

## DISSEMINATING THE USE OF SUSTAINABLE DESIGN PRINCIPLES THROUGH ARCHITECTURAL COMPETITIONS

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### Abstract

Sustainable architectural designs have become current issue, as in other disciplines, in architecture since 1970s because of these reasons, oil shock, global warming, to be consumed natural resources, get further away from the nature... Putting into practice and increase of awareness of sustainable architectural designs become a important topic 2000s in Turkey. It's hard to reach clear information about how much designs are carried into practice. Obtaining energy efficiency certificate for new buildings has become obligatory since 1 January 2011 and it's determined that 450.815 buildings have this certificate. But this certificate evaluate energy performance of buildings only. In fact, process of sustainable design cannot be evaluated by just energy performance analysis. Efficiently use of energy, water, building land and environment, relationship with environment and buildings, benefit/damage analysis in urban area, increase of user comfort in building come into prominence. 425 buildings obtained LEED certificate that make a comprehensive investigation. As it seen, the numbers, used above, show us, it's necessary that sustainable design principles must be disseminated and the methods, are been used, must be evaluated.

This work tackles architectural competitions as a method for developing and disseminating sustainable design principles. Architectural competitions are not only didactic but also developer and independent design platform which all architects can join. The results are reached the large masses over draw up a contract, design process, evaluating the projects and discussion platform, colloquium. So that the establishment, designers, the jury and the other participants are involved in an interaction. Architectural competitions can used for development, evaluation, discussion and dissemination of sustainable design principles.

The aim of this work is that evaluating how to tackle "sustainability" as a term in competitions, in 2010s and in accordance with the results, offering suggestions for disseminating the use of sustainable design principles with competitions also.

**Keywords:** Sustainable Architecture, Architectural Competitions

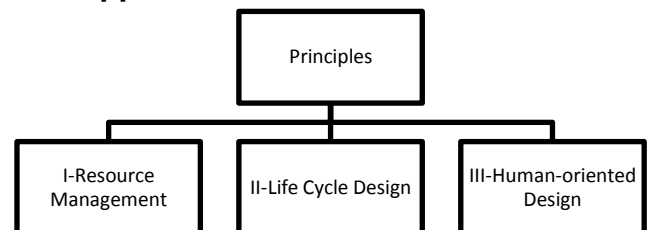
### 1. Introduction

The oil crisis of the 1970's and the emergence of the concept of global warming in the 1980's led humanity to reconsider it s activities in every field [1]. As a result of this tendency, "sustainable architecture" became a major issue in the global agenda.

Today, sustainable architecture is interpreted in various ways and energy efficient building design, green buildings and ecological design are the most common definitions that come to mind. However, sustainable architecture is not only about energy or ecology. It has more extensive sub-meanings and it can even be considered a philosophical way of thinking.

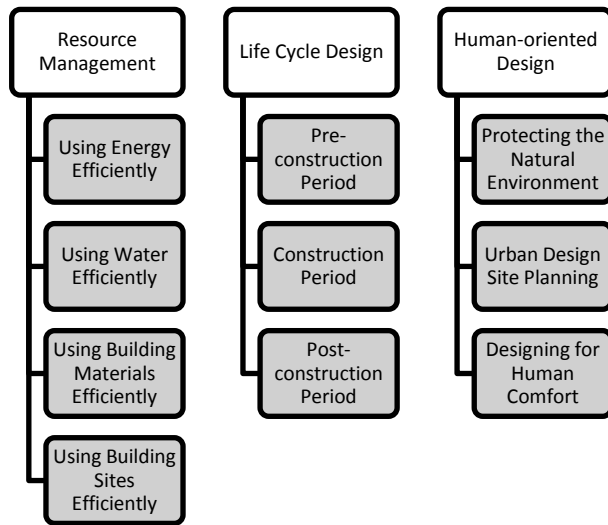
Ayşin Sev defines sustainable architecture as "production of structures that prioritize the use of renewable energy sources; are environmentally conscious; use energy, water, materials and their locations effectively; and protect human health and comfort while taking future generations into consideration, under existing circumstances and at every stage of their existence," and lays out its principles in the diagram given below [1].

Table 1 [1]:



The strategies for implementing these principles are as follows:

Table 2 [1]:



Jason F. Mclennan on the other hand, defines sustainable architecture in more general terms: "Sustainable Design is a design philosophy that seeks to maximize the quality of the built environment, while minimizing or eliminating negative impact to the natural environment" and relates it to day lighting, indoor air quality, passive solar heating, natural ventilation, energy efficiency, embodied energy, construction waste minimization, water conservation, commissioning, solid waste management, renewable energy, xeriscoping/natural landscaping and site preservation categories [2].

Paola Sassi points out that sustainable architecture has two main objectives: "First, sustainable buildings should metaphorically tread lightly on the Earth by minimizing the environmental impacts associated with their construction, their life in use and the end of their life. Sustainable buildings should have small ecological footprints. Second, buildings should make a positive and appropriate contribution to the social environment they inhabit by addressing peoples practical needs while enhancing their surrounding environment and their psychological and physical well being" [3].

As mentioned above, sustainable architectural design requires attention to detail, multidimensional thinking, correct assessment of data and a combination of various types of data in a single design, thus necessitating a comprehensive process. Teamwork is crucial for an adequate design process and these teams must involve collaboration between architecture and engineering professionals, consultants, clients, users, administrators, construction companies and building material manufacturing firms.

Kristel Del Mytlenaere lists three important questions that architects should ask themselves in this process, which requires multidimensional thinking [4]:

1) How architects propose to conciliate the human being with his natural environment?

2) How architects propose to articulate the different scales our humanity?

3) How architects propose to transmit to the future generations what they inherit from the past ones?

In a study conducted by RIBA this multidimensional process is divided into 10 stages:

- commit the leadership
- benchmark practice performance
- demonstrate practice performance
- build on existing resources
- upskill with continuing professional development
- develop collaborative project methodologies
- consider the uses of software
- adopt a knowledge management framework
- follow the RIBA outline plan of work
- monitor sustainable projects [5].

As opposed to the comprehensive work in this field in Europe and the US, Turkey is lagging behind—particularly in terms of implementation—even though it is known that sustainable design has been on the agenda as “environmental design” in the 1970’s, as “green design” in the 1980’s, as “ecological design” in the 1990’s and finally as “sustainable design” since mid-1990’s [6].

Although this subject has been discussed conceptually since the 1970’s, its appearance in practice happened much later. The subject became prevalent after 2009, when the KYOTO protocol was signed, and especially since 2011, when “Building Energy Performance” certificates became obligatory for new buildings. Nevertheless, the number of buildings that are built according to sustainable design principles in Turkey is still very small in comparison to the total building stock. The first place to look for data to evaluate this subject is the Turkish Statistical Institute (TUIK). According to TUIK, 1,348,211 buildings were given “occupancy permits” in Turkey since 2000 [7] and 450,815 buildings were given Energy Identity Certificates, which was made obligatory by the Ministry of Environment and Urbanism, since January 1, 2011 [9]. The Energy Identity Certificates evaluate buildings in terms of energy, water and building material use, but do not encompass the comprehensive scope of sustainable architecture. LEED on the other hand is a much broader certificate in this context and it has been received by 425 buildings [8].

These figures suggest that sustainable architectural design needs to be further promoted in Turkey. Many methods can be suggested for realizing this goal and this study aims to discuss the effectiveness of architectural design competitions for this purpose.

## 2. Disseminating an Idea through Architectural Design Competitions

Architectural design competitions are, by nature, ways of obtaining projects by encouraging free thought. In these competitions ideas and designs are taken into consideration regardless of the architects’ particulars (ideology, school, business contacts etc.).

“The concept of competition constitutes a distinct structure that involves elements of competitiveness, authentic production, comparison and rewarding. Perhaps the most influential feature of this method is the fact that it provides a basis for criticizing, testing and even challenging every aspect of our profession [9].”

Architectural design competitions pave the way for disseminating opinions, movements and ideas. The features listed below are particularly confirming this aspect of competitions.

- Architects from every sector (public, private, academic etc.) can enter competitions and thus, dissemination of ideas among architects in every field is supported.
- Every submission is scrutinized by the jury. Jury reports that are published afterwards offer information on the submitted projects and their assessments. Therefore, competitions can inform us about the competency of the submitted ideas and encourage new ones.
- Designs that best comply with the rules of the competition are rewarded. The inclusion of sustainable design principles in competition rules—with the assumption that they are successfully implemented—and exhibiting successful projects will help these principles to spread.
- Competitors get a chance to observe and discuss their own designs in comparison with other submissions.
- From the announcement stage to the colloquium process, competitions reach a wide audience. The organizers, the members of the jury, the competitors and the colloquium participants are all involved in an interactive process.

Due to these characteristics, architectural competitions do constitute a ground for new ideas to emerge and spread. The Architects’ Council of Europe confirms this and states that architectural competitions benefit all participants—the organizers, the public and architects—by offering alternative solutions to the client’s building problems, allowing the public to witness the whole process from the beginning and forcing architects to face the challenge of comparing their strengths with others’ to create appropriate and innovative solutions [10].

In this context, it is concluded that competitions have the potential to be a means to disseminate sustainable design principles.

### 3. Methodology

The study aims to identify the current status of architectural design competitions in Turkey in terms of sustainable design, and find out whether competing projects provide a means for spreading sustainable design principles. If these projects are not promoting these principles, then proposals will be offered to make this possible.

The study evaluates architectural design competitions organized in Turkey in terms of sustainable architecture

principles. This evaluation focuses on the 2010’s, which is the period that sustainable design principles started to reach wider audiences. Competition rules, jury reports, successful projects and project reports from this period are examined.

The evaluation tries to answer questions that are given below, the answers to which are expected to show at what level this subject is included in competitions, how they are handled by architects and juries, and whether competitions are effective in disseminating them.

- What does the competition expect from submissions in terms of sustainable design?
- How do the submissions deal with sustainable design criteria, and what types of competitions and projects include them?
- Do sustainable design criteria add value to the projects?
- How are competitions effected by the fact that the idea of sustainable design reached wider audiences in the 2010’s?
- Is the philosophy of sustainable design an integral part of these projects?
- Are the newly developed ideas interacting with results of other competitions?
- Are the newly developed ideas repeating existing information or are they innovative?

### 4. Case Study

Similar to the development of sustainable architecture, development of architectural design competitions was also late in Turkey, compared to the rest of the world. The first competitions were held in the 1930’s and the total number of competitions up to date is 867, 26% of them announced after the 2000’s. Between 2010 and 2015 109 competitions were held and the rate is increasing.

The table below shows the types and numbers of competitions held between 2010 and 2015.

Table 3

<b>Types and Numbers of Architectural Design Competitions Held between 2010 and 2015</b>	
<b>Type of Project</b>	<b>Number of Competitions</b>
Prison	1
Religious Building	4
Educational Building	5
Call for ideas	30
Public Building	29
Urban Design	11
Residential	1
Tower	1
Culture and Arts Building	4
Tomb	2
Museum	2

Table 3 (Continuation):

<b>Types and Numbers of Architectural Design Competitions Held between 2010 and 2015</b>	
<b>Type of Project</b>	<b>Number of Competitions</b>
Healthcare Facility	3
Social Facility	7
Sports	1
Commercial	1
Transportation	4

Below are some findings from the analysis of these competitions.

- Among these 109 competitions, 7 are directly about developing sustainable design ideas and one of those is an urban design competition (Çanakkale Municipality "Green" Urban Design for City Square and Surroundings Competition) while six of them (National Architectural Design Competition by Ytong: Roofs and Sustainability, Urban Dreams 5: EGO Hangars and Field Assessment National Student Project Competition, Sustainable Reception-Exhibition-Presentation Space National Student Project Competition, Urban Dreams 8: Saraçoğlu Neighborhood Assessment Project National Call for Ideas, 7 Climates 7 Regions National Architectural Design Competition, Houseboat Design Competition) are calls for ideas and are not application-oriented.
- Other competitions call for designs that comply with relevant legislation and therefore ask projects to comply with the Building Energy Performance Bylaw.
- Most competitions expect projects to take sustainable design criteria into consideration in one way or another. However, the subject is dealt with only a few superficial sentences in competition rules.
- The competition rules include concepts such as energy efficient building design, using renewable energy sources, environmentally sensitive design, design for all, sustainability of quality of life, multidimensional sustainability and sustainability of the architectural idea.
- Among these concepts, the submissions predominantly deal with energy efficient design. Double facade designs, using solar and wind energy, recycling water, green roofs, green shells, green wall designs, natural ventilation, orientation and natural temperature control using earth are some of the themes found in competing projects.
- Spatial sustainability, inheriting the design to future generations, sustainability of the building-environment relation and flexible space design are dealt with in project reports, despite not reflected in the designs themselves.
- Jury reports demand sustainable design principles to be considered at the implementation stage, when and if these projects are actually implemented.
- Sustainability are handled more effectively in call for ideas where it is the main theme of the competition.

- There is an interaction between competitions and especially the ways they handle energy efficient design are quite similar.

## 5. Conclusion and Proposals

As a result of the analysis, it is concluded that architectural design competitions can have a dissemination function for sustainable design criteria if improvements are made in aspects listed below.

- Competition rules only superficially indicate sustainable design expectations.
  - Successful projects are mostly handling sustainability in terms of energy efficiency, mainly due to the fact that the Energy Performance Bylaw is one of the regulations that the projects are asked to comply with.
  - While other aspects of sustainable design (spatial sustainability, social sustainability, economic sustainability etc.) are mentioned in project reports, these cannot be read in the designs.
  - Sustainable design principles add value to architectural projects and this is indicated in jury reports.
  - Calls for ideas deal with this subject in more detail and allow new ideas to be tested. These projects are focused more on improvements in this field rather than repeating existing methods.
  - As mentioned earlier, implementing sustainable design principles requires comprehensive and systematic work by a large multidisciplinary team. Interviews with competitors show that the prescribed time for submissions are not long enough for both interpreting the given program and integrating sustainable design criteria in the design. This is mainly due to the fact that these two subjects are still considered separate and sustainable design is not adopted as a design philosophy.
- These results show that architectural design competitions have not been effective tools in disseminating sustainable design criteria. "Sustainable design" needs to be included properly in competitions before it can be disseminated by them. For competitions to effectively disseminate these principles,
- Juries must include architects, and engineers if necessary, who are competent in this subject. The importance of the issue must be emphasized, the quality of the projects must be increased and successful projects should communicate these principles properly.
  - Sustainable design expectations must be expressed in detail, not only in the prefaces of the competition rules but also in architectural programs, ensuring that the subject is brought to the attention of not only the competing architects but also everyone that is interested in the program.
  - The prescribed submission periods must be revised in order to allow more in-depth study on the subject.

- The subject should be handled in all competitions as comprehensively as it is handled in calls for ideas.
- Application of sustainable design ideas should not be delayed to the implementation stage. This way competition colloquiums can host noteworthy discussions and these can be shared with everyone.
- Travelling exhibitions should be organized so that the audience is not limited to the city where the colloquium is held, and exhibitions and colloquiums should be open to the general public.

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