



14TH CONFERENCE ON
SUSTAINABLE DEVELOPMENT
OF ENERGY, WATER AND
ENVIRONMENT SYSTEMS

October 1-6,
2019,
Dubrovnik,
Croatia



BOOK OF ABSTRACTS

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Publisher Faculty of Mechanical Engineering and Naval Architecture, Zagreb

ISSN 1847-7186 (book of abstracts)
ISSN 1847-7178 (digital proceedings)

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SDEWES2019.0720

Smart Energy Systems: Integration of Power, Heating/Cooling, Transport, Water and Waste Sectors

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Abstract

Smart energy systems with smart infrastructure definitely represent the fundamental ingredient in the process of integration of variable generation from renewables. Even more, the steps towards smart infrastructure should be expanded to integration of energy consumption in transport, heating/cooling, water and waste sector in order to establish observability and controllability features in the integrated energy sector. These topics, with a number of complementary issues, will be elaborated through the proposed review paper. The literature overview is quite long and focus of elaboration should be concentrated on research papers with significant contributions.

Topics that will be covered in this review paper include modern energy systems with high penetration of renewable energy sources and with smart grid wide applications, but also papers devoted to demand response programs (they enable distribution system operators to manage consumption in response to grid imbalances), energy storage options (including electric cars with smart electric charging), smart municipal energy grids including electricity and heat production infrastructure, power to heat technologies,...

Transport electrification and integration of energy consumption/production in water and waste sector will be covered in this review also with the special emphasis on increasing needs for electricity due to electrification of transport and heating sector (heat pumps,...).

In this review paper open questions within smart energy system will be recognized and directions for future research and investigations will be identified. A special attention to gradual transition from the conventional energy systems towards smart multi energy systems and to corresponding research results in this field will be given.