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Editorial

Energy Consumption in a Smart City

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1. Overview of the Articles in This Special Issue

Increasing and inexorable urbanization calls for the involvement of all the stakeholders. This includes energy providers, policymakers in the municipality, facility managers, and the citizens themselves, as energy consumption is influenced by this interconnected network of actors. The Smartness of the City enhances the interactions between those actors because its architecture already integrates elements to collect data and connect to the citizens. Furthermore, the proliferation of Web platforms (e.g., social media, Web fora) and the increased affordability of sensors and IoT devices (e.g., smart meters) make data related to a large and diverse set of users accessible, as their activities in the digital world reflect their real-life actions. These new technologies can be of great use for the stakeholders as, on one hand, it provides them with semantically rich inputs and frequent updates at a relatively cheap cost and, on the other, it allows them to have a direct channel of communication with the citizens.

This Special Issue aims to provide insights on original multidisciplinary research works about AI, data science methods, and their integration with existing design/decision-making processes in the domain of energy consumption in a Smart City. For this purpose, the Special Issue "Energy Consumption in a Smart City" has been designed and launched, intended for researcher, planners, users of the broad domain of the Smart City. Among a very high number of submissions, 11 articles have been accepted and published.

The first paper by Dharani et al. [1] presents the strategies to manage energy flows in a limited portion of the urban environment, i.e., the University campus, by an intelligent use of time-varying electrical load via developing efficient energy utilization patterns using demand-side management (DSM).

The second paper by Esfandiari et al. [2] investigates and assess the quality of the indoor environment of Platinum-certified office buildings in a tropical climate through surveys and questionnaire highlighting the human-centric perception of comfort that, whatever technologies are going to be included, is the requirement of the built environment.

The third paper of this Special Issue by Mousavi Motlagh et al. [3] propose a way for acquiring the foremost window allocation scheme to have the best trade-off among energy, environmental, and comfort criteria in a building by an advanced decision-making tool.

The fourth paper by Bazazzadeh et al. [4] focuses on the impact of climate change on the heating and cooling energy demands of buildings as influential variables in building energy consumption by the statistical downscaling method accounting for the future forecasted weather data for 2050 and 2080 and derived increased cooling demand calling for serious measures to control it.

The fifth paper by Csáky [5] focuses on the future cooling demand increase in buildings explaining how it greatly depends on the building structure, window coverage, and orientation. The detailed findings in the paper will be useful in the future for building renters and operators that have to manage the cooling systems during the—future more often—torrid days.

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The sixth paper of this Special Issue, by Cumo et al. [6] dealt with the different limitations in the transition of historical buildings to near zero energy (nZEB), including invasive interventions, historical and architectural structure constraints and impact on heritage value. The integration of renewable energy technology is seen as the way to reduce the energy footprint of such buildings.

In the seventh paper, Agostinelli et al. [7] discusses an infrastructure digitization policy to manage and optimize the energy transition process to transform ports area into zero energy districts. The strategies are not only aimed at the energy transition but have implications on the environmental, economic and social spheres, setting the port area as the epicenter and extending to the city.

In the eighth paper, Sureshkumar et al. [8] focus on induction heating for melting applications assisted by electronic power control as appealing technology since it provides higher efficiency, zero pollutants, non-contamination of material, etc. in comparison with conventional heating.

The ninth paper by Casini [9] is a review study on virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies and applications for smart building operation and maintenance. The application of XR in building and city management is showing promising results in enhancing human performance in technical O&M tasks.

In the tenth paper, Bruck et al. [10] propose a new method to compare European neighborhoods to plan the energy infrastructures needed for the energy transition. They identified a set of parameters to build a QGIS-based visualization that allows them to compare different areas easily and directly.

Finally, the last article by Liu et al. [11] analyzed the Smart City Policy (SCP) set in China as significant tool to reduce the carbon emission intensity of enterprises in urban contexts. The mechanism analysis finds that digital transformation, innovation by enterprises, and urban green innovation all strengthen the impact of SCP on the carbon emission intensity of enterprises via a smart way.

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