
Towards the Ultimate E³-topia: Scrambling the Energy Efficient, Eco- friendly and Electronic Urban Future?

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The current phase of climate changes has significantly affected numerous areas of everyday life – from energy transition, economy, urban demography to urban/spatial planning and design. Consequently, many environmental, social and technological factors directly or indirectly shape a new image of our cities defining a future action framework for the contemporary global world.

Have we entered a new phase of energy production and consumption or just returned to the beginning of the circle, which instigated development of our civilization as we know it today? Will our future bring astonishing innovations, cataclysmic perspectives or just recycle and transpose already used ideas from the past? What should really be sustainable, renewable, environmentally friendly, green and low/no carbon and how?

All these questions influence a development and transformations of cities but, unfortunately, the problem(s) we are facing nowadays do not have a general solution. Instead, a wide range of actions have to be used in order to set up a more applicable and effective planning and design approach which would trace our livable and environmentally responsible urban future. The recent practice, implemented on different levels, scales and contexts, reveals the importance of 'e³' imperatives whose synergy is recognized as a significant contributor to climate-proof cities and a carbon neutrally built environment. Energy efficiency, eco-friendliness/awareness and electronic interconnectedness – are they sufficient to provide a wishful setting for our 'purified' visions?

Introduction

Contested by the multiplying problems and obstacles, the world of the 21st century needs new solutions and immediate actions, which would protect the fragile body of our civilization. Exposed to unavoidable natural forces and shaken by drastic corrective processes, it gradually becomes a demonstration of our own failures and a perplexing expression of a self-proclaimed

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but unconfirmed omnipotence. Simultaneously, the created global setting emphasizes the importance of cities (i.e. urban world) – in social, economic, technological and, above all, environmental contexts. Recognized as key producers of carbon dioxide and major nodes of energy consumption, modern cities reconsider their role and (negative) impact constantly reinventing, adjusting and modifying their own logic and configuration. Reflecting recent environmental changes, speculations and forecasts the current architectural and planning practice introduces new trends, but also deliberately or accidentally uncover our ego- and eco-frustrations, doubts and conflicts.

The concept of sustainability is further elaborated and distorted by new paradigms and labels (for ex. ‘low/no carbon’) covering even a wider range of issues – from environmental pollution and energy policies to resource management. Therefore, striving to achieve an acceptable level of environmental protection and GHG emissions – while dealing with overwhelming world inequality – certainly becomes a demanding and ambiguous task. The over-production of numerous strategies, recommendations and visions could set the pace for positive changes – including higher environmental quality and better energy efficiency. However, their real-life effectiveness is still debatable and has to be evaluated and confirmed by generations to come.

The collision of (mis)conceptions

Considered as a nexus of contemporary flows, activities and communications, the city of the 21st century has become a major ingredient, instrument and actor of recent environmental changes. Due to its polyvalent influence on our modern society it represents a significant element of a momentous climate shift, but it also comprises possible solutions for generated problems. Therefore, on our way to an ‘eco-clean’ consciousness it is necessary to learn how to reduce and control our carbon intensive mode of living. Unfortunately, according to the ‘Gidden’s paradox’, we have a difficult task ahead since we are not ready to change our behavior or to take any serious action as long as the consequences of global warming

are not tangible, immediate or visible in everyday life. Giddens (2009) also underlines the importance of a symbiosis of modern technologies, renewable energy, network communication and cross-party framework proposing a positive model of a low-carbon future based upon current everyday life. According to him, the politics of climate change should include the following concepts: sustainability, the polluter pays method, the ensuring state, political convergence, economic convergence, foregrounding, climate change positives, political transcendence, the percentage principle, the development imperative, over-development and proactive adaptation. Giddens argues that even the most exclusive environmental initiatives could create a new trend, which might be globally accepted and appreciated as a new 'green', carbon-free beacon.

Susanne Moser (2010) emphasizes a problem of public communication of climate changes, indirectly supporting the 'Giddens paradox'. Although she claims that media practices have improved, the differences in approach, scope, focus, level and coordination of climate change/energy-related campaigns are still noticeable, often instigating confusion and partial understanding of risks and possible (negative) outcomes. In addition, Moser identifies several challenges:

- invisibility of causes;
- distant impacts;
- insulation of modern humans from their environment i.e. lack of immediacy and direct experience of the impacts;
- delayed or absent gratification for taking action;
- disbelief in humans' global influence;
- complexity and uncertainty;
- inadequate signals indicating the need for change;
- perceptual limits and self-interests.

Obviously, a dynamic relationship between climate changes, society, technology and energy efficiency represents a complex system of equations, with multiple unknowns. Even the notion of eco/sustainable city is described

ambiguously – some authors stress its regional and civic orientation, while others define it in the framework of globalization – for example Sustainable Cities of the Future (White & Whitney in Stren et al. 1992). Furthermore, concepts of eco/sustainable cities could also differ in the approach to their integration with/in the biosphere, while their development could be guided by pragmatic objectives or a general, evolutionary goal.

Downton (2009) underlines the contrast between the common, mainstream definition of a sustainable city and the Ecopolis. The first one describes an introverted, city-oriented model of continuity, focused towards the future of existing urban areas and structures. It is supported by effective local policy-making within an economic, social and environmental agenda (Cappello et al. 1999). The second one reveals the extroverted nature of the Ecopolis, representing an ‘urban system consciously integrated into the process of the biosphere with the intent of maintaining the optimum functioning of the biosphere for human purposes’ (Downton 2009, 75).

Interweaving with theoretical speculations, visions and forecasts, the planning and architectural practice have also been challenged to (re)act and upgrade, in accordance with a new perception of climate risks and increasing global anxiety. The methods and tools have been updated, modified and elaborated, aiming to improve the current condition of the environment and trace some future measures. However, various national strategies (if formulated) still lack a globally oriented mainstream action. Instead, a large number of projects targeting policies, legislation/regulation, citywide plans, ecological neighborhoods and other specific urban interventions have been launched.

An additional problem represents a high natural/geographic diversity of urban regions and nodes, different levels of economic and technological development, as well as an increasing number of vulnerable populations - for example urban poor, slum dwellers and other marginalized groups. Therefore, the proposed solutions for the reduction of GHG emissions, supported by a range of mitigation and adaptive strategies, currently create a unique development background determined by detected and estimated climate change impacts, new national energy policies and systemic changes. The important role is also given to economies of scale interventions,

good governance and management, as well as to new building codes and laws. Seemingly, a variety of issues, scales and levels are tackled, but the overall result is still vague.

E³-topia – back or forth?

The future based upon a notion of e-e/eco/e-topia (Anderson 2006; Callenbach 1975; Calthorp 1993; De Cauter 2004; Downton 2009; Miles & Hall 2003; Mitchel 2000; Pinder 2002; Rushkoff 1994; Sterling 1989 etc.), although conceived as a comprehensive answer to the main problems, conflicts and trends of modern society, might still depict a deeply radical and completely controlled (i.e. totalitarian) counter-image of presence (Stupar 2009). However, the outcomes of these considerations, from hypothetical concepts to actual projects and initiatives, also follow well-known patterns of utopian thinking (Van Middelaar 2002). Consequently, they could be defined as:

- ideal society (for ex. Callenbach's 'Ecotopia');
- limited/small-scale social experiment/commune (Ithaca EcoVillage, Malmö's neighbourhoods Augustenborg and the Western Harbour area, the proposal for the Jätkäsaari Climate Neutral District in Helsinki etc.);
- large-scale social experiment (Masdar, Tianjin etc.);
- yearning for justice, fulfillment or salvation (for ex. Midrand EcoCity, the EcoCity project in India, 'UN-HABITAT Cities and Climate Change Initiative').

Unfortunately, in global reality the integration of 'green' (natural environment) and 'brown' (urban environment) agendas still represents a demanding assignment for all the actors involved in a process of planning and development of cities. Therefore, it is not surprising that the official statement from the ISOCARP Congress in Porto (October 2009), which was also sent to COP 15, highlights the importance of "Seven Ingredients for Low Carbon Cities" (Gossop 2009):

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- urgency, leadership and vision;
- strategies reflecting the particular responsibilities and needs of countries in the developed and the developing world;
- a stimulating approach which combines public policy, changing behavior and technological innovation;
- public policy development at all levels;
- integrated, inclusive planning;
- carbon conscious design;
- delivering low carbon cities.

In the meantime, UN Habitat (2009) has detected several innovations which occurred globally, all of them representing options that should facilitate the expected level of synergy:

- development of renewable energy;
- striving for carbon-neutral cities;
- distributed power and water systems;
- increasing photosynthetic spaces as part of green infrastructure;
- improving eco-efficiency;
- improving sense of place;
- sustainable transport; infrastructure priorities and transit planning; street planning and mobility management;
- developing cities without slums.

The impact generated by these improvements could fluctuate but we could distinguish three main groups of actions - new 21st century cities, urban (re)development projects and global and local initiatives. They differ in size of urban and architectural intervention, type of innovation and level of expected/achieved sustainability, but all of them deal with the same problems aiming to recover urban environment, enhance energy efficiency and set up complementing virtual layers of electronic integration and communication. However, some of them have even higher and

more exclusive ambitions, which include new and attractive image(s) of a future bio/technopolis with significant competitive advantages.

New 21st century cities - towards a new urban organism?

Avoiding the accumulated obstacles and limitations, which exist in contemporary urban nodes, the new cities of the 21st century have, at least declaratively, become symbols of the e³-era. Representing an inaugural statement of enhanced environmental consciousness they continue the ancient tradition of city foundation, which was usually an inseparable part of initiation rituals important for the establishment of every autocratic system. These cities, however, have a slightly different role. Although conceived as exclusive and totally defined settlements, which benefit from cutting edge technologies and renewable energy resources, they also serve as latest tools of international promotion and a highly rated competitive advantage of new global economic powers.

Their stunning images, a sci-fi design and bold eco-objectives (carbon neutral, zero waste, completely based upon renewable energy resources) certainly communicate messages of an eco-advanced future. The challenging demands related to the sustainability of their construction, vegetation and community actually express high technical and technological aspirations of their creators, but a slow pace of their realisation still keeps most of these projects in a two-dimensional mode.

The project of Masdar (UEA), a clean-tech city positioned between the Abu Dhabi International airport, Capital District and existing central business district at the north end of Abu Dhabi Island, represents a scenery for the implementation of an energy-responsible future. It is a testing ground for the Emirate's new approach to sustainability and a symbol of the anticipated Abu Dhabi's global leadership in the field of renewable energy. Initiated in 2006 by the Government of Abu Dhabi and designed by Foster and Partners, the development is driven by the Government-owned Mubadala Development Company. Guided by the principles formulated in the Abu Dhabi Economic Vision 2030, the project under-

lines the importance of a shift from a hydrocarbon economy to one based on knowledge, innovation and latest technologies (i.e. their export).

Planned for 40.000 residents and approximately 50.000 employees, Masdar should occupy 640ha. The master plan combines contemporary architectural elements with traditional Arabic design, shaping a compact form which is well connected to the airport by a new railway and a road system. The internal network relies on a modern public transportation (LRT), an innovative personal rapid transport system (PRT) and a car free environment, interwoven with pedestrian and bicycle networks. Following the six design imperatives – orientation according to climate and geographic location, integration of all urban aspects, low rise and high density, vibrant urban realm, pedestrian focused environment and high quality of life with the lowest possible environmental footprint – Masdar should become a technological platform of the region and a unique innovation and education hub.

The Masdar Institute of Science and Technology and the headquarters of the International Renewable Energy Agency represent the key-elements of the development, creating an impetus for the other planned activities related to education and research of sustainable technologies and alternative resources of energy. The first phase of the development (by 2015) should provide 1 million sqm of gross floor area for research, commercial, residential, retail and community activities attracting about 7000 residents and 15.000 commuters. The information from the Masdar City Corporate Website (2012) reveal some other interesting news about activities, promotion and innovation(s) in the city – from an intensive global co-operation, organization of numerous international events related to renewable energy, clean technology and business, to the community activities which support a preferred low-carbon and sustainable life style (for example ‘The Market@Masdar City’ – a street fair and organic market).

Dongtan (China), another example of improved eco-consciousness and wannabe holistic approach, did not have an equally successful start. Planned on an alluvial island near Shanghai as an energy-efficient initiative of the Shanghai Industrial Investment Corporation (SIIC), the settlement was designed by ARUP in 2005. Reflecting China’s effort to face and solve numerous energy/environmental/migration problems, Dongtan

was supposed to be a self-sufficient entity for approximately 500.000 people, backed by the use of solar, wind and biomass-based energy, with zero-energy structures and 80% recycling. Driven by local and global political motives, which were additionally emphasized by a loud rhetoric of Tony Blair who launched the project with the Chinese president Hu Jintao in 2005, the 'first eco-city' is still nothing more than a high-profile utopia. It is visualized only in ARUP's drawings and models (e.g. ARUP 2007) which were used to promote (and utilize) eco-credentials of this company, especially in China.

However, the idea of the Dongtan Eco-City received global attention, although often with opposing connotations. Causing numerous debates, the project was labeled as a part of knowledge transfer, an advocate and/or a progressive model of sustainability, but also a totalitarian experiment and an overpriced tool of state marketing (Sigrist 2009). Unlike Masdar, the focus of this urban organism was on tourism which could become a threat for agricultural land, wildlife habitat and social balance between current population and anticipated elite clientele. The project prioritized 'green' over 'brown' agenda which is not considered as socially sustainable, but it underlined the estimated market expansion for the local agriculture, farming and fishing. However, the implementation of this utopia is postponed to an undetermined date and will probably remain in a paper-architecture realm. In spite of this failure, China has become the leading initiator of numerous eco-city projects which are still far away from materialization.

The Sino-Singapore Tianjin Eco-City Project (conceived in 2007) is another attempt to create a holistic and well balanced sustainable environment, but this time it has an additional, symbolic dimension – as a token of already established cooperation between China and Singapore. Located in an important national strategic area, adjacent to the Tianjin Port and Coastal Leisure Zone, the site occupies 31.23 sq km of salty land. Planned for 350.000 inhabitants, it is well connected to Tianjin Proper (45 km) and Beijing (150 km). The present natural and ecological conditions are challenging but they should be used as triggers of innovation and recycling/restoration (Sino-Singapore Tianjin Eco-City Administrative Committee 2008-2010).

The key-words are already recognizable – energy efficiency, clean renewable energy, green buildings and transportation, ecologically friendly environment, technologically advanced water and waste management and economic vibrancy (focus on environment-related research and technologies). Being accessible for all groups of inhabitants, the project includes elements of subsidized public housing and barrier-free urban space. Additionally, it emphasizes the importance of local heritage, addressing the issues of social harmony and heritage conservation (Sino-Singapore Tianjin Eco-City 2011).

The groundbreaking ceremony of the Tianjin Eco-City was held in September 2008. During 2009 the city celebrated groundbreaking of the first housing development and several other projects in the Start-up Area (SUA) related to commerce, residence, recreation and entertainment, clean-tech industry and green business. The National Animation Park, as a national project supported by the PRC Ministry of Culture, was also initiated during that year, while 2010 was announced as an intensive construction year for the Eco-business Park, the Shimao development, educational facilities and road and service networks. However, there are no up-to-date official reports about a success of these undertakings.

The concept of new eco-cities, although enthusiastically embraced by powerful national economies, cannot be fully evaluated as long as it exists mostly in ambitious strategies, dazzling projects, over-optimistic presentations and hip promotional videos. The real efficiency cannot yet be verified and the recipes for future sustainability cannot be used as universal way out from accumulated problems of traditional cities. Therefore, until a total implementation of tempting eco-ideas, new nodes of low-carbon culture will remain a figment of our imagination – based upon our fears, habits and expectations.

Urban (re)development projects – crossover, patch or implant?

The gap between conceived e3-strategies and their material results represents a constant test for the contemporary urban world. Obviously, it is difficult to synchronize numerous domains and transcend multiplying

obstacles, which outline the present condition of cities. However, an environmentally friendly approach gradually becomes reality in spite of diverse methods, available funds and inevitable setbacks.

The well known example of Curitiba in Brazil, a city which started its 'behavioural' transformation more than forty years ago, has already become an iconic role-model for planning professionals. Although it does not have the lavishing appearance of an idealized e³-topia and it faces common urban problems like poverty, pollution, overpopulation and limited financial resources, Curitiba could be labelled as a real(istic) eco-city. It has successfully applied inexpensive and innovative solutions for transportation system, social programs and environmental issues simultaneously conducting activities related to an expansion of green areas, preservation of natural heritage and recovery of brownfields. Addressing both environmental and poverty issues, Curitiba launched the model of an extensive, low-cost and flexible bus network and the 'Cambio Lixio' trash exchange program. The city has also been oriented towards a development of different social services (including environmental education, 24-hours accessible public internet), new industry, knowledge economy and high technology (Santos 2005).

The increased eco-awareness of the society has become a well-rooted urban tradition, which further stimulates Curitiba's urban experiment, supported by local leaders, an independent planning office and a combination of various funding mechanisms and procedures. Nowadays, the raised environmental consciousness definitely represents the most important element of Curitiba's excellence, which is globally transferred and recognized as a possible crossover between our past, present and future perception of urban life and its consequences.

The age of climate change has instigated other modes of urban restructuring and the city of Sarriguren, the first eco-city in Spain, was supposed to become a sprout of a new life mode supported by generous funding of the Government of the Navarra region and numerous financial incentives focused on possible developers. Completed in 2007, the project provided 5000 bioclimatic dwellings for high-quality social housing, the Innovation Park of Navarra and various urban programs based upon imperatives of sustainability and energy efficiency. The proposed concept

also underlined the importance of an integral and bioclimatic approach in architecture and urban design, as well as the innovativeness, social accessibility and affordability of structures and activities (Vegara et al. 2009).

Becoming a new focal point of creativity, innovation and research, Sarriguren also reflects the development strategy of Navarra region, which is one of the wealthiest regions in Spain and the EU. Therefore, it is not surprising that this ambitious project was awarded several times – in 2000 ('Good Practice' by the United Nations Center for Human Settlements), 2005 (two prizes for the building of the National Renewable Energy Center) and 2008 (7th European Urban and Regional Planning Award in the category of Environmental Sustainability). The confirmed reduction of energy consumption has become another element of general success, which is essential for the attractiveness and competitiveness of this urban node.

Simultaneously promoting ecological and economic sustainability of the applied model, Sarriguren has become a role model with an acceptable level of development flexibility, but it is apparent that its experiences cannot be applied to the inner city structures (Ah asociados architecture office 2011). Nevertheless, it also represents an experimental crossover that facilitates energy transition and improves the current condition, thus providing a new piece for the e³-puzzle.

The case of Midrand, one of the fastest growing towns in South Africa, has offered a number of solutions, which could be used in less developed economies and socially and environmentally sensitive contexts. The geographically, racially and economically divided city concentrated attention on environmental issues in the early 1990s, after two accidents – a chemical fire and threat from a hazardous waste dump in close proximity to the proposed housing (Sugrue 2000). The non-governmental organization Earthlife Africa Midrand started a campaign for environmental justice accepted by the town council and the community, and the outcome of these activities was the initiation of the council-driven 'EcoCity' project (1998), supported by the Danish Agency for Environment and Development. After the establishment of the Midrand EcoCity Trust a number of workshops have been organized and the Midrand EcoCity was conceived as a smart, eco-friendly, self-sustaining economy supported by easily accessible modern

information technology. Following the key-principles related to Africa-specific solutions, environmental justice, poverty eradication, self-reliance, green transformation and quality of life and natural environment, numerous projects generated by the EcoCity project prepared fertile ground for different initiatives. Consequently, the introduction of community gardens for organic food, an eco-bank and eco-village, as well as the waste recycling and the use of environmentally responsible technologies have put some healing patches on a devastated urban tissue. Additionally, the application of eco-friendly constructions and the erection of green office buildings have gradually shaped a new image of the city, which will hopefully overcome a recent political shift and centralization.

In another system of cultural values and socio-economic circumstances, but under a similar e³-agenda, the example of Jätkäsaari in Helsinki proposes a different model of urban development and transformation, which should represent a universal implant applicable in different contexts and scales. The project of a new carbon neutral urban district, initiated by The Finnish Innovation Fund (SITRA) and backed by the municipality of Helsinki, was directed by the Low2No Sustainable Development Design Competition (2009), which underlined the importance of a sustainable approach to planning and energy policies, economic and social systems, low/no carbon building and mobility.

The winning proposal, 'C_Life: City as a Living Factory of Ecology' (by Arup - Sauerbruch Hutton - Experientia - Galley Eco Capital) actually represents a comprehensive manual which provides fifty ideas for preferred eco-behavior and reduced carbon emission. The selected eco-stimulating concept combines a bottom-up and top-down method connecting legislation, socio-economic structure and information infrastructure, but it also suggests energy strategy, as well as different funding mechanisms and instruments which should attract new green/sustainable initiatives. Although C_Life incorporates architectural and urban shaping conditioned by the local climate and functional demands, it remains flexible and suitable for global dissemination (ARUP 2009).

In the meantime, the materialization of the project has started and the first block should be ready by summer 2013, providing an experimental tissue for the onsite and offsite impact analysis of proposed Low2No

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practice. However, a parallel stream of formal and informal activities organized by urban enthusiasts and local entrepreneurs defines another level of this project, introducing and transmitting interesting ideas about urban food production, green lifestyle and fashion, problems of suburbs and neglected urban pockets.

The sensitive organism of our highly urbanized society is still overexposed to various negative influences, but the presented strategies could instigate a broader process of positive environmental transformation. Although with limited effects, a synergic effect of these concepts could at least stimulate the envisioned modification of our carbon-intensive way of life into a more moderate concept of consumption and behavior. Will it be on time?

Global and local initiatives – greening and cleaning, streaming or gleaming?

Perceived as a global(ized) commitment, an act of awaken environmental consciousness or quite superficially as the latest urban fashion, the politics of climate change, as well as (in)formal joint or individual initiatives, are nowadays focused on adaptation, mitigation and prevention of the ongoing processes. The current state of climate is reviewed and assessed by the Intergovernmental Panel on Climate Change (IPCC), an international body established in 1988 by the World Meteorological Organization and the UN Environment Programme. It provides relevant information about the scientific, technical and socio-economic dimension of climate problems which were published in scientific literature. The IPCC consists of three working groups which concentrate on climate change issues from different perspectives – from geophysics(1), to impacts, vulnerability, adaptation(2) and the mitigation of GHG emissions(3). Their reports combine scientific and policy-making standpoints enabling an insight into our future via projections, possible scenarios and general recommendations.

In order to prevent negative consequences and improve existing conditions, a number of transnational co-operations are launched covering a wide range of issues related to e3- requirements which should target the

global, regional and metropolitan scale. For example, The C40 Cities Climate Leadership Group was established in 2005 as a network of 58 world cities interested in local implementation of sustainable climate-related actions, organization of advance programs and partnerships, which would have global impact and international recognition (C40 2012). The collaboration with the Clinton Climate Initiative, the funding from Bloomberg Philanthropies and the involvement of city mayors and governors definitely gives an exclusive flair of high politics to this program which promotes and supports integrative, green, smart, energy-efficient and low-carbon urban projects of participating cities. Simultaneously, the Transition Network, conceived in 2006, represents the completely opposite approach to the same problems supporting small-scale community actions and bottom-up changes across the globe in order to embrace a transition model and achieve CO₂ reduction (Transition Network 2012).

There is an interesting global trend related to the 'ecocity' label. It exists in different climatic, socio-economic and cultural contexts, covering diverse topics, scales, methods and time-spans. For example, the EcoCity project of the European Union's FP5 (1998-2002) included seven different cities (from Austria, Spain, Hungary, Finland, Slovakia, Germany and Italy) and challenged the usual approach to urban planning and development targeting levels of urban structure, transportation, energy, material flows and socio-economic issues (Coplak 2003; Downton 2009).

The ECO-City project (2005-2010) demonstrated innovative energy concepts of three energy-advanced communities in Scandinavia and Spain (Helsingør and Helsingborg in Denmark/Sweden, Tudela in Spain and Trondheim in Norway). It also included the Slovak community Zilina and some neighboring municipalities in order to transfer knowledge and disseminate a successful practice of selected communities, especially in the field of renewable energy technologies and their rational use (ECO-City Project 2008).

The EcoCity Project from India, initiated in 2002, was adjusted to the contextual framework of developing and undeveloped countries and it provided a community-oriented approach which included several stakeholders – from the Central Pollution Control Board and Ministry of Environment & Forests (India), to international supporters – German organizations GTZ and Capacity Building International, Austria Recycling, Adelphy

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Research and Asia Urbs Programme. The main aim of the initiative was to improve the environment, pollution control and sanitary conditions of 12 selected towns, simultaneously protecting environmental resources and infrastructure (EcoCities 2006).

Obviously, the 'eco'-prefix has been highly evaluated by numerous international funds, which encouraged an exchange within evolving networks of municipalities, cities and regions and between their political leaders, professionals and representatives of grassroots movements.

A variety of other initiatives and projects, created and backed by UN-HABITAT, UNEP, World Green Building Council and World Bank are dedicated to vulnerable African, South American and Asian cities – for example Cities and Climate Change Initiative (Petrella 2010). Simultaneously, wealthier and more energy-advanced societies have their own set of projects within general frameworks (for ex. EU projects INTERREG, EU FP) which deal with fundamental or singular problems of climate change, including the adaptation of urban spaces to our new reality (GRaBS project – Green and Blue Space Adaptation for Urban Areas and Eco Towns 2008-2011). However, beyond these official channels of e³-upgrading, complicated application procedures and uncountable project partners, there is an expanding universe of creative proposals shaping a new fashion which, according to Brand (1999), definitely represents the fastest level of change in every civilization.

The global electronic interconnectedness has enabled extremely intensive transmission, exchange and mediation of an ever-increasing flow of ideas, which should induce 'greening' of our everyday life patterns and set up some new trends in technology, art, design and architecture. The websites and web-blogs have an important role in this process, representing educators and promoters of a new lifestyle which should be 'green and clean'. For example, the website GreenMuse (<http://www.greenmuze.com/>) presents the latest green ideas and innovations from different areas, WebEcoist (<http://webecoist.com/>) introduces articles about energy, green living, nature, ecosystems, technology and travels, Inhabitat (<http://inhabitat.com/>) is related to a smarter and sustainable future of design and My Life Scoop (<http://mylifescoop.com/>) aims to simplify technology for efficient use and better interconnectivity.

Similar ideas could be recognized in Solaripedia (<http://www.solaripedia.com/>), an extensive online portal of green-labeled architecture, building and development, while 'e²' (<http://www.pbs.org/e2/>), an ongoing PBS series of movies about the economies of being environmentally conscious, opens another field of cross-media approach to design, energy and transport. Launched in 2006 it also intends to call broader public attention guaranteed by the participation of well-know actors, architects, politicians and innovators.

In addition to virtual streams of behavioral change, urban space explores some other options for the reduction of carbon consumption and the purification of the environment. Bicycle sharing systems, 'chic' recycling, urban gardening, food miles and the astonishing self-regulating TERMES concept (Termite Emulation of Regulatory Mound Environments by Simulation) complement new tendencies in architecture and underpin a global environmental awareness wrapped in a lustrous membrane of a techno-green aesthetic.

The avalanche of e³ creativity has started, covering footprints of our previous delusions. However, we should always have in mind a remark given by Santosh Ghosh, former Chief Architect for Calcutta and West Bengal, who once said that pseudo-environmental approaches were like adding twice the lettuce to a Big Mac and calling it an eco-burger (Polo 1999). Obviously, the notion of 'being green' should not remain just a catchy motto. Instead, it should be accepted as an integral concept with resonant implications providing a necessary balance between nature and its urban trespassers.

Conclusion

According to Turner (2000) the next Golden Age of architecture will delete boundaries between buildings and their environment, unifying the living and inanimate worlds. Hopefully, this merging will not be a cataclysmic epilogue but a livable outcome of our efforts to understand climate change and carefully (re)consider its dynamic. The foundations of a new e³-culture are recently laid, stimulating cultural change and altering our identities. Nevertheless, the awareness of real dangers generated by our

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carbon-intensive lifestyle is still hidden behind hyper-consumerism and mass-production of information, enticements and contaminants.

The synergy of 'green'/'bio'/'eco' aesthetic and an increased attractiveness of environmental topics gradually pervades all segments of our lives but the imperatives of energy efficiency, eco-friendliness/awareness and electronic interconnectedness have not fully become a part of our routine. Instead, they are often perceived as elitist prerogatives although numerous examples demonstrate their universal applicability.

The projects of new cities – in spite of their relative (un)success, the innovative urban (re)development projects and an amalgam of global and local initiatives – certainly influence the reshaping of our environment, adjusting the inherited comprehension to new demands imposed by climate shift and energy transition. Therefore, the method implemented in Big Dig House in Lexington (SingleSPEED Design) could represent a symbolic crossover between different environmental concepts – the authors (re)used and transposed steel beams and concrete from the most expensive highway project in the history of the US to create a structural system of a private house and enable the organization of large roof gardens.

Obviously, the contemporary city and its development, transformation and intended upgrading could be perceived as a composite message of our epoch and its uncertainties. Warnings, recommendations and limitations have become an existential constant of our ominous urban reality, but creativity and innovativeness still represent a backup for the future to come. Until then, our newly improved and trained environmental consciousness will float in numerous material and electronic realms, waiting for a proper exoskeleton to host its sustainable body.

However, the question remains – will it breathe in the purified air of an e³-topia?

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