

## Preface

First of all, on behalf of ICECAE 2022 Scientific and Organizing Committee let me express my sincere gratitude to our International Peer-Review team who donated a massive amount of their time to review the submitted papers – their contribution is invaluable. I have to mention that we applied multi-cycle or three stage peer-review process that includes: initial screening, peer-review and post-review phases, and selected based on significance, originality, and clarity for the aim of the ICECAE 2022. Many thank to our authors for their understanding and patience throughout this whole in-deep process.

The objective of the ICECAE 2022 is to learn and share knowledge among all and those who have rich experience and expertise in relevant areas of science and technology. This conference is a privileged space to discuss current issues related to Energetics, Civil and Agricultural Engineering. As well as, this international event aims to explore emerging technologies and concepts in a collaborative way, bringing together scientists, researchers, engineers, students and professionals from different areas.

In addition, the Organizing Committee intends to strictly adhere to the recommendations of WHO. Hence, ICECAE 2022 Organizing Committee is fully responsible for everything related to the organization of this international event and assured to maintain a safe and healthy environment, as well as favorable working conditions.

Moreover, I am in particular grateful to our plenary, honorable and international speakers and authors for their considerable contribution to the success of this international conference. We are also grateful to our collaborative partners: Cracow University of Technology (Poland), Karabuk University (Turkey), Jizzakh Polytechnical Institute (Uzbekistan), and Ecological Party of the Republic of Uzbekistan for their comprehensive support and contribution. The last but not least, we would like to thank our publishing partner – the team of EDP Sciences & E3S Web of Conference for their all-round support and commitment to publishing selected articles of the ICECAE 2022.



ICECAE 2022 Editor-in-Chief & Scientific Chairman

**Prof. Dr. Obid TURSUNOV**

*International Expert-Scholar*

*TIAME National Research University*

## ICECAE 2022 COMMITTEE

### Scientific Chairman:

***Prof. Dr. Obid Tursunov***

(International Expert-Scholar, and Professor of the TIIAME National Research University)

***Prof. Dr. Bahadir Mirzaev***

(Rector of the TIIAME National Research University)

### Collaborative Chairman:

***Prof. Dr. Abdushukur Khamzaev***

(Ecological Party of the Republic of Uzbekistan)

***Prof. Dr. Alisher Usmankulov***

(Rector of the Jizzakh Polytechnical Insitute)

### Co-chairman:

***Prof. Dr. Jan Wincenty Dobrowolski***

(Head of International Scientific & Technical Committee, Fellow of World Academy of Art and Science)

***Assoc. Prof. Dilshod Kodirov***

(Head of the Department of Power Supply and Renewable Energy Sources, TIIAME National Research University)

***Dr. Otabek Khujaev***

(Research Institute of Forestry, Uzbekistan)

### Coordinators:

***Dr. Sirojiddin Khushiev***

(Docent of the TIIAME National Research University)

***Dr. Jurabek Izzatillaev***

(Docent of the TIIAME National Research University)

## International Scientific & Technical Committee

**Prof. Dr. Franciszek Dubert**

(The Franciszek Gorski Institute of Plant Physiology, Polish Academy of Sciences, Poland)

**Prof. Dr. Jan Wincenty Dobrowolski**

(Fellow of World Academy of Sciences; AGH University of Science and Technology, Poland)

**Prof. Dr. Antoni Stasch**

(President of the European Academy of Technology and Management, Germany)

**Prof. Dr. Jacek Gyurkovich**  
(Cracow University of Technology, Poland)

**Prof. Dr. Justyna Kobylarczyk**  
(Cracow University of Technology, Poland)

**Prof. Dr. Yuguang Zhou**  
(China Agricultural University, China)

**Prof. Dr. Janusz Ryzkowski**  
(Maria Curie-Skłodowska University in Lublin, Poland)

**Prof. Dr. Marcin Furtak**  
(Malopolska Laboratory “Energy-efficient Construction”, Poland)

**Prof. Dr. Kazimierz Klima**  
(University of Agriculture in Krakow, Poland)

**Prof. Dr. Hamiyet Şahin Kol**  
(Karabuk University, Turkey)

**Prof. Dr. Ziyodulla Yusupov**  
(Department of Electrical-Electronics, Karabuk University, Turkey)

**Assoc. Prof. Dr. Muhammet Kayfeci**  
(Department of Energy Systems Engineering, Karabuk University, Turkey)

**Assoc. Prof. Dr. Dominika Kusnierz-Krupa**  
(Cracow University of Technology, Poland)

**Assoc. Prof. Dr. Tomasz Kozłowski**  
(Cracow University of Technology, Poland)

**Assoc. Prof. Dr. Alirza Mamedov**  
(Kiev National University of Building and Architecture, Ukraine)

**Assoc. Prof. Dr. Michal Krupa**  
(Cracow University of Technology, Poland)

**Asst. Prof. Dr. Vasudeva Madav**  
(Department of Mechanical Engineering, National Institute of Technology Karnataka Surathkal, India)

**Asst. Prof. Dr. Songül KASKUN**  
(Department of Environmental Engineering, Karabuk University, Turkey)

**Dr. Katarzyna Zubek**  
(Department of Energy and Fuels, AGH University of Science and Technology, Poland)

**Dr. Andrey Kuzmin**  
(Institute for Engineering Thermal Physics, National Academy of Sciences of Ukraine, Ukraine)

**Dr. Sergii Sergienko**  
(CICECO – Aveiro Institute of Materials, University of Aveiro, Portugal)