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Editorial

Introduction to the Special Issue: "Sustainable Buildings for Citizens, Cities and Communities"

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Nowadays, climate change has turned into the leading environmental, technological, social and economical worldwide challenge. Energy-saving and green power generation applications and plans are actually accelerated due to decarbonization compared to the past and will strengthen year by year.

The European Green Deal has placed the primary policy drivers in order to make Europe climate neutral in 2050 [1]. A plan exists to reduce 50% of the EU's greenhouse gas emissions by 2030, introducing a new legislative framework for building renovation. Additionally, the latest European Directives (Energy Performance of Buildings—2018/844, energy use from renewable sources Energy—2018/2001, energy efficiency—2018/2002), as well as the Paris Agreement, demonstrate clearly the short and medium tendencies.

Besides, recent EU initiatives, such as the territorial energy strategy and administration, contribute fundamentally to the construction and execution of these policy and technological schemes. Besides, although the portion of renewable energies is high on the policymaking plans, the overall society, yet is delayed to embrace it, to consolidate energy poverty improvement [2], schemes supporting green funding [3], and cooperative paradigms [4].

In the context of critical issues influencing our current, as well as the future, quality of living, the following have become a high priority:

- Credible tools to assess the built stock;
- Analysis of the energy society performance and its effectiveness;
- The impact of climate change in the built environment;
- The urban heat effects on the outdoor urban spaces.

This Special Issue includes carefully and strictly selected papers depended on their:

- Innovation, in order to become a worldwide Scientific and Technological example;
- Pure scientific and applied technology findings;
- Novel and alternate attitude.

These papers are the outcome of the authors' creative and intensive work, combined with the thorough *Energies* peer-review procedure. We are grateful for the help of:

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- The MDPI Editorial Office;
- The reviewers for their mindful recommendations and fruitful recommendations.

Although all these distinguished publications of this Special Issue could stand all alone, depending on their specific technical and geographical typology, we have attempted to create a holistic viewpoint, covering this research topic.

In the beginning, **R. Apanaviciene**, **A. Vanagas** and **P. A. Fokaides** initiate an innovative evaluation agenda in order to integrate Buildings into a Smart City. They follow the analysis of the literature,

existing international project examples and identifying the performance of smart buildings in various periods and for various stakeholders. The authors selected and analysed nine office buildings in a range of smart cities built during 2007–2018 with areas in the range 10,000–143,000 m^2.

Subsequently, **V. Marinakis** presents a high-level structure for real-time data exchange of buildings usable in different climate zones. The presented big data environment combines cross-domain data, artificial intelligence and distributed ledgers technology. Multilingual repositories of heterogeneous data typologies are combined with querying and visualization tools, programming interfaces, as well as analytical components employing machine learning.

Afterwards, **N. Sifakis**, **T. Daras** and **T. Tsoutsos** provide a systematic, in-depth, behavioural analysis of the prosumer members of renewable energy cooperatives in five renewable energy cooperatives (Belgium, France, Italy, Portugal, Spain), as proved energy consumption is strongly dependent on the typology of intervention and the analysed group. Besides, implementing these interventions proved effective to achieve their energy goal, in parallel alerting members, and pioneering towards a greener consumption behaviour.

After that **J. Li**, **Q. Wang** and **H. Zhou** proposed 27 key performance indicators for green building operations monitoring their operational performance more practically and efficiently, minimizing evaluation time and cost. An indicators library was established and a "SMART" principle and Delphi method were adopted to choose the most proper key performance indicators for the monitoring of green building operations.

Next **F. Mancini** and **G. Lo Basso** investigate the residential sector in Italy, studying current and processed meteorological data, projecting to future climate scenarios. A simplified dynamic model analyses 419 buildings from different climate zones (Milan, Florence, Rome, and Naples) in order to cover their heating and cooling needs under current and future conditions. The employment of photovoltaics as a compensatory measure matches the increase of electrical consumption due to air conditioning,

Finally, **S. Tsoka**, **K. Tsikaloudaki**, **T. Theodosiou** and **D. Bikas** review the environmental, energy and social consequences of urban warming, assessing the principal reason of the phenomenon accompanied by experimental and computational investigation methods. The most frequent strategies towards the mitigation of urban warming are presented. Emphasis is put on nature-based techniques, such as the role of green spaces, albedo changes of the urban surfaces and water.

Concluding, the forecasts for necessary accelerated medium and long term energy transitions are on the policy table with a high impact on cities and communities [5]. During this period, the impact of COVID-19 is the current priority, seeing drops of 5% and 7% for global energy demand and CO_2 emissions, respectively, during 2020. Hopefully, renewables, are less affected than other fuels by the pandemic and its consequences. Until 2040, renewables are expected to expand by 90% in global electricity demand [5].

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