T collectors and Fresnel lenses with linear absorbers. The presented solar energy systems and the architectural solutions that are suggested aim to adapt aesthetics, performance and cost with energy saving and solar control of buildings by replacing of conventional energy sources in heating, cooling and electricity and contributing therefore to significant CO₂ reduction.

11h10-11h25 **A. Moropoulou, J. Palyvos, M. Karoglou, V. Panagopoulos** “**Using IR Thermography for the Performance Assessment of Building Photovoltaic Array**”

Abstract:

In this work infrared thermography is used for the assessment of the performance of photovoltaic panels at the façade of NTUA's Chemical Engineering building. On the southern façade and roof of the NTUA's Chemical Engineering building complex, under the Thermie Project (SE-142-97-GR-ES), it is installed a grid-connected 50 kWp solar photovoltaic array, in a standard and hybrid PV-Thermal configuration, meant to save conventional energy. The thermographic system used was of 8-12μ wavelength. The thermographs obtained during the day continuously, using a standard video PAL. The thermal images obtained showed that there are temperature differences on the PV panels, which may be attributed to PV material defects or PV malfunction

11h25-11h40 **Drakopoulos Panayiotis (EL)** “**Thermal Insulation Façade Systems: Optimal Energy Savings, Better Investment Practices**”

Abstract:

The energy consumption matter for the building sector has come up again urgently looking for standards, measures, policies and best practices. That is because building sector have direct impact both on energy consumption and environment (cooling, heating, raw materials for construction, consumption of natural sources-water, fossil fuels and emissions of harmful substances). Buildings are responsible for the approximately 40% of the primary energy consumption in EU and for about 50% of CO₂ emissions [1], [2]. Given the lifetime of buildings and the large number of

existing buildings it is clear that the largest potential for improving the energy performance of buildings and creating ecologically sound and pleasant human interior environment in short time, is in the existing building sector. Building refurbishment costs much less than demolition and reconstruction plus protects the architectural heritage. Building refurbishment with thermal insulation façade systems provide the main thermal protection of the building envelope, given the fact that this is the major thermal bridge to the environment [3]. The building envelope has to provide the requirements of statics and stability, thermal insulation, noise, moisture and fire protection, plus protection from the weather conditions. These requirements plus a vast architectural flexibility and freedom in design can be acquired by an external composite insulation system, provided that this system is certified and standardized [4], applied by certified applicators according to the technical details and specifications provided by the materials' producer. An external thermal insulation composite system (ETICS) is composed by multiple layers: the insulation material (commonly consisting of boards of expanded polystyrene [5] or mineral wool while the thickness varies accordingly to the average air temperature difference between inside and outside building i.e. geographical location, climatic conditions, HDD) the fixing on the substrate (adhesive and/or dowels), the reinforcing intermediate coating (intermediate plaster and reinforcement mesh) and a variety of decorative finish coatings. ETICS are proven to minimize energy consumption of buildings, while reducing emissions of greenhouse gases. ETICS technology has been developed in order to achieve minimum times of application, longer lifetime of materials, greater protection of the building according to its geographical location and climatic conditions, plus protection, if such is desired, by electromagnetic radiation (electro smog), contributing to a better and healthier indoors environment. A quick review of the advantages of ETICS: Energy saving up to 60% on existing buildings, reduction of emissions, important influence on the microclimate, elimination of thermal bridges, façade protection, easy, quick application, cost worthy investment, long term durability, reduction of black-out possibility during pick demand of electricity.

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11h40-11h55 **Flourentzou Fl., Dunant Erich (CH)**

“Centre médical des Grangettes: une preuve que les techniques sobres peuvent mener à des bâtiments de haut standing a basse consommation”

Abstract:

Low energy buildings are often imagined as efficient machines with lots of ducts, cables, micriprocessors and high tech look. This article shows that, for the climate of north Mediterranean and central Europe, high-energy performances and high comfort standards may be obtained also with technical sobriety, using passive techniques One m2 of the Grangettes Medical Centre dissipates only 100 kWh to offer a comfortable ambiance and hot water to its occupants, due to its well-insulated envelope (16/20 cm of insulation, window U value 1.3 W/m2K). It finds 52 kWh in the sky in the form of passive solar heat and in the emitted heat by its occupants. Remain 48 kWh to find elsewhere. The 31 kWh are found in the earth through geothermal heat pumping. Remain only 17 kWh to find from external sources. 30% of this energy is covered by

35 m2 of translucent photovoltaic panels used also as solar protection and light filter. The 10 kWh of final energy (29 kWh of primary energy) makes the building conform to the Minergie standards Indoor environment quality and energy efficiency were optimised using mainly the Swiss LESO software (lesocool for natural ventilation and passive cooling, lesosai for the envelope performance, lesokai for the wall humidity behaviour, DIALeurope for natural lighting optimisation). Very good envelope well dimensioned and positioned windows, high thermal mass, correctly dimensioned and positioned openings, make the building behaviour compatible with its local climatic environment.

Instead of the building fighting against climatic conditions, it is adapted to them and takes profit from its immediate environment. A 1-year monitoring shows that energy performance, summer thermal comfort, light, quality and air quality correspond to the predicted ones. This realisation shows that for central Europe and northern Mediterranean cold climate, it is possible to build naturally conditioned buildings also for the requirements of prestigious use like a private clinic. During the extreme temperatures of June 2006, when outside it was 34°C, in the Grangettes medical center temperature did not exceed 27°C while in standard buildings it was at 32°C.

The article shows the steps of integrated design procedure, showing the appropriate software for each step and the obtained results after one year of use.

11h55-12h10 **Doulami Marina, Dimitrakopoulos Dimitrios (EL)**

“Ecodomima” A holistic sustainable house”

Abstract:

“**Domima**” is a company owned by Dimitris Dimitrakopoulos and Marina Doulami.

“**Domima**” has built over 100 selling units (offices, apartments, houses, shops) in 10000 square meters.

We decided to expand our company with a new project regarding to ecological, hygienic houses, independent from conventional energy forms, namely “green houses”. Although it is early for the Greek market, we hope that, people will be rendered more sensitive to ecological and hygienic houses. We decided to build our first house in a land, which belongs to our company, and this will be a model house for the next projects. It is our plan to construct such houses upon client’s request. Up to now, there aren’t any similar constructions, except for few innovators. We believe that by creating a model house we will attract the market interest. Our first movement towards this direction was to create a team of collaborators, who will help us to construct such the model house. We aim to introduce to the market a full range of services, from architectural designs to alternative solutions for ecological and hygienic buildings. Our company will be responsible for the coordination, customer relations, and the selection of the ecological products and the construction of such houses.

WHY GREEN BUILDING

The building material industry, the transport of materials and products, their constructions on site and the pollution and energy wastage coming for building collectively has wider impact on the environment than the most other human activities.

PRINCIPLES of GREEN BUILDING

Reducing Energy in Use

For example

Use maximum possible low embodied energy insulation, but with good ventilation

Use renewable energy resources.

Use none or low pollution heating.

Make use of passive and active solar energy wherever feasible.

Use passive and natural ventilation systems.

Minimizing External Pollution and Environmental Damage

For example

Design in harmonious relationship with the surroundings

Avoid destructions of nature habitats.

Re-use rain water on site.

Treat and recycle waste water on site if possible.

Try to minimize extraction materials unless good environmental controls exist.

Avoid material which produce damaging chemicals as a by product.

Reducing Embodied Energy and Resource Depletion

For example

Use locally sourced materials.

Use materials found on site.

Minimize use of imported materials.

Use materials from sustain ably managed sources

Keep use of materials from non renewable sources to a minimum

Use low energy materials, keeping high embodied energy materials to a minimum

Use second hand/recycled materials where appropriate.

Minimizing Internal Pollution and Damage to health

For example

Use non toxic materials or low emission materials.

Avoid fibres from insulation materials getting in to atmosphere.

Ensure good material ventilation

Reduce dust and allergens

Reduce impact of electromagnetic fields (EMFs).

Create positive character in the building and relationship with site.

The construction of the building will be based on the following principles.

Holistic Design

Minimizing External pollution and Environmental Damage

Sourcing green materials

Autonomy with zero carbon emission.

Non ecological products will be used only if ecological products are not available in Greek market.

Project Name: **ecodomima**

Makri – Alexandroupolis - Greece

Nr of Dwellings: 1

Tenure: Example Dwelling

Features: Holistic Design, Micro-climatic Design, Autonomy, Passive and active solar

Heating, Geothermal Heating, Super insulated structure, Thermal mass, Natural materials, Recycled-Recyclable materials, Timber from managed sustainable sources, Chemical use minimised, PVC-Formaldehyde-toxic excluded, Windows with low emission coating, Fresh air maximised, embodied energy calculated, local material, Grey water recycling, Rain water recycling, waste storage.

Details: The target is to build a house totally autonomous with zero carbon dioxide emission.

The design of the house will be based on the ancient Greek houses.

We will have an effective insulation for the building, solar energy, Solar thermal, hygienic materials and biological cleaning system. As a back we will use biomass or geothermic heating system.

12h10-12h25 **Manioudakis Nicos** (EL):

“The pilot energy autonomous building of SOLAR Energy Hellas in Palaion Faliron”

Sol Energy Hellas SA, with great care for protecting the environment and with particular enthusiasm from all its researchers, after four years of continuous research has completed, along with its cooperating partners (NCSR «DEMOKRITOS», Aristotle University of Thessaloniki, and “Metchovio” National Technical University of Athens), the construction of a totally energy-autonomous building named “Prometheus Pyrphoros” (“Prometheus the Fire-Bringer”), which by way of exploiting solar energy and geothermy practically puts an end to the use of oil, natural gas, and other expensive and, most importantly, polluting sources of energy.

Furthermore, through a series of bioclimatic applications and innovations, and by the use of products already available in the Greek market, the effective operation of the building is completed, and an excellent environment is ensured, both at the offices of the working spaces and at the apartments above.

The building is located in Paleo Faliro, not far from the center of Athens, where its presence, integrated in its surroundings and deeply respecting environmental protection, states that a building with conventional architectural design can operate on non-conventional and, most importantly, green energy sources, free from any necessity of buying external power, and securing at the same time the quality of life we all are entitled to.

This particularly innovative project is a pilot implementation of the solutions for integrated energy design of autonomous buildings that have been favored during a subsidized research program of the General Secretariat for Research and Technology (GSRT) of the Ministry of Development. The following technologies are developed and integrated in this building:

- Hot water generation by high-efficiency flat-plate solar collectors for heating and air-conditioning.
- Seasonal thermal storage in non-metallic tanks.
- Solar cooling (absorption technology).
- Solar-assisted desiccant cooling

- Shallow geothermy - geothermal heat pumps.
- Passive energy design (special thermal insulation, orientation, double-glazed panels of low emittance and high reflectance, thermal break aluminium frames, special low-consumption lighting).
- In-wall and in-floor heating and cooling.
- "Pre-air-conditioning" fresh air through split central air-conditioning units.
- Photovoltaic panels.
- Automation system with advanced control programming for optimal energy management.

Sol Energy Hellas SA, guided by environmental protection concerns and conforming with european quality standards, provides consulting services concerning:

- strategic energy planning,
- obtaining permits for electromechanical installations, and
- drafting dossiers for funding requests in the framework of subvention programs

The company has also undertaken construction of many projects in Greece and abroad, always serving the global quality of life and environmental protection values; these projects concern:

- large-scale active central solar systems, for generating hot water for domestic use, for heating swimming pools, and for heating spaces;
- central solar systems of concentrated collectors, for generating high-temperature water or steam for industrial use;
- heating and cooling through use of drilling or of the sea, as well as all necessary peripheral installations (fan coil units, air pipes etc.);
- solar air-conditioning, by means of absorption technology chillers;
- design and construction of swimming pools, and of hydraulic elements of thalassotherapy center (SPA) installations;
- central engine room construction;
- water treatment systems for generating potable water;
- Legionnaires' disease (Legionella) control systems, by means of a UV-radiation disinfection system;
- design and implementation of central automation systems for installations with PC Graphical User Interface (Building Management Systems - BMS), for the control and optimal energy management of the installations;
- photovoltaic systems for electricity generation;
- integrated management of solid and liquid waste.

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Saturday 12 January 2008

10h40-12h25
Salle D12, Room D12

ATELIER 3a : Ville, climat et design urbain : l'impact de la forme urbaine
WORKSHOP 3a : City, climate and urban design : the impact of urban form

Chairmen, Présidents : **Maria Sinou** (SD-MED, EL) , **Adriano BELLONE** (SD-MED, IT)

10h40-10h55 **Milakis Dimitris** (EL)

"Travel behaviour as function of urban form. Evidences from Athens"

Abstract:

The aim of this paper is the investigation of the effects of the physical characteristics of urban form on travel behaviour. The present study introduces non-urban form parameters, in pursuit of a two-fold goal: (a) to compare the degree of influence of urban form and non-urban form parameters on travel behaviour, (b) to identify the urban form parameters that directly influence travel choices. Data from the Metro Development Study has been employed for the area of

Athens. The results indicate that urban form parameters influence public transport use and walking, the mean journey length and energy consumption by car. Non-urban form parameters influence mostly car use. The urban form parameters that turn out to influence transport choices directly are residential density and distance from city centre. Finally, conclusions about the strategic planning priorities that Athens could adopt in order for more sustainable travel patterns to appear are presented at the end of this paper.

10h55-11h10 Teli Despoina, Aksarli Kleo (EL)

“The contribution of bioclimatic design of urban open spaces to the improvement of urban microclimate: redesigning of an open urban space in Thessaloniki”

Abstract:

Είναι γνωστό ότι οι ανθρωπογενείς δραστηριότητες που απελευθερώνουν στην ατμόσφαιρα σημαντικές ποσότητες διοξειδίου του άνθρακα (CO₂), ευθύνονται σε μεγάλο βαθμό για την κλιματική μεταβολή.

Οι βασικότεροι πυρήνες πρόκλησης του φαινομένου είναι τα αστικά κέντρα, καθώς εκεί συγκεντρώνεται το μεγαλύτερο ποσοστό ανθρωπογενούς δραστηριότητας. Συγχρόνως η πυκνή δόμηση, η έλλειψη υπαίθριων χώρων και πρασίνου, η χρήση σκληρών υλικών και η υποβάθμιση του αστικού μικροκλίματος είναι ορισμένα από τα χαρακτηριστικά των σύγχρονων πόλεων που επαιξάνουν το φαινόμενο.

Η συμβολή των υπαίθριων χώρων στην αναβάθμιση του αστικού περιβάλλοντος και στη δημιουργία συνθηκών άνεσης για τους κατοίκους της πόλης, αποτελεί αδιαμφισβήτητο γεγονός.

Η παρούσα εισήγηση εστιάζει στην διαδικασία σχεδιασμού των αστικών υπαίθριων χώρων με βιοκλιματικά κριτήρια με σκοπό τη βελτίωση του μικροκλίματος των πόλεων, γεγονός που μπορεί σε βάθος χρόνου να συμβάλει στον περιορισμό των αρνητικών επιδράσεων της κλιματικής μεταβολής.

Στην εισήγηση παρουσιάζεται ο ανασχεδιασμός ενός ελεύθερου χώρου που φιλοξενεί διάφορες δραστηριότητες, και μπορεί να οδηγήσει σε σημαντική αναβάθμιση του αστικού τοπίου μέσα από την εφαρμογή βιοκλιματικών αρχών στο σχεδιασμό του. Η περιοχή βρίσκεται στη Θεσσαλονίκη (40° Β. Γ.Π.), μία μεσογειακή πόλη, με την ιδιαιτερότητα της γειτνίασης με τη θάλασσα και την ύπαρξη ψυχρών χειμερινών ανέμων. Προτείνεται η αναδιαμόρφωση του χώρου με σκοπό τη βελτίωση των συνθηκών άνεσης αλλά και του αστικού μικροκλίματος γενικότερα. Λαμβάνονται υπόψη στο σχεδιασμό τόσο τα ιδιαίτερα κλιματολογικά στοιχεία της περιοχής όσο και οικονομικά και κοινωνικά κριτήρια και γίνεται προσπάθεια να συνδυαστούν με τον καλύτερο δυνατό τρόπο. Η πρόταση περιλαμβάνει οργάνωση και χωροθέτηση των λειτουργιών, διαμόρφωση του χώρου, μικρής κλίμακας κατασκευές, οργάνωση τοπογραφίας και φυτεύσεων καθώς και πρόταση υλικών κατασκευής. Στόχος είναι η καλύτερη δυνατή αξιοποίηση των ευμενών στοιχείων του μεσογειακού κλίματος και η αποφυγή των δυσμενών για την εξασφάλιση ηλιασμού, σκιασμού, δροσισμού, αερισμού ή ανεμοπροστασίας, ανάλογα με τις απαιτήσεις της εποχής του έτους. Παράλληλα, ορισμένες επεμβάσεις του υπαίθριου χώρου συμβάλλουν στην βελτίωση της ενεργειακής συμπεριφοράς των κτιρίων της περιοχής με αποτέλεσμα την εξοικονόμηση ενέργειας.

11h10-11h25 Rizhopoulou S., Meletiou-Christou M-S., Nassios K., (EL)

“A study of the growth rate of Mediterranean plants exposed to the air pollution of the city of Athens”

Abstract:

The atmospheric environment of the city of Athens is air polluted; plants growing in this area do respond to air pollution *via* a variety of mechanisms depending on the species, the plant developmental stage, the concentration and combination of pollutants and other environmental stresses. In this study, we present annual data on CO₂ fixation of Mediterranean plants grown under atmospheric pollution at ten different sites in the center and the suburbs of the city of Athens –that are characterized by a gradient of air pollutant concentrations–. In addition, we investigated the total chlorophyll and the water status of leaves. Leaf gas exchange parameters (A: photosynthetic CO₂ fixation, Ci: intercellular CO₂ concentration and g_s: stomatal conductance) were measured in the field with an infrared gas analyzer (Licor-6400), whereas leaf samples from the same shrubs were collected for analyses (i.e. chlorophyll and water relations) in the laboratory.

It seems likely that air pollution in the city of Athens does not affect severely gas exchange parameters of the evergreen Mediterranean species that are, in a great extent, responsible for the growth rates of the plants.

11h25-12h25, Salle D12 (suite)

ATELIER 3b : Urbanisme et habitat en face des changements climatiques
WORKSHOP 3b : Urban development and Housing facing climate change
Chairmen, Présidents : Yannis Trypanagnostopoulos, (EL)

11h25-11h40 **Dias Dominique** (FR)

“Mutabilité du Périurbain: le modèle pavillonnaire, face a la Crise Energétique”

Abstract:

Le phénomène périurbain remonte à la fin des années soixante et se poursuit encore aujourd'hui avec une intensité soutenue, dépendant toutefois de la conjoncture économique, du marché immobilier et de la pression foncière en marge des agglomérations. Dans le champ de l'urbanisme et de l'architecture, après avoir incarné un certain idéal (cité-jardins, cité des usines Renault de Flins,...), l'espace périurbain est aujourd'hui décrié: faible qualité architecturale des maisons de constructeurs, gaspillage de l'espace, absence d'équipement collectif, coût exorbitant des déplacements au regard de l'impératif du développement durable, absence de mixité tant fonctionnelle que sociale...

La critique doit être comprise au regard de l'extrême faiblesse de l'intervention des architectes et des urbanistes sur ce type d'espace qui constitue l'impensé de la ville. Les constructeurs et les promoteurs se sont en effet emparés du marché lucratif de la maison individuelle. Les lotissements édifiés résultent alors plus d'une logique économique, qui fait du pavillon un bien uniquement marchand, que d'une planification urbaine ou de projets urbains.

Au nom des leitmotifs " vivre à la campagne " et " devenir propriétaire " qui résultent des politiques du logement des années soixante-dix, et non pas d'une aspiration naturelle de la population, le pavillon a connu un succès jusqu'à devenir un modèle d'habitat, en tant que système social et architectural. Il imbrique une réponse relativement formalisée et répétitive (la maison provençale aux murs ocre par exemple) et des pratiques spécifiques (entre autre, la contrainte des déplacements automobiles).

Le propos de l'atelier n'est pas de trancher les débats entre les tenants et les détracteurs du périurbain mais appelle à porter un regard prospectif sur la pérennité d'un modèle, son entrée en crise, ses chances de mutation, voire son éventuelle disparition. Les trois intervenants déclinent chacun, selon leurs spécialités, les changements qui peuvent bouleverser le modèle pavillonnaire.

La dépression périurbaine découlerait de la limitation des déplacements automobiles. Suite à l'augmentation du prix de l'énergie, à l'inversion des politiques d'infrastructure routière, à la généralisation des péages urbains, se déplacer en voiture en ville devient un luxe réservé à une minorité. La mobilité des couches moyennes résidant dans les lotissements périurbains s'effondre et les habitants se retrouvent prisonniers de leur villa. Le déplacement des populations vers des zones plus centrales, desservies par les transports en commun conduit à une dépréciation de ces quartiers.

La crise de l'idéologie pavillonnaire résulterait de la désaffection des habitants envers la maison individuelle. D'un point de vue sociologique, la paupérisation des quartiers périurbain signe la fin de l'affirmation, à travers la propriété, de l'appartenance aux couches moyennes ou supérieures. Sur le plan symbolique, l'occurrence croissante de catastrophes naturelles, sur ces anciens terrains agricoles, dénature les signes de la maison individuelle. Dans le cas de l'inondation, la souillure de la boue transgresse les règles du pavillon qui organisent la saleté et la propreté dans l'espace domestique.

La viabilité technique pose question. La qualité des matériaux, la fragilité des structures, le vieillissement des éléments préfabriqués pourraient amener à des opérations de rénovations périurbaines d'ici une ou deux décennies, sur le modèle des opérations menées aujourd'hui sur les grands ensembles. On remarquera d'ailleurs que la vétusté du bâti est souvent un prétexte pour détruire un modèle jugé caduque, au grand damne des habitants.

11h40-11h55 **Lusardi Alain** (IT)

“Sustainable Housing in Europe”

Abstract:

Sustainable Housing in Europe (SHE) is a five-year demonstration project, co-funded by the European Commission, which will realize sustainable homes for 600 families in Denmark, France, Italy and Portugal.

It is led by social housing organisations and aims at demonstrating the feasibility of sustainable housing for all social groups. The simulation of the energy consumption of the dwellings shows a 40% energy saving on heating, a 100% energy saving on cooling, a 20% energy saving on lighting and a 30-40% water saving

The great commitment of both the social housing cooperatives and the scientific partners of the project combined with the close dialogue with and active involvement of other stakeholders, including local authorities, have already led to the launch of new SHE-oriented projects, to the updating of local building regulations and to a new trend on the national social housing organisation policies.

Innovative outcomes of the project will be:

- a roadmap with practical recommendations aimed at supporting social housing organisations in introducing sustainable building principles in their daily practice and to define the responsibilities and engagements of all the participants of a sustainable housing project;
- the definition of new procedures to ensure the effective direct participation of all the building stakeholders, especially the final users, in the decision-making process thus increasing environmental awareness;
- a dwelling manual for each SHE pilot project aimed to educate the future inhabitants in the use and maintenance of the sustainable dwellings and a new tool, a global life cycle costing methodology, to establish the social and economic benefits and externalities of sustainable housing.

11h55-12h10 **Allen Christopher** (US)

“Green Workforce Housing: Sustainable Urban Development and Revitalization through Low-carbon Housing”

Abstract:

This presentation will explore the role of green/low-carbon workforce housing in urban development and revitalization. As cities contemplate how to sustain their economies and revitalize their neighbourhoods and commercial centers, housing the workforce is a common concern. Developing innovative and effective strategies for building and maintaining low carbon, healthy, and attractive housing in urban centers is critical to sustainable economic development. The presentation will focus on several case studies in the US that profile successful models for integrating green/low carbon housing into urban redevelopment projects. Particular focus will be given to the Green Communities program of Enterprise Partners which has invested US\$425 million in green workforce housing projects in 23 states in the US. Key lessons learned, principles, partners, and outcomes will be featured and opportunities for international collaboration will be outlined.

12h10-12h25 **Kotsi Ageliki** (EL)

“Ville-Corps et environnement”

Abstract:

En tant que corps social organisé et doté d'un ordre, la Ville crée, chaque fois, la civilisation et l'environnement convenant à ce corps ; l'individu vit dans cet environnement et prend contact avec celui-ci, au moyen de ses mécanismes perceptifs, de son mouvement et de ses sens. D'autre part, un facteur essentiel pour le fonctionnement de l'organisme-ville, l'énergie, occupe une part importante de responsabilité dans l'aggravation environnementale, l'épuisement des sources énergétiques, ainsi que le risque de destruction, altération, dégradation ou de disparition d'éléments - culturels ou autres - émanant de l'homme. Cependant, ce facteur aggravant n'est pas le seul; l'environnement naturel et bâti de la ville est voué à subir des changements climatiques et une dégradation de la qualité d' «habiter», suite au mode d'organisation et de planification de son espace bâti, des éléments de construction mis en oeuvre, de la dégradation engendrée par le fonctionnement même de l'espace urbanistique, entraînant ainsi des conditions où l'individu a du mal à vivre et où son corps s'épuise, en particulier. Une nouvelle approche de l'environnement, notamment une révision de la relation de celui-ci avec le corps et ses sens, contribuera à une re-planification de l'espace, de façon à le rendre plus viable et à assurer une intégration dans l'environnement (naturel, social, culturel, esthétique) des installations de toutes les formes d'énergie.

Η Πόλη, ως κοινωνικό σώμα με οργάνωση και τάξη, δημιουργεί κάθε φορά τον πολιτισμό και την Πόλη, ως περιβάλλον, που του ταιριάζει. Αποτέλεσμα, ένας ζωντανός οργανισμός που λειτουργεί, σε διαλεκτική πάντα σχέση μαζί του, διαμορφώνεται, μεγαλώνει, αλλάζει, αναπνέει, καταναλώνει, αποβάλλει, διαθέτει πρόσωπο με χαρακτηριστικά, μια οντότητα δηλαδή, που αποτυπώνεται στην εικόνα του. Μέσα σ' αυτό το περιβάλλον ο άνθρωπος ζει και έρχεται σ' επαφή μαζί του με τις αισθήσεις του, την κίνησή του και τους αντιληπτικούς μηχανισμούς του.

Η ενέργεια είναι σημαντικότερος παράγων για τη λειτουργία αυτού του οργανισμού (παροχή υπηρεσιών, βιομηχανία,

δημιουργία θέσεων εργασίας), αλλά καταλαμβάνει και σημαντικό μέρος της ευθύνης στην περιβαλλοντική επιβάρυνση και στην εξάντληση των ενεργειακών πηγών, καθώς και στον κίνδυνο καταστροφής, αλλοίωσης, υποβάθμισης ή εξαφάνισης πολιτιστικών και λοιπών ανθρωπογενών στοιχείων.

Δεν είναι όμως ο μόνος επιβαρυντικός παράγων. Το φυσικό και δομημένο περιβάλλον της πόλης με τον τρόπο οργάνωσης και σχεδιασμού του δομημένου χώρου της, των δομικών στοιχείων της, τη χωρίς μελέτη επιλογή των δομικών υλικών, την υποβάθμισή του από την ίδια τη λειτουργία του οικιστικού της χώρου (απόβλητα, απορρίμματα, εκπομπές θερμότητας) οδηγείται σε κλιματικές αλλαγές και σε μια υποβάθμιση της ποιότητας του «κατοικείν», που διαμορφώνουν συνθήκες δύσκολης διαβίωσης, ιδιαίτερης καταπόνησης του σώματος του ανθρώπου – τόσο ως βιολογικού, όσο και ως αντιληπτικού μηχανισμού – και μείωσης της αντιληπτικής πρόσληψης του περιβάλλοντός του.

Επιβάλλεται η επιδίωξη αύξησης της αειφορίας του περιβάλλοντος μέσα από μια νέα προσέγγιση μ' αυτό και κυρίως η επανεξέταση της σχέσης του σώματος και των αισθήσεών του με το περιβάλλον, για να μπορέσει να επιτευχθεί ένας επανασχεδιασμός του χώρου, που θα το καταστήσει πιο βιώσιμο, θα βοηθήσει στον περιορισμό της κατανάλωσης της ενέργειας και των δυσμενών συνεπειών της χρήσης της και θα διασφαλίσει την ένταξη των εγκαταστάσεων όλων των μορφών ενέργειας στο περιβάλλον (φυσικό, κοινωνικό, πολιτιστικό και αισθητικό).

Samedi 12 janvier 2008

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Saturday 12 January 2008

10h40-12h25 , **Salle D12, Room D12**

ATELIER 4a : Environnement et construction de l'antiquité à la modernité
WORKSHOP 4a : Environment and construction from antiquity to modernity
Chairman, Président : **Marina Doulami (EL)**

10h40-10h55 **Moropoulou A., Karoglou M. (EL):**

“From Protection of Cultural Heritage to Sustainable Construction”

Abstract:

Historic structures protection consists of a valuable source of knowledge and experience regarding structural materials/components behaviour. Recording and analyzing of this knowledge can contribute to the development of new criteria and methodologies for buildings sustainability increase.

10h55-11h10 **Varouta-Florou Evangelia (EL):**

“Historical buildings as source of experience on building philosophy according to a sustainable development paradigm”

Building has always been a “Man’s Shell” whose construction aims at his protection. The study of energy behavior of historical constructions makes us appreciate their excellent performance, apparent from various energy indexes, since man of their times lived in immediate contact with his environment, vibrated by and referring to it, and, therefore acquiring precious experiential knowledge. The Sacred Vedes define that when a building is designed, everything should be placed in such a way that “Natural Law qualities can be utterly utilized”.

Before the Industrial Revolution, buildings were, more or less, being planned and constructed in accordance with such a rule, by using materials from their immediate environment and by following easily applied techniques thus saving labor, time, money and energy. It is therefore understood that, historical buildings are exemplary for low energy consumption and can set as examples worth to be imitated, in order to draw useful conclusions regarding, among others, energy performance of nowadays buildings.

11h10-11h25 **Papavasileiou Maria-Sofia (EL):**

“Sustainable rehabilitation of the Mezzacappo historical building in Italy”

Abstract:

Nowadays the saving of energy constitutes one of the most important factors for the support of bioclimatic architecture. For this reason the energy planning was used for the rehabilitation of the historical building ‘Mezzacappo’, that is located in the town of Maiori at the South of Italy.

Taking into consideration the characteristics of micro-environment (structured environment, morphology of soil, view), the

economic data etc. and supported by the institutional structure (regulations and laws), the particular requirements of institution, the extent of building, we collect the information in order to be the building developed and included in his around environment.

The energy planning of buildings or if you want the bioclimatic planning or the rational use of energy, intend to deal in one and unique aim: ensure acceptable internal climatic conditions with the right thermal behaviour of building in - winter and summertime - and consequently to limit the consumption of energy. Through all the profits that this involves, economically, environmentally with the reduction of emissions CO₂, the quality of life etc. moreover it limits the dependence from the mechanical equipment for the heating or refrigeration of buildings. In order to achieve the reduction of consumption of energy during winter, it is obvious that it will be supposed to restrict the thermal losses of building (losses by conductivity and losses by aeration) and on the other hand to maximize mainly the thermal solar profits.

Generally it is pointed out that in a completed bioclimatic planning, the planner would be supposed to deal seriously with three subjects, that is to say the passive heating, the natural cooling and lighting of buildings; thus the consumption of energy is limited and the quality of life in the internal spaces to be improved through an environment that will be heated, will be frozen and lighted as possible in a natural way.

Consequently the main objective of all this "strategy" of planning is to integrate the historical building in the category of "low consumption energy buildings".

11h25-11h40 **Sinou Maria (EL):**

"Environmental design in domestic ancient Greek architecture"

Abstract:

This paper demonstrates that key issues of what is today known as passive solar architecture not only were well established in ancient Greek domestic design, but also that the subtleties developed between the different architectural types had direct relevance with the different environmental issues involved. The typology of the ancient Greek domestic architecture consists of three main types of housing, the "*pastas*", the "*prostas*" and the "*peristyle*". All the three types are open court houses, an element which affects not only the microclimate of the house but also informs us about the social conditions at the time and the relations between both family members and guests. The question that rises at this point is how much aspects of the natural environment like the sun, the wind, the temperature and the site had affected the planning both of the cities and the houses. The research focuses in classical and early Hellenistic period and in the first two types. The third, *peristyle* type, was introduced in the mature Hellenistic period and has almost the same characteristics from an environmental point of view. For the first type, the *pastas*, the example of the city of Olynthus will be examined, and for the second, the *prostas*, the city of Priene.

11h40-12h55 , **Salle D12, Room D12 (suite)**

ATELIER 4b : Gestion, Gouvernance et mécanismes financiers pour un environnement urbain à bas-carbone WORKSHOP 4b : Management, Governance and Financial issues for a low-carbon urban environment

Chairman, Président : **Maria Sinou(EL)**, **Ageliki Kotsi (EL)**

11h40-11h55 **Marava Nektaria, Kokkoni Georgia, Kyvelou Stella (EL)**

"Urban infrastructure environmental management practices through PPPs"

Abstract:

Η δημιουργία συμπράξεων του Δημόσιου με τον Ιδιωτικό τομέα (Public –Private Partnerships or PPPs) βρίσκει ένθερμους υποστηρικτές τόσο στον επιστημονικό όσο και στον πολιτικό χώρο. Οι νέες αυτές σχέσεις Δημοσίου – Ιδιωτικού τομέα αποτελούν έκφραση της γενικότερης νεο-φιλελεύθερης πολιτικής απορύθμισης, της αναδιάταξης της σχέσης κράτους – οικονομίας και ειδικότερα του πλαισίου της νέας επιχειρηματικότητας και εμπορευματοποίησης των δημοσίων αγαθών.

Αντικείμενο της παρούσας εισήγησης είναι η παρουσίαση μιας μελέτης –περίπτωσης συνεργασίας Δημοσίου και Ιδιωτικού Τομέα για την παραγωγή ηλεκτρικής ενέργειας από βιοαέριο. Στόχος να αναδείξει τις πρωταρχικές συνθήκες υλοποίησης της συγκεκριμένης εταιρικής σχέσης, τα χαρακτηριστικά της ενσωμάτωσης των περιβαλλοντικών αρχών σε ένα έργο πρωτοποριακό για τα ελληνικά δεδομένα από την τοπική αυτοδιοίκηση και τον ιδιωτικό τομέα και την σκοπιμότητα και την βιωσιμότητα του συγκεκριμένου έργου για την τοπική κοινωνία.

Ειδικότερα, το συγκεκριμένο έργο πραγματοποιήθηκε στο ΧΥΤΑ Άνω Λιοσίων και αποτελεί μία σημαντική επένδυση συμπαραγωγής ηλεκτρικής και θερμικής ενέργειας με αξιοποίηση του παραγόμενου από τα σκουπίδια βιοαερίου. Ο σταθμός είναι από τους μεγαλύτερους παγκοσμίως σταθμούς παραγωγής ηλεκτρικής ενέργειας από το βιοαέριο. Η

ηλεκτρική ενέργεια που παράγεται από τον σταθμό τροφοδοτεί τον υποσταθμό της ΔΕΗ στον Ασπρόπυργο. Το τελικό κόστος της επένδυσης του έργου ανήλθε σε 35,5 εκατομμύρια Ευρώ από τα οποία το 45% προήλθε από δημόσιους πόρους και το υπόλοιπο ποσό από ιδιωτικούς πόρους. Ο σταθμός ηλεκτροπαραγωγής από βιοαέριο ανήκει στην εταιρεία ΒΕΑΛ Α.Ε., σύμπραξη της ΗΛΕΚΤΩΡ Α.Ε. με την Αυστραλέζικη Energy Developments Ltd. Η εγκατάσταση λειτουργεί με την υποστήριξη του Ενιαίου Συνδέσμου Δήμων και Κοινοτήτων Νομού Αττικής (ΕΣΔΚΝΑ) και του Δήμου Άνω Λιοσίων που είχε και την πρωτοβουλία για το συγκεκριμένο έργο.

Η συγκεκριμένη εισήγηση μέσω της συστηματικής και κριτικής περιγραφής του έργου, της εταιρικής σχέσης, της αποτύπωσης των ωφελειών που απολαμβάνουν τα εμπλεκόμενα μέρη και της σημασίας της λειτουργίας της συγκεκριμένης περιβαλλοντικής επένδυσης στο ήδη επιβαρυσμένο περιβάλλον του Δήμου Άνω Λιοσίων επιδιώκει να εξάγει κάποια ενδεικτικά συμπεράσματα για: α) τους παράγοντες που αποτελέσαν το έναυσμα για την επιστέγαση της συγκεκριμένης συνεργασίας, β) τις δυσχέρειες και τις αντιφάσεις που προκύπτουν από την ίδια την εταιρική σχέση και γ) την αποδοχή και την χρησιμότητα των νέων ανανεώσιμων πηγών ενέργειας αρχών από τον ιδιωτικό τομέα και την τοπική αυτοδιοίκηση.

11h55- 12h10 **Del Río Merino Mercedes, García Navarro Justo (ES)**
"Improvement of construction demolition and waste management"

Abstract:

This paper highlights the importance of the problem originated by the wrong management of the waste produced in the processes of construction and total or partial demolition of buildings.

At the same time, in spite of some of the effort carried out by some European countries to adopt several measures so as to improve the management of the construction and demolition waste, there are other countries –basically the Mediterranean countries—which have not yet incorporated any of these measures, or some of them are being very slowly implemented. This is due to the fact that environmental and social interests have to be considered together with large economic interests. If these measures performed in some European countries are having a good result, why not adapting them to the legislation of other countries?

Additionally, this paper presents a number of measures to improve the management of construction and demolition waste since not only the governments should enforce the different legal regulations, but also the different agents included in the construction process should involve themselves in this process. The aim is to prevent the generation of waste whenever possible, reuse and recycle the materials and energetically valorize this waste. Obviously, the final disposal in dumps or landfill should be the last option to be considered.

These measures are grouped in two main groups: on the one hand, the ones prior to obtaining the working permit. And on the other hand, good practice measures involving all the agents included in the construction and building process: designers, construction works director, on site manager, developers, contractors, subcontracts, insurance agents, etc.

12h10-12h25 **Bougas Vassilis (UK) :**
"Producing wealth from glass : Ecological, commercial and social dimension"

This work aims to outline the potential of waste glass recycling for meeting the targets of High Environmental Quality (HQE) approach. The paper examines state-of-art of waste glass collection in a city of Brighton, England, UK both from academic and practical aspects. The latter is based on the established links with a local glass collector company, Magpie Coop. It is suggested that a locally based on-site waste glass granulation and processing has much potential as a vehicle for economic prosperity and local community creativity. Granulation of beer and wine bottles onsite in restaurants and pubs can produce glass cullet that is a useful and saleable commodity straightaway. A glass granulation workshop in a remote village can avoid transportation costs and landfilling of waste glass; it can also facilitate a local production of useful and decorative items for home and garden. Social and educational potential of creative glass recycling is explored. A range of waste glass products is developed at the pilot workshop for glass recycling of University of Brighton. Estimates are made for the savings of prime materials for TinGlass & concrete macro-composite construction block. Savings in embodied energy for the construction block are evaluated whilst bearing in mind the possibility of cutting the costs when mass producing TinGlass construction blocks.

12h25-12h40 **Constantine Grapsas (EL) :** **"Heating/cooling demands simulation for a public building in Greece"**

The study of built environment has been a valuable tool in archaeology, anthropology, environmental behaviour studies, sociology, as well as building engineering; each field utilises basic information derived from built environmental analyses for its own research purposes. Architecture is the field that is called to respond to the multifaceted nature of

needs and realities that are to be addressed through building making. The way architecture is created develops and responds to those needs, shows changes in human perception of their relationship to nature and society as well as it traces cultural and natural changes to specific places through history *. This study is concerned with building creation as shelter mechanisms under the view of what is today called 'bioclimatic' Architecture. It is said that 'bioclimatic' Architecture is generated by human realisation of the need to address the shortage of our planet's resources and possible detrimental consequences of greenhouse emissions. Another might be that 'bioclimatic' architecture responds to a specific theory of existence (*weltanschauung*) that calls for simplicity, modesty and direct responsiveness to reality, based on awareness, coexistence and respect between all entities in the planet. Thus 'bioclimatic' architecture can be seen as the logical way humans may build their environments and manifest their relationship to nature **.

The development of passive architecture was greatly effected by the changes economic development brought to modes of production. As the time when buildings were built by local craftsmen who (consciously or unconsciously) were responding to specific client/cultural and climatic needs (Parpairi 1995) gave its place to mechanistic production which evolved after industrial revolution buildings became re-saleable commodities following a series of trends, and tendencies demonstrating attitudes and generating stylistic issues that may revive market commercial operation.

This way the essence of architecture as experienced in the past was lost giving its place to a new essence of architecture not as a space for life but as a market commodity. This lack of engagement with history was also related to a rapid creation and adoption of technology probably at excessive levels and speeds, sometimes almost for the sake of technology itself or for the survival of certain market realities. This development affected architecture to a great degree as well as the development of a possible bioclimatic approach, which was inherent in the architecture of the past.

Furthermore, the above described attitudes were (as a result of their promotion for commercial interests) considered by the people as unquestionably beneficial improvements worth adopting while –in parallel- rejection of their own achievements gave place to the new ways. This is especially evident in non economically dominant societies; architecture is one of the main manifestation of this phenomenon (Fathy 1973).

The first question generated by the above is related to the degree to which architecture in a non economically dominant country (Hellas in particular) could be original and respond to its own needs rather than the needs of others. For the purposes of this dissertation this will be examined focused on the practice of bioclimatic architecture.

Specific bioclimatic strategies has been be examined and compared to climatic needs as derived by climatic data analysis as well as to precedent examples. Those strategies have been applied on a real office-building design proposal for Lefkada and the thermal effect of each strategy on internal microclimate will be identified.

We have been able to draw conclusion on the general 'appropriateness' of the techniques already used and tested in the particular building and climate.

Methodology description

The research has been divided into two parts: Part I aims to identify climatic needs of the country based on proposed climatic zones, psychometric and bioclimatic charts analyses, co-responsive bioclimatic strategies suggested and a base case simulation. Findings have been discussed along with historical precedence examples.

Part II applies bioclimatic strategies derived by the above research on a specific public building proposal and computer simulations assessed their thermal effect on internal environment.

The final conclusion discusses the appropriateness of the suggested techniques and demonstrates their effectiveness in creating a thermally comfortable microclimate.

Results show that a dramatic reduction of energy consumption is possible by simple adjustments and application of the most commonly used in Greece strategies.

POSTER SESSION

POSTER 1 : Nathalia Kafassis (FR) : « Réaménagement et Réhabilitation de la zone des anciens logements pour réfugiés à Athènes »

POSTER 2 :Evangelia Varouta-Florou (EL): “The sick building syndrome”

Abstract:

The alienation from our natural environment, the rationale of an anthropocentric development and the construction of buildings using polluting methods and materials that do not allow constructions and cities to “breathe”, has led to the “sick building syndrome”, which harms their occupants’ health causing a large range of ailments as well as serious infirmities. The presence of chemical, biological or electromagnetic pollutants in closed spaces is characterized as “pollution”. Recent trends in architecture, construction methods or construction deficiencies, such as glass facade buildings, energy saving methods through reinforced (heavy) insulation and airproof openings’ frames, that decrease “invisible” breathing”, or thermal bridges are but a few of the crucial factors conducive to the decrease in the quality of indoor environment and the creation of indoor pollution. What is more, pollutants coming from mineral fuels used for heating, vehicles, lighting and industrial production, destroy the ozone layer of the atmosphere and that is expected to have dramatic impact on the Ecosystem due to global warming, greenhouse effect, rise of sea-level, extremely severe storms or fires and, in general, degradation of natural environment.

POSTER 3 : Harijaona Zaratiana (FR)

“Le bois en revêtement intérieur des bâtiments”

Abstract:

Le bois est un matériau naturel capable de stocker le carbone. Ainsi, utiliser le matériau bois dans la construction présente l'avantage de prolonger cette capacité de stockage du carbone jusqu'à la fin de vie de l'ouvrage. Le bois présente des qualités mécaniques et environnementales certaines, et participe ainsi au développement durable. Cependant les effets du bois sur l'ambiance thermique intérieure des bâtiments ne sont pas évalués.

Nous avons donc réalisé des campagnes de mesures in situ en France dans des bâtiments dont le revêtement intérieur est entièrement ou partiellement en bois massif naturel. Ces revêtements conservent leurs propriétés hygrothermiques naturelles puisqu'ils ne sont ni peints, ni vernis, ni huilés, sachant que le bois a du être traité contre les agents de dégradations avant utilisation. Plusieurs études de cas présentent différentes combinaisons du bois avec d'autres matériaux en revêtement de murs, plancher et plafond : le béton, la pierre, le carrelage... Nous avons effectué des mesures ponctuelles et continues de différents paramètres hygrothermiques susceptibles d'avoir un impact sur le confort thermique des occupants: température et humidité d'air intérieur et extérieur, température et humidité de parois intérieures.

Les résultats obtenus mettent en évidence les effets de l'inertie thermique et des caractéristiques hygroscopiques du bois utilisé en revêtement intérieur. Ces résultats montrent la capacité potentielle du bois à améliorer passivement l'ambiance thermique et la qualité d'air intérieure.

L'article présentera le protocole expérimental utilisé pour l'étude, la description des études de cas et des mesures, et une analyse des résultats obtenus.

POSTER 4 : Profiroiu Marius, Normand P-F. (RO)

“ Risques naturels- Impact de nouvelles réglementations sur les désordres de nature sismique”

Abstract:

Tout le bassin de la Méditerranée est sujet à des séisme. Si des règles de construction ont été mises en place pour le bâti récent, il n'en reste pas moins que nous souffrons de 2 faiblesses:

- Les constructions plus anciennes, et celles ayant subi des tremblements de terre sont fragiles.
- La protection incendie est un point faible. En cas de séisme, jusqu'à 50% des sinistres peuvent être causés par des incendies (conduites de gaz, distribution du courant électrique, stations de carburant, centrales de chauffage urbain, usines et entrepôts, ...),

Il existe des mesures tant techniques que législatives qui permettent, à des coups raisonnables, de limiter de manière drastique l'impact économique et humain d'un tremblement de terre.

- Techniquement, on peut réduire à 50% les conséquences humaines et matérielles d'un séisme en ne consacrant seulement que l'équivalent de 2 à 3% du budget nécessaire au renforcement des infrastructures existantes.
- Et dans le cadre de la politique publique de prévention, on peut légiférer par une loi cadre sur la prévention des risques tels que incendie, séismes, inondations, ...Chaque acteur tant privé que public (propriétaires, industriels, ...) se voit incité financièrement à s'adapter en mettant en place les procédures et équipements indispensables.

On se retrouve ainsi petit à petit dans le même cas de figure que la mise en place des ceintures de sécurité et des airbags dans le parc automobile, et sans bourse déliée par la puissance publique.

POSTER 5 : Ioanna Pothitaki (GR)

**"Les transports terrestres face à l'effet de serre: Le cas d'Athènes".
"The greenhouse effects and transportation: The case of Athens"**

Abstract:

This poster addresses the issue of the relation between the greenhouse effects and transportation. The greenhouse effect is a natural phenomenon that enables the earth to maintain a medium temperature of 15°C per year. According to the ongoing research, the medium system's equilibrium of radiation per year in the whole world is 236Wm⁻² of incoming solar radiation and 390 Wm⁻² of outgoing earth surface radiation, whereas the two figures should be equal.

Consequently, a large quantity of radiation is blocked in the earth's atmosphere thus resulting in the aggravation of climate change. This phenomenon has been going on since 1990, causing the increase of medium temperature from 0,3-0,6 °C and the elevation of oceans level 10-25cm due to the ice melting. It is therefore obvious that these consequences call for immediate action.

Especially in a city like Athens where the air does not circulate properly due to its mountainous morphology and high medium temperature, the greenhouse effect makes the atmosphere unbearable. Furthermore, the gas emissions that circulate in Athens can not escape consequently they block the outgoing radiation and multiply its adverse effects within the atmosphere. National European and international authorities and private enterprises, the whole public and private sector should be mobilized in order to minimize the greenhouse effects, before it becomes too late, particularly in the transport sector where everyone has the ability to choose and the capacity to contribute to our planet's preservation!

Due to the fact that surface and subsurface transportation laws are mainly regulated by local governments as opposed to air transport where international laws prevail, this poster is focused on three main subjects:

- the greenhouse effect, its definition and its consequences
- the case of Athens and other mountainous cities
- what is done and should be done (examples based on the Athenian reality and international experience)

POSTER 6 : Bellone Andriano (IT)

"Regional Strategies for the development of sustainable building"

Abstract:

Piedmont is an Italian region, part of north-western Italy, bordering France and Switzerland. It is economically prominent amongst the twenty Italian regions. Piedmont and its capital city, Turin, are focusing on urban renewal as the main way to develop sustainable building practices.

With the industrial areas' displacement, the regional government and the local administrations have found a way to redeem the mistakes in architecture and urban planning made from the 60s through the 70s.

Parts of the former factories are destined to new functions (i.e. museums); other industrial buildings are replaced by new areas, which will reweave the urban fabric and remove its rifts.

In such context, Piedmont promotes sustainable building through its policies and incentives. The Region works towards sustainable building through strategies such as urban renewal and industrial reorganization; the projects include: - new buildings which will be models for future realizations (the skyscrapers); - sustainable districts and the wood manufacturing process; - agreement protocols.

For these projects, the Piedmont regional government, allotted 4 billion euros, to be used over the next 6 years.

Every Country has different problems, but undeniable is necessity to develop strategies for to manufacture new ecological materials; also undeniable is necessity to develop the sustainable building by means of models that will be example for future realizations; in the end undeniable is necessity to impose sustainable building where public financial support are previewed

The Regione Piemonte and Itaca with iISBE activity, may be a reference for to development of sustainability policies .

POSTER 7 : Crivat Emmanuel, Gheorghe Marian (FR,UK)

"L'ingénierie software pour des stratégies de développement urbain durable"

Abstract:

Le véritable défi d'une approche durable de la conception du « creux bâti », de l'espace signifiant se heurte à l'immense difficulté du choix des solutions constructives de l'enveloppe et des flux d'énergie qui font fonctionner l'espace de vie.

La durabilité de la maison est l'inscription dans le temps de cet espace de vie.

Nous sommes dans l'incapacité de concevoir un « objet maison » comme une voiture, recyclable après un nombre d'années bien défini. Il n'y a pas d'autre choix que de faire appel à des modèles ... des simulations...

Le blog de Dominique Bidou est la preuve de cette difficulté. Le développement durable se heurte à une « non

définition», une multiplicité de thèmes dont l'importance est multiple, sans règle et sans définition.

Notre expertise en planification urbaine et modernisation nous fait suggérer une approche qui s'appuie sur des modèles mathématiques. Modèles de «choix», de «présentation», de «solutions» de «présentation directe», de «mécanismes formels de la signification».

L'ImmoDurabilité n'est pas seulement un concept définissant l'inscription dans le temps du creux bâti, mais aussi une inscription dans une démarche rigoureuse de la constitution des modèles formels permettant les choix les plus significatifs, dans les projets les plus modestes.

Sollicité pour une expertise en développement durable pour une ville sans perspectives ...je me suis dit : quel est le modèle qui m'aiderait sortir de l'impasse ? Sans simulation, je ne peux pas me permettre de conclure...

L'ingénierie software s'est développée suite à l'incapacité vers la fin des années '60 des méthodes existantes de l'époque pour le besoin de définir et manœuvrer des systèmes softwares complexes (type Sommerville). Depuis, différentes méthodes se sont développées et adaptées pour satisfaire les besoins de spécifier, de projeter et d'implémenter des systèmes de plus en plus complexes et sophistiqués. Comme un domaine relativement nouveau, il a été influencé par d'autres développements déjà expérimentés dans d'autres domaines de l'ingénierie ; de ce point de vue, l'ingénierie civile, électrique ou chimique ont été les précurseurs de l'ingénierie software et le modèle le plus ancien de développement d'un projet software, appelé « modèle en cascade » - waterfall model, a été adapté suite à une telle interaction.

L'ingénierie software s'est ultérieurement développée par ses propres moyens, surtout grâce aux demandes spécifiques et à la nature spéciale de l'objet produit. Le produit software a toujours été considéré comme un produit facilement modifiable malgré sa complexité et ses règles de développement suffisamment rigoureuses. Dans certaines limites, ce produit est en apparence modifiable comparé aux produits de l'ingénierie civile – habitations, ponts, constructions en général, d'électricité ou de mécanique...

Les méthodes récentes du software, appelées « développement agile », ont accentué cette perception de ce domaine. Ces méthodes ont été introduites pour remplacer le manque de succès des précédentes méthodes. Le développement des systèmes software complexes est soumis continuellement à des changements fréquents tant au niveau de l'élaboration et de l'implémentation que celui de l'utilisation – exploitation.

Dans le même temps, la recherche, surtout dans le domaine de l'informatique théorique, a développé différentes méthodologies de spécification et de mise en œuvre des systèmes complexes, accompagnés d'une série de modalités formelles mathématiques de vérification de l'exactitude des produits softwares par rapport aux exigences initiales.

Ces développements et recherches de la science informatique et de la pratique de l'ingénierie software ont atteint un niveau de maturité assez élevé pour devenir des instruments applicables à d'autres domaines. Des exemples récents en biologie et économie montrent dans quelle mesure ces concepts et méthodologies peuvent contribuer non pas au remplacement des modèles récents mais pallier aux limites des modèles mathématiques actuels pour résoudre les problèmes spécifiques de la compréhension du fonctionnement de ces systèmes. Les modalités dans lesquelles les cellules sont en interaction dans le contexte de différents tissus ayant des structures dynamiques ou le moyen dont différents marchés financiers réagissent aux facteurs perturbateurs sont modélisées à l'aide de ces modèles robustes et efficaces.

L'exemple présenté plus haut est relevant non seulement pour les recherches interdisciplinaires récentes dans les domaines sus cités mais il est extensible à d'autres domaines de recherche. Pour aborder et modéliser les soit disant systèmes complexes, interactions complexes, hasard, bruit, etc.

Cette modélisation au niveau du développement durable relève, au moins partiellement, de quelques aspects présentés plus haut. Les essais isolés de modélisation des différents aspects hétérogènes et complexes de ce phénomène montrent les limites des investigations sectorielles, d'où la nécessité de les aborder.

Un modèle computationnel devrait dans ce contexte inclure des aspects qui par leur nature sont complexes et difficiles à appréhender par des moyens habituels qui doivent inclure des aspects dynamiques, composants qui évoluent dans le temps en fonction de différents paramètres, hasard etc..

Dans d'autres domaines interdisciplinaires la création d'un langage standard propre s'est déjà imposée. Actuellement, le Systems Biology Mark-up Language (SBML) représente ainsi la « lingua franca » de toute approche dans ce contexte.

Est-ce trop tôt pour parler d'un tel langage pour le développement durable? Certainement, mais les premiers pas doivent être faits ! Surtout si les modèles computationnels veulent être considérés comme des bases de données et de connaissances relatives à plusieurs domaines ou approches transfrontalières, mais aujourd'hui sans simulations, on ne peut pas concevoir un réel progrès dans ce monde complexe et divergent.