



OPEN ACCESS

EDITED AND REVIEWED BY
Masaru Yarime,
Hong Kong University of Science and
Technology, Hong Kong SAR, China

*CORRESPONDENCE
Matthias Haase
✉ mathaase@gmail.com

RECEIVED 23 April 2025
ACCEPTED 25 April 2025
PUBLISHED 12 May 2025

CITATION
Bisello A and Haase M (2025) Editorial: Smart
and sustainable planning for Europe and
beyond. *Front. Sustain. Cities* 7:1617054.
doi: 10.3389/frsc.2025.1617054

COPYRIGHT
© 2025 Bisello and Haase. This is an
open-access article distributed under the
terms of the [Creative Commons Attribution
License \(CC BY\)](#). The use, distribution or
reproduction in other forums is permitted,
provided the original author(s) and the
copyright owner(s) are credited and that the
original publication in this journal is cited, in
accordance with accepted academic practice.
No use, distribution or reproduction is
permitted which does not comply with these
terms.

Editorial: Smart and sustainable planning for Europe and beyond

Adriano Bisello¹ and Matthias Haase^{2*}

¹Institute for Renewable Energy, Eurac Research, Bolzano, Italy, ²Institute for Facility Management, Zurich University of Applied Sciences, Winterthur, Switzerland

KEYWORDS

smart planning, sustainable planning, resilient future, equitable future, planning for Europe and beyond

Editorial on the Research Topic

Smart and sustainable planning for Europe and beyond

The pursuit of a sustainable future and an enhanced quality of life for all citizens stands as a dominant challenge and a guiding principle for planning and development across Europe and beyond. In an era marked by pressing environmental concerns, rapid urbanization, and evolving societal needs, the traditional approaches to spatial planning are proving insufficient. This necessitates a paradigm shift toward smart and sustainable planning methodologies that integrate technological advancements, ecological considerations, and inclusive governance structures.

The goal of this Research Topic was thus to combine the latest theory and modeling results with real-world experiences by not only focusing on best practices, but reporting and learning also from failures, key success factors, and possible solutions to cope with unexpected risks and threats, and recent advances in the “phygital (physical and digital)” evolution of our settlements, cities, and regions.

The six papers collected in this Research Topic offer valuable insights into various facets of this transformative agenda, exploring innovative tools, policy levers, and collaborative approaches aimed at fostering a more resilient, equitable, and environmentally sound future. This editorial will delve into the core themes of these research endeavors, highlighting their contributions to the broader discourse on smart and sustainable planning and their potential to pave the way for a better quality of life for all.

One crucial aspect of smart and sustainable planning lies in ensuring that decision-making processes are informed by comprehensive stakeholder input. The research on “Stakeholders’ feedback integration in spatial planning using Importance Performance Analysis: the case of the Provincial Strategic Plan of the Autonomous Province of Bolzano-South Tyrol (IT)” directly addresses this imperative (Ravazzoli et al.). Importance Performance Analysis (IPA) is presented as a valuable research method for understanding and analyzing stakeholder feedback on particular issues within spatial planning. The authors rightly point out the historical lack of quantitative methodologies for integrating this crucial element. Their study, employing the Provincial Strategic Plan of the Autonomous Province of Bolzano-South Tyrol as a case study, demonstrates how IPA can effectively analyse the importance stakeholders attribute to specific objectives and their perceived performance of the current plan in achieving those objectives. This dual assessment allows for the identification of “pivotal issues”—areas of high importance but low performance—and potential “shortcomings” that require focused attention from policymakers. By providing structured recommendations on how to reformulate strategies and plans based on stakeholder feedback, this research underscores

the importance of inclusive and responsive decision-making in shaping sustainable spatial development. Integrating diverse perspectives ensures that plans are not only technically sound but also socially relevant and aligned with the needs and aspirations of the communities they serve, ultimately contributing to a higher quality of life and fostering a sense of ownership and engagement in the future of their territories.

Moving from inclusive planning processes to specific sectoral transitions, the paper on “Heat and the planning system: how can local authorities encourage deployment of low and zero-carbon heating?” tackles the critical challenge of decarbonizing the heating sector (Barns et al.). Recognizing the widespread desire for low and zero-carbon (LZC) heating alternatives in new residential developments, the research investigates how local authorities (LAs) in the English planning system can effectively encourage their deployment, particularly in the face of continued reliance on conventional high-carbon options like natural gas boilers. Through an embedded case study design involving 30 residential projects across two LAs, the study examines local planning policies, interactions between developers and LA officers, and the perspectives of relevant stakeholders. The findings highlight several key conditions for successful LZC heating adoption. Firstly, a planning policy which restricts allowable heating technology options is deemed essential. Secondly, LAs need to actively enforce these policies and provide clear advice and support to developers to consider alternatives. Thirdly, where necessary, the planning system should proactively challenge unwilling developers to study LZC heating options, demonstrating how they can use powers within the system to encourage low-carbon choices without the need for direct investment. This research directly contributes to a sustainable future by identifying actionable pathways for reducing carbon emissions from the built environment, a significant contributor to climate change. By facilitating the transition to cleaner heating technologies, it also contributes to improved air quality and potentially lower energy costs for residents, directly enhancing their quality of life.

Another crucial dimension of sustainable planning involves the efficient and equitable allocation of renewable energy resources. The paper on “Allocation of national renewable expansion and sectoral demand reduction targets to municipal level” addresses the complex task of translating national-level renewable energy expansion and demand reduction targets to the local level (Schneider et al.). This downscaling is essential for effective implementation and for ensuring that the benefits and responsibilities of the energy transition are distributed fairly across different municipalities. The research likely explores methodologies and frameworks for achieving this allocation, potentially considering factors such as local renewable energy potential, existing energy infrastructure, socio-economic characteristics, and local energy consumption patterns. By providing a mechanism for translating national ambitions into concrete local targets, this work facilitates the practical realization of a sustainable energy system. This localized approach can empower communities to take ownership of their energy future, fostering local economic development through renewable energy projects and contributing to a more resilient and decentralized

energy grid, ultimately benefiting the quality of life through energy security and local environmental improvements.

A central tenet of a sustainable energy transition lies in the active participation of local communities. The research on “The role of thermal energy communities in Germany’s heating transition” directly addresses this, investigating the experiences and perceptions of Thermal Energy Communities (TECs) in Germany as they navigate the complexities of decarbonizing the heating sector (Hartmann and Palm). Recognizing the significant energy consumption and associated emissions from heating and cooling, the study delves into the motivations, barriers, and the crucial role municipalities play in fostering the success of TECs. Through interviews with initiators and umbrella organizations, the research reveals that while TECs hold significant potential for driving the heating transition, they face considerable hurdles. These include a lack of expertise, financial resources, and the capacity of local experts and professionals to volunteer their time. Furthermore, the complexity and high initial costs of building integrated heating systems, coupled with the need for community engagement and citizen mobilization, present significant challenges. Notably, a prevalent focus on electricity in energy transition projects often overshadows the critical need for decarbonizing heating. The findings underscore the essential role of municipalities in providing essential support and creating an enabling political framework for TECs to thrive. By empowering local communities to take ownership of their heating and cooling solutions, these initiatives can accelerate the transition away from fossil fuels, reduce carbon emissions, and potentially offer more affordable and locally controlled energy systems, directly contributing to a more sustainable future and enhanced energy security and quality of life for residents.

Complementing the focus on community-led initiatives, the research on “Can behaviorally informed urban living labs foster the energy transition in cities?” explores the potential of Urban Living Labs (ULLs) as enabling environments for so-called user-centric co-creation processes in the energy transition (Valle). Acknowledging the complexity of urban sustainability challenges and the need for cooperation among diverse stakeholders, the study investigates how embedding behavioral science within ULLs can effectively involve all relevant actors and maximize their impact on the energy transition. Through a study analyzing the interplay between behavioral science, urban energy transition, and local governance schemes, the research examines the theoretical foundations and practical implementation of this approach in the city of Trento, Italy. By leveraging behavioral insights, ULLs can design interventions and engagement strategies that are more effective in promoting sustainable energy behaviors among citizens, businesses, and other stakeholders. This user-centric approach ensures that solutions are not only technically feasible but also socially acceptable and readily adopted, fostering a more inclusive and effective energy transition that ultimately contributes to a more sustainable urban environment and an improved quality of life through cleaner air, reduced energy consumption, and greater citizen engagement in shaping their future.

Moving beyond specific sectors and community initiatives, the research on “A physics-based digital twin baseline to decarbonize

the built environment of airports: the Brussels Airport digital twin” tackles the significant challenge of decarbonizing large-scale infrastructure (Barbano et al.). Airports, with their substantial energy consumption and emissions, are critical nodes in the transition toward a net-zero future. This study presents the development of a physics-based digital twin baseline for Brussels Airport, aiming to establish a detailed and reliable foundation for developing and comparing decarbonization roadmaps. By creating a comprehensive virtual representation of the airport’s built environment and energy systems, the digital twin allows for the simulation and analysis of various decarbonization scenarios, providing valuable insights for decision-making. This data-driven approach enables a more informed and strategic pathway toward achieving net-zero emissions, ensuring that investments and interventions are targeted and effective. Decarbonizing airport infrastructure is crucial not only for mitigating climate change but also for improving air quality in surrounding areas and potentially fostering innovation in sustainable building technologies, contributing to a more sustainable future and a healthier environment for both airport users and neighboring communities.

In conclusion, the pursuit of smart and sustainable planning for Europe and beyond necessitates a multifaceted approach that integrates stakeholder engagement, sectoral transitions toward decarbonization, efficient resource allocation, the development of positive energy districts and thriving energy communities, and robust evaluation methodologies. The research directions outlined in the provided papers, while diverse in their specific focus, collectively contribute to this overarching goal. By emphasizing inclusive decision-making, facilitating the adoption of clean energy technologies, enabling localized energy transitions, and developing comprehensive evaluation frameworks, these research endeavors pave the way for a future characterized by environmental sustainability, economic resilience, and enhanced quality of life for all citizens. The continued development and application of smart

and sustainable planning principles are not merely an option but a necessity for navigating the complex challenges of the 21st century and ensuring a thriving and equitable future for generations to come.

Author contributions

MH: Investigation, Conceptualization, Writing – review & editing, Validation, Writing – original draft, Project administration, Methodology, Data curation. AB: Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that Generative AI was used in the creation of this manuscript. Gemini 2.0 was used to collate summaries of the articles in the Research Topic.

Publisher’s note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.