



# Energy and building aesthetics. Slovenian examples of good practice



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## ABSTRACT

The well-being of people, the industry and the economy depends on a safe, reliable, sustainable, affordable, efficient and economical use of energy. At the same time, energy-related emissions represent almost 80% of the total greenhouse gas emissions in the European Union (EU). Therefore the question of efficient energy use is one of the biggest challenges facing Europe and Slovenia in the coming decades. The building industry is responding to the energy and environmental crisis with a development of new low energy systems for the heating and cooling of the buildings. New technologies pose designers and architects new tasks and challenges, as well as opportunities for creating new, low energy and sustainable environment and buildings. With a multidisciplinary approach, featuring technical disciplines, as well as architecture as an art, it is possible to transform new technological arrangements and buildings into poetic living spaces for people. The possibilities of such an approach are illustrated by seven examples of low energy buildings in Slovenia.

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## 1. Introduction

To some extent the architectural profession follows pioneering research in the fields of energy saving construction and nature friendly buildings with skepticism. For all new approaches are, in principle, ideologically extreme, often professionally naïve, and exclusionary, and as such, the proposed solutions are generally just as extreme, naïve and exclusionary e.g., underground houses with grass roofs (modern versions of the fairy tale houses?), contemporary “high tech toasters” under the unbearable afternoon heat etc.; the list goes on.

Half of the early research in the field of sustainable, energy efficient construction focused on reviving bygone times, while the other half focused on searching for a new utopian technological environment; orthodox architects were standing by, as though it was none of their business.

And yet, after decades of opposing opinions, there are few of us who do not wrap houses in warm coverings, or consider the path of the sun's soothing light as it enlivens interior spaces and conversely, the coolness of its shade, or who do not reach in the house's basement to search for new spatial and energetic possibilities. The simple fact is that we have become accustomed to ecological awareness. The extreme solutions of the pioneers have

been spruced-up, familiarized – normalized – so that they are now included in the designs for buildings and settlements. The tendency of ‘green’ construction in architecture is to reduce the costs of energy consumption; however, these tendencies are not only seen as striving for energy efficient construction and performance, but as a part of a new, integrated approach that respects the natural environment and its resources.

The origins of ecological thinking can be traced to the Renaissance architect and writer Giorgio Vasari who, in his book ‘Vite dei piu eccellenti pittori, scultori ed architetti’ [1], writes, among other things, about the ‘principle of the other man’: *the concept that it is ethical to respect the work begun* (we know that throughout history much architecture was in the making for several generations and hence principle became self-explanatory). However, if we consider the principle within a broader context the above axiom, which appears simple at first glance, acquires many additional shades of meaning. Who is the ‘first man’? Is it nature, locus, existing architecture, which is intended for renovation, adaptation, reconstruction due to changing needs?

The prominent Slovenian philosopher Dušan Pirjevec's [2] thoughts on space and architecture are similar: “Architecture shapes space, or rather: architectural work opens up the space but it simultaneously takes it away from people and itself.” (as well as from nature, we might add). This is precisely why we must treat architecture and space, which is being opened and taken away by it, with the utmost sensibility and caution. Our approach to creating an environmentally friendlier architecture has been present in Slovenian architecture – under the influence of both writers – from

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the late 1970s, as a result of a heightened ecological awareness concerning several levels of spatial arrangement encompassing everything from regional planning to urban planning (of settlements) to constructing buildings. Therefore an 'awareness' is not only about introducing relatively simple technological and material solutions to building construction, but also an introduction of an integrated ecologically oriented approach to spatial arrangement in order to improve living, and therefore health conditions, of the population as well as a kind attitude of human interference in nature. This awareness is now being implemented legally under the motto "sustainable development", including the promotion of energy efficiency measures, use of renewable energy and the transition to a low carbon society.

However, this is a complex process: "Implementing the principles of sustainable development is a demanding, long-term and still unfinished process in Slovenia as well as in numerous other EU member states. Despite accepted guidelines on European level and several attempts of their introduction on national level, Slovenia still has not seen efficient implementation of detailed guidelines for planning and incorporation of tools and criteria for sustainability evaluation into a suitable legal framework" [3].

For this purpose, Slovenia adopted two cover documents, namely "Spatial Development Strategy of Slovenia and energy legislation". The *Spatial Development Strategy of Slovenia* [4] is a strategic spatial planning document adopted by the National Assembly of the Republic of Slovenia. It is the principal national document for guiding spatial development at lower levels and implementation of different national and local policies in the territories. It represents the framework for spatial development across the entire national territory and sets priorities for development within the European space. The energy legislation [5], establishes the principles of energy policy, and rules of operation for the energy market, however, the focus is on the use of energy from renewable sources and energy efficiency. Slovenia implements the principles of energy efficiency through educational, information, and public awareness programs providing energy consultation, stimulating energy audits, preparation of regulations, and other support programs. When planning new settlements and the modernization and expansion of existing settlements and facilities, priority shall be given to the use of renewable and environmental friendly energy sources maximizing neutralization and reduction of dust emissions, greenhouse gasses, SO<sub>2</sub> and NO<sub>x</sub>.

### 1.1. Comprehensive strategic approach to energy sustained spatial planning

The goal of The Spatial Strategy in Slovenia is to prevent the adverse effects of an increasing urban dispersion that wastes energy and exceedingly consumes various natural resources. In addition, due to the criticism of extant negative trends there exists the tendency for ecological movements to return to autarkic forms of settlement intended to once again enable a harmonious coexistence between man and nature that indirectly influences life patterns in the community. But is everything old also good? A few years ago, when I started writing a textbook entitled "Preservation and Arrangement of Cultural Landscape" [6], I was deeply convinced that the seemingly chaotic changes, reflected in the disintegration of traditional cities and rural ecological systems in the form of new settlement patterns, a changes typology of construction, which does not follow the traditional example any more, only a temporary error in the spatial planning system, which would have to be repaired, improved, or made more efficient in terms of preserving traditional cultural values.

After almost three decades since writing the book I came to the conclusion that it is not the case of a temporary system error but that these changes are an inevitable companion of the

modern lifestyle and are therefore not a Slovenian peculiarity but a consequence of global cultural and technological changes we are witnessing at the turn of the millennium. We are faced with the fact that the traditional image of cultural landscapes, especially the prevailing agrarian landscapes linked to the autarkic ecological philosophy, is steadily disappearing. The most obvious is the invasion of urban forms into rural areas as a result of accessible and affordable fossil energy, advancement in transport, information technologies' explosive development, new materials and technologies. The building materials market offer materials that are cheaper than local materials and with the increase in individual transportation the time and cost of distances are diminished. Now the Internet allows working at home, therefore the geographic location of the dwelling and the workplace are becoming a less important factor even within international labor market. Work positions that were once distinctly bound to urban centers are now moving deep into the urban periphery, and the cities are becoming regional urban systems.

### 1.2. The new urban paradigm as a response to the contradiction of the modern world

The new global social environment exposes the need for a balanced coexistence of seemingly exclusive entities in a space that leads to the interlacing diverse residential behaviors. Traditional cities are no longer the exclusive places of the urbane, but are becoming a part of a new, broader, more scattered urban system, which is generally more wasteful in terms of energy and location. The land, which once represented a means of agrarian production on the outskirts of cities, has now become a desired location for urban expansion [7]. While expansive urban areas have lost their function and represent a vast reserve for the city's re-urbanization, the outskirts of towns and their immediate countryside spontaneous and seemingly chaotic forms of settlement patterns are appearing: complex in terms of activity, hybridity and defying all established rules of aesthetic evaluation. If we wish to evaluate these developments we will have to supplement the existing epistemological tools and enable a plurality and coexistence of different value systems. Alongside the modernistic concept "less is more" [8] it will be necessary to grant validity to the ecological concept "more is more", which stems from the realization that complex ecological systems in nature are livelier than simple ones and can therefore better adapt to the explanations of modern social and spatial organizations. Complexity is not an end in itself, it is a response to the needs of human life and is therefore a means for fulfillment of these needs and is not only functional, but also an emotional form that fulfills certain emotional needs of a contemporary human. Therefore complexity's occurrence extends beyond the borders of "intellectual/rational" and touches several planes of reality [9].

### 1.3. Between regulation and deregulation

The complexities of a modern world demand the need for recycling urban elements as an integral part of a new social reality based on individuality and flexibility as well as the affirmation of a new ecological sensibility. Spatial developments are becoming unpredictable and therefore impossible to plan. In the broader context of urban regions (today the traditional agricultural or suburban area) a new relationship between nature and urbanization is being established. On the one hand we are striving for a denser urban concentration, which seems more rational in view of integrated energy consumption and preservation of non-built-up natural environment, but it also raises significant adverse phenomena associated with concentration. In a way to a "new spatial organization in contradiction to hierarchical spatial rules of urban city forms and rural dispersed structures, is not a chaotic irregularity, but a new,

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