MOKSLAS – LIETUVOS ATEITIS
SCIENCE – FUTURE OF LITHUANIA

ISSN 2029-2341 print / ISSN 2029-2252 online
2013 5(3): 181–188 doi:10.3846/mla.2013.34

K. Šešelgio skaitymai – 2013
K. Šešelgis' Readings – 2013

# GREEN ARCHITECTURE PARADIGM: FROM URBAN UTOPIA TO MODERN METHODS OF QUALITY ASSESSMENT

**Gintaras Stauskis**

*Vilnius Gediminas Technical University, Vilnius, Lithuania*
*E-mail: Gintaras.Stauskis@vgtu.lt*

**Abstract.** Trends of environmental, social and economic development in the modern world are driving forward the theory and practice of Green Building with important role for architecture and architects. The article presents a comprehensive analysis of the Green Building doctrine and its historic background based on a review of main ideas of Green Architecture including its historic roots, as well as modern theories and practices of contemporary system of sustainability. Complex quality assessment methodologies developed in different regions of the world to evaluate environmental, social, economic and creative features of new and renovated buildings and urban complexes are analyzed in order to identify the most effective and advanced tools and methods. The importance of sustainability aspects is presented by a comparative analysis of basic features of building's quality assessment methods originated in different countries and regions, as it reveals the structure and weight impact of different evaluation methods. The article also addresses the impact of Green Architecture theories and assessment methods on architectural practice by analyzing outstanding case studies in urban design, landscape architecture and volumetric building design.

**Keywords:** Architecture, green urbanism, quality assessment methodology, landscape architecture, sustainable buildings.

## Introduction

Different cities can be characterized by different quality of life, though certain variety always exists because of natural, cultural, ethnic and other reasons. Urban communities, authorities and institutions are trying to improve living conditions in the city and this is mostly influenced by a balance between its residents' wishes to live comfortably in the city on the one hand and the need for clean and healthy urban environment on the other. Strive for a clean and healthy city is accompanied by the need of durable, lasting and efficient urban spaces and buildings. In this context the special skills and competences are needed in all phases of project development starting with a preliminary design, full project, construction and post-construction maintenance. The point of interest is in analysis how these specific methodologies for achieving more sustainable urban areas and buildings affect architectural design practices.

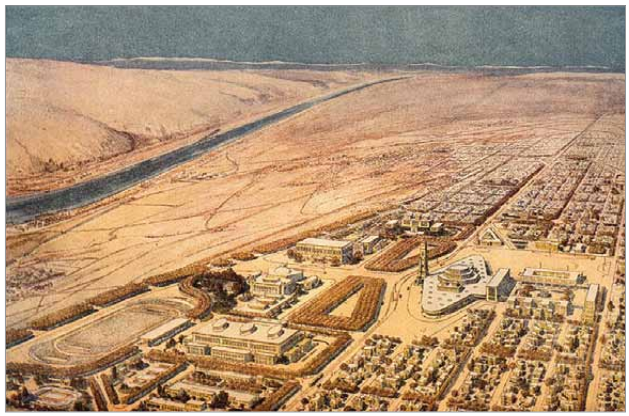

Fig. 1. Industrial City (T. Garnier) – the vision of ideal urban form. 1917. *Source:* http://classconnection.s3.amazonaws.com/149/flashcards/759149/jpg/01-46319_851141344563380707.jpg

## Development of Green Architecture Paradigm

The principles of a fairer, healthier, user- and environment-friendly city have been declared through the main ideas, projects and real cases of early urban utopians. E. Howard's *Garden City* (1898), T. Garnier's *Industrial City* (Fig. 1, 1917), Le Corbusier's *Radiant City* (1928), N. Miliutin's *Linear City* and inexpensive housing system (Fig. 2, 1933) illustratively demonstrate the goals of outstanding urban philosophers, researchers and practicing designers for providing more ecology and social comfort in the built environment under fairer social and economic conditions from the outset of the industrial revolution in the second half of the 19th century until present days. The core principle under exploration is respecting and protecting natural and cultural resources in the process of urbanisation by designing and constructing inclusive buildings of advanced qualities. These theories demonstrate the link between ecological features, living comfort, public health, social satisfaction

© Vilniaus Gedimino technikos universitetas

a)

b)

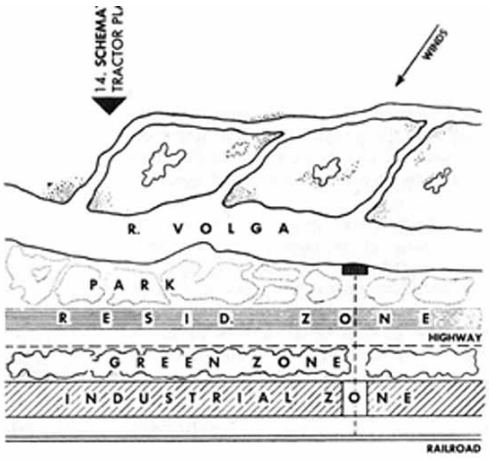


Fig. 2. Low-cost timber construction of local materials (a) for the ideal linear city (b). By N. Milyutin, 1933.
*Source:* http://en.wikipedia.org/wiki/File:Milyutin_buildings_1933.jpg; http://pd.cpim.org/2007/1111/romi-ph-3.gif

and economic potentials of urban communities. Prophets of all these theories had a goal of achieving a better ecological, socio-economic and aesthetical quality in a city.

While outlining the driving forces for the leading principles of modern urban policies, Lynch identifies several layers of human values: (a) practical values, such as housing, services, infrastructure, (b) wishes and aspirations, such as higher social equality and rational use of resources, (c) weak values, such as social stability and integration, (d) hidden values and motivation, such as political control, culture, profit, and (e) neglected values, such as links between ecology of urban environment and basic needs of human biology or the level of control over the surrounding environment (Lynch 1986: 53–57). In this context of value analysis, we observe the broken links between the strong or dominating and week and neglected values. It is important to note that such values as ecology, rational use of resources, good access to services, and quality of the surrounding environment are identified as the key values of urban communities dominating in both qualitative and quantitative aspects.

The phenomenon of intellectual crisis in development of modern cities was actively analyzed by the leading urban researchers in several radically critical publications from the 1960-ties. Jane Jacobs, the great author of the 20th century, in her book *The Death and Life of Great American Cities* (1961) stated that urban development involves everybody except those living in the city – the urban communities (Jacobs 1961). The author evoked active and creative role of community which was usually neglected in urban development plans. Abandoned urban land and vast public areas are nothing else, but a result of unsustainable urban development and destructive urban policies, according to which the "old-fashioned" housing blocks with economically weaker residents were pulled down in favor of "modern" city development and wealthier citizens in USA and in Europe. Simultaneously historical urban communities with extremely high level of social interaction were pulled apart, and the newly built concrete blocks never generated something like that instead.

This period in urban development is often considered the crisis of urban policy both, in theories and practices. Cities started demolishing their urban blocks and moving the local residents away in London, Manchester and the other cities in the UK (Hackney 1990: 52–67). This architectural and social barbarism was flagged by a goal of giving the valuable urban areas to more wealthy tenants. This became a usual urban practice all over Europe including also former Soviet block countries, such as Lithuania. The brutal transformations destroyed a lot of urban heritage complexes in numerous local urban communities and caused big social unrests of the residents against local and central authorities that were managing this destructive process. Many architects and even members of the British Royal family stood out to the movement of protecting community interests in urban refurbishment process and made the authorities look for more flexible solutions. Retaining the existing social contacts and functions in the process of urban renovation is especially important in historic environment (Jurkštas 1994: 130–134). As a result, architects involved in this activity gained a great professional prestige, and even a specific profession of 'a Community Architect' emerged. Thus the importance of local communities in developing and maintaining the existing urban structures was demonstrated.

Soon, in the middle of the 20th c., due to the massive trend of developing concrete blocks and highways over the existing urban areas and green plots cities and their residents realized the effect of pollution, noise and monotonous cityscape. The future of urban and social legacy was endangered again and leading researchers sent a clear

signal to society. I. McHarg's *Design with Nature* was one of the first publications that clearly manifested the concept of urban design based on careful assessment of natural context. Growth of a metropolitan area was compared to the evolution of live organism in nature and the need was stated of proper response to natural values of the country, region, urbanity or a particular site, meaning nothing else, but the principles of ecological urban planning and design (McHarg 1971: 79–83).

The global energy crisis that stroke in 1970 had a strong impact on developing the energy efficiency criteria for construction of residential, public and industrial buildings in Europe and around the world. This made national and local authorities, as well as designers and planners review the planning policies and design practices on extensive urban development and unreasonably spacious buildings. The new planning and design regulations were followed by a new practice of densification of urban areas, as well as more rational and efficient buildings. Thermo-dynamic features of the building's envelope, flexible planning of the internal spaces, rational amount of windows and application of typical standard projects was the landmark of this period (Kjisik 2009: 157–163). Replicating housing blocks in a massive way and shrinking apartment room spaces was a typical trend in Lithuania and the rest of the soviet dominated space, whereas the principles of sustainability and green design were still unknown and unexplored both, in theory and in practice.

The green dimension in planning, design and construction has become a prevailing trend since the last decade of the 20$^{th}$ c. Practicing architects were more and more engaged in practical implementation of the basic sustainability ideas. Jan Gehl, the leading ideologist and conceptualist of Green Urbanism, noted that "First we shape the cities, and then they shape us" (Gehl 2010: 9–18). Urban lifestyle is a complex feature formed by aesthetic, social, environmental and economic conditions. On the other hand local urban communities with strong interrelation and communication traditions are the engine for making identity of all cities. Such local communities can shape and maintain their urban environment in terms of ecology, sustainability, good access etc. and do this much more efficiently than the ones with weaker social contacts between the residents (Dadd 2010).

Different quality aspects are identified and evaluated on different levels of architectural practice, as stated by V. Stauskas, famous researcher, urban planner and designer of recreation architecture in Lithuania. The most important issues of the large-scale projects are proper site and land plot selection, typology and volumetric design of buildings, as well as to obtain most of available harmony between the buildings and the surrounding landscape. On the small-scale level, the critical solutions are those affecting the physiological (microclimate), psychological (aesthetics) and ecological (building materials) needs and comfort of users and residents (Stauskas 2012).

## Quality Assessment Methods for Urban Environment, Landscape Architecture and Buildings

The practical goal of Green Architecture is higher quality of a project and that of a realized building complex with definite environmental, technical, economic, social and aesthetic benefits that could be measured or otherwise evaluated. The whole complex of requirements for urban planning and design of buildings is presented in the national building legislation in the form of technical regulations. Unfortunately, in many countries, including Lithuania, building regulations present just the minimal parameters and requirements for efficiency of built environment and therefore they focus just on a lowest acceptable threshold do not motivating developers, designers and contractors to go for higher quality of the built environment. This explains why national building regulations cannot fully respond to the green building goal and objectives and why additional tools are needed. As obtaining certain economic, social and environmental benefits is very complex goal depending on the nature of the client, the application of specific methods and tools leading towards these benefits cannot be forced in a compulsory way, but rather can be practiced only as a complementary voluntary system of sustainability methods. They can be applied on the same voluntary basis as higher profitability, higher selling or renting prices or higher business and professional prestige. By consolidated effort of leading researchers, business and public institutions, the systems of quality assessment methods have been developed in different regions since 1990. Finally, they have been integrated in the complex quality assessment methodologies of the leading world economic regions: the USA, Europe and Japan. These methodologies have paved a wide road towards consolidating the basic principles of Green Architecture and implementing them in green environment practices (Farr 2008).

The market survey report produced by McGraw Hill agency in 2008 reveals that major part of the green-house-gas effect on a global scale in the next decades will be generated by the developing countries and regions, especially China, India and South-East Asia (Global 2008). On the other hand, the synergy of public, private and research partnership in Green Building sector will grow

the most in the world – from 26% to 73% of global construction volumes in those regions. Therefore the analysis of Singapore and Japan's experience in implementing the Green Building policy and practices for two decades reveals the general tendencies of architecture and construction in this economically prospering and ethnically diverse region. On the other hand, numerous speculative examples of extraordinary urban forms that are far from being green, environmentally friendly or sustainable appear in different Asian cities (Fig. 3).

Fig. 3. Deira Island in Dubai UAE. Is it a case of Green Urbanism? *Source:* www.thepalm.ae

Complex sustainability assessment methodology, the Green Mark, was introduced in Singapore by a joint decision of national authorities and multiple market players of the construction sector in the early 1990-ties. The system is a tool for detailed assessment of ecological, social and economic quality of buildings on a small scale and urban environment on a larger scale. This system is a part of activities for introducing and establishing the green urbanism as a dominating doctrine in the development of modern Singapore. This aspect is especially important for countries that are just in a starting position of introducing green architecture principles, such as Lithuania and the neighboring Baltic Sea countries. Key principles for successful implementation of the Green Building principles and moving forward on a national level introduced in Singapore have been: (a) implying higher requirements for new and renovated urban and architectural complexes of public use and public funding (schools, hospitals, government buildings, etc.); (b) introducing financial and tax incentives for those developers who achieve higher thresholds based on approved green building assessment methods; (c) involving local communities by direct financing of refurbishment of housing blocks; (d) starting and running a modern education and vocational training programmes for architects and engineers; (e) increasing public awareness about green building benefits and other achievements by disseminating the good practice case studies; (f) developing national legislation and construction regulation framework towards higher quantitative and qualitative requirements for new construction and refurbishment of existing buildings, landscapes and urban complexes (Green Mark 2010). The Green Mark is a tool for evaluating ecological, technical and social quality, in particular features of energy efficiency, water-use efficiency, environment-friendliness, exterior and interior air quality, as well as implementation of innovations (The BCA 2010). Different versions of this flexible system allow for grading buildings of different functional use against four scoring thresholds. It is especially important that each development of a public or green space requires proofing the project's quality in compliance with the Green Mark methodology. As a result of a decade-long application of this methodology, the major part of new construction is done under a quality umbrella of the Green Mark. Recently the most prestigious and most publicly sounding projects correspond to the highest technical and environmental requirements and boldly visualize the present cityscape of Singapore.

BREEAM[1] is another building quality assessment methodology widely used in Europe and beyond. The attractive paradox of BREEAM is the place of its origin – the UK – a country that has come through the most contradictory phases in urban development to start with massive housing and demolition of urban communities in the 1960-ties and up to the energy efficient, environmentally and socially advanced architecture of today. This sustainability methodology is widely promoted in the UK by the national legislation and building regulations that require all publicly funded or co-financed developments, e.g. schools and hospitals, to be BRE-compliant. It is a flexible and well balanced methodology with similar weight for all ten aspects of assessment (BREEAM 2010). Moreover, the BREEAM provides specific tools with indicators to measure sustainability of development at a site or estate level (Reed 2009).

The construction and design market in the USA is evidently dominated by the LEED[2] – the outstanding and easy to use sustainability assessment methodology of the US Green Building Council, an association consolidating more than 20,000 market players. Its verification is compulsory for federal and different state's development projects to achieve minimum of Silver quality threshold. Great market

[1] Building Research Establishment Environmental Assessment Method. See: www.breeam.org

[2] Leadership in Energy and Environmental Design. See: www.leed.com

dominance by LEED in the USA and beyond is achieved by the mass associating of professional skills in development of specific requirements for sustainable land plots, building materials and energy, design and construction practices, interior air quality and maintenance. All together this is a very clear message to the wide public about the competitiveness by quality and efficiency.

The Germany-originated DGNB[3] method is the most recent, introduced in Germany, Austria and Switzerland in 2007. The name of this advanced tool discloses that it is a result of leading market players under the German Sustainable Construction Association. The distinctive feature of the DGNB is that assessment of a planned development can be performed on different stages of its planning, starting with the preliminary design. It allows for checking the project performance on very early stages, when major changes and improvements are still possible. The DGNB is strongly focused on the service and maintenance qualities of new and refurbished buildings and corresponds to the high quality and reliability of products and personnel in the German-speaking countries.

The CASBEE[4] method is widely used in Japan since 2001. It is based on a complex of requirements for built environment and buildings with several specialised versions for assessment of new, existing and renovated buildings, for urban areas and cities that are assessed in the categories of the Quality for the User and Load for the Environment (CASBEE 2010). The user interface is a very important feature of quality assessment methodologies, as it opens or limits the implementation and usability of environmental, socio-economic and aesthetical aspects of the project. The CASBEE has an extremely easy user interface, which allows for a preliminary and final check online so reducing the cost and time from control until the project improvement. Using proper evaluation method is important on all stages of the project: pre-design, design and post-design, and CASBEE provide specific tools for this purpose (Fig. 4).

## Discussion: Impact of the Green Building Methodology on Development of Modern Architecture

The analyzed sustainability assessment methodologies used in different regions of the world have some differences, but also lots of common features. Firstly, they all are clearly focused on environment, economic and human comfort and overall sustainability aspects for new, existing and refurbished buildings in their urban environments including landscape. While analyzing the weight balance of different assessment aspects more differences are observed. Projects and buildings that are well estimated following the BREEAM usually score well under the LEED, while the opposite dependencies are observed more rarely. This indicates the BREEAM being more stringent than

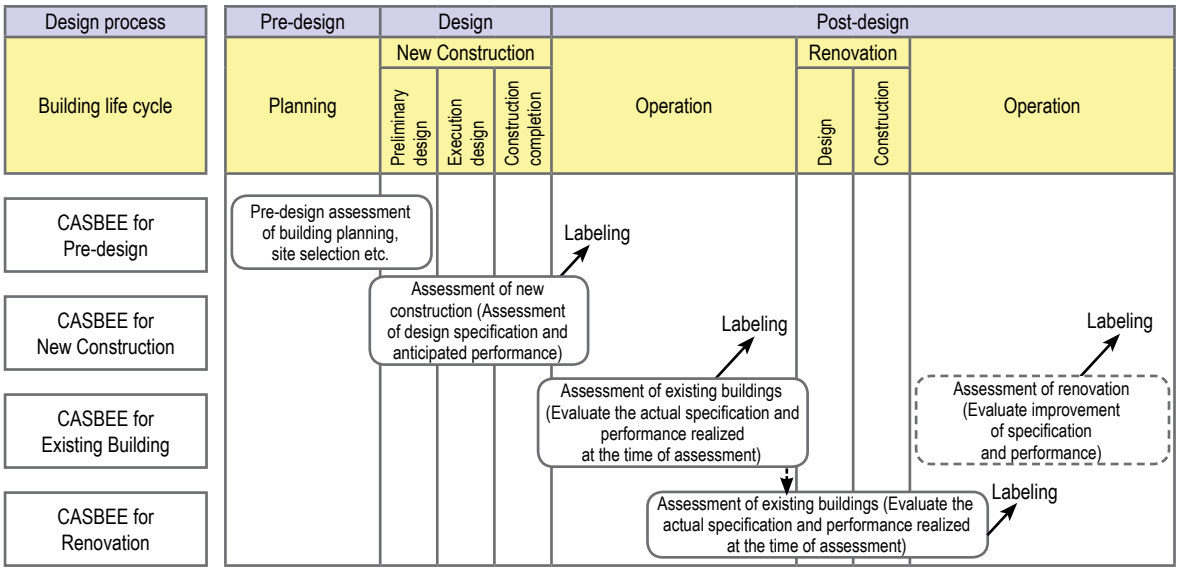


Fig. 4. Structure of the CASBEE methodology: building a life-cycle and four basic tools for sustainability assessment

[3] Deutsche Gesselschaft fur Nachhaltiges Bauen. See: www.dgnb.de

[4] Comprehensive Assessment System for Built Environment Efficiency. See more at: http://www.ibec.or.jp/CASBEE/english/overviewE.htm

the LEED. Each methodology has its national roots and therefore it reflects national environmental, socio-economic and cultural realities and priorities. On the other hand, all these methodologies have direct impact on the professional services of urban planners and architects, and that is the main focus of this paper.

Comparative analysis of the reviewed sustainability methodologies discloses the priorities among different assessment aspects (Fig. 5). Based on the highest overall score of 10 – 15% BREEAM and LEED quality assessment methods have the strongest impact on ecologic features and performance of buildings on assigned land plots. These project factors are mostly determined in the processes of planning and design.

Energy efficiency of buildings and their complexes is the central axis and dominating field of sustainability, but diversity in evaluating this aspect is great: from 10% in the DGNB till 60% in the Green Mark. Quality of building materials affects from 9% (Green Mark) to 20% (BREEAM) of overall score, therefore it is an important aspect to estimate in the process of design. The sustainable water management could influence the final result from 3% (DGNB) to 12% (LEED).

This comparison shows that the BREEAM is the most balanced methodology and its impact on planning and design is the most comprehensive one. Still, the aspect of user involvement is omitted by the BREEAM. The analysis shows that the LEED has a more liberal influence on a project planning and design, probably because it is adjusted to American economic environment with multiple market players and diverse requirements of the stakeholders. The Green Mark versions are distinct by extreme appraisal of energy efficiency issues, but its attention to land plot features, mobility and innovation is rather small. The DGNB especially encourages more sustainability in project management and maintenance of facilities, consequently other aspects get less attention.

Different sustainability methodologies are structured in three major competence segments: (a) social aspects, such as project management, use of land plots and territories, implementing design and construction innovations, user's awareness; (b) technical – economic aspects, such as energy efficiency, building materials, communications, waste; and (c) environmental aspects – site ecology, water use and pollution. These segments are the key competences required for practical urban planning and architecture and a detailed content for these subjects is presented in respective chapters of sustainability methodologies.

Analysis of historic development, as well as thematic structure and the content of different sustainability methodologies put much more light on the essential meaning of green architecture and urbanism. Social, technical and environmental benefits of green architecture and sustainable construction are clear and often evident. Impact of green building techniques on aesthetic quality of urban planning and architectural design projects raise more questions, while the answers lay in the complex nature of architecture. The fundamental role of architects and architecture lay in creative synthesis of specific social, technical and environmental tools and methods to turn them into the masterpieces of spaces and volumes.

In the process of urban development, environmental and technical aspects have a very important impact at the initial phases of design. Based on the concept of green

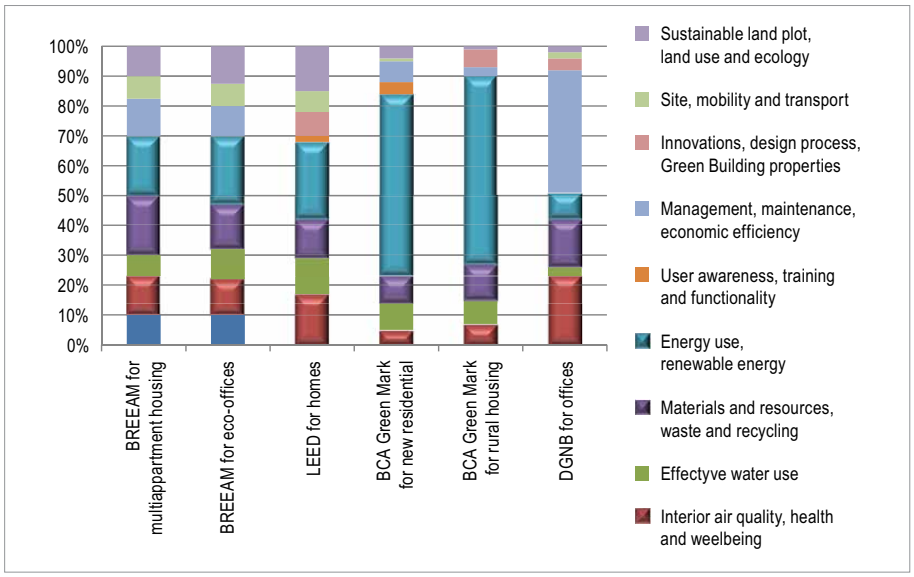


Fig. 5. Comparative analysis of impact ratios of different sustainability methodologies

Fig. 6. Aerial view of Purmeerend City (The Netherlands). The live example of Slim Grid energy network in the heritage city of 70.000 residents with 70% of renewable energy. Sky Pictures

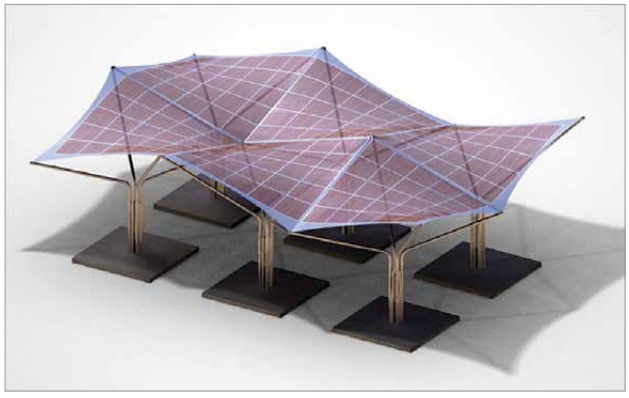

Fig. 7. Engineering of solar membrane structures opens the new opportunities for designing comfortable public spaces and self-efficient landscapes. *Source:* www.solar-tension.de

urbanism, the initial concept is built on the framework of natural values of local landscape, and later infrastructure and development layers are added to emphasize the existing character of the territory. One of sustainability aspects – green blue water management – provides a strong tool for planning and design of landscapes as identity features of the site. Sustainable district energy system is planned as a Smart Grid (or Slim Grid) where different users are functioning in an integrated energy generation and provision network (Fig. 6). On the level of planning and urban design, the primary unit – local urban territorial community – is a structural cell for spatial and functional arrangement, as well as for energy generation, provision and exchange.

Sustainability of individual buildings is a zoom-in of a larger urban design scale and therefore it is based on the same planning strategies just on a smaller scope. Design

Fig. 8. Urban regeneration of Masthusen district (Malmo, Sweden). The BREEAM certification in progress. This multifunctional area has 700 apartments, 70,000 $m^2$ office spaces and 20,000 $m^2$ commercial areas

quality (soft measures) and technology (hard measures) of the project require an architect and project manager with perfect analytic, creative and technical skills to turn the array of technological elements (Fig. 7) into an integral architectural art (Fig. 8). In this light the need of competent professionals is the main issue, especially having in mind that most of practicing architects of the present generation received little university knowledge and understanding about sustainability of the built environment especially on a practical level. Following the example of the advanced green building regions the way to progress is paved through the associated education efforts of all construction chain stakeholders and professionals: developers, material suppliers, designers and planners, contractors, supervisors and managers.

## Conclusions

The paradigm of Green Architecture has become a dominating trend in modern architecture and construction. It first appeared as a consequent result of historical track with deep philosophic roots. Understanding of environmental, social – economic and artistic mission of architecture has created favorable conditions for flourishing of green architecture ideas and practices in the developed world. Many developing regions are still in initial phase of discovering and practicing the basic Green Architecture principles for new development and refurbishment of existing urban areas. Main obstacles for this are lack of qualified professionals as a result of low quality education and vocational training systems as well as week public awareness of the issue. Big fall-down of construction and development industry in last five years period could become a good stimulus for taking

a higher speed in this way as the old and unsustainable projects and products are no more needed on the real estate market on one hand, and green building gives a perfect quality advancement, on the other.

Wider spread and implementation of Green Architecture principles in construction lie in training of specialists in theory, research and professional practice of sustainability. The regions that start implementing the Green Building methodologies are in a crossroad of choices of conceptual priorities, incentives and general policies. Countries like Lithuania and its neighbors also have to make a choice in adopting one dominating sustainability assessment tool and so limiting professional competences to a single method, or developing professional expertise in all main fields of sustainability in green architecture and so widening specialist's qualification and skills, also opening more opportunities for urban planning and design.

Green Architecture is a very complex topic that is in the focus of leading researchers in academic environment. The complexity, inter-disciplinary and comprehensive nature of this topic could and should be assessed in the modern clusters of researchers, public entities and business partners. Green Urbanism as a multi-layered practice of sustainability has an important social format which should be realized as a practice of creating and maintaining sustainable urban communities that are beneficial both for their citizens and environment of their habitat.

## References


BREEAM versus LEED. 2010. Inbuilt Ltd. Kings Landley.

CASBEE for New Construction. 2010. Comprehensive Assessment System for Built Environment Efficiency. Technical Manual. Virtual access 2013.1.25: http://ibec.or.jp/CASBEE/english/download/CASBEE-NC_2010manual.pdf

Dadd, D. L. 2010. *Saugi aplinka*. AKS sistemos, Vilnius/ Jeremy P. Tarcher / Penguin, Londonas.

Farr, D. 2008. *Sustainable Urbanism*. Urban Design with Nature. John Willey & Sons.

Gehl, J. 2010. *Cities for People*. Island Press. Washington.

Global Green Building Trends. 2008. McGraw Hill Construction. Virtual access 2013.1.17. http://gianlucasalvatori.nova100.ilsole24ore.com/files/global_green_building_trend_copia.pdf

Green Mark Singapore. 2010 [interaktyvus], [žiūrėta 05.09.2012]. Prieiga per internetą: www.greenmark.sg

Hackney, R. 1990. *The Good, the Bad and the Ugly*. Frederic Muller. London.

Jacobs, J. 1961. *The Death and Life of Great American Cities*. Random House. New York. ISBN 0-679-74195-X.

Jurkštas, V. 1994. *Senamiesčių regeneracija. Architektūros harmonizavimo problema*. Vilnius: Technika.

Kjisik, H. 2009. *The Power of Architecture*. Helsinki University of Technology. Towards Better Hospital Buildings. Helsinki University of Technology. Helsinki. ISBN 978-952-248-033-0.

Lynch, K. 1986. *A Theory of Good City Form*. The MIT Press, 53–57.

McHarg, I. L. 1971. *Design with Nature*. Doubleday/Natural History Press, Philadelphia.

Reed, R., *et al*. 2009. International Comparison of Sustainable Rating Tools, *The Journal of sustainable Real Estate JSRE* 1(1): 1–22.

Stauskas, V. 2012. *Architektūra, aplinka, atostogos*. Vytauto Didžiojo universitetas. Kaunas.

The BCA Green Mark Certification Standard for New Buildings (GM V. 4.0). 2010. Building and Construction Authority. Singapore.


## ŽALIOSIOS ARCHITEKTŪROS PARADIGMA: NUO URBANISTIINĖS UTOPIJOS IKI ŠIUOLAIKINIŲ TVARUMO VERTINIMO METODIKŲ


**G. Stauskis**



Santrauka

Straipsnyje nagrinėjama žaliosios architektūros paradigmos raida skirtingais miestų filosofijos ir architektūros teorijos laikotarpiais, pateikiama daug nuoseklios idėjos raidos pavyzdžių nuo 19 a. pabaigos iki 20 a. vidurio. Materialiosios aplinkos, miestų ir pastatų tvarumas vertinamas pagal nustatytus kriterijus, naudojamus skirtinguose pasaulio regionuose nuo 20 a. pabaigos. Pateikiama skirtingų tvarumo nustatymo ir vertinimo aspektų analizė išryškina dominuojančius aspektus, taip pat parodo skirtingų tvarumo nustatymo metodų būdingus bruožus. Tyrimo išvadose nurodomi žaliosios architektūros platesnio įdiegimo Lietuvoje būdai: specialistų mokymas ir profesionalių architektų profesinis tobulėjimas, skirtingose statybos proceso grandyse dirbančių specialistų pajėgų konsolidavimas, įstatymų ir reglamentų bazės tobulinimas, numatant ekonomines ir kitas paskatas žaliosios architektūros principus taikantiems vystytojams.



**Reikšminiai žodžiai:** architektūra, žalioji urbanistika, kokybės vertinimo metodika, kraštovaizdžio architektūra, tvarūs pastatai.