

**18TH CONFERENCE ON
SUSTAINABLE DEVELOPMENT
OF ENERGY, WATER AND
ENVIRONMENT SYSTEMS**

**18th
sdewes
Conference
DUBROVNIK
2023**



**SEPTEMBER 24-29, 2023
DUBROVNIK, CROATIA**

BOOK OF ABSTRACTS

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September 24 – 29, 2023, Dubrovnik, Croatia

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Publisher Faculty of Mechanical Engineering and Naval Architecture, Zagreb

ISSN – 2706-3690 (digital proceedings)

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Modelling the Long-Term Energy Transition in Different Regions of the World, Consideration of Different Region-Specific Data

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Abstract

This research presents the results of energy transition pathways in the different world regions. These regions are differentiated in the aspects of the availability of resources, different demand levels and distributions as well the different hourly distributions of the availability of renewable energy. Also, the differences in the regions are presented throughout different energy transition policies that are implemented. In order to model the specifics of interactions between the renewable energy generation and power to X technologies, the process of interlinking the outputs from EnergyPLAN simulations with the WILLIAM (Within Limit Integrated Assessment Model) was developed. The ranges of simulations are run in EnergyPLAN and the method of regression is used to create simple relations between input and output values. Furthermore, an additional step of input data normalization was developed to speed-up the process of conducting the simulations. The research focusses on the differences in the resulting curves for relations of the flexibility technology application levels and capacity factors of variable generation. Also, the curves resulting from regression approach are compared as well as the results of implementation in WILLIAM. Preliminary results show the differences in transition pathways with the regions predominantly located in the north or south focussing more on the implementation of wind and offshore wind energy, while the regions located closer to the equator such as India opting more for solar based energy systems.