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Urban Energy Planning Procedure for Sustainable Development in the Built Environment: A Review of Available Spatial Approaches

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Abstract

Urban and Regional Integrated Energy Planning is crucial to define transition strategies toward sustainable development and post-carbon cities; particularly, in the built environment sector which is one of the main responsible for energy consumption and carbon emissions.

The paper aims at offering a systematic review of existing urban and regional energy planning approaches. This analysis is based on literature review. The reviewed papers are critically analyzed and discussed through a Meta-analysis and a SWOT analysis. The papers are classified in order to highlight the main research trends and to illustrate the most relevant characteristics of the principal approaches.

This critical analysis of the papers highlights the lack of an holistic and integrated framework which is able to take into account the large variety of dimensions related to sustainable planning. A major achievement of this study is to provide information on how the various existing approaches can be integrated to handle the entire planning procedure adequately.

The result provides a preliminary theoretical framework to integrate different approaches, identify the main barriers and future challenges in the field of research. This framework will help urban actors to develop energy planning projects, guiding them in the choice among a significant number of existing planning approaches.

Key words

Urban and Regional Integrated Energy Planning, Built Environment, Energy Modeling, Spatial Decision Support System

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