



## Abstracts

**Ademović, Naida, Prof. Dr.**

**University of Sarajevo, Faculty of Civil Engineering, Bosnia and Herzegovina**

### **IMPACT OF CLIMATE CHANGES ON CIVIL ENGINEERING STRUCTURES**

In the past period, alternation of the weather changes has been noted and this is an ongoing process. The impact of these changes can be seen on existing structures and this has and will have a direct influence on the future development and design of civil engineering structures. In the last years, we have seen how extreme weather as increased temperatures, intensive rainfall causing floods and landslides, as well as natural hazards like earthquakes affect existing buildings. Additionally, one of the major problems of existing structures is the lack of maintenance, which accelerates the impact of climate change on structures. These challenges are rather complex and in the long-term, the upgrading of the structures will be a challenging task so that they can sustain these changes. In this light the priorities that are identified are durability, sustainability, and resilience of structures, leading to the creation of reliable and resistant structures. As structures are designed according to various standards, rules, or codes, these have to go hand in hand with the occurred climate changes. The effects of climate changes on civil engineering structures will be presented and how one can decrease their negative effect on existing structures. This in term will prolong the service life of structures and have a beneficial effect on the durability.

**Anđelković, Uroš, Dr.**

**University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Serbia**

### **CONSEQUENCES OF WRONG DIRECTIONS OF ENERGY TRANSITION IN SERBIA ON THE ENVIRONMENT - THE EXAMPLE OF THE MINI HYDROPOWER PLANTS IN THE VLASINA RIVER BASIN**

Current energy production in Serbia mostly rely on lignite coal. This low rank coal provides low heat content with high amount of ash, high amount of sulfur (0.3-0.8%) and high amount of highly toxic elements including arsenic (1.4 g/t) and mercury (0.4 g/t) and in the end its quantity is limited to a few more decades. One of the directions of energetic transition foreseen by the government in Serbia is construction of mini hydropower plants. However, foreseen locations, and construction criteria are not well defined. Consequently, devastation of environment is substantial. Moreover, this devastation has direct markedly bad effect on the water supply of settlements in the Vlasina river basin. We provide data proving poor and bad effect of mini hydropower plants construction in locations that are not selected taking into account the negative consequences of construction.



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**Batas Bjelić, Ilija, Dr.**  
**Serbian Academy of Sciences and Arts Belgrade, Institute of Technical Sciences, Serbia**

**NATIONAL ENERGY AND CLIMATE PLANNING IN SERBIA: FROM LAGGING BEHIND TO AN AMBITIOUS EU CANDIDATE?**

Just in the immediate neighbourhood of the European Union (EU), the Republic of Serbia, one of the Western Balkan (WB) EU candidate countries, is lagging behind in the process of energy transition regardless of technological advances and policy instruments available. The EU created a momentum for energy transition acceleration with the European Green Deal, which has been forwarded to the WB through the Energy Community secretariat in the form of the Green Agenda; generally speaking, response in the form of National Energy and Climate Plans (NECPs) is expected in the short term. The Republic of Serbia's available documents will be commented on, and improvements will be suggested for the acceleration of energy transition, based on the newest findings from the simulation-based optimization techniques using the sector coupling approach to achieve ambitious variable renewable energy shares. The motivation of this research is to provide decision makers in Serbia with the best available insights regarding sustainable energy system planning tools and possible shortcuts for delayed planning of activities. In addition, the purpose is to improve Serbia's chance of benefitting from adoption of these strategies in the country's faster transition towards EU membership. The research compares two scenarios to illustrate a possible policy shift from small hydro power plants to photovoltaics (PV). A further increase in PV and wind power plants has been simulated using the EnergyPLAN to achieve expected scenarios of 40% renewable energy share and some more ambitious ones—up to 80%, which is realistic only with the sector coupling approach.

**Dedić, Aleksandar, Prof. Dr.**  
**University of Belgrade, Faculty of Forestry, Serbia**

Milenković, Milan, University of Belgrade, Institute of Geography / Salemović, Duško, High Technical School of Applied Science / Đukić, Matilda, High Technical School of Applied Science

**ADEQUATE BIOMASS UTILIZATION IN SERBIA IN THE LIGHT OF THE EUROPEAN GREEN DEAL**

The developed countries of European Union such as: Germany, France, Sweden, etc. have the great potential of biomass and its large utilization, at the same time. The reason is that biomass is a renewable energy source and furthermore with zero S emission and very low CO<sub>x</sub> and NO<sub>x</sub> emission after the combustion process in a furnace.

Some objective and subjective problems that limited utilization of biomass in Serbia are given in the presentation which will be useful to present the problem and to start the discussion about it.

The results of our projects on developing a demo CHP plant with installed electric power of 200kW will be briefly reported. The basic concept of the high-temperature drying plant for wood waste will be also presented. In addition to that, the device for briquettes production convenient for individual house-keepers and small companies in rural areas will be explained. All these projects were financed by the The Ministry of Education and Science of the Republic of Serbia

One of the main reasons to introduce plants with combined heat and power co-generation in Serbia is, beside zero emission, in its great ratio of efficiency which is more than 20% higher in comparison with the utilization of this energy in classic ways.

At the end, opportunities for Serbia for better biomass utilization will be presented on the session and will also be a matter of discussion.

**Key words:** biomass, utilization, CHP plants, emission.



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**Đorđević, Đorđe, Prof. Dr.**  
**University of Niš, Faculty of Civil Engineering and Architecture, Serbia**

Avramović, Biljana, Construction Cluster Dundjer

### **RECENT EU PROJECTS DEALING WITH EU GREEN DEAL AND SUPPORTING INTERNATIONALISATION OF SOUTH SERBIAN BUILDING INDUSTRY**

#### **Project 1:**

Increasing competitiveness level of SMEs in construction sector of Niš Region, for EU market, by introduction of EU standards and methodologies for quality and sustainability assessment of buildings

**Overall objective:** To contribute to the enhanced competitiveness of SMEs in Niš region in construction sector.

**Specific objective:** To upgrade the quality level of products and services of the SMEs in construction sector, in Niš region, required for their market expansion in the EU countries, by implementing EU standards and methodologies for quality and sustainability assessment of buildings.

Supported by: EU PRO - Programme is financed by the European Union, implemented by UNOPS in cooperation with the Government of the Republic of Serbia, 2020-2021.

#### **Project 2:**

Strengthening clusters management activities and running trans-national for implementation of nearly zero energy buildings - SMART4NZEB3

**The main objective** of SMART4NZEB is to create a sustainable collaboration between the involved partners and relevant stakeholders representative for the nZEB market in the selected Central and East-European countries, with a view to develop the involved clusters management excellence and to support interregional partnerships to facilitate the development of competitive products and technological solutions intended for new and existing buildings, which will lead to market penetration of nearly zero energy buildings, related to their production, use and reuse.

Supported by: EU COSME project, Grant Agreement No. 874425, 2020-2022.

#### **Project 3:**

Boosting the internationalisation for circularity in the building environment - ICBUILD4

**The main objective** of this project is to intensify the collaboration of the European construction and building-related industry clusters across borders, to establish the European Strategic Cluster Partnership, and to lead international cluster cooperation in fields of strategic interest for SMEs companies towards foreign markets beyond Europe (case study: Canada, Mexico, Brazil, UAE, India).

Supported by: EU COS-CLUSINT-2020-3-01 – Clusters Go International, 2021-2024.

**Đurić, Emilija, Dr. Med.**  
**University of Belgrade, Faculty of Medicine, Serbia**

### **ENDOCRINE DISRUPTOR AGENTS AND OTHER HARMFUL SUBSTANCES IN COSMETIC INDUSTRY**

Cosmetic products are substances or mixtures of substances primarily intended for external use, such as improving aesthetic appearance, hygiene, perfume, and sun protection. Nowadays, a growing number of cosmetic products are consumed in the mission for eternal youth, despite known health and environmental risks. The cosmetic industry is rapidly expanding; in the last decade, we have seen an increase in the number of brands and an exponential increase in the number of cosmetics products released with insufficient environmental research behind them. Endocrine disruptor Chemicals (EDC) are either naturally occurring or created by humans; they can imitate or interfere with the body's hormones, known as the endocrine system. EDCs are a vast family of compounds that include numerous industrial chemicals, plastics and plasticizers, fuels, and various other chemicals present in the environment or are in widespread use. Most common EDCs in cosmetics include parabens, phthalates, aluminium salts, triclosan, some UV filters, Bisphenol A, perfluorinated chemicals. EDCs are known to disrupt the endocrine system, cause reproductive issues, pollute the environment, and pose a significant risk to ecosystems. EDCs enter natural environments through a variety of routes, the most common of which is through water, posing a hazard to aquatic ecosystems. However, while some of the chemicals themselves are not harmful, their metabolites can become toxic when they are exposed to specific environmental changes. Coral bleaching, the accumulation of EDCs in aquatic species, EDCs in pet food and urine, and even the presence of EDCs in the human placenta are some evidences of hazardous activity. Awakening public consciousness about biocide levels in the environment and their impact on ecosystems is essential; everyone must speak out.



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**Georgijević, Milosav, Prof. Dr. (Prof. in pension)**  
**University of Novi Sad, Faculty of Technical Sciences / AvH-DAAD Club Novi Sad, Serbia**

**INNOVATION AS AN ENGINE FOR THE DEVELOPMENT OF ECONOMY AND SOCIETY**

The presentation gives an overview on innovation, with examples (from own practice, our environment, our people in the world, from Germany, ..).

Following the definitions of change in the concept -idea of innovation in the twentieth century, an analysis of the impact of the social environment on innovation and the measures to taken by regulated societies to accelerate innovative processes in research and business, then the parameters that measure of the state of innovation of the society are analyzed, such as:

- allocations from the GDP for education and research,
- number of patent applications (patent pending),
- high technology trade, ...

With examples from Germany and the world, an analysis of innovation with the events that led to the *4th Industrial Revolution*, the *Internet of Things* and the current place of the academic pyramid in innovative societies is given.

An analysis of the situation in Serbia and the misconceptions that have led us to the current situation provides the basis for the answers:

- is there any way out of the *backwater* of society,
- how to get out of a crisis and reach an innovative society.

The above is supported by their own examples.

**Kadić, Azra, Prof. Dr.**  
**Bosnia and Herzegovina**

**EDUCATION FOR SUSTAINABLE DEVELOPMENT IN THE ELEMENTARY SCHOOL**

Environmental education is becoming an increasingly important paradigm, the modern concept of understanding the environment and the development concept of protection. In accordance with the idea of protecting the environment in society, education for sustainable development in the education system has been formed.

The presence of the protection of the environment in the curricula represents the degree of development of society, modernization and orientation of the educational system. In the long run, sustainability education should be integrated into the national curriculum.



**Piplaš, Haris, Dr.**  
**Drees&Sommer, Sector: Integrated Urban Solutions, Switzerland**

### **INTERPLAY OF GREEN AND BLUE INFRASTRUCTURES: PRIMARY MEDIA OF FUTURE CITY DESIGNS?**

Our planet's climate is anything but simple. A firm and ever-growing body of evidence points to a clear picture: the world is warming. The warming is caused by human activities which are increasing levels of greenhouse gases in the atmosphere. According to UN HABITAT cities are responsible for 80% of greenhouse gas emissions while only comprising 2% of land mass - an immense ecological footprint showing the inseparable link between nature, cities and sustainability. This evidence shows that the art and process of making and managing cities and all its aspect must go through a process of re-thinking. Nonetheless, cities designed in the 19<sup>th</sup> and 20<sup>th</sup> century are still expected to provide the same, outdated aesthetic and functional indicators.

The presentation argues that urban space including its landscapes, need to become more flexible and adaptable offering important services for the city which would also enhance the socio-cultural and political implications of constructed space. We require a multi-scale, multi-functional and inter-disciplinary approach for designing and planning to adapt to the needs of a peak-oil society. Neglecting the importance of Green and Blue Infrastructures, we tend to take only the 'built volume': the traffic infrastructure and buildings of a city as the only determining characteristic of the sustainable city.

This presentation proposes Green and Blue Infrastructures as framework for design of future cities: integrating urbanism and ecology and aiming to catalyze the interaction between different urban media. It argues that the interplay between Green and Blue infrastructures possesses immense potentials for proactively improving the sustainability of cities because of its direct connection to urban natural systems. It is the Green and Blue Infrastructures, which are often neglected in a discussion regarding innovative and sustainable urban design and planning. This presentation proposes an increase of importance of integrated urban solutions: such as participation with mobility, energy and water management - showing that urban landscapes and its ecosystem services can firmly contribute to urban sustainability and self-sufficiency.

**Key Words:** urban management, constructed space, ecosystem services, green and blue infrastructures, urban design, ecologic framework, integrated urban solutions

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*Jakarta's urban transformation (Source: Gunawan Kartapranata - Creative Commons)*





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**Savić Zdravković, Dimitrija, Dr.**  
**University of Niš, Faculty of Natural Sciences and Mathematics, Serbia**

**BACK TO BASICS – FIGHTING CLIMATE CHANGE THROUGH TRADITION**

All Temperature-change scenarios in Europe consistently reveal apparent rise of external temperature, which would have considerable consequences for food security and health as well as for ecosystems on land and under water. This leads to pauperization of existing ecosystems due to loss of keystone species and invasion of new ones that will cause still unknown repercussions to local human communities. This is especially true for “sensitive” ecosystems such as mountain and high mountain areas of Serbia, which are one out of six biodiversity centers of Europe. Local people who live in those areas have contributed little to climate change, but are also the ones most adversely affected by it. Thorough the world indigenous people are in the worst position, due their dependence on local biological diversity, ecosystem services and cultural landscapes. The 2030 Agenda calls for increased efforts to combat climate change and far-reaching environmental degradation to ensure that their impacts do not become even more severe. What about mitigating climate change through indigenous knowledge and governance by local communities? Indigenous people continue to be excluded from the decision and policymaking, such as official UN climate negotiations, which increases the direct impacts of climate change on their livelihoods. The local peoples’ knowledge about their lands provides a crucial foundation for community-based adaptation and mitigation actions that sustain resilience to climate change. The “old ways” have proven to be “sustainable” and “green” before the era of consumerism. Many developed countries are turning back to the traditional agriculture, food production, farming ... is the real progress written in the basics?

**Simikić, Vlasta, Dr.**  
**University of Tübingen, Research fellow at the Carl Friedrich von Weizsäcker Center, Germany**

**COORDINATED (RE)ACTION TO GLOBAL THREATS**

During the current COVID-19 pandemic, we experienced the need for a coordinated response coming both from scientists and policymakers throughout the world. Since the world did not anticipate this global threat, we were mainly reacting to it. Nowadays, we should take a more active role and make our societies robust against future global threats. Specifically, we should proactively address climate change as one of the most immediate challenges. I will discuss how science communication that promotes building epistemic trust helps in climate protection. Moreover, since the threat of climate change can only be successfully addressed from the international perspective, I will emphasize the importance of the inclusion of the Global South in the processes of environmental protection. Finally, this inclusion is only achievable through solidarity and equity measures.