



DESIGN TODAY SAVE FUTURE

**International Conference on Energy
and Sustainable Built Environment**

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**The 1st International Conference on Energy and
Sustainable Built Environment
(ICESBE 2019)
entitled as
“DESIGN TODAY SAVE FUTURE”**

organized by
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and
Energy Technologies Application and Research Center

Istanbul Gedik University
Istanbul, 2019

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ABOUT THE CONFERENCE

Along with the development of technology, industrialization and rapid population growth have increased the energy demand. The awareness of the energy crisis has led researchers to search for new solutions and use new technologies in this area. Renewable energy has an extremely important place in energy requirement of the countries with domestic resources, reducing the external dependency, diversifying the resources and ensuring sustainable energy usage and minimizing the damages to the environment as a result of energy consumption.

Today, around 20 percent of the world's consumed energy is supply from renewable sources. Despite the high level of dependence on fossil fuels in the current situation, the use of renewable energy has been increasing steadily over the years. The conventional energy sources that already supply most of the energy demand. However, it is estimated that fossil fuels, especially petroleum, will be consumed in the next 200-300 years. In order to be able to produce solutions for this situation, it is necessary to carry out many research/development and production/development projects related to both conventional energy sources and alternative energy sources.

The built environment is one of the areas that has been presenting the highest rates of primary energy consumption worldwide. The need for a more sustainable built environment in account of reducing energy consumption and emission has become a core issue in the focus of energy and environmental debates and policies which are requiring platforms continuously to share researches and findings, innovative approaches, new technologies and methodologies.

Therefore, the 1st International Conference on Energy and Sustainable Built Environment (ICESBE 2019) entitled as "DESIGN TODAY SAVE FUTURE" is organized in order to bring together the fellow academicians, researchers, scientists, practicing architects and engineers on energy and sustainable built environment. The conference will provide this international forum for experts to present and discuss their new ideas, research results, applications and experience in the field.

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First Day (June 19, 2019)

I Chair

A Systematic Approach to Energy and Exergy Management Systems

Prof. Dr. Arif Hepbasli

Novel Green Urea Synthesis with Enhanced Efficiency Technology for a Sustainable
Intensive Agriculture

Prof. Dr. Noorhana Yahya

Exploring Multisensory Qualities of Loggia Spaces for Urban Resilience
to Climate Change

Dr. Carlos Mourao Pereira

Novel Green Urea Synthesis with Enhanced Efficiency Technology for a Sustainable Intensive Agriculture

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Abstract

Sustainable and intensification are two essential components in the current timeframe of our agricultural production system. Both elements will enable an integrated approach and solution for improved food production and environmental blue prints. Fertilizer has been the wing for agricultural production system. However, the extensive use of conventional fertilizers, particularly urea, had created environmental implications. Urea synthesis processes have been carried out at relatively high temperature (160–270 °C) and high pressure (120–250 bar). Here we propose a green urea synthesis method and enhanced efficiency fertilizer (EEF) application as an integrated sustainable solution. The novel synthesis method employs electromagnetic interaction with nanocatalyst surface. The theoretical work on adsorption of CO₂, H₂ and N₂ gasses on the surface of Fe₂O₃ (1 1 1) nanocatalysts, observed reduction of band gap by 84 %, increase of the total number of electrons by 54% and magnetic moments by 34%. Kinetic modelling predicted the effect of electromagnetics frequencies on reaction rate; the magnetic components of the EM waves contribute in the triplet conversion and hence improve catalytic performance. We subsequently develop a working reactor that enables to demonstrate facile methods for reliable production and that operates at 60 % energy reduction as compared to the conventional process. Coating techniques for slow release strategies are done to increase the efficiency of urea fertilizer application and reduce environmental blue prints. Combination of these would definitely make a great impact to the sustainability challenges.

Keywords: Urea, Sustainable Intensive Agriculture, Green Synthesis, Coating Technology

Exploring Multisensory Qualities of Loggia Spaces for Urban Resilience to Climate Change

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Abstract

This paper presents an exploratory study about multisensory perception in the use of the urban *loggia*, i.e., outdoor covered space open to one or more sides integrated in the ground level of buildings, providing public shaded walkways and living areas.

Due to current temporary occurrences of extreme intensity of ultra-violet radiation and the increasing periods of heat waves, public health risks are increasing, specifically situations of skin cancer and heart attacks as a consequence of excessive sun exposure.

Loggia spaces have the potential to generate microclimates, allowing for a shadow shelter with the advantages of passive cooling on paths of pedestrian mobility in building entrances. By reducing energy consumption for indoor temperature regulation and climatization, they contribute to mitigating and adapting buildings to climate change.

In literature, the perception of the urban *loggia* shadow spaces has been studied mainly in two different fields, thermal comfort and visual aesthetics. Exploring spaces that are inviting for all users requires a multisensory research approach, integrating the non-visual sensory modalities beyond the mentioned perception of thermal comfort.

The urban *loggia* has been mainly developed for horizontal circulation on squares, in order to allow the visual perception of geometrical compositions of building facades.

Furthermore, other sensory modalities beyond vision, such as auditory and olfactory spatial qualities, are forgotten, resulting in non-stimulating spaces to use. To make the building performance of the urban *loggia* shadow spaces more inclusive, our research is centered on integrating the diversity of people's conditions and needs, as far as possible. To this extent, we explored empirical knowledge related with the absence of sight of blind people, keeping in mind that fully sighted and partially sighted people are temporary subjected to lacks of visual attention in the use of the space. The methods used are based on qualitative research and aim to identify a diversity of spatial perceptions, in order to achieve the understanding of the complex reality in study.

We interviewed blind people of 18 nationalities, including five continents to achieve a multicultural perception about risks in their use of cities and buildings. Furthermore we conducted participant observation in the absence of sight, in cases of urban *loggias*. These case studies took place in the city centre of Lisbon, characterized by a Mediterranean climate.

The obtained results allowed to identify affordances and consequent atmospheres approaching sensory modalities beyond vision. Moreover, they allowed to identify positive and negative spatial components inherent to the urban *loggia*.

These spatial attributes, following inclusive and multisensory qualities, may contribute to empirical knowledge about how the urban *loggia* can facilitate the mitigation and adaptation of urban buildings to climate change in Portugal and other countries with similar weather conditions and vulnerabilities.

Keywords: climate change; health promotion; integrated invisibility; loggia; public space.

First Day (June 19, 2019)

II Chair

Session Chair: Prof. Dr. Nilgun Baydogan

Fabrication of CIGS Thin Film to use at Smart Grids
Prof. Dr. Nilgun Baydogan

Forced convection of nanofluid in a vented cavity with an elliptic inner adiabatic obstacle
under the influence of magnetic field
Assoc. Prof. Dr. Fatih Selimefendigil, Prof. Dr. Hakan F. Oztop

Hybrid Nano-Composite Design for Nano-Architecture
Dott. Eng. Arch. Selale Elcin Sungur, Prof. Cristina Tedeschi

Intelligent Systems Against Counterfeiting: Track & Trace System in Pharmaceutical
Industry – Implementation in Turkey as a Pioneer Project
Assist. Prof. Dr. Seda Celik Teker

Fabrication of CIGS Thin Film to use at Smart Grids

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Abstract

CuIn_{1-x}Ga_xSe₂ (CIGS) thin film has been fabricated as flexible thin film for the application at the building integrated photovoltaics. This paper introduces CIGS fabrication method by sol-gel process to obtain low-cost electricity current. This study is focused on the examinations on the key issue and the main problems in the industrialization of the flexible CIGS thin film. This study presents some suggestions from aspects of the thin film development and economical industrial fabrication. For this purpose, CIGS thin film has been derived and their structural properties have been examined as an absorber layer for the use at the flexible solar cells because of their high absorption coefficient, stability and flexibility.

Keywords: Flexible thin film, Sol-gel, CIGS

Forced Convection of Nanofluid in a Vented Cavity with an Elliptic Inner Adiabatic Obstacle under the Influence of Magnetic Field

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Abstract

In thermal engineering applications, design of energy efficient devices is important and during the last decades many active and passive techniques have been developed to control the heat transfer features encountered in practice. In one of these methods, nanotechnology was used where a small amount of nano-sized particle addition to the base fluid resulted in significant amount of the heat transfer enhancement. Use of magnetic field and inner obstacles in various thermal engineering devices also provided solutions to control convective heat transfer features. In this study forced convective heat transfer of CuO-water nanofluid in a vented cavity is numerically examined with an elliptic inner adiabatic obstacle under the effects of an inclined magnetic field. Vented cavities are import in design of ventilation systems, MEMs and many other heat transfer engineering systems. Galerkin weighted residual finite element method was used for the numerical problem. The simulations are performed for various values of Reynolds number (between 100 and 500), Hartmann number (between 0 and 40), solid nanoparticle volume fraction (between 0 and 0.04) and aspect ratio of the elliptic obstacle (between 0.002H and 0.25H). It was observed that the fluid flow and heat transfer are affected by variations of these pertinent parameters. The average heat transfer rate enhances with higher values of Reynolds number, solid particle volume fraction and aspect ratio of the elliptic obstacle. The effect is opposite for the magnetic field strength. The variation of average Nusselt number versus solid nanoparticle volume fraction shows a linear relation and different parts of the hot wall contribute differently to the overall heat transfer rate.

Keywords: MHD flow; nanofluid; finite element method; elliptic obstacle; cavity

Hybrid Nano-Composite Design for Nano-Architecture

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Abstract

The aim of this research is to create a comparison and correlation between the treatments in medicine in terms of “bone regeneration”, the treatments in architecture in terms of “nanolime consolidation effects on limestone” and the treatments of aerospace technology in terms of anti-icing nano-coatings techniques in order to prevent the effect of freeze-thaw cycles in CH buildings. The criteria to be discussed related to these issues will be the porosity and mass transport between the correlation of human bone and limestone, and anti-icing nano-coatings between the correlation of aerospace engineering techniques to adopt into preserving CH buildings against the freeze thaw cycles.

The issue will be held in 2 main steps: 1st Step: As reference to Faculty of Medicine: France; University of Orleans (Almhdie, Rozenbaum, Lespessailles, & Jennane, 2014) on bone regeneration therapy : Absorption of compatible nano-chemicals (nano-silica SiO₂, HAP<200nm particle size, CaO, Ca(OH)₂ nano-composite design) treatment to inner porous structure : limestone, in order to have mechanical strength and consolidation. 2nd Step : As reference to AIRBUS ICEPHOBIC Anti-icing Nano-Coatings Technology European Commission Project – Polytechnique Montreal Canada – Functional Coatings and Surface Engineering Laboratory (LaRFIS): Antiicing icephobic nano-coatings of the porous structure (limestone) against the problem of freeze-thaw cycles and building material deterioration on cultural heritage buildings. (coatings made of silica nanoparticles). Expected result of the 1st step nano-treatment is to gain mechanical strength and consolidation effect inside the building material , regarding as the main treatment. Then, in the 2nd step, regarding as the after treatment therapy with the anti-icing nano-coatings, the expected result will be to prevent the CH buildings against their wellknown problem of freeze thaw cycles, caused by the thermal effects and the temperature differences

between day and night, and summer-winter, especially in the regions where the humidity and rain factor are the basic factors for deterioration, caused the ice formation and the cracks inside the building material structure.

Research questions of this thesis; firstly, by using the techniques in medicine for “bone regeneration”; how to find a solution to the well-known two problems of the nanolime treatment in architecture ; reduced penetration and accumulation, whitened deposition. How to solve the problem of reduced penetration and accumulation in porous structures in order to increase the capability of their treatment efficiency ? How to solve the problem of whitened deposition in nanolime? Secondly, by using the techniques in aerospace technology, used by AIRBUS, for “anti-icing nano-coatings technology”; how to find a solution to the well-known problem of freeze-thaw cycles and ice-formation inside the building structure, that finally cause and effects the building material deterioration.

During the study, the discussion will be focus on the solutions for sustainability of nano-treatments in nanoarchitecture for future. The discussion points are; hybrid nano-composite design, “a simulation of bone regeneration in medicine”, in which ways and techniques? “HAP hydroxyapatite - SiO₂ - Ca(OH)₂” hybrid works well to solve the problem? Which hybrid nano-composite design could be the best solution? In which synthesis technique to form the hybrid nano-composites works better? Which criteria effects the efficiency? How to get a better penetration and consolidation in porous structures: “bone and limestone” ? How to avoid the back migration of nano-particles?

The idea of this research has application to patent for Politecnico di Milano POLIMI IRIS : 05.1. Brevetto & Patent Application: 2018. NANOTECHNOLOGY IN ARCHITECTURAL RESTORATION: SCIENCE & INNOVATION: Hybrid Nano - Composite Design for Consolidation of the Porous Structures : Limestone & Bone “Transport Phenomena”, ID: hdl:11311/1065405

Keywords: Nano-architecture, Nano-composite, Hybrid, Design, Sustainability.

Intelligent Systems against Counterfeiting: Track & Trace System in Pharmaceutical Industry – Implementation in Turkey as a Pioneer Project

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Abstract

This paper gives an overview from a project against counterfeiting which was implemented in Turkey for the first time in the world. Since counterfeiting is one of the major problems for manufacturers, most industries use different systems to protect their original products, income and reputation. If governments are also involved in that process, it becomes more complicated. Turkey has decided to go on track & trace system in year 2010. The first phase, production declaration, of this project was printing Data Matrix Code (DMC) on items (boxes etc.) and bundles. The second phase contains printing DMC on case/multi pack and pallets which can also be called as sales declaration. This was a pioneer action overall the world and become a benchmark for the global pharmaceutical industry.

Keywords: Track and Trace, Counterfeiting, Pharmaceutical Industry, Data Matrix Code

First Day (June 19, 2019)

III Chair

Session Chair: Assoc. Prof. Dr. Ece Ceylan Baba

Urban Conservation: Sustainable Heritage Management of the Historic Settlement of
Chanderi Madhya Pradesh, India
Assoc. Prof. Neeraja Jayan

Energy, environment and sustainable development
Assist.. Prof. Dr. Afsin Yusuf Cetinkaya

A Framework for Social Sustainability Assessment for Dense Urban
Neighbourhoods
Assoc. Prof. Shubhi Sonal, Dr. S. Kumar

Urban revival in the Context of Historical, Cultural and Spatial Sustainability: A Case
Study of Kayseri Agirnas
Ozgun Ozbudak, Prof. Dr. Feride Onal

Urban Conservation: Sustainable Heritage Management of the Historic Settlement of Chanderi, Madhya Pradesh, India

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Abstract

Chanderi is a small picturesque medieval town in Madhya Pradesh, which is located adjacent to several important historic sites such as Gwalior, Orchha and Khajuraho. Chanderi has several layers of history ranging from the Pre-historic era to Sultanate to Mughal to Bundela till the present day. The early 11th century Chanderi dominated the trade routes of Central India and was proximate to the arterial route to the ancient ports of Gujarat as well as Malwa, Mewar, Central India and the Deccan. Chanderi's turbulent history is imprinted on its monuments, which measures the cadence of its various phases. Proclaiming the grandeur of medieval empire, they are fascinating statements of the diversity of influences, the contribution of individuals and the continuity of tradition. Chanderi is among the few cities in the country where the continuity in its indigenous crafts, traditions, beliefs and skills have survived over the centuries. Weaving occupies a place of pride in Chanderi today. The weaving tradition, with its shimmering fabrics, have survived the trails of time and changing rulership. With a loom in virtually every home, weaving is literally the heartbeat of the town. The incessant beat of the warp and the weft, and *the tana and bana*, is the lifeline of Chanderi, a metaphor for the beating heart. Chanderi lies on the northern slopes of a hill. On top of this hill is the fort which dominates and overlooks the town. The spectacular views of *talaabs*(water bodies) surrounded by hills escalate the aesthetic appeal of the town.

The settlement is divided into two parts- the area within the outer fortification wall known as *Andher Shahar*(inner city) and the area outside the fortification wall known as *Bahar Shahar*(outer city). The outer city *Bahar Shahar* is currently undergoing a lot a changes due to development along the State Highway which divides the settlement into two parts. This is mainly due to limitations of space within the *Andher Shahar*. Some of the other issues faced by Chanderi is the conversion of fertile land into residential development which is affecting occupation and natural ecology. There is a rapid change in the land use which is affecting the heritage buildings such as the palace complex, *havelis*(bungalows), vernacular residences etc. due to commercial development along highways and fortification wall. Also, due to the migration to urban areas, some of the *havelis* are left unused which in turn becomes abandoned buildings. In addition to this, other major issues include ineffective maintenance of unprotected heritage buildings like *havelis* (bungalows), and *baodis* (water

tanks), inappropriate interventions, absence of people participatory approach, lack of public awareness of heritage management, change of ownership of vernacular buildings and unplanned development of Bahar Shahr.

This paper is divided into three categories, firstly it looks into the historical development of the place, secondly the analytical part, such as the analysis of different administrative bodies and their roles in heritage management, existing built heritage, circulation, community studies, housing typologies, infrastructure development, land use pattern, natural eco-system, open spaces and tourism, so as to understand the issues faced by the historic settlement and finally the proposed strategies for the heritage management of Chanderi without disturbing its historic fabric which includes traffic management plan, adaptive re-use, guidelines for future development, design strategies for weaver's housing, revitalization of traditional water bodies and revitalization of market areas.

Keywords: Revitalization, Heritage, Management, Development, Built Heritage

Energy, Environment and Sustainable Development

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Abstract

Energy is one of the most important parameters in the development of countries. On a global scale, per capita energy consumption generally indicates the level of economic development. So Energy is a key factor in efforts to achieve sustainable development. There is an organic communication between energy, the environment and sustainable development. In a sustainable system, the demand for energy needs of the existing energy resources, the damage to the environment should be considered in a common denominator. Sustainable development is a matter of many disciplines. However, energy and environmental systems play a central role. In sustainable development, the effects of energy resources on first and second order effects on environment should be examined. Through long-term potential activities for sustainable development, we can find solutions to the environmental problems. This article discusses the some solutions to current environmental problems in terms of energy saving and renewable energy technologies are the discussion of the relationships between energy and sustainable development. The relationship between energy, sustainable development, and environment are explained.

Keywords: Energy, Environment, Sustainable

A Framework for Social Sustainability Assessment for Dense Urban Neighbourhoods

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Abstract

In the western world, urbanisation is often linked to the phenomenon of urban sprawl. However, in the developing world, lack of transportation linkages and poor infrastructure in the peri urban areas makes sprawl an unattractive proposition. As urbanisation pulls more people towards our already crowded cities, it is not merely density but “high density” that has become a matter of concern. Even as researchers debate the evils of high density compact living, the cultural and socioeconomic milieu makes it an evident ground reality in Asian cities. Rising urban population coupled with inadequate infrastructure provision raises concerns regarding the Social sustainability of dense urban residential neighbourhoods. Social sustainability is a metric under the broad umbrella of Quality of life. Quality of Life itself is a very broad based concept that manifests itself in the physical, social, environmental and economic realms at the neighborhood level. In today’s urban scenario, physical infrastructure and development control guidelines usually govern the outlook of a neighborhood. However we find that there exist subtle factors which make us feel that certain neighbourhoods are better than others in the quality of life offered. The authors contend that it is the social infrastructure and social sustainability factors which lend the “*feel good*” outlook to neighbourhoods. In our quest to delineate and define these factors the authors propose the concept of “Neighborhood Social quality” as a measure of social sustainability of urban residential neighbourhoods. This paper attempts to formulate a matrix that can help in estimate, measure and compare neighborhood social quality in empirical terms. Extensive literature review, expert opinion surveys followed by statistical analysis for factor extraction and weightage allocation are used to formulate the Neighborhood Social quality matrix. The matrix generated can be a useful tool to measure, quantify and compare the neighborhood quality of an urban residential neighborhood. It can give us sound



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empirical basis for evaluating the social quality of life in an urban neighborhood even though the physical parameters may be fixed or similar to other urban neighbourhoods. To conclude, paper draws parallels between empirical construct of social sustainability and qualitative theories that exist about use and articulation of space.

Keywords: Social Sustainability, Quality of life, liveability, factor analysis, Theories of Space

Urban Revival in the Context of Historical, Cultural and Spatial Sustainability: A Case Study of Kayseri Ağırnas

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Abstract

As a result of intense urbanization and construction, historical areas in cities face the danger of deterioration and abandonment. In this case, the traditional residential pattern is the most affected in the urban pattern. At this point, the most important responsibility for the society is the protection of natural and cultural values in the historical environment. Therefore, the planning and design process should be based on sociocultural factors to ensure sustainable urban development.

Ağırnas is a town of Melikgazi district of Kayseri. Ağırnas, formerly known as Taşören (Stone+Builder), is the town where Mimar Sinan was born. With its hulls, caves and underground city ruins, Ağırnas is a settlement where life has been going on until 3000 years ago. In the city where the Hittite, Roman, Byzantine and Ottoman works are together, a pattern can be observed where there are places created by carving the rocks as an underground city and where many entrances can be found at different points within the city. The most important building material in the town is also the stone building material that forms the pattern of the area. Stone houses lined up on narrow streets covered with local stones, and sometimes the squares formed by expanding these streets form the urban pattern of the town.

The town has survived to the present day with its Christian and Muslim population living together, churches, fountains, underground settlements and urban pattern with a high density of stone materials. Since the economic



situation of the local people is not suitable for repairing the registered structures, it can be observed as an area where the ruins are dense.

These concepts were studied in Kayseri Ağırnas. In the study, on-site investigations were made and suggestions were made to revitalize this area and to be sustainable in spatial, cultural and historical context. The aim of this study is to compile and analyze the suggestions and to contribute to the following studies.

Keywords: Kayseri, Ağırnas, Sustainability, Urban Revival, Urban Design

First Day (June 19, 2019)

IV Chair

Session Chair: Prof. Dr. Beril Tugrul

Energy Relation With Sustainable Development

Prof. Dr. Beril Tugrul

Integrated Water Management and its Challenges in Urban and Water Basin Scales

Sahar Pouya

Energy Relation with Sustainable Development

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Abstract

Energy is an essential for developing of the countries and demand of energy is increasing in huge amount in the present time. Fossil fuels have dominant energy sources in producing of the energy that cause the greenhouse effects widely. In this circumstances, concept of sustainable development comes in forward and some prevention must be improved immediately. Therefore sustainable energy that is energy solutions that address development issues related to economic growth, environment and social equity simultaneously is vital for our earth. Energy and sustainability are explained in detail. Some actions related with energy for sustainable development clarified by main lines.

Keywords: energy ;sustainability, sustainable development

Integrated Water Management and its Challenges in Urban and Water Basin Scales

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Abstract

Water management has been a challenge in terms of sustainability and administration. With increasing critiques from 1975 on traditional central water management, a new paradigm of water management named “Integrated Water Management” has emerged based on the sustainability principles. Implementation of Integrated water management has been discussed in various researches in the world. Even though there are some noticeable achievements in some executed cases of integrated water management, the concept is still unclear and complex in so many aspects. This research aims to provide a wide review of the concept, its implication, and related aspects. The main question of this work is how the approach has contributed to water sustainability in urban and regional areas. Therefore, the implication of integrated water management in both urban water and water basin scales are evaluated and compared. In this way, a summary of the main techniques and principles performed in the real practices of integrated water management are provided. In conclusion, the disconnection between two water basin and urban water management is criticized. It emphasizes on the need for comprehensive water management which considers various administrative scales of water management.

Keywords: water basin; urban water systems; integrated water management

Second Day (June 20, 2019)

A/I Chair

Session Chair: Prof. Dr. Luis Miguel Moreira Pinto

Urban Sensitivity Emotions and Technology

Prof. Dr. Luis Miguel Moreira Pinto

Nano-Century & Nano-World: Dreams and Limits of Nano-Architecture

Dott. Eng. Arch.Selale Elcin Sungur, Prof. Cristina Tedeschi

Urban Gardens as Locus of Social-Ecological Memory: The Case of Kuzguncuk and
Yedikule Bostans
Tugce Gurleyen

Urban Sensitivity: Emotions and Technology

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Abstract

The propose of this article is to illustrate how the use of tangible technological issues, like internet or mobile applications, for example and the intangible use of colors and shapes meaning will improve citizens mood and the immaterial value of a specific place. Over the years, the street has been understood as a place where buildings just line up. The street has measures and dimensions, those we can find on the building's shapes, or in the streets. When we walk our perception of reality is helping us to understand the space around us, and our emotions alters our perception, and at the same time we can interact with equipment's, like mobile applications, that will help and give us information's about issues of the place. For example: hotels, shops, hospitals, restaurants, etc. Those APP's, usually, interact in real time with traffic movement information's, or the best way to go to a specific place. For one side citizens are each time more and more used and sometimes addicted to the urban technology and mobile applications, it seems that no one can live without it. For one other side people developed specific feelings, according them cultural and individual emotions, because of

surrounding shapes and colors from the street or buildings. Along our research we developed workshops with children and with adults, but separately, to find the mood meaning about colors and shapes. With these results we started the process to draw a mobile application that will show us the percentage of good mood from a specific place. As a conclusion we believe that with the use of this application we can offer a new perspective about the meaning of the place, improving the value of the street or of the building, in terms of real estate value.

Keywords: Architecture, Technology, App, Colors, Perception

Nano-Century & Nano-World: Dreams and Limits of Nano-Architecture

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Engineering, Architecture and Medicine are the concepts that exist since the human being has been created in the world, arise regularly in response to human needs health, practice and living. Nevertheless, do we ever consider before the correlation between nano-engineering, nano-architecture and nano-medicine in terms of the nanostructured solutions that scientists discover worldwide in an interdisciplinary platform, getting advance rapidly.

Untill 2000s, the most inventive revolution was industrial revolution that hit the headlines during 18., 19. century, based on steel and its innovations. However, today the scienceworld consider and discuss for nanotech as a contemporary intelligence that will be expected to be the world leader forever. So, what are the dreams and what are the limitations for this new nano-world, how efficient are the results, how much repetitive, what is the criteria for the success and what must be the standarts?

The aim of this research welcomes all the scientists to a new dimension of the nanotech world to discuss for all the affects, critics and drawbacks of nanoscience. What are our concerns, how safe it is, what can be the further risks that we have to face in terms of the health concerns on human and environmental concerns on nature. The size nano has a big question that disorient our minds which is hardly possible to guess all the affects without experiencing the drawbacks. Therefore, the question is; how it could be possible to get precautions against toxicity and how to make a balance to adopt to a new high tech world of nano-architecture? On the other and, what makes nano-tech so innovative and what creates the magic? How qantum theory and nano-particle kinetics concepts manage to amaze nanoscientists with its innovations and extraordinary outcomes? Is it possible to create shortcut solutions between the results that has been achieved in nano-medicine to nano-architecture? How the theory and application procedure of nano-tech can be parallel to multiple solution concepts? How sustainable are these solutions? With all the great intelligence of nano-world, how it is possible



to enhance the quality standards of high tech buildings and constructions, how this new findings affects the mechanical strength, structural configuration and construction technology.

During this research, the answers of all these questions will be criticized with all aspects. So, a standardization methodology will be created about the way how we need to adopt the needs, norms and regulations of nanotechnology will be evaluated. Evaluation of efficiency (EE) and success parameters will be examined that will result to understand the limits and the advantages of nano-treatments, with the drawbacks and risks as well. The idea of this research has application to patent for Politecnico di Milano POLIMI IRIS : 05.1. Brevetto & Patent Application: 2018. Nanotechnology In Architectural Restoration: Science & Innovation: Hybrid Nano - Composite Design for Consolidation of the Porous Structures : Limestone & Bone “Transport Phenomena”, ID: hdl:11311/1065405

Keywords: Nano-architecture, Efficiency, Stability, Standardization, Sustainability

Urban Gardens as Locus of Social-Ecological Memory: The Case of Kuzguncuk and Yedikule Bostans

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Abstract

Local ecological knowledge, experience and associated practice are essential to enhance human ecosystems and their managements in the broader urban context. Green open areas including fertile agricultural lands, city orchards, hobby gardens, arable field and cultivated urban lots foster societal and psychological benefits to human societies beyond their explicit environmental, ecological and economic value. Community or allotment gardens at the interface of the urban and rural are retained and transmitted by cultural practices, oral communication, collective rituals and habits as well as ecological and economic worth such as learning local knowledge about gardening and food cultivation, improving interaction with soil, helping physical and mental health, sustaining natural diversity, supporting the local economies in terms of agricultural production and meeting the food requirements for a sustainable future emerge. These gardens where participation and reification interact and social–ecological memory is a shared source of resilience of the community carry experiences of practice. However, cultural sustainability and social inclusion in urban gardens of İstanbul have been challenged by economic development into recent changing urban environments. The unrestrainable expansion of urban growth reduces the relationship between people and nature, decreases the green open areas and damages the agricultural production. Hence, it increases environmental amnesia among city dwellers that do not experience nature regularly. In this context, ecosystem management of significant landscapes within the urban areas has become a critical issue recently. Sustainable conservation of cultural and natural heritage has been a major task for local authorities. The aim of this paper is to identify framework of social-ecological memory favoring the production of ecosystem services in urban garden and to shed new light on the perspective and management of urban gardens in terms of sustainable policy decisions and conservation politics. The present study emphasizes both destruction on the Yedikule Urban Gardens and development on Kuzguncuk and Roma Urban Gardens which can maintain their presence with external support through various forms of social networks, collaborative organizations and local structures. It focuses social-ecological memory of urban gardens which is a crucial subset of human ecosystems providing sources of resilience to deal with rapidly changing urban dynamics. The methodology of this research consists of a field study for learning about the destruction and development of allotment gardening; a survey for identifying key factors of social and cultural sustainability and their management practices with guidance form literature about social-ecological memory. The main proposals for the policy makers and urban planners claim that urban gardens should be sustained to future within their historical contexts, physical infrastructures and social networks through civic participation and collective production.

Keywords: human ecosystem, social-ecology memory, urban garden, Kuzguncuk

Second Day (June 20, 2019)

B/I Chair

Session Chair: Asst. Prof. Dr. Devrim Aydin

Advances in Thermochemical heat storage materials and processes for low carbon buildings: Challenges, opportunities and future directions

Asst. Prof. Dr. Devrim Aydin

Sustainability of Modern Architectural Heritage: TBMM Mosque Complex

Assoc. Prof. Dr.Şengül Yalçinkaya, Assoc. Prof. Dr. Funda Kurak Açıcı

A Sustainable Model: From House to Museum

Assoc. Prof. Dr. Funda Kurak Acici, Assoc. Prof. Dr. Sengul Yalcinkaya

A Different Approach to Representation: Trabzon 'Tekel' Cigarette Factory

Yusuf Bera Bilici, Prof. Dr. Aysu Akalın

Sustainability of Modern Architectural Heritage: TBMM Mosque Complex

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Abstract

The architectural heritage of the Republican era, which began to emerge after the 1930s, contains many values such as architects, high-quality design products, technology and materials used, artistic and memorial values, their role in society and their contributions to urban life. However, this cultural heritage is in danger of extinction. Rapid population growth, urbanization, globalization and consumption have changed the physical urban space and disrupted the existing urban fabric. Cities are today faced with high and intense construction pressure. Therefore, they are resembling each other and losing their unique identity. In this process, cities are losing important buildings, especially the examples of modern architecture. This is due to the lack of adequate legal regulations for the preservation of modern architectural heritage and general lack of awareness about that heritage.

The aim of this study is to draw attention to the architectural heritage of the Republican era. The study addresses, first, the general information about the architectural works of the Republican era and then the debates on the subject. To analyze the problems faced by this building group, the study focuses on the TBMM Mosque Complex in Ankara which is one of the most important works of 20th century architecture in Turkey and deregistered and under the threat of destruction today. The Complex was the work of choice in this study because it has a unique design and won the Aga Khan Award for Architecture in 1995. Its design is proportional, modest and contemporary. Having opened in 1990, the Complex has an innovative and unique structural design. Although mosques are widely used, only a limited number of innovative interpretations and approaches are used in their designs. Therefore, the TBMM Mosque Complex is important. The study points out the similarities and differences of the design of the Complex with those of other mosques, which were the main topic of conversation when they were built, in order to highlight the contribution of the Complex to the



Turkish architecture, to draw attention to its values and to answer the question of why it should be preserved. The Complex has a unique and qualified design in terms of its understanding, style, typology and designer as it bears the architectural style of the period in which was built. It is important that historic buildings continue their existence in urban life not only because of their physical properties but also because of the traces that they bear, the events that they have witnessed and many characteristics that they have. The sustainability of such historic buildings should be ensured as they are important means of passing down historic traces to the future generations and of constructing and advancing collective memory.

Keywords: Sustainability, Conservation, Republican Era, Architecture, Place of Worship, Mosque

A Sustainable Model: From House to Museum

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Abstract

Some historic buildings stand the test of time and bear the traces of sociocultural transformations that they have witnessed since they were built. Cultural diversity resonates with the textures lived in and architectural styles discovered. History arises out of the stratification of knowledge accumulated throughout centuries. History provides evidence for all periods and bridges the past, present and future. Architecture is the concrete representation of history. Therefore, historic buildings reflecting unique architectural characteristics and projecting the identity of a geography, country or city should be preserved and passed down to the future generations. Therefore, the sustainability of historic buildings is of paramount importance. What makes a city sustainable is its ability to pass down its historical and cultural values that it has accumulated throughout history to the future generations. This makes the concept of sustainable architecture of great importance. One issue that sustainable architecture is concerned with is the sustainability and conservation of historic buildings with their architectural characteristics intact.

Historic buildings that have lost their function and been in disuse can be refunctionalized. Refunctionalization not only preserves the historical value of buildings but also makes social, cultural and economic contributions to the regions in which those buildings are located. Especially houses, which are examples of civil architecture, are abandoned due to the fact that they fail to meet the comfort standards of users, require frequent maintenance or get old. The refunctionalization of historic buildings and their reintegration into urban life benefit both the city and people living there. Historic buildings can be refunctionalized in various ways, one of which is turning them into museums. Museums maintain the history and identity of cities and pass down knowledge to the future generations. The refunctionalization of historic buildings as museums also brings the quality of museums to those buildings. This study addresses the reutilization of historic buildings through refunctionalization, which is a method of sustainable architecture. Some refunctionalized houses across Turkey/Istanbul were used in this



study as examples of civil architecture to discuss the sustainability of historical buildings. The aim of this study is to propose a sustainable model within the context of buildings transformed from houses to museums through refunctionalization. This model will allow houses to assume new functions in society and be reintroduced into urban life.

Keywords: sustainability; civil architecture; refunctionalizing; house; museum

A Different Approach to Representation: Trabzon ‘Tekel’ Cigarette Factory

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Abstract

Although industrial buildings are important indicators of a country's socio-economic history, they often lose their functions due to rapid technological developments. These buildings are generally built for practical and functional use and as time goes by, they gain representation character as a reference of the development of technology together with the time they witnessed, in other words, the place and time they belong. These industrial buildings in the state of industrial heritage, give us the feeling of the place of the period they are in, and even if time passes, they maintain a reference in our relationship with that place as a proof of industrial developments, in the collective memory of societies. These buildings are special places that include details of our origins and historical background with their forms, characteristics and usage histories. According to Maurice Halbwachs, the collective memory is that individuals that form a group or community of people having a collective image, and becoming aware of their own unity and originality through this image. The sustainability of this memory is closely related to intergenerational communication [1]. With this approach in mind, the main subject of this article discussed is Trabzon Tekel Tobacco Factory which is built in two stages between the years 1951 to 1965 that is an industrial heritage and an important element of collective memory. According to the documents its function has been terminated in the 1990s but wanted to be revived in 2006 with a competition project in order to sustain the collective memory of people who had worked in it and has been experiencing around it. However, as a result of the ‘flexible approaches’ of the Conservation Board and the jury members during the competition and implementation phase, the building was completely demolished and rebuilt.

As a method, the historical background of the building in question has been revealed through archive documents, and the approaches of the Conservation Board and the Municipality on the sustainability of the building have been tried to be understood from the reports. Interviews have been held with the first prize winner and the individuals using the present building to understand the whole process much better. As understood since the beginning the main approach of the Conservation Board and the jury members to the project has been basically not based on the conservation of the whole in a holistic approach. In fact during the application of the project awarded the whole historical heritage was demolished despite all conservation decisions taken and approved by all sides at the beginning. Regarding the project applied, one part of the building is applied without any reference to the previous one that is Municipal Service Building in the north. The other part that is the shopping mall in the south end seems to get reference from what is in the memory of the city but it is a reconstruction as an exact copy of the previous. To conclude by emphasizing Alois Riegl's 'antiquity value', in a world which we tend to create by destroying, it is expressed that we cannot ensure the sustainability of collective memory by demolishing the original and later building the exact copy of it at the same place or in another place.

Keywords: Trabzon Tekel Tobacco Factory, Urban Memory, Collective Memory, Adaptive Reuse, Antiquity Value.

Second Day (June 20, 2019)

C/I Chair

Session Chair: Asst. Prof. Dr. Mert Tolon

Investigation of the Use of Solar Energy Systems in Sustainable Buildings with Artificial
Neural Networks Method

Assist. Prof. Dr. Mert Tolon, Arif Karabuga, Assist. Prof. Dr. Utku Canci Matur, Prof.
Dr. Zafer Utlu

Assessment of thermal energy storage system during charging cycles of advanced exergy
analysis

Arif Karabuga, Prof. Dr. Zafer Utlu, Assist. Prof. Dr. Devrim Aydin, Prof. Dr. Saffa
Riffat

Investigation of Availability of Parabolic Solar Collector Storage System in Local Heating.

Assist. Gamze Soy Turk, Prof. Dr. Ahmet Kabul, Prof. Dr. Resat Selbas

Investigation of the Availability of Electricity, Heating And Cooling Requirements of a House
with a Parabolic Solar Collector System

Assist. Serpil Celik Toker, Prof. Dr. Resat Selbas, Prof. Dr. Ahmet Kabul

Investigation of the Use of Solar Energy Systems in Sustainable Buildings with Artificial Neural Networks Method

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Abstract

Along with the development of technology, the increase in energy demand has increased the interest in energy sources. There are two kind of energy sources conventional and alternative energy sources. Conventional energy sources that already supply most of the energy demand however it is estimated that fossil fuels, especially petroleum, will be consumed in the next 200-300 years and increase the level of chlorofluorocarbons (CFC). Alternative energy has an extremely important place in energy requirement of the countries with domestic resources, reducing the external dependency, diversifying the resources and ensuring sustainable energy usage and minimizing the damages to the environment as a result of energy consumption.

Environmental and energy-related problems that arise due to urbanization with each passing day require the use of renewable energy sources and environmentally friendly structures at a local, regional and global scale. In this sense, Sustainable Buildings are considering ecological, economic and social aspects by a comprehensive concept. The main aim is to decrease the energy maintenance costs, waste, and pollution. Sustainable buildings also aim to increase the efficiency and suitability of the construction materials, the durability of the structure and its components and using the energy in an efficient way.

In this sense, the use of energy is the main parameter. The Solar systems belong to alternative energy sources are systems that convert photon energy into electrical and/or thermal energy through solar energy conversion. The solar system is environmentally friendly and good candidate for the innovative researches for alternative energies. There are different solar thermal technologies can be used in buildings and industrial sectors. These are divided into two as focused and non-focused systems. The Linear Fresnel Reflector (LFR) is a focused solar thermal system. Nowadays, sustainable engineering approaches are used to increase the efficiency of all engineering research areas. Therefore, it can be seen from the thermodynamic literature that the Artificial Neural Network (ANN) model is effectively used to predict different energy efficiency problems. In this study an experimental study has been performed on PV system and modeling using artificial neural network by using fresnel data. An artificial neuron network (ANN) is a computational model based on the structure and functions of biological neural networks. Information that flows through the network affects the structure of the ANN because a neural network changes and learns, in a sense - based on that inputs and outputs. The ANN method can define complex non-linear relationships between input and output data sets. This study presents a new procedure for defining the structure and parameters of ANN models that are hidden layer feeding and show the potential of these models for thermodynamic values.

This ANN is trained by using temperature, pressure, enthalpy and entropy as inputs. The results obtained from the method are also compared to the input–output model predictions with good accuracy. In this paper, a comparison was made by developing a model based on an artificial neural network (ANN), and a model based on thermodynamic principles as to control and to predict the solar energy and the exergy efficiency of the system by applying different types of neural network architecture (back propagation, general regression, etc.). Finally, results have been obtained which shows that the use of artificial neural networks in estimations is appropriate for energy efficiency.

Keywords: Sustainability, Sustainable buildings, Sustainable engineering approach, Thermodynamic analysis, Artificial neural networks.

Assessment of a thermochemical energy storage system during charging cycles through advanced exergy analysis

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Abstract

The using solar energy-assisted thermal energy storage systems a rising trend in recent years. The use of solar energy based heat storage systems in domestic heating systems is important in terms of environmental and economics. This paper presents a thermodynamic investigation on heat thermal energy storage system during charging cycles system with advanced exergy analysis. By splitting the advanced exergy destruction into endogenous/exogenous and unavoidable/avoidable parts. The results indicate that the Linear Fresnel Reflector (LFR) is largest exergy destruction as 1.736 kW. When the exergy destruction of the LFR system is examined in detail, it is shown that the greatest exergy destruction is avoidable exergy destruction as 1.382 kW. Moreover, when the advanced exergy analysis results of reactor component are investigated largest exergy destruction is determined unavoidable exergy destruction as 0.1327 kW. This result is showed that approximately 20% of the total exergy destruction in the reactor during charging can be prevented.

Keywords: Advanced exergy analysis, Heat storage system, Linear Fresnel reflector

Investigation of Availability of Parabolic Solar Collector Storage System in Local Heating

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Abstract

In this study, it is aimed to become continuous solar energy which is an intermittent and fluctuating energy source by heating an average of 100 m² house in Isparta province with solar storage system. For this purpose, collector design has been done according to January, where the heating need is highest, considering the parameters such as ambient temperature, wind speed and radiation intensity. It was decided to use sodium acetate trihydrate considering the physical and chemical properties, cost and availability of phase change agent for the choice of phase change agent to be used for the designed system. As a result of the calculations, 8 parabolic solar collectors and 1171 kg sodium acetate trihydrate were needed to meet the heating needs. Since the designed system is designed to meet the January most of the heating needs, it meets all of the heating needs in other months.

Keywords: Solar energy, parabolic trough collector, phase change materials (PCM), energy storage, sodium acetate trihydrate.

Investigation of the Availability of Electricity, Heating And Cooling Requirements of a House with a Parabolic Solar Collector System

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Abstract

The worldwide energy demands are increasing gradually. Most of the world energy was provided by fossil fuels, such as coal, oil and natural gas. These fuels have negative effects on environmental and their use is not sustainable. With latest technological development in renewable energy, utilization of solar energy has become important in many system and applications. Parabolic trough solar collector technology is considered the most founded solar thermal technology for power generation. To use this renewable energy; Organic Rankine Cycle (ORC) is a promising technology. In this study, the feasibility of electricity, heating and cooling needs of a house was investigated by using parabolic solar collector. Solar energy, one of the renewable energy sources, is collected by the parabolic solar collector. The collected heat is transferred to the ORC system using a heat exchanger and mechanical power is generated. The heat from the condenser part of the system is sent to the

heating system in winter to meet the heating needs of the house; in summer, the heat is sent to the cooling system to meet the cooling needs of the house. According to the results, it was seen that the cogeneration system could meet all electricity needs between April and September. It was found that the cogeneration system could be met by 26%, 41%, 81%, 78%, 40% and 24% respectively in January, February, March, October, November and December. The heating requirement can be met by 45% in January and 48% in December, while it can be met by 100% in all other months. It has been calculated that all cooling needs can be met in all months except August.

Keywords: Parabolic Solar Collector, Organic Rankine, Energy, Cooling.

Second Day (June 20, 2019)

A/II Chair

Session Chair: Asst. Prof. Dr. Melik Ziya Yakut

Energy Efficient Building Design Model
Assist. Prof. Dr. Melik Ziya Yakut, Sinem Esen

Investigation of CO₂ Concentration, Occupancy and Window Opening Behaviour In
University Classes
Nurdan Yıldırım, Elif Gundogdu, Assist. Prof. Dr. Ilker Kahraman

Determination of Thermal Comfort Conditions of An Educational Building in Temperate -
Humid Climate
Ferhan Hasmaden, Fatma Zoroglu Caglar, Ahmet Bircan Atmaca, Prof. Dr. Gülay
Zorer Gedik

Leveraging Energy Efficient Construction Delivery in Turkey by Introduction of Building
Information Modelling Practices
Yasemin Somuncu, Nil Kutlar

Energy Efficient Building Design Model, Hot-Humid Climate Type Application Example

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Abstract

The fact that almost half of the energy consumption is due to buildings and the global energy bottleneck makes energy efficient design in the building sector increasingly important. To this end, the energy analysis process is incorporating into the early stages of the design process with increasing regulations all over the world.

In this study, through design the building in line with the energy-efficient design parameters at the early design stage and to integrate energy-efficient systems into the building at this stage was determined the saving rate providing in the amount of energy consumption. Within the scope of the model, a reference building has been established to compare the energy-efficient alternative and the energy consumption amounts. Different alternatives of the parameters affecting the energy performance of the building were evaluated through the reference building. Energy-efficient building has been created by creating a combination that minimizes energy consumption among these alternatives. In the modeling, only the most influential of many parameters were examined and had to be studied by acting with program restrictions. Autodesk Revit, the BIM software, was used in the modeling process. The model was transferred to Green Building Studio-GBS for the analyzes of energy performance and evaluation of design alternatives. In this way, the model is included in the BEM process.

As a result of energy performance analyzes, according to the reference building with the implementation of energy efficient design decisions; electricity consumption and fuel consumption improved by %56.7 and



%89, respectively. These results show that the energy-efficient building designed according to the climate type can provide considerable energy savings during the life cycle in the amount of energy consumption.

Keywords: Energy efficient building, Energy efficient building design parameters, Energy efficient systems, BIM, BEM.

Investigation of CO₂ Concentration, Occupancy and Window Opening Behaviour in University Classes

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Abstract

People spend approximately 90 percent of their lives in indoor spaces according to various literature. Indoor air quality is effecting concentration and memory, which affects efficient learning. University lecture rooms are can be described as temples of knowledge. In this case indoor environmental quality (IEQ) issues (which affects efficient learning) has been investigated. The aim of this paper is to understand the relation between human behavior for window opening related with temperature and/or CO₂ level. To do so paper first focuses on relationship between indoor environmental quality (IEQ) issues and learning performance. Secondly shows the real case scenario in two lectures rooms of Yaşar University. This study shows the relationship between occupancy, CO₂ level and temperature in lecture rooms of a university building. Although more than two lecture rooms are investigated only the result of two rooms for two months has been used for this paper. Collected data (with the help of different devices, which were



attached to classes) has been reviewed and evaluated. Obtained results proved a correlation between levels of CO₂ concentration, occupancy and window opening behaviour.

Keywords: indoor air quality; CO₂; occupancy behavior; university, window opening

Determination of Thermal Comfort Conditions of An Educational Building in Temperate - Humid Climate

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Abstract

The comfort conditions of indoor environments should be appropriate to maintain healthy and comfortable living and to be more productive working. Acceptable thermal comfort of the educational buildings will increase the efficiency of the occupants. In the scope of the study, three classrooms in different facades, sizes and heights were determined in a faculty building, in order to check the suitability of thermal comfort conditions of educational buildings. Measurements and surveys were carried out in the determined classrooms during a day in heating period. The body is one of the important parameter that affect thermal comfort conditions. The temperature of the indoor environment varies according to the number of people in the environment due to heat generated within the body, namely metabolic rate. Therefore, the field measurements were repeated in case the classrooms were full and empty. The results of the survey were analyzed and compared with the measurement

results. The thermal comfort conditions of the classrooms were evaluated according to the specified levels in the standards.

In the results of the measurement, it was determined that the classrooms were more comfortable when empty compared to their fullness. It is determined that the occupants are not satisfied with the thermal situation, but in general the environment allows the course to be understood and focused. It has been determined that the thermal comfort conditions vary according to the directions, volume dimensions and locations of the classrooms. In order to ensure thermal comfort, design parameters such as; the building layout, orientation, building form, internal planning and optical - thermophysical properties of building envelope should be determined properly. In addition, indoor air conditioning should be done according to occupant density and these design parameters. In this way, while providing thermal comfort, energy consumption will be reduced.

Keywords: Thermal Comfort, PMV – PPD, Educational Building, Classroom, Temperate - Humid Climate

Leveraging Energy Efficient Construction Delivery in Turkey by Introduction of Building Information Modelling Practices

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Abstract

Building Information Modelling (BIM) is the most established tool that connects the process of design, construction, and operation and maintenance of buildings over their life cycle. Despite its economic, environmental and social benefits, its application in the construction sector in Turkey has not been widespread and ceased to be used from the practice eventually. The aim of this paper is to propose a specific and comprehensive solution to retrieve the practice back into the sector by increasing the practicality and userfriendly approaches of BIM between stakeholders in the Turkish market, including designers, builders, material suppliers, municipalities, owners and end-user of buildings. Furthermore, energy modelling contribution throughout the process will be included in order to achieve the next generation energy efficient building management methodology for Turkey. First of all, the reasons behind the failure in the establishment and dissemination of BIM in the Turkish construction sector will be analyzed, afterwards a roadmap will be suggested for the envisaged transformation in which energy efficiency practices are included.

Keywords: Building Information Modelling; Turkish Construction Market; Designers; Contractors, End-Users.

Second Day (June 20, 2019)

B/II Chair

Session Chair: Assoc. Prof. Dr. Goksenin Inalhan

The Future We Want/Sustainable Cities and Communities: Creating Age Friendly
Environments and Services in an Aging Rural Society
Assoc. Prof. Dr. Goksenin Inalhan

Soundscape in Landscape Design
Assist. Prof. Dr. Sima Pouya

An Investigation on Safety in the Context of Urban Sustainability: Dead Ends
Mine Batal, Gulendam Ulusoy

As a Sustainable City Model, Eco-City Proposal
Ismet Akinci, Assist. Prof. Dr. Sima Pouya, Prof. Dr. Bulent Yilmaz

The Future We Want"/Sustainable Cities and Communities: Creating Age Friendly Environments and Services in an Aging Rural Community

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Abstract

By 2050, the world's population of people over the age of 60 will double. This demographic change has strong implications for sustainable development. The ageing issue which is generally approached as a demographical problem requires paying attention to the urban dynamics such as diversifying local services and different social policies and generalize them, care services for elderly people and their living an active life in a place.

However, environments play a key role in determining our physical and mental capacity across a person's life course and into older age and also how well we adjust to loss of function and other forms of adversity that we may experience at different stages of life, and in particular in later years. Both older people and the environments in which they live are diverse, dynamic and changing. In interaction with each other they hold incredible potential for enabling or constraining Healthy Ageing.

In 2015, UN's the Sustainable Development Goals (SDGs) set 17 objectives that seek to make the world a better place for everyone by 2030. In line with the SDGs, the global strategy and action plan on ageing and health listed five key strategic objectives on which we need to take action in order to improve the ability of older people. Cities, communities and other human settlements are important to enabling people to live long and healthy lives.

Age-friendly environments are defined by being free from physical and social barriers, and are supported by policies, systems, services, products, and technologies that:

- promote health, and build and maintain physical and mental capacity across the life-course; and
- enable people, even when experiencing capacity loss, to continue to do the things they value.

In doing so, age-friendly cities and communities:

- recognize the wide range of capacities and resources among olderpeople;
- anticipate and respond flexibly to ageing-related needs and preferences;
- respect older people's decisions and lifestylechoices;
- reduce inequities;

- protect those who are most vulnerable; and
- promote older people's inclusion in and contribution to all areas of community life.

Age-friendly cities and communities are environments that allow all people to maximize their capacity and their ability across the life course. Creating environments that are truly age friendly requires action in many sectors such as health, long-term care, transport, housing, labour, social protection, information and communication and by many actors such as government, service providers, civil society, older people and their organizations, families and friends. Working to create cities and communities that are sustainable and accessible to all requires a process across the life course that progressively improves the fit between people's needs and the environments in which they live (WHO, Healthy Ageing and the Sustainable Development Goals Report, 2018). Helping cities and communities everywhere to become age-friendly is critical if we want to achieve the SDGs and the Global Strategy.

In Turkey whose population is also rapidly getting old, when services are presented to elderly people and the inadequacies in the substructure are taken into consideration, ageing studies have never been a current issue or have been prioritized neither by the academy and NGOs nor central and local authorities. In this regard, NGORW Istanbul has supported age and ageing studies both at academic and implementation level. In collaboration with the Gerontology Department of Akdeniz University, "Age-Friendly Environment Project" has been being carried out with an aim for transforming living spaces in an ageing society. As a result of the studies carried out in Gökbük village in Antalya province, Fenike Town, dementia-friendly environment assessment tool has been developed. Later stages of the study an opportunity has arisen to collaborate with ITU Department of Architecture, to transform the lives of elderly and researchers in the rural society to design AGE-LAB. The results obtained from these projects which brings academics from different disciplines, local and central authority representatives together are aimed to be implemented in local authorities and generalized. Implementing the global strategy and action plan on ageing and health will contribute to the realisation of the Sustainable Development Goals which were developed to secure "The Future We Want" for present and future generations. By making cities and communities age-friendly, we ensure that cities and communities are inclusive and equitable places that leave no one behind – especially the most fragile older people. Equitable societies, in turn, have benefits for everyone.

Keywords: Age Friendly Environments, Sustainable Development, AGE-LAB, Healthy Aging

Soundscape in Landscape Design

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Abstract

Densely populated urban cities are often associated with the increase in traffic that leads to noise pollution. One of the major contributions to noise emanates from the transportation sector. With the regeneration of city centers, urban open spaces are reconceptualized with the new 'urbanity'. Organizers of nature studies often find listening activities to be a good way of calming people and tuning them in to their environment. Children often need to be encouraged to listen to sounds, especially to more subtle ones. Consider both sounds that occur naturally and those that can be activated by people. Soundscape design, it considering environmental noise as a source, it can be the most effective method of urban design and planning process. The aim of this paper is to introduce a soundscape approach to urban design development and in it, a specific strategy for paying attention to the city's soundscape in metropolitan Turkey is presented. This article presented a framework for urban soundscape design that can be used to identify cities. In the present article, it was introduced a strategy for changing soundscape of the metropolitan areas of Turkey. Soundscape in urban open spaces is not just a noise control issue or sound issue, but also should be considered different aspects such as acoustics, social features, different demographics and characteristics of users, and environmental conditions. The conclusion of this article is that soundscape design, a critical part of the planning process for sustainable cities, is supposed to be a pleasant place to live.

Keywords: Soundscape design; urban planning; sound

An Investigation on Safety in the Context of Urban Sustainability: Dead Ends

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Abstract

Dead end streets have been created for purposes such as privacy and war strategy in traditional cities. These streets are closed to interaction due to their plan typology. The neighborhood culture continued as a result of being closed to interaction. The dead-end streets were evaluated for safe, social interaction places.

On the other hand, it has been criticized in terms of the lack of security and preventing accessibility due to the high level of privacy, low circulation and lack of vitality in the evening.

The aim of this study is to investigate the concept of security by examining the streets in terms of urban and social sustainability and to investigate to whether the fact that a street is a dead end is sufficient to describe it as safe.

In this study, security, urban and social sustainability concepts were examined in the first stage. In the second stage, the process of formation of dead end streets in urban planning, usage purposes throughout the history and plan typologies are mentioned. and the third stage, the social and cultural dimensions of dead-end streets were emphasized. The contributions to neighborhood relations, the potential for social space formation, the unifying and discriminating role in social dimension and their impact on security were examined. As a fourth stage, in this study, the rate of crime in dead end streets has been evaluated by two different research methods: Space Syntax and crime map investigations. The security level of the dead end streets was tested by using Space Syntax method which evaluates the urban spaces by taking social, economic and perceptual factors into consideration. In addition, in order to test crime rates and crime types in different areas, a crime map was used as a manipulation and processing of spatially referenced crime data to be visually shown in an output that provides information to a particular user. In the light of these evaluations as a result, it can be concluded that a street is a dead end is not



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sufficient to describe it as safe and that other parameters have also been found to be effective in defining dead end streets as safe.

Keywords—sustainability, dead ends, crime, security, blind alley.

As a Sustainable City Model, Eco-City Proposal

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Abstract

Recently, the concept of eco-city has emerged in order to create cities that produce their own energy and respect the nature. The concept of eco-city is the urban design and application approach in which are discussed within the relation and interaction of city and the environment with each other. Eco city designs; Sustainable principles such as the use of renewable energy resources, minimum waste generation, recycling material use, biodiversity conservation, minimizing carbon footprint, preventing air pollution, preventing the formation of an urban heat island and reducing the impact of the city on the environment are taken into account. With this approach, the functions of the ecosystem can be maintained in a healthy way and the quality of life of the people will be improved.

Although some local administrations and city dwellers adopt the concept of eco-city because of the population of millions of present-day cities, the implementation process is suspended due to the cost of the implementation process and the lack of communication and cooperation between institutions and organizations. With the increasing population, the environmental problems of the rapidly growing cities will have more serious devastating effects in the future. Therefore, before it is too late, eco-city principles should be accepted as a necessity in order to achieve targeted eco-urban designs.

Keywords: Eco-city, Sustainable City, Urbanization, Urban Design, Environment and Nature

Second Day (June 20, 2019)

C/II Chair

Session Chair: Asst. Prof. Dr. Bulent Imamoglu

Investigation of the Cooling Performance of the Thermoelectric Modules for Mobile
Cooling System
Bahadır Bozkurt, Assoc. Prof. Dr. Savaş Dilibal, Assist. Prof. Dr. Yeşim Müge Şahin

A Workshop Experience on Recycling: Yapı Unplugged
Assist. Prof. Dr. Nihan Gürel Uluşan

Removal of lipid-regulating drug from aquatic environment by an ecofriendly recyclable
calcined nanomaterial ZnAl-CO₃ : A challenge to green and sustainable chemistry
Dr. Hassan Mourid, Mohamed Lakraimi, Lhaj Benaziz

Valorization of a medicinal plant *Herniaria hirsuta* using a solar drying convection as a
sustainable energy for a better conservation
Younes Bahammou, Zakaria Tagnamas, Mounir Kouhila, Abdelkader Lamharrar, Ali
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Investigation of the Cooling Performance of the Thermoelectric Modules for Mobile Cooling System

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Abstract

Thermoelectric coolers (TEC) generally consist of semiconductor materials placed between two ceramic plates. Heat is passed through the modules upon applying the electric current. Peltiers, also known as heat pumps, can produce electrical current using an external heat source. Each module contains n and p type semiconductors. These n and p-type semiconductors are arranged to form a pair called a thermocouple. These pairs are connected electrically in series, thermally parallel, because they produce or deliver heat at very low power. Thermoelectric cooler modules transmit heat from one surface to the other surface with conduction. This phenomena occurs via the change of energy level of electrons in n-type and p-type semiconductor materials.

Thermoelectric coolers have significant advantages, such as long service life and simple mechanism. Additionally, they don't have moving parts in their mechanism to wear. Since they can operate in narrow places with their small scale size, they can be used in various electronics cooling system applications where conventional systems cannot be used. However, in terms of energy efficiency, it is left behind compared to conventional refrigerants. There is a need to improve their energy efficiency using special heat insulation techniques. It is crucial to insulate the circumference of the semiconductors to receive higher cooling performance. Due to the low thermal and electrical conductivity of the metallic parts that connect the semiconductors, it prevents the heat to remain at desired levels. This reduces the efficiency of the thermoelectric module and prevents reaching the desired temperatures.

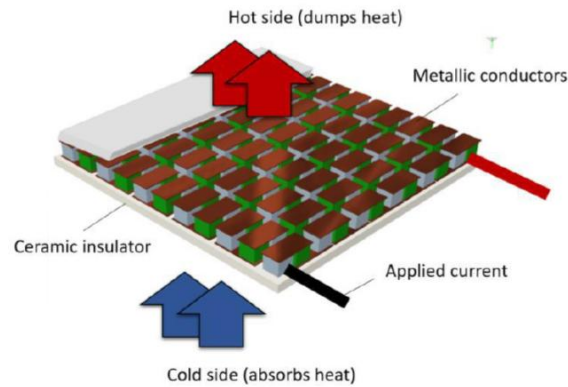


Figure 1. Illustration for the working principle of thermoelectric cooler with subcomponents

The efficiency is one of the significant parameters for the Peltier which can be used in mobile heating-cooling systems. The most important factor affecting the efficiency is the accumulation of heat transportation when the thermoelectric module is operated as a heat pump. In this study, an experimental setup is built to measure the cooling rate of the thermoelectric module. The cooling performance of the Peltier is investigated by applying electrical current with different frequency. Additionally, the experimental results are compared with the numerical counterparts.

Keywords : Peltier effect, thermoelectric cooler, semiconductor, bismuth telluride

A Workshop Experience on Recycling: Yapı Unplugged

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Abstract

The aim of this work is to make the recycling of waste materials available and transform them into usable designs through a workshop experience, by this way to emphasize the importance of issues such as sustainability, environmental protection and economic design solutions. This year, Yapı Unplugged workshop, placed on May 10-11, 2018, under the organization of Arkitera and collaboration of Architecture For All and Assemble, within the scope of 41st Building Fair-TurkeyBuild Istanbul, waste materials such as chipboard, carpets, pallets, strobiles and paper rolls that emerged during the installation phase of the fair will be recycled and converted into landscaping / seating elements for Uşak Eşme Güllü Primary and Secondary school playgrounds and open classrooms. 47 students and graduates from different schools' architecture, interior architecture, landscape architecture, industrial product design, city and regional planning and painting departments participated to this workshop. On the first day of the workshop, the Assemble introduced the materials and tools to be used, and then the participants formed working teams of 3-4 people. Then, the teams reviewed the recycled waste materials and they began to develop the first design proposals for their products. Team members modeled their first designs with 1: 1 scale. The first day was completed by presentation and evaluation of the arrival stage. On the second day, the designs were finalized and strengthened from the structural standpoint. In the last stage, sanding and varnish steps and products have been made ready for use. At the end of the workshop, 15 pieces of furniture revealed were sent to the selected school with the support of ITE Turkey-YEM Fuarçılık, and the use started by the students. As a result, in the context of this workshop, it is important that the requirements contained in the definition of the economy are met with the available resources and that people contribute to spatial production in the division of labor.

Keywords: Recycling, Sustainability, Workshop, Waste Material

Removal of Lipid-Regulating Drug from Aquatic Environment by an Ecofriendly Recyclable Calcined Nanomaterial ZnAl-CO₃: A Challenge to Green and Sustainable Chemistry

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Abstract

Micropollutants in the aquatic environment are a major problem for both the human population and the aquatic ecosystems. Among the emerging micropollutants, pharmaceuticals have attracted the attention of the scientific community worldwide for several years. Many reports regarding the effects and risks of these compounds have been exposed for sensitization on the toxicity of such pollutants. In addition, these compounds may have a toxic effect, are directly emitted in rivers in countries without effluent treatment.

Clofibrac acid (CA) is widely used as an active ingredient and regulator of lipid levels in blood clofibrate. Its first detection in wastewater was reported in samples from wastewater treatment plants in America in the 1930s. Nowadays, CA is considered one of the residual drugs with persistence in the environment estimated at 21 years. It is frequently detected in environmental monitoring of plant protection products at the global level. The potential long-term effects of CA are not yet known, but its potential harm should not be underestimated. During a typical pass through wastewater treatment in factories, only 40-50% of the initial amount of CA is effectively removed. Several processes for the removal of CA from wastewater have been used, such as catalysis, biological methods, anion exchange and adsorption. Compared to these methods, the adsorption process remains more efficient because of its relatively low cost and easy to use. Our work aims to reduce the contamination of wastewater by drugs, such as lipid regulators. Therefore, we will study the removal of CA from the waters using a calcined lamellar double hydroxide [Zn₂-Al-CO₃] (CLDH), it is chosen for its higher adsorption capacity, its affinity for most pollutants, the non-regeneration of sludge and its recyclability. It was synthesized by the coprecipitation method at pH 10 with a metal ratio Zn/Al = 2, then calcined at 500 °C for 5 hours. Different experimental parameters are optimized, such as contact time, pH and the mass ratio CA/CLDH.

The optimal removal was performed at pH 5 where the CA is in anionic form and is retained easily by the calcined material. The retention kinetics is relatively fast and follows the pseudo-second order model, which reflects a strong affinity between CLDH and the pollutant (CA). In the experimental conditions used, intraparticle diffusion seems to be an important step but it is not the only one involved in this process.

The isotherms are in agreement with the Freundlich model (multilayer adsorption), they are of type S, which implies a cooperative adsorption with a maximum retention amount exceeds 2220 mg/g. The elimination is maximal for an optimum mass ratio (CA/CLDH) of 3. The removal rate of CA by CLDH achieved 90% and the remaining quantity is widely below the tolerance thresholds.

The results of the four complementary techniques used (XRD, FT-IR, TGA and SEM) confirm this retention by adsorption of CA on the surface of a reconstructed LDH phase intercalated by the pollutant CA with a slight contamination by the carbonate anions (Figure 1). The cohesion is ensured through hydrogen bonds (HB) and electrostatic interactions. From the comparative study and after five cycles of repeated regeneration of calcination-rehydration-anion exchange, it is clear that this material is promising and very effective compared to other adsorbents used by several authors in different recent studies for the removal of such pollutant.

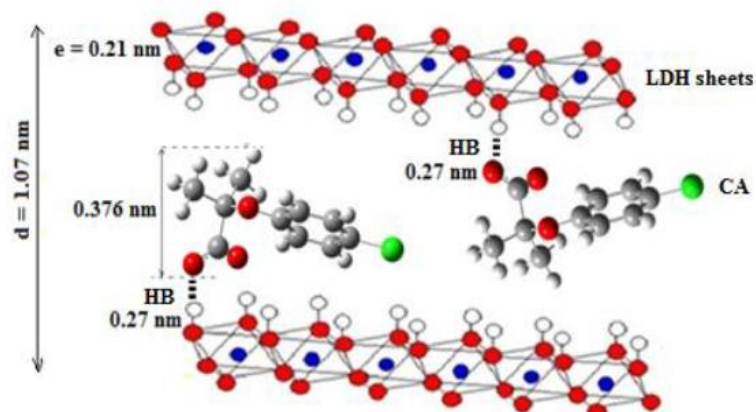


Figure 1. Structural model of CA orientation between LDH sheets.

Keywords: Calcined ZnAl-CO₃, Clofibric acid, Removal, Reconstruction, Recycling.

Valorization of a Medicinal Plant *Herniaria Hirsuta* using a solar Drying Convection as a Sustainable Energy for a Better Conservation

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Abstract

Adapting seasonal medicinal plants to human consumption and daily use, is one of the ultimate objectives for both pharmaceutical industry and traditional medicine. *Herniaria hirsuta*, a medicinal plant, was conserved using a nondestructive innovative preservation process intergrating sustainable energy in order to establish the optimal conditions for drying and storing *Herniaria hirsuta*, which is an endemic plant of Morocco solely used for its virtues. For this purpose, a thermo-kinetic study was carried out in a forced convection solar dryer using solar energy in order to determine the influence of different aero-thermal parameters (air temperature and air flow rate) on water loss of fresh *Herniaria hirsuta*. The kinetics of drying is studied for three temperatures (50, 60 and 70 °C) in a two air flows drying (150 and 300 m³/h). The experimental results are used to determine drying curves. Several modelling programs have been tested to simulate the drying data. The drying air temperature is a determining factor influencing on the drying kinetics of *Herniaria hirsuta*. The drying rate decreases in low drying air temperature. The Midilli-Kuck model was found to be the best fitted drying curves in

thin for *Herniaria hirsuta* layers. This study that was conducted for the first time on this plant allows the elaboration of a characteristic drying curve equation. This equation is essential in a solar drying sizing and simulation point of view for the dimensioning of a *Herniaria hirsuta* adequate and efficient solar dryer. According to this study, the obtained results are satisfactory, which allows to valorize and conserve this medicinal plant after solar drying for a wide use.

Keywords: *Herniaria hirsuta*, Solar drying, Sustainable energy, Modelling programs, Conservation.

Second Day (June 20, 2019)

A/III Chair

Session Chair: Assoc. Prof. Dr. Nevin Tasaltın

High Efficient Supercapacitors: Outlook and Future Prospects
Assoc. Prof. Dr. Nevin Tasaltın

Determination of the Optimum Hybrid Renewable Power System: A case study of Istanbul
Gedik University Gedik Vocational School
Onur Akar, Assoc. Prof. Dr. Umit Kemalettin Terzi, Prof. Dr. Zafer Utlü, Temel Sonmezocak

Protecting Heritage to Sustain the Future: The Use of Passive Solar Techniques in Vernacular
Architecture
Assoc. Prof. Dr. Meltem Vatan

High Efficient Supercapacitors: Outlook and Future Prospects

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Abstract

Supercapacitors can be used for energy storage in electric or hybrid vehicles, fast-charge electronic devices and military vehicles. The market share of supercapacitors is estimated to be 3.5 billion dollars in 2020. In the literature, there are studies on modeling and electrochemical experiments of supercapacitor electrodes consisted of graphene, carbon nanotube, boronkarbonitride nanotube, metal oxide, metal hydroxide, metal sulfide and conductive polymer materials which are used individually or in binary composite form.

There are no theoretical and experimental studies of the materials in triple composite form such as Graphene/Vertical BC2N Nanotube Array/CoMn2O4 and Graphene/Vertical BC2N Nanotube Array/MnCo2O4.

In future prospects, electrical circuit modeling of the triple composite formed electrodes included supercapacitor can be performed, also atomic and electrochemical properties of the electrodes can be determined by Molecular Dynamic (MD) simulation and Density Functional Theory (DFT) simulation. Obtained data can be directly related in the performance of supercapacitors with high energy storage property.

Keywords: Supercapacitors, graphene, BC2N nanotube, CoMn2O4, MnCo2O4Si.

Determination of the Optimum Hybrid Renewable Power System: A Case study of Istanbul Gedik University Gedik Vocational School

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Abstract

In this study, Hybrid Renewable Power System (HRPS) has been designed to meet the energy requirement of Istanbul Gedik University Vocational School (IGUVS) in an optimum way. The energy requirement will be achieved mainly with wind and solar power generation system. The hybrid regenerative power system will be requested from the network when it can't meet its energy needs. The optimum configuration of grid-connected solar/wind hybrid power generation system will be determined by considering the wind speed data and solar radiation data of the location of IGUVS. Moreover, sensitivity analysis will be carried out taking into consideration the wind speed and solar radiation values. If the optimum hybrid power generation system specified is used, the carbon emission values obtained will be examined.

Keywords: Building Based Renewable Energy Sources; Hybrid Power Systems; Electricity Generation; Distributed Generation.

Protecting Heritage to Sustain the Future The Use of Passive Solar Techniques in Vernacular Architecture

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Abstract

Vernacular architecture has specific response to the climate condition, social condition, technological condition and the like. Vernacular buildings are anchored to their places both tangibly and intangibly. Therefore, understanding of local practices and reason – result relationship of building design and construction as heritage protection actions is a fundamental concern to sustain the future. Accordingly, this study is focused on the use of passive solar techniques in vernacular buildings in order to be used in contemporary buildings.

Keywords: passive solar; climate responsive; vernacular architecture; thermal comfort; energy; heritage

Second Day (June 20, 2019)

B/III Chair

Session Chair: Lect. Arif Karabuga

Simulation of rice straw gasification in bubbling bed reactor Using Aspen Plus
Senem Sezer, Assist Prof. Dr. Ugur Ozveren

Simulation of Pine Cone Gasification in Fluidized Bed Gasifier by Using Aspen Plus
TulgaOchir Tumurbat, Furkan Kartal, Prof. Dr. Fatma Karaca Albayrak,
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Simulation of rice straw gasification in bubbling bed reactor Using Aspen Plus

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Abstract

The aim of this work is to make the recycling of waste materials available and transform them into usable designs through a workshop experience, by this way to emphasize the importance of issues such as sustainability, environmental protection and economic design solutions. This year, Yapı Unplugged workshop, placed on May 10-11, 2018, under the organization of Arkitera and collaboration of Architecture For All and Assemble, within the scope of 41st Building Fair-TurkeyBuild Istanbul, waste materials such as chipboard, carpets, pallets, strobiles and paper rolls that emerged during the installation phase of the fair will be recycled and converted into landscaping / seating elements for Uşak Eşme Güllü Primary and Secondary school playgrounds and open classrooms. 47 students and graduates from different schools' architecture, interior architecture, landscape architecture, industrial product design, city and regional planning and painting departments participated to this workshop. On the first day of the workshop, the Assemble introduced the materials and tools to be used, and then the participants formed working teams of 3-4 people. Then, the teams reviewed the recycled waste materials and they began to develop the first design proposals for their products. Team members modeled their first designs with 1: 1 scale. The first day was completed by presentation and evaluation of the arrival stage. On the second day, the designs were finalized and strengthened from the structural standpoint. In the last stage, sanding and varnish steps and products have been made ready for use. At the end of the workshop, 15 pieces of furniture revealed were sent to the selected school with the support of ITE Turkey-YEM Fuarçılık, and the use started by the students. As a result, in the context of this workshop, it is important that the requirements contained in the definition of the economy are met with the available resources and that people contribute to spatial production in the division of labor.

Keywords: Recycling, Sustainability, Workshop, Waste Material

Simulation of Pine Cone Gasification in Fluidized Bed Gasifier by Using Aspen Plus

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Abstract

Biomass is a renewable source which can be processed almost CO₂ neutral. Compared to other renewable energy resources, biomass is enormous in yearly generation and more evenly spread around the world. Biomass gasification is considered as one of the most promising thermo-chemical routes to take advantage of biomasses turning into energy-rich gaseous and solid energy carriers using gasifying medium such as air-steam, oxygen, carbondioxide and water steam.

Pine cone is one of potential renewable energy sources in Turkey for steam gasification. Steam gasification of pine cone supplies remarkably higher gas qualities than air-blown gasification in fluidized bed gasifier. The objective of this study is to simulate a fluidized bed gasifier for pine cone gasification in situ steam atmosphere using Aspen Plus software. The gasifier temperature, equivalence ratio and steam to biomass ratio were discussed. The results demonstrated that the higher amount of steam in pine cone gasification enhances the lower heating value of the syngas and the composition of H₂ in syngas that produced in the fluidized bed gasifier model. The flowsheet of Pine Cone Gasification in Fluidized Bed Gasifier has been presented in Figure 1.

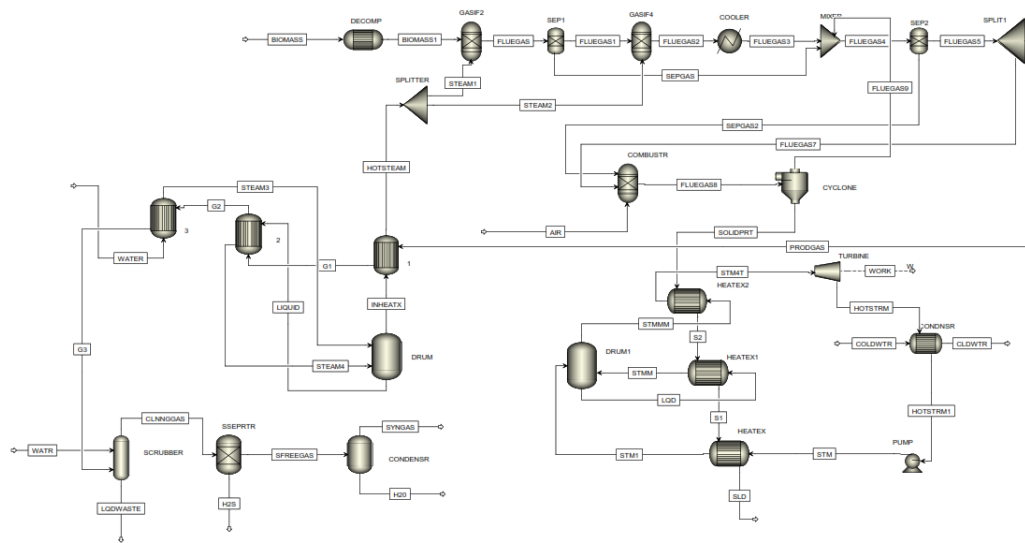


Figure 1. Flowsheet of Pine Cone Gasification in Fluidized Bed Gasifier

The model can provide in details the performance of the steam gasification of pine cone process in terms of product gas distribution and lower heating value as well as the process efficiency, and it is in a good agreement with the models found in the literature.

Keywords: Pine Cone, Fluidized Bed Gasifier, Biomass, Aspen Plus.

Second Day (June 20, 2019)

C/III Chair

Session Chair: Asst. Prof. Dr. Pinar Erkan Bursa

Assessment of Green Hospital Criteria: Case of Trabzon
Zeynep Nilsun Konakoglu, Assoc. Prof. Dr. Funda Kurak Acici

An Overview of National and International Standards and Certification Systems for
Sustainable Building Materials
Keziban Yalap, Assoc. Prof. Dr. Cahide Aydin İpekci

To sustain not to forget the Past: Eskişehir Armenian Church as a Cultural Heritage
Cagri Burak Baskol, Prof. Dr. Aysu Akalin

Assessment of Green Hospital Criteria: Case of Trabzon

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Abstract

Globalization affects the whole world and brings with it such problems as environmental pollution, rapid consumption of natural resources and excessive energy use, resulting in a focus on sustainability in design. The concept of sustainability aiming at efficient use of energy, water, material and space, preserving natural resources and using eco-friendly and renewable materials is also addressed in healthcare field as well as other fields. The amount of energy, water and material consumed, and chemical waste disposed are high in hospitals, which, therefore, damage the environment a lot. This fact makes the concept of green hospitals that take building, environment and human health as a whole more and more important every day. Green hospitals are sustainable buildings that aim to use natural resources efficiently, support recycling and minimize environmental and medical waste use. In order for a hospital to be a green building, it should meet such criteria as waste, environment, water, energy and hazardous substances management, material selection and sustainable facility size. Turkey, however, has very few hospitals that completely satisfy the green hospital design criteria. The aim of this study is to draw attention to this low number and to emphasize the significance of green building designs that focus on sustainable use and management of natural resources. The study sample consists of hospitals in the city center of Trabzon. The hospitals were selected for ease of transportation and user preferences. Hospital managers were interviewed to determine whether the hospitals in question satisfy the green hospital design criteria; waste, environment, water, energy and hazardous substances management, material selection and sustainable facility size.

Keywords: Trabzon; hospital; green hospital; sustainability; design

An Overview of National and International Standards and Certification Systems for Sustainable Building Materials

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Abstract

Sustainable building materials have gained considerable importance worldwide in recent years. With the decrease of natural resources, material preferences have started to change and manufacturers are working on alternatives. The rapidly developing technology in the building materials market also brings some environmental problems. The mentioned building materials cover a long period from the production of the material to the design of the building and the process of use of the building to the demolition phase, during which time it is necessary to prevent or reduce the possible effects of the environment. In this context, the choice of environmentally friendly material is gaining importance. However, it is expected that the materials chosen will not meet the basic material properties without compromising their durability and material performances, and are expected to comply with the relevant material standards. The studies on whether the relevant international material standards are in conformity with the 'Sustainable Materials' have been introduced with the efforts to be shaped in accordance with the national and international standards. For this reason, in this study, national and international standards related to Sustainable Construction Materials were examined and the method of evaluating certification systems was followed. In this study, it has been determined that the number of international standards on sustainable building materials is increasing day by day and special technical committees focused on the subject are carrying out studies. In addition, it has been observed that sustainable Building Certification systems are spreading rapidly all over the world.

In this study, it is aimed to reveal the standards and the deficiencies of the standards and certification systems in sustainable construction materials. As a result of the study, the current standards related to building materials are reviewed in terms of sustainability and also the certification processes; transparency, continuity and reliability.

Keywords: Sustainability, Standards, Building Materials, Certifications

To Sustain not to forget the Past: Eskişehir Armenian Church as a Cultural Heritage

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Abstract

Eskişehir Armenian Church, today known as Zubeyde Hanım Cultural Center, used to be a building that nobody knew its presence until the last ten years, not because it was a church, but probably because it used to be a cinema showing adult movies. The church, which was estimated to have been built after the Armenian immigration to Eskişehir at the end of the 1800s, is located near Köprübaşı, a popular district at the heart of the city both in the past and still today. In the early 19th century, the Muslim neighborhoods were clustered around the Odunpazarı site, while the Greek and Armenian neighborhoods were around Porsuk River at Köprübaşı. Unfortunately, many traces of the urban memory such as the Armenian School, the Armenian Club and the houses of this period do not exist today. The Armenian Church which has a single-centered, central-domed with apses in the east, is the only building left in the city that has witnessed a certain period. The church was not used for a long time due to the deportation of the Armenians in the early 1900s. It was repaired in the 1930s to host entertainment and cultural activities of the city. In the 1990s the number of seats was increased from 40 to 600 by adding a gallery floor. In the 1970s, it served as the entertainment venue of a certain group of people by changing the quality with the concern of the decline of the audience. At the time of its construction, the building could be perceived in its plot easily, but nowadays it can hardly be noticed due to the structures added over time to the surroundings, so has difficulty in transferring its existence to the urban memory. After the renovation in 2009 it was named as Zübeyde Hanım Cultural Center (Atatürk's mother's name). Today the building is home to events such as theaters, concerts, movie premieres, screenings, international congresses and seminars. Despite all the changes many people are experiencing the space without knowing that it used to be a church.

In this article; the presence of Armenians in Turkey and specifically in Eskişehir is discussed, and the period in which the church building belongs is documented with the help of written documents and visual materials (maps and plans) from the archives. The preservation of a historical heritage is important for the social sustainability that contributes to the continuity of the collective memory by making possible the revitalization of memories.



Figure 1. Eskişehir Armenian church, 1990s

However, the social sustainability of a space is condemned to exist with the absence of its aura, both when the original usage ended (e.g. industrial structures) and when the original users were not around (e.g. churches). A structure whose function or user has disappeared becomes ‘representative’ of the technology of the period it belongs and the forms of life of the people at that time, as indicators that tell us about their traditions and habits. Eskişehir Armenian Church restored to host new collective memories with its new usage in the present urban memory should be represented at least by a name that should be the reminiscent of its original usage to represent Armenian culture which remained till the early 19th century.

Keywords: Armenians, church, Eskişehir, urban memory, collective memory, social sustainability, representation.

Second Day (June 20, 2019)

A/IV Chair

Session Chair: Assoc. Prof. Dr. Burcu Yavuz Tiftikcigil

Turkey's Energy Policies: Nuclear versus renewable energy sources
Assoc. Prof. Dr. Burcu Yavuz Tiftikcigil, Arif Karabuga, Prof. Dr. Zafer Utlu

Reuse of Historic Buildings for the Preservation of Cultural Heritage: Samsun Tařhan
Assist. Prof. Dr. Serap Faiz Buyukcam

Social Perception of The Effects of Green Roof Applications on Urban Sustainability; Zorlu
Center, Istanbul
Tuba Sari Haksever, Ilkim Markoc

Turkey's Energy Policies: Nuclear versus renewable energy sources

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Abstract

Studies show that there is a relationship between economic growth and energy consumption of countries. Energy supply in Turkey can not be achieved with existing energy sources and revealed so of foreign origin energy dependence. This dependence of about 72% in 2018; and this is an issue extremely important in terms of Turkey's energy security. In this context, one of the main objectives of energy policy implemented in Turkey is to achieve energy source diversity. However, energy efficiency, decarbonization and energy storage are the energy policies of many states. Today, the energy consumed has three main sources of energy, such as fossil fuels, renewable energy and nuclear energy. Renewable energy and nuclear energy come to the forefront in the sustainable energy policies of the countries. Turkey's energy dependence and the nuclear energy to renewable energy and sustainable energy policies accordingly come to the fore. The reduction of Turkey's energy dependency and accordingly it is important for sustainable economic growth.

The aim of the study In this context, an analysis of Turkey's energy dependence, examine their energy policies and fossil, renewable and realistic way to demonstrate the advantages and disadvantages of the use of nuclear energy sources, reduction of Turkey's energy dependency and sustainable depending on it is important to ensure economic growth .

Keywords: Advanced exergy analysis, Heat storage system, Linear Fresnel reflector

Social Perception of the Effects of Green Roof Applications on Urban Sustainability; Zorlu Center, Istanbul

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Abstract

Due to the employment opportunities in the cities after the Industrial Revolution, there has been intense migration from rural to urban areas. There has been a rapid construction process in order to meet the housing needs of the increasing population in the cities. Unplanned urban development has led to the destruction of green areas. As a solution to this problem, green roof applications in urban centers have gained popularity. Urbanization, which has been realized within the framework of the principles of sustainable urban development, has been a crucial requirement for the physical and mental health of future generations.

The aim of this study is to investigate the green roof awareness of the visitors of Zorlu Center located in Besiktas, Istanbul. Zorlu Center, which can be defined as mall and urban living space, hosts about 30-40 thousand visitors per day with its shopping units, eating-drinking spaces, cinema, performance arts center, public green space and public courtyard. The social perception of the green roof, which is defined as an urban balcony, -by its architect, located in an intensively used area, has been questioned.

Perception enables people to critique, interpret, distinguish and analyze their environment according to their internal values to adapt to the environment. Perception in this study; It has been associated with socio-demographic characteristics such as age, education, familiarity, culture and attitudes. A field survey was conducted with 100 Zorlu Center users in different age groups, living in Besiktas district of Istanbul. In this context, a survey was designed to measure the impact of the green roof, which has gained public space function, on the imaginary expression of Zorlu Center. The questionnaire consists of four parts. The first part contains the demographic information of the participants. The second section questions the reasons for coming to the shopping center, to determine the preference priority for the use of the green roof in the city. The third part is based on the perception of the necessity of the green element in daily life in order to reveal the perceptual effect of the urban balcony on the imaginative effect of the visitors. The raw data collected by the questionnaire was evaluated by using statistical program.

The most significant result of this study is that most of the participants are aware of the need to develop the green roof in Istanbul. This study shows that the commercial environment in the urban area, which has green

elements such as the green roof, helps to renew and revitalize the city. It has been found that the green roof application in Zorlu Center attracted the users from the settlements in its close vicinity, such as Levent, Ortakoy, Gayrettepe and Dikilitas. The people came to Zorlu Center, especially to this green area, for the leisure time activities. The green roof application at Zorlu Center has positively affected the users of different age groups, in terms of physical and mental health. In addition to its ecological and aesthetic objectives, green roof applications are gaining importance as a space that provides usage as a recreation area which is very close to the urban residents. Considering the positive effect of the city skyline, it has been found that green roof applications have a positive effect on sustainable urban development especially in the high density city centers.

Keywords: Green roof, shopping center, perception, urban sustainability

Second Day (June 20, 2019)

B/IV Chair

Session Chair: Prof. Dr. Guner Arkun

Technical and Economic Investigation of Solar Energy Cooperatives for Sustainable Energy
Production in Distribution Systems

Ahmet Hamzaoglu, Ali Erduman, Mustafa Alci

Exploring the Potential of Biomimicry as a New Approach for Sustainable Building Design

Afef Ouis, Nassira Benhassine

Life Cycle Assessment of Building Materials: Literature Review

Nuray Benli Yildiz, Hakan Arslan

Technical and Economic Investigation of Solar Energy Cooperatives for Sustainable Energy Production in Distribution Systems

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Abstract

Demand for renewable energy sources has increased rapidly in recent years. The demand for energy is met by various production models. One of these is on-site production practices. Renewable energy sources such as wind and solar are among the most preferred methods in on-site production applications. Instead of building individual renewable systems for sustainable urbanization in many developed countries, regional based cooperative models are preferred. Installation costs of renewable systems, maintenance periods, energy production costs etc. considering the criteria, the amount of revenue generated by using the energy produced and selling more than the usage is important in how long the system will amortize. Individual users often do not meet the system installation costs individually.

In this study, a model for sustainable energy generation and reduction of recycling costs is given. With the proposed model, the technical and economic dimensions of solar energy usage in Hakkari province have been investigated. In addition, individual solar energy production and cooperative energy production conditions were compared.

As a result, according to the proposed model; compared to the regional user-based cooperative model with individual user model. In the regional based cooperative model; solar energy system costs, maintenance periods, operating and maintenance problems have been found to be less.

Keywords: Solar Energy, Individual Electricity Generation, Renewable Energy Cooperatives, Sustainable energy systems.

Exploring the Potential of Biomimicry as a New Approach for Sustainable Building Design

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Abstract

Today nature appears as a rapidly changing universe, our relationship with this world in motion is becoming more difficult and complicated affecting building users as well as building performance. At the same time, it acquires importance and a growing need insofar as the new concepts and images of scientific research meet immediately echo. They shape the look, the perception of the general public, and infect them. Biomimicry forces a new set of questions that can be applied to the design process. As opposed to our buildings, which remain static, biological designs respond to the environment and they are adaptable, resilient, multifunctional, and generally zero-waste. Although, there have been several achievements of using biomimicry principals as a new approach for achieving energy-efficient building design, but if we pose a question on sustainability! Some biomimetic designs do not achieve net positive impact lead to disadvantages rather than advantages. Hence, how can use the Biomimicry to support sustainable building design? The evolving sustainability approach to building aims to energy and resource efficiency, and environmental friendly outputs. To this end, successful building design is becoming an increasingly complex task, due to a growing demand to satisfy more ambitious environmental, societal and economic performance requirements, it is currently the most pressing, complex and challenging agenda facing architects. This paper explores biomimicry, a new field that studies and emulates the forms, functions, and process found in nature, which presents an immense source of inspiration for architects and builders. However, the absence of a clear definition and comprehensive application of different approaches of biomimicry particularly in the built environment remains elusive. Finally, the research problem is summarized by highlighting various biomimetic approaches through a theoretical framework reviewing previous theories and researches and also studying biomimetic technologies that lead to sustainability.

Keywords: biomimicry; building design; nature; sustainability.

Life Cycle Assessment of Building Materials: Literature Review

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Abstract

Sustainable development policies are often on the agenda as global warming and resource depletion problems are increasing. The construction sector is one of the focal points of these studies with high environmental burdens. Many building materials, methods and tools are used together during the construction process. The life cycle assessment (LCA) method has been developed in order to determine the environmental load of these inputs. As a result of yd. studies, the load of components or processes on the environment can be calculated and critical points can be determined. In this study, the sustainability of construction materials and the books, theses and articles in Turkey and around the world have been examined and made a table.

Keywords: Life Cycle Assessment, Sustainable Building Material

Second Day (June 20, 2019)

A/V Chair

Session Chair: Asst. Prof. Dr. Elif Alturk

Transparent Electrode Development Using AgNW
Asst. Prof. Dr. Elif Alturk

Biopower and Engine Biofuels Current Situation in Turkey
F. Enda Tolon, Filiz Karaosmanoglu

Determination Energy Potential of Biomass Sources in Turkey with Exergy Approach
F. Enda Tolon, Zafer Utlu

Role of Zero Energy Buildings in Sustainable Campuses: A review of Current Situation and
Its Future
Mert Tolon, Ebru Toy

Transparent Electrode Development Using AgNW

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Abstract

In this letter, we have fabricated transparent electrode by using silver nanowire (AgNW). Indium tin oxide (ITO) has been used in organic electronic devices. It is a semitransparent electrode, however its cost is very high. It is tried to replace ITO electrode with AgNW electrode, since it is quiet cheap and solution processable. Solution processable electrodes are very advantageous for industry, it can be deposited by roll to roll (R2R) or ink jet printing techniques. AgNW with conductive polymer composites were also studied for transparent electrode fabrication.

Keywords:AgNW, PANI, PEDOT, transparent electrode

Biopower and Engine Biofuels Current Situation in Turkey

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Abstract

Energy demand and usage shapes according to the economic growth of the countries in the world. While Turkey still maintains its place among developing countries, over the past decade, the Turkish economy grew at an annual average real gross domestic product growth rate %5.6. It has been an important driver of energy demand and investment in the Turkish energy market.

Because of the limited domestic energy sources available, energy demand has resulted in dependency on energy imports, primarily of oil and gas. Considering Turkey's growing energy demand, utilization of domestic energy sources and increase the share of renewables has indispensable significance for Turkey. Turkey is implementing new energy targets, strategies and action plan on energy efficiency, renewable energy, and climate change under the Vision 2023. Turkey has issued all laws and regulations related to energy and environmental context of the harmonization process with the EU acquis.

Turkey's Total Primary Energy Supply (TPES) was 84.2 million tons of oil equivalent (Mtoe) in 2005; however, with the increase of %62 in 2016, it was 136.72 Mtoe. In 2005 after release law on Utilization of Renewable Energy Sources and Electricity Market Licensing Regulation of the Electricity Market law private sector investments in renewables have increased and for the first time biomass was defined as an energy source. Even, renewable energy supply hydro and geothermal energy, be at the forefront of biomass energy as a strategic source of energy for the country is noteworthy. Compared to other renewable sources, biopower has a low penetration rate in Turkey. Its development depends on the availability of raw materials which depend on the type of technology also current feed-in tariff in the short term. After the release of related law and regulations, private sector investments in biopower generation have increased. Energy from biomass sources share among renewables is 13.5%, the highest share after hydro and geothermal in 2017. Biomass share of renewable energy supply occurs from 0.66% biofuel, 6.6% animal and agricultural wastes/residues and 7.2% fuelwood. Also,

fuelwood so traditional biomass is used by direct combustion widespread in households of rural and poor urban districts for cooking and heating purposes. Fuelwood constitutes 53.5% of the combustible biomass resources (fuelwood, animal and agricultural waste/residues) supplied in 2017.

Engine biofuels have a place with Petroleum Market Law the ethanol content of the gasoline types supplied to the market as fuel products it is mandatory to include ethanol produced from domestic agricultural products must be at least 2% as of 1/1/2013 and at least 3% as of 1/1/2014. By the end of 2015, bioethanol production in Turkey was determined to be 150 million liters per year level. As of April 2019, 15 licensed firms produces engine biofuels; Biodiesel Processing License Owners 10, Biofuel from Waste Processing License Owners 1, Bioethanol Producer License Owners 3.

Turkey has enormous potential to offer improved rural energy services according to biomass, forest and agricultural wastes. Although agricultural and forest residues/wastes are among Turkey's primary biomass energy sources, they are not efficiently used to meet the energy needs of the country. This study examined Turkey's existing biopower, engine biofuels profile within sustainable energy supply in Turkey's fight against climate change and the study puts forth the place of biomass and development opportunities.

Keywords: Biomass, Biofuel, Biopower, Renewables, Climate Change.

Determination Energy Potential of Biomass Sources in Turkey with Exergy Approach

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Abstract

In need of to reduce energy-related CO₂ emissions to limit climate change, energy transition is a path from fossil-based sources to zero-carbon conversion. Energy transition can succeed by increasing the share of renewable energy in the power sector. With the transformation trilogy in energy Decarbonization, Digitalization and Decentralization energy from biomass sources have advantages following Turkey's economic, social development and sustainable development goals. Due to the growing economy and the increasing population, Turkey's energy demand is increasing every day and, according to International Energy Agency's forecasts, and the Turkish Ministry of Energy and Natural Resources' projections energy trend will continue to grow in the future. Turkey's current energy structure is already dependent on energy import. To reduce this dependency in parallel to national energy strategy and to increase the security of supply renewable energy sources should be used with the most efficient available technologies.

In Turkey, regulations for energy, and renewable energy are made considering the accession negotiations with the European Union. Together with hydraulic, biomass, geothermal, wind and solar power plants, the share of renewable originated energy sources in electricity generation reached 29% in 2017. Regarding the legislation, biomass energy is defined in act 5346 Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (Renewable Energy Law). Biomass sources are using for heating, cooling, and electricity purposes and blending component (biodiesel, bioethanol) for transportation. According to the Energy Ministry, 3,216 GWh of electricity generated from biomass-based electricity generation plants with a total installed capacity of 811 MW, in 2018. However, it is estimated by the Turkish Ministry of Energy and Natural Resources that Turkey's biowaste (biodegradable) potential of about 8.6 million tons of oil equivalent (MTOE) and 1.5-2 MTOE of the amount of biogas that can be produced.

Turkey Biomass Energy Potential Atlas (BEPA) formed by the Renewable Energy Directorate of Energy Ministry and demonstrate the potentials of generating electricity and biofuels from biomass sources in regional and city-based. However, beyond that, due to bulk density and uneven distribution around the world energy



utilization from biomass has its complexities. In order to benefit from the available biomass resources in the most efficient manner exergy analysis has critical importance to designing sustainable biorefineries. Thermodynamic metrics use to achieve high process efficiency in an energy system and to find the answer *"What is the minimum amount of natural resource consumption (material and energy) required to make a particular product?"*

This study determines the available amounts of Turkey's biomass resource potential for energy utilization assessments by using exergy analysis.

Keywords: Biomass, Biopower, Exergy, Energy Utilization, Turkey.

Role of Zero Energy Buildings in Sustainable Campuses: A review of Current Situation and Its Future

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Abstract

The building sector has one of the key sectors both in the economic and in the energy demand perspective of countries. For this reason, nowadays countries aim to reduce greenhouse gas emissions from the construction sector too. The university campuses, which are among the major places created by the large buildings responsible for significant energy consumption, operate in this area to reduce greenhouse gas emissions. Also, universities face different challenges each day due to decreasing budgets and increasing energy costs. These pressures at universities have been a motivation to implement energy efficiency programs and to bring university buildings to a sustainable concept at the same time.

In this context, the concept of sustainability comes to the fore in the construction sector. Here, the sustainable construction refers to the process of a construction or a building that the processes are responsible for the use of the building and which are efficient in terms of location, design, construction, operation, maintenance, renovation and demolition of the building where the building will be located during the life cycle of a building. As a sustainable building may lower the life-cycle costs, higher the property value reduces the effects on infrastructure, better for the environment and local economy, etc., universities consider its benefits in sustainable campuses.

Because of this, Zero Energy Buildings (ZEBs) concept is widely used and applied in most countries. Also, it is obvious that zero energy buildings represent the latest technology when energy performances evaluated in terms of individual buildings. As an example, many new buildings at campuses can be designed to be ready for zero energy by minimizing energy usage by designing and building the roof solar photovoltaic (PV) installation.

In general, an energy-efficient campus defined as the actual annual delivered energy is less than or equal to the on-site renewable exported energy. For this reason, there is a certain need to process, develop and implement campus energy-reduction plans at universities. In these kinds of plans, the ZEBs are the most suitable applications. ZEBs aim to develop innovative solutions for reducing the energy requirements of the building envelope; increase of the efficiency of active energy systems and supply the energy from renewable sources.



The purpose of this paper is, therefore, to identify the ZEBs conception in a literature scale and to give the relationship and applicability of ZEBs at Sustainable Campuses. The study has structured the description of the methodological framework. Accordingly, the correlation between sustainability and ZEBs gives the example case studies under a multi-thematic approach from different countries and finally discusses the current situation and its future in terms of sustainable development of countries.

Keywords: Sustainability, Sustainable building designs, Sustainable campuses, Zero energy buildings.

Second Day (June 20, 2019)

B/V Chair

Session Chair: Prof. Dr. Paulo Eduardo Maia de Carvalho

Environmental Sustainability of Groundwater in Fundão – Portugal

Prof. Dr. Paulo Eduardo Maia de Carvalho

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Gizem Ozerol, Aysu Akalin

Environmental Sustainability of Groundwater in Fundão - Portugal

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Abstract

The area of implementation of the Cova da Beira's irrigation system, due to its geographical situation and its sustainable socio-economic development requires the execution of geo-environmental studies, focusing on the behaviour of a set of variables with important ecological significance. This study is aimed to characterize the distribution patterns of variables in groundwater samples and their characterization in terms of chemical quality. Hence, an exploratory data analysis was performed in order to characterize the overall sample, followed by a stage in which a multivariate analysis was carried out through a dimensionality reduction technique (analysis of main components). The study of the dynamics of natural processes, anthropic and its influence on the dispersion, fixation and (re)mobilization of chemical elements, has contributed decisively to the optimization of the diagnostic strategy and the environmental management as well.

Keywords: Groundwater; Statistical; Agricultural activity

Sustainability of Collective Memory in Industrial Buildings: Historical Kilis Kalaycılar Masmanası

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Abstract

In his article called 'Protection with Questions and Answers', Mete Tapan states that the most correct approach in protection should be 'by using'. This holistic approach, mentioned by Mete Tapan, should also be valid to industrial heritage structures whose function has lost importance. Although industrial buildings are important indicators of a country's socio-economic history, they often lose their functions due to rapid technological developments. These buildings are often built for practical and functional use, and therefore often do not have a symbolic meaning when built. But as time passes, they become important as a reference to the place and the time they testify. Since they often lose their functions due to rapid technological advances, they become 'representative'. The antiquity value put forward by Alois Riegl is the feeling of physical aging on the object, or the aging of the material on those who experience it. Another important reason for the recognition of industrial heritage as a cultural heritage is the awareness of the value of art, the change in the perception of the environment. Kilis Kalaycılar Masmanası is an industrial heritage which is saved with this awareness. The building has continued its original function as an olive oil extracting and the soap-making factory until the 1960s and then it has been left to its fate for many years in a ruined and dysfunctional way. The building was restored between 2014-2016 by the architect Sıdıka Bebekođlu, who spent her childhood and youth in Kilis, with the budget of the Ministry of Culture and Tourism to be used as a temporary exhibition space for a while. The building currently undergoes minor repairs by the Ministry of Culture and Tourism and is not known for what purpose it is going to be used.

Kilis Kalaycılar Masmanası, which has only a few surviving examples left, should be sustained not only spatially but also with its original function. As Rossi summarizes; continuity is the past that can be experienced today, and the past which has been experienced since its existence, and which will be experienced in the future adding value to the structure. They are concrete values with the expression of Rossi, but also something different than concrete. While experiencing these concrete representations, each generation will bring a different interpretation to the past, will receive a new inspiration from it, and it will be distinguished with different memories. As



mentioned in the article the new generations should experience Kilis Kalaycılar Masmanası by knowing its original function. It is for the sustainability of the collective memory and for not to forget what the industrial past was and how it contributed to the development of the country.

Keywords: Kilis, masmana, industrial heritage, social memory, antiquity value, usage.

Evaluation of Environmental Management Practices of Marinas in Istanbul

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Abstract

Marinas are ports, which serve small sea vehicles and generally serve them for supply, repair and some other services. Marinas have environmental impacts on coastal and marine areas both at their construction and operation phases due to the activities executed. Despite they have lower environmental impacts compared to the bigger ports, marinas are still source of pollution in coastal environment which makes application of environmental management practices a must.

Istanbul is a metropolis being Turkey's most developed and largest city and it has coastlines nearby Sea of Marmara, Black Sea and Bosphorus. Ataköy Marina, Güzelce Marina, Kalamış Fenerbahçe Marina, İstinye Tekne Park Marina, Tarabya Tekne Park Marina, West İstanbul Marina ve Viaport Marina are marinas located in İstanbul (Figure 1). Total capacity of listed 9 marinas is 5657 yachts located at marine and land area of the marinas (Table 1). With this high capacity of serving yacht owners, it is important that the marinas in İstanbul do not harm its marine environment and neighboring coastal zones.

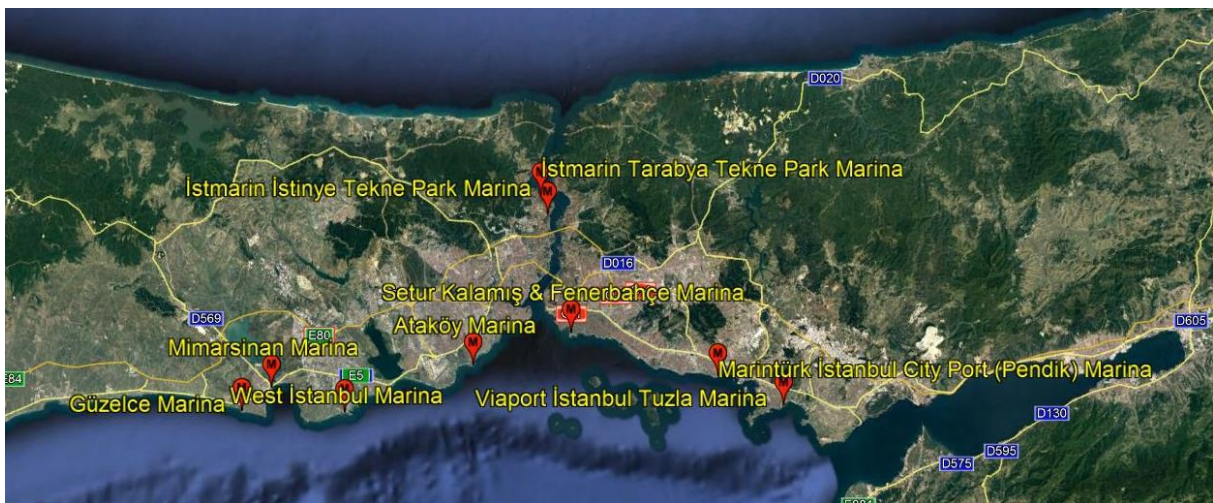


Figure 1. Locations of Marinas in İstanbul (Google Earth)

In this study, it is aimed to evaluate existing environmental management practices in marinas in Istanbul and suggesting some improvement practices besides enlightening the ongoing situation. In this context, a questionnaire was used to collect data from marina managers related to the existing environmental management practices in marinas in Istanbul. Maine Clean Marinas and Boatyards Program Clean Marina Checklist was adapted by the aim of preparing questionnaire with the permission of Maine Marine Trades Association. The questionnaire consists of 53 questions under six main sections titled as Stormwater Runoff Management, Erosion, Sedimentation Control; Boat Maintenance and Repair; Fueling Activities/Petroleum Control; Wastewater Management; Waste Recycling, Disposal, & Storage and Boat Pumpouts and Sewage. In each section, there are questions related to best management practices applied in marinas under related title. The participants are asked to evaluate their existing environmental management practices choosing one of the three answers: 'Yes', 'No' and 'Not Relevant'.

Marina Name	Sea	Location	Area	Capacity
Ataköy Marina	Sea of Marmara	40°58'22"N 28°52'55"E	- 155.419 m2 marine & 455.414 m2 land + 87.642 m2 marine & 25.362 m2 land	252 yachts + 613 yachts
Kalamış Fenerbahçe Marina	Sea of Marmara	40°58'37.0"N 29°02'08.9"E	- 230.000 m2 marine & 90.000 m2 land	1290 yachts
İstinye Park Marina	Tekne Bhosphorus	41°06'46"N 29°03'23"E	- 57.000 m2 marine & 800 m2 land	145 yachts
Tarabya Park Marina	Tekne Bhosphorus	41°08'30"N 29°03'45"E	- 57.000 m2 marine & 100 m2 land	265 yachts
West Marina	İstanbul Sea of Marmara	40°57'46"N 28°39'49"E	- 161.000 m2 marine &160.000 m2 land	900 yachts
Güzelce Marina	Sea of Marmara	41°00'00"N 28°30'35"E	- 41.344 m2 marine &37.168 m2 land	370 yachts
Mimarsinan Marina	Sea of Marmara	41°00'58"N 28°33'51"E	- 25.000 m2 marine & 5.000 m2 land	150 yachts
Viaport Marina	Sea of Marmara	40°48'51"N 29°19'12"E	- 210.000 m2 marine & 16.000 m2 land	820 yachts
Marintürk Marina	Sea of Marmara	40°52'04" N 29°14'23" E	- 175.000 m2 marine &70.000 m2 land	852 yachts

Questionnaire was applied for the whole marinas in Istanbul (Table 1). According to the will of participants, questionnaire results are presented using nicknames to the marinas as Marina A, B, C, D, E and G. The results show that, Marina C has the highest ratios of ‘Yes’ answer (81.8%) related to Stormwater Runoff Management, Erosion, Sedimentation Control. Marina E has the highest ratios of ‘Yes’ answer (91.7%) related to Boat Maintenance and Repair. Marina G has the highest ratios of ‘Yes’ answer (76.9%) related to Fueling Activities/Petroleum Control. Marina A has the highest ratios of ‘Yes’ answer (100%) related to Wastewater Management. Marina C, Marina D, Marina E and Marina G have the highest ratios of ‘Yes’ answer (100%) related to Waste Recycling, Disposal, & Storage. Marina G has the highest ratios of ‘Yes’ answer (76.9%) related to Boat Pumpouts and Sewage. As the general view of all of the questionnaire, Marina E and Marina G have the highest number of ‘Yes’ answers (79.2%) that indicate their better performance of environmental management practices. According to the detailed evaluation of the questionnaire results, some improvement suggestions developed.

Keywords: Marinas, environmental management practices.

The Cultural Sustainability: Merzifon Anatolia College, Turkey

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Abstract

The article proposes an analysis of the role of American Board of Commissioners for Foreign Missions (ABCFM) during the late Ottoman and the early nationalist (Republican) Turkey and focusses especially on the ABCFM organization and the role of Protestant missionaries, which they succeeded in establishing autonomous schools, hospitals, clinics, orphanages, lodgings and ateliers not only in the capitals, but also in provinces. The American Board began evangelism among Armenians, and the education and the social services became part of the Protestant movement in the Near East. Following efforts to Christianize the nations through evangelism, in the mid of 19th century, Merzifon (Marsovan) province was chosen due to its location in the middle of Anatolia and Merzifon Anatolia College was designed as an important 'station' in order to support the American missionary movements. Then, between the years 1886 and 1938, ABCFM built strong connections with Anatolia College in Merzifon to gain a very important strategic position.

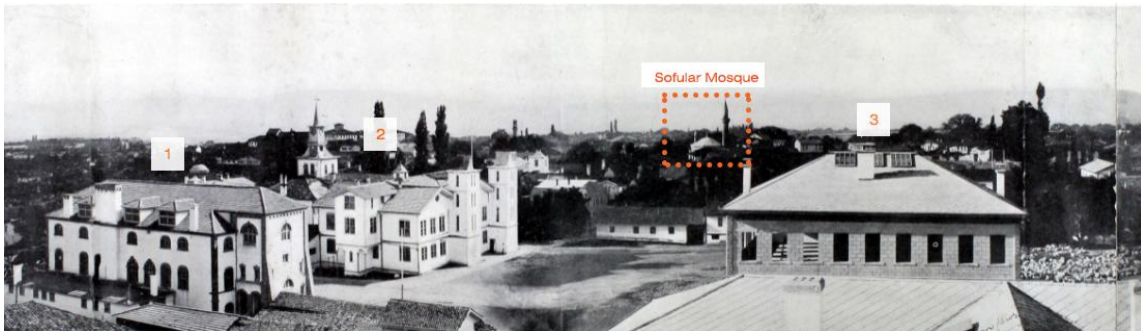


Figure 1. (1) The North College, (2) Boys' College Boarding School (3) Library- Museum, early 1900s.

In the context of the First World War, the function of the Anatolia College buildings has changed for different aims; the military used these buildings as the Artillery Regiment. After the war the ABCFM's network broke down but its strong contribution to present education in Turkey is inevitable. The site as a heritage is still an active part of the city's cultural life with some existing buildings of ABCFM supporting culture and education. For instance Merzifon Anatolia College Hospital is used by Merzifon High School for Science (Figure 2 and

Figure 3), Merzifon Anatolia College Library and Museum Building are used by Amasya University as Vocational School Administration Building (Figure 4, Figure 5). The other College buildings have been used by the Ministry of National Defense for many years. The North College, for instance, served as Non-commissioned Officer School during the First World War. (Figure 6). Today the building is under restoration (Figure 7).

In this study, cultural sustainability of the Merzifon Anatolia College buildings each constructed with different aims and various stories has been investigated. As a method, the historical background of the site and the buildings has been revealed through archive documents and interviews have been held with historians. A detailed field search has been carried out to document the current status and usages of the buildings.

Protecting aura with the function of the building thus its authenticity is an opinion that is supported by many theorists but when the function is no longer valid, sustainability of aura is in danger. In this sense, the present usage of the Anatolia College buildings for educational purposes might be the indication that the aura of the past is still culturally sustained.



Figure 2. Anatolia College Hospital, 1900s.



Figure 3. Merzifon High School for Science, 2019.



Figure 4. Anatolia College, Library and Museum, 1912.



Figure 5. Amasya University Vocational High School, 2019.



Figure 6. The North College, 1890s.



Figure 7. The North College, 2019.

Keywords: Collective Memory, Cultural Sustainability, American Missionary Movement, Merzifon, Anatolia College.

Closing Remarks

Dear Professors, Colleagues, Researchers, Students,

We've been attending this conference for the last 2 days. It is the first International Conference on Energy and Sustainable Built Environment organized by Istanbul Gedik University.

As you are all aware that the built environment is one of the areas that has been presenting the highest rates of primary energy consumption worldwide. The rapidly increasing energy demand and the consumption of high rates of fossil fuels and natural sources has been bringing serious consequences. The need for a more sustainable built environment in account of reducing energy consumption and emission has long become a core issue to be adressed urgently.

Therefore we have to do something! Now! We must do something! That is why the theme "Design Today Save Future" was selected for the first of the coming conferences on the matter.

Energy consumption in the built environment has crucial impact on the World. In an attempt to be part of the solution, we invited colleagues, researchers, scholars, practicing architects and engineers, social scientists in order to discuss the related issues, to provide a forum focusing on energy and environmental debates and policies.

We heard speeches, yesterday and today, that were tremendously valuable. The works delivered by our distinguished guests presented great diversity including eco-city, nano-tehnology, urban sensitivity emotions, the impacts on climate change which is the core of the matter. We heard for the first time presentations of some very valuable works as in digital applications in architecture in urban spaces, technical and economical investigations, Potential biomimicry.

What ever we do, we have to do it without harming cultural and historical heritage.

In conclusion, we have to come together. We have to work in collaboration.

If we can do anything to save the future we have to design today.

We have to must act now. This conference has been an initial contribution on our side.

We hope that you all found it valuable and enjoyable.



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