



Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025





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Publication prepared and funded under Erasmus+JM Project
«EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD –
ERASMUS-JMO-2022-HEI-TCH-RSCH



Co-funded by
the European Union

Petro Mohyla Black Sea National University,
Mykolaiv, Ukraine, 2025
<https://chmnu.edu.ua/>

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UDC 502.131.1+551.58] =111

Approved for publication by the Academic Council of Petro Mohyla Black Sea National University, Mykolaiv, Ukraine (№7, 29.05.2025).

Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025 [Electronic resource], Mykolaiv : PMBSNU, 2025, 100 p.

ISBN 978-617-8176-45-7

Proceedings of the International Conference «European Green Dimensions: Fundamental, Applied, and Industrial Aspects», June 5–7, 2025 present abstracts of the reports of the Conference, which had place on June, 5–7, 2025 at Petro Mohyla Black Sea National University, Mykolaiv, Ukraine, prepared and funded under Erasmus+JM Project [«EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD – ERASMUS-JMO-2022-HEI-TCH-RSCH.](#)

The Proceedings covers such questions: European Green deal; Climate change; Energy efficiency, renewable energy; Conservation of biodiversity; Water resources management; Water quality, wastewater treatment; Protection of atmospheric air, environmental control and monitoring systems; Industrial and household waste management; Sustainable development and education for sustainable development.



**Co-funded by
the European Union**

Printed by: FOP Shvets V.M., Phone: +3806660946881;
Certificate subject publishing DK № 5078 from 01.04.2016.

The authors are responsible for the reliability of the results.

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Publication prepared and funded under Erasmus+JM [Project «EUROPEAN GREEN DIMENSIONS» 101081525 – JM EUGD – ERASMUS-JMO-2022-HEI-TCH-RSCH](#)

FOREWORD

Dear colleagues!

This collection of abstracts represents the culmination of the International Conference "European Green Dimensions: Fundamental, Applied, and Industrial Aspects," held on June 5–7, 2025, at Petro Mohyla Black Sea National University in Mykolaiv, Ukraine.

In an era where the planet's vital signs are flashing red, the International Conference isn't just timely – it's a critical intervention. We're operating in a complex system, where the European Green Dimensions represents a bold attempt to recalibrate humanity's relationship with Earth. This isn't solely about policy; it's a call to reimagine our industrial DNA, redefine energy itself, and resuscitate ecosystems gasping for breath.

From the thermodynamics of climate change to the intricate web of biodiversity, and from the chemistry of wastewater to the physics of renewable energy, the conference's scope mirrors the interconnectedness of the challenges. It's a recognition that sustainability isn't a niche concern—it's the operating system upgrade our civilization desperately needs. This isn't an academic exercise; it's a solution-focused sprint. The urgency is palpable, and the stakes couldn't be higher.

The Proceedings covers such questions: European Green deal; Climate change; Energy efficiency, renewable energy; Conservation of biodiversity; Water resources management; Water quality, wastewater treatment; Protection of atmospheric air, environmental control and monitoring systems; Industrial and household waste management; Sustainable development and education for sustainable development. The issues of ecology and sustainable development are of paramount importance and growing urgency for the future of humanity, demanding innovative solutions and collaborative efforts.

The International Conference attracted participants from a wide geographical distribution, fostering a rich exchange of ideas and perspectives. The contributions herein reflect the diverse approaches and innovative solutions being explored across various contexts.

It is our hope that the ideas presented within these pages will spark inspiration for further research, and facilitate the building of bridges for future collaboration and partnerships among scientists and practitioners.

We extend our sincere gratitude to the Erasmus+JM Programme, whose funding made this important event and this publication possible.

Prof. Olena Mitrysova

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Bioeconomy for Achieving Sustainable Development Goals

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Bioeconomy is a paradigm and a tool for achieving sustainable development goals. The essence of the transition to sustainable development is the survival of mankind and simultaneous preservation of the biosphere. However, in order to survive, to preserve as a unique biological species, humans need to radically transform all areas of activity in the direction of reducing the significant pressure on the biosphere. In this context, the formation of a knowledge-based bioeconomy is a key strategy that meets the needs of society, as it ensures efficient use of resources on the principles of sustainability. According to some scientists, sustainable development is a process of harmonization of productive forces, guaranteed provision of satisfaction of the necessary needs of all members of society, subject to the preservation and gradual reproduction of integrity of the environment, creating opportunities for balance between its potential and the requirements of people of all generations. Since bioeconomy is a form of economic activity that is based on the balanced interaction of three systems – economic, environmental and social, which is determined by the processes of mutual exchange of renewable bioresources in order to ensure a high level of quality of life and preserve ecological balance for future generations, the transition to a bioeconomy can become, in our opinion, one of the main priorities of sustainable development. In general, the strategy of sustainable development is based on a very logical and understandable approach: for the sustainable development of humanity on a planet with limited resources, it is important not to exhaust these resources and not to exceed the planet's natural capacity for self-regeneration. The bioeconomy ensures the production of renewable biological raw materials and the transformation of these resources and waste into products with added value, in particular, into food, feed, bio-based products and bioenergy [1]. The formation of the bioeconomy is an important priority and the main vector in the concept of sustainable development policy, as it integrates economic and social components that are aimed at meeting the needs of both current and future generations.

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