



UNIVERSITAS
INDONESIA

Veritas, Probitas, Justitia

SCHOOL OF
ENVIRONMENTAL
SCIENCE

PROGRAM BOOK

4th International Symposium of Earth, Energy, Environmental
Science and Sustainable Development

AUGUST 26-27, 2023

<https://scholarhub.ui.ac.id/jessd/>
symposium.jessd@ui.ac.id

    @journal_jessd



SPONSORED BY:



PROGRAM BOOK

**4th International Symposium (Hybrid) of Earth,
Energy, Environmental Science and Sustainable
Development 2023**

August 26th – 27th, 2023

4th International Symposium (Hybrid) of Earth, Energy, Environmental Science and Sustainable Development 2023

26-27 AGUSTUS 2023

Steering Committee

Chairman : Dr. Ahyahudin Sodri

Editorial Board of JESSD Journal :

- a. Mari Eko Mulyani, Ph.D.
- b. Dr. Stefanie Steinebach
- c. Prof. Dr. Ing. Ir. Misri Gozan, M.Tech.
- d. Prof. Dr. D'joni Hartono
- e. Ratih Dyah Kusumastuti, Ph.D.
- f. Prof. Dr. Ivandini Tribidasari Anggraningrum

Organizing Committee

Person Rensponsible : dr. Tri Edhi Budhi Soesilo, M.Si.

Chief Executive : Dr. Herdis Herdiansyah

IT Section : Azhar Firdaus, M.Si.

Administration Section : Nova Amalia Sakina, M. Si

Social Media Section : Anna Ilmika, S. P.

Publication Section : Salma Mar'atus Sholihah, SE.

Other Member Team : Glenzi Fizulmi, S.KM., M.KM

Ameylia Puspita Rosa Dyah Ayu Arintyas, S.Fil.

Muhammad Alfarizi

Veronica Mandasari, S.T.

Rosida Marasabessy, M.Pd

Sinan Vidi Lazuardi, S.Sos.

Simulation of Illumination and Wind Conditions for Green and Fed Cities Using CFD Software

Tetiana Tkachenko¹, Viktor Mileikovskiy^{2*}, Maryna Kravchenko³ and Viktoriia Konovaliuk⁴

¹ Environmental Protection Technology and Labor Safety Department, Faculty of Engineering Systems and Ecology, Kyiv National University of Construction and Architecture, Kyiv, 01010, Ukraine

² Heat-Gas Supply and Ventilation Department, Faculty of Engineering Systems and Ecology, Kyiv National University of Construction and Architecture, Kyiv, 01010, Ukraine

³ Environmental Protection Technology and Labor Safety Department, Faculty of Engineering Systems and Ecology, Kyiv National University of Construction and Architecture, Kyiv, 01010, Ukraine

⁴ Heat-Gas Supply and Ventilation Department, Faculty of Engineering Systems and Ecology, Kyiv National University of Construction and Architecture, Kyiv, 01010, Ukraine

Email: tkachenkoknuba@gmail.com, mileikovskiy@gmail.com, marina-diek@ukr.net, viktorija.konovalyuk@gmail.com

Abstract. To avoid ecological catastrophe, most cities are moving toward green building. The important component is greening – conventional and green structures. Urban agriculture is a very prospective direction. Green roofs, terraces, and rooftop greenhouses are the most promising places for growing. This solves multiple tasks: heat loss recovery for planting (for rooftop greenhouses), additional thermal insulation, optimized logistics, increasing pollinator populations, avoiding pests, etc. In different-height districts, there are problems with natural illumination and winds. No good urban wind theory has been developed. The winds can be simulated in CFD software using a 3D model of a district. Most of the software can simulate solar radiation for thermotechnical calculations only. It should be simulated in other special software. The approach to calculating solar radiation is proposed using CFD software without additional needs. The special material – "integrator" – should be added to the engineering database. Its thermotechnical properties can be set to obtain a temperature, numerically equal to the interesting parameter. Application is shown in an example of a different-height building with a green roof. The results show areas most favorable for growing photophilous and shadetolerant plants, and to place cleaning and phytoncidal plants for the maximum air quality in stagnation zones.

Acknowledgments

The work is invested by state grant 0223U000498 "Creating perspective technologies of forming the safe building environment combining "green structures", phytodesign, and engineering systems". This work is supported by Erasmus Plus grant «Multilevel Local, Nation- and Regionwide Education and Training in Climate Services, Climate Change Adaptation and Mitigation – ClimEd», 619285-EPP-1-2020-1-FI-EPPKA2-CBHE-JP, 15.11.2020 – 14.11.2023.

*The title on abstract of paper section is just temporary so the title can be changed