



University of Novi Sad | Faculty of Sciences  
DEPARTMENT OF GEOGRAPHY, TOURISM AND HOTEL MANAGEMENT

# INTERNATIONAL CONFERENCE on HYDRO-CLIMATE EXTREMES and SOCIETY

*Abstract Book*

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## *Abstract Book*



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*Novi Sad skyline during the heatwave July 2022 by Prof. Lazar Lazić*

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## Innovative Technology for Recycling Polyethylene Terephthalate: Climate Changes, Approaches, Solutions

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Worldwide pollution induces a negative impact on the complete environment. Modern societies are becoming more involved in developing and implementing climate change adaptation policies as a result of the enormous hazards that climate change poses to human safety worldwide. One of the biggest problems that highly affects climate change is plastic pollution. Also, the utilization of a linear economy prevents the opportunity of solving mentioned problem. Hence, a major component of the strategy for tackling plastic pollution and trying to decrease global weather changes is an implementation of a circular economy. Plastic has to be reduced, reused, and recycled since its widespread consumption has put environmental protection at risk. PET, also known as polyethylene terephthalate, is a prominent polymer material used for the production of packaging, particularly plastic bottles. The majority of PET-based products are made using raw materials supplied from fossil fuels. However, methods based on biobased materials and recycling-modified products for obtaining novel products from waste PET have fewer greenhouse gas (GHG) emissions than the traditional method. Therefore, the subject of this paper is the innovative technology for the fabrication of materials by PET recycling. Obtained monomer units - glycolysates were acquired by PET depolymerization by inducing greener solutions. The resulting glycolysate was structurally modified with maleic anhydride and finally with 2-octanol to obtain a novel plasticizer. The physicochemical characterization of the obtained plasticizer, performed by infrared spectroscopy with Fourier transform (FTIR) and NMR spectroscopy, confirmed structural modifications. The mechanical characteristics of the final product were tested after the plasticizers had been combined with bitumen at a range from 1 to 10 wt.% concentration. In addition, other PET recycling techniques will be presented and discussed. By comparing them, it will be determined which technique is most suitable for recycling with the smallest carbon footprint. The second purpose of the research is to evaluate and contrast the financial and ecological implications of recycling PET in comparison to other types of waste and renewable energy sources.