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BOOK of ABSTRACTS

GREEN DEVELOPMENT,
INFRASTRUCTURE, TECHNOLOGY

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GREEN INFRASTRUCTURE,
GREEN TECHNOLOGY**

BOOK OF ABSTRACTS

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International conference



**GREEN DEVELOPMENT, GREEN INFRASTRUCTURE,
GREEN TECHNOLOGY**

**COMMEMORATING 2 YEARS FROM THE PASSING
OF
PROF. DR. FOKION K. VOSNIAKOS,
FOUNDER OF THE BALKAN ENVIRONMENTAL
ASSOCIATION (B.EN.A.)
AND JOURNAL OF ENVIRONMENTAL PROTECTION
AND ECOLOGY (JEPE)**

GREEN DEVELOPMENT, in essence, is the scientific outlook of development, it is people-oriented and embodies the establishment of a comprehensive, coordinated, and sustainable development concept to promote economic, social, and comprehensive human development.

GREEN DEVELOPMENT is a new form of development that uses an integrated approach toward economics, society, and ecology.

It is characterized by increasingly rational consumption, low consumption, low emissions, and preserving ecological capital. Based on green innovation, its fundamental aim is the accumulation of green wealth and improved human welfare to achieve harmony between humanity and nature. In essence, green development is the logical result of the scientific outlook of development.

GREEN DEVELOPMENT constitutes a profound criticism of, and fundamental break with, traditional “black” development, and inherits and transcends the concept of sustainable development. Sustainable development, as a correction to the excesses of more than 200 years of capitalist industrialization, cannot address the fundamental essence of this developmental paradigm, and so cannot fundamentally change it. The pattern of high consumption and over-consumption is rigidly locked into the social fabric of developed countries, making it very difficult to reduce per capita resource consumption and pollution emissions. However, by adopting green development, developing countries may find a new way to achieve green innovation and avoid repeating the mistakes of the traditional form of development.

GREEN DEVELOPMENT can only be achieved by promoting GREEN INFRASTRUCTURES and GREEN TECHNOLOGIES and as Prof. Dr. Vosniakos – always said, each country and every citizen who is an active member of society should encourage the “*green infrastructures*”, “*green economy*” and “*green business*” in order to promote growth, reduce social inequality, to reduce the impact of climate change and environmental degradation.

The International Conference GREDIT 2018 is an excellent opportunity for scientists, academics and people involved in the bussines sector to promote the state-of-the-art concepts of GREEN DEVELOPMENT. This scientific event is dedicated to the loving memory of Prof. Dr. Fokion K. Vosniakos, arduous promoter of environmental protection and education in the Balkan area and worldwide.

*Dr. Mariana Golumbeanu,
Vice President of Balkan Environmental Association
(B.EN.A.)
JEPE Editorial Board*

International conference



**GREEN DEVELOPMENT, GREEN INFRASTRUCTURE,
GREEN TECHNOLOGY**

MESSAGE FROM CO-DIRECTORS

The geopolitical landscape of the 21st century is rapidly changing. With increased urbanization and industrialization, sustainable development is central to our existence. The complexity of meeting human development goals while maintaining the ability of natural systems to provide the natural resources and ecosystem to co-exist are quintessential for interdependence of the economy and civilization. Literature describes that the Sustainability is development that satisfies the needs of the present without compromising the capacity of future generations, guaranteeing the balance between economic growth, care for the environment and social well-being. Balkan Environmental Association (B.EN.A.) is developing a scientific network in Balkan and Black Sea region to address this global challenge. B.EN.A's specialists are involved in the study of pollution (air, water, soil, agricultural, industrial); ecology; risk assessment; waste management; radioactivity; clean technologies; environmental education, environmental legislation, management and informatics; health impact and computer application to environmental issues. Consistent with the mission of B.EN.A we are conducting GREDIT 2018 to address sustainable development in a multidisciplinary format thereby exploring the topics, such as, Air – water – soil pollution; Risk assessment; Renewable energy resources and management of natural resources; Agriculture, Forestry, Agro-ecology, Food Quality safety; Management of urban and

industrial waste and waste water; Climate change – biodiversity – Energy efficiency; Green smart cities/societies – green architecture, landscape design and transport; Health and Environment; Legal framework – GIS and remote sensing control and Bionic alternatives for environmental protection. The desired outcome is anticipated to be a state of society where living conditions and resource use continue to meet human needs without undermining the integrity and stability of the natural system and sustainable development can be classified as stated above.

The GREDIT 2018 conference will follow this lead to discuss, describe, and exchange technological innovations for 3 days meeting in Skopje, Republic of Macedonia.

With enthusiastic participation from over 20 countries, we anticipate a shared and productive exploration of many key scientific and technological advancements in the areas of sustainable development. It is our hope that all participants will find the conference a welcome and productive means to collectively advance the field of sustainable development and form future alliances within these important areas of research. On behalf of the members of the local and international Organizing Committees, we would like to extend a warm welcome to all of the participants of GREDIT 2018, here in Skopje, Macedonia.

International conference



GREEN DEVELOPMENT, GREEN INFRASTRUCTURE, GREEN TECHNOLOGY

FOREWORD

GREDIT2018, dedicated to Green development, Green infrastructure and Green technologies, is a Second International Conference and overall a third scientific event of the GREDIT Family in Skopje. The preparations for GREDIT2018 Conference begun just after the Conclusions from GREDIT2016 were drafted on April 1st, 2016. It came clear that there are mayor issues that need to be addressed concerning the impact on the environment from human activities in several fields. Skopje, the host city of GREDIT2018, as several other cities in the world, is challenged to urgently implement green development, green infrastructure and green technologies so it can provide healthy urban environment.

GREDIT2018 Conference is a place where scientific research is shared among fellow scientists but also with the local and regional stakeholders and representatives from the industry.

The aim of the GREDIT2018 international conference is to contribute to sustainable development in a multidisciplinary way, exploring the following topics:

- Air – water – soil pollution
- Risk assessment
- Sustainable development, Renewable energy resources and management of natural resources
- Agriculture, Forestry, Agro ecology, Food Quality safety
- Management of urban and industrial waste and waste water
- Climate change – biodiversity – Energy efficiency
- Green smart cities/societies – green architecture, landscape design and transport

- Health and Environment
- Legal framework – GIS and remote sensing control
- Bionic alternatives for environmental protection

As a preparation for the Conference, two round tables were organized in the fields of: Unregulated landfills and Urban Air Pollution.

This Conference has been organized as a joint effort of the Ss. Cyril and Methodius University in Skopje, Balkan Environmental Association BENA, the Chamber of certified architects and certified engineers of Macedonia, PAKOMAK, FUEL and 6th Star.

We are grateful for the mutual cooperation of the International Scientific Board members of the Conference, the members of the Honorary presidency of the Conference and the Organization Board with the authors and researchers present at GREDIT2018.

All of our efforts were supported and sponsored by the Organizers and Sponsors of the Conference, presented on the Cover of this Book of Abstracts, who have shown high social responsibility. The support from the Sponsors and Contributors of the Conference is highly appreciated.

Dame Dimitrovski

SOURCES OF URBAN AIR POLLUTION IN MACEDONIA – BEHIND HIGH POLLUTION EPISODES

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Abstract: High air pollution episodes during the winter season throughout urban areas in Macedonia become primary public health concern and topic for wide public discussion. However, although this topic is marked as one of most important pollution topics, volume of scientific data published on air pollution sources and pollution profiles is quite low, especially having in mind dynamic changes in source profiles and pollution patterns over the last years. Few recent studies indicate domestic heating, traffic and industry as dominant sources (listed in order of importance), but no clear conclusion about dominant sources of high pollution episodes is drawn. Lack of this data clearly limit possibilities for proper response and development of efficient control/reduction measures during such episodes. The paper summarize latest publicly available data, as much as the finding from the studies and combine them in order to point dominant sources and pollution patterns during the high pollution episodes. This work also include pollution patterns collected from AMBICON.UGD monitoring network in several urban areas in Central and Eastern Macedonia, as much as chemical profiles of ambient particulates, all in attempt to fill the data gaps and indicate dominant pollution sources.

Key words: air pollution, particulate matters, high pollution episodes, pollution patterns, chemical profiles.