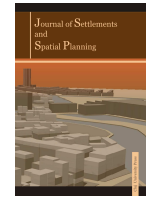




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## Guest Editorial

# Planning for Resource Efficient Cities

**Christian FERTNER<sup>1</sup>, Niels Boje GROTH<sup>1</sup>**

<sup>1</sup> *University of Copenhagen, Faculty of Science, Department of Geosciences and Natural Resource Management, Copenhagen, DENMARK*

E-mail: [chfe@ign.ku.dk](mailto:chfe@ign.ku.dk), [nbg@ign.ku.dk](mailto:nbg@ign.ku.dk)

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### ABSTRACT

Addressing the threats of climate change has become a key issue in urban development. Striving towards energy self-sufficiency, implementing regional resource cycles, retrofitting of the built environment, turning energy consumption towards renewables as well as generally decoupling urban development from energy consumption are crucial for a city's future vulnerability and resilience against changes in general resource availability. The challenge gets further complex, as resource and energy efficiency in a city is deeply interwoven with other aspects of urban development such as social structures and the geographical context. As cities are the main consumer of energy and resources, they are both problem and solution to tackle issues of energy efficiency and saving. Cities have been committed to this agenda, especially to meet the national and international energy targets. Increasingly, cities act as entrepreneurs of new energy solutions acknowledging that efficient monitoring of energy and climate policies has become important to urban branding and competitiveness. This special issue presents findings from the European FP7 project 'Planning for Energy Efficient Cities' (PLEEC) and related research.

We are grateful for the invitation of the editors of the *Journal of Settlements and Spatial Planning* to edit a special issue on 'Planning for Resource Efficient Cities'. Resource efficiency is ranked high on the political agenda, especially in the light of climate change. Just a few months ago, in December 2015, all of the 195 member states of the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement, promising to reduce their carbon output to keep global warming well below 2°C. Key strategies to this are also reflected in EU's 20-20-20 targets, of jointly increasing energy efficiency, reducing CO<sub>2</sub> emissions and increasing the share of renewable energy sources.

Despite the international and national frameworks, regions and cities play a crucial role to put such ambitions into practice. The major part of energy and resource consumption takes place in the cities. Furthermore, the demand of urban citizens for goods and services typically involves a large hinterland and

causes resource use in other places. Many projects and organisations around the world are currently working on making our cities more resource efficient. Most recently, the European Environment Agency has published three new reports on resource efficient cities [1], combining a wide variety of topics (energy, housing, transport, waste management, public spaces, green areas, governance and policy-making), making clear that we are not just dealing with technical solutions, but also with structural, social and behavioural aspects.

This also is one of the conclusions of the European project *Planning for Energy Efficient Cities (PLEEC)* [2], in which we were involved in the last three years. The project was a so-called 'coordination and support action' within the EU's 7<sup>th</sup> Framework Programme for Research and Technological Development, focusing on the adaptation, application and dissemination of existing research in close cooperation with end users (six cities in the case of PLEEC). However, several interesting themes of a more

general academic interest have come up and are partially reflected by the contributions to this special issue. In the open call for papers, we asked for contributions related to:

- sustainable urban development;
- energy and resource planning in cities;
- urban structure and energy systems;
- transport planning and energy;
- retrofitting of the built environment;
- urban energy production and consumption;
- sustainable transition and governance of energy and resource use;
- multi-level energy planning and policies;
- rebound effects and trade-offs in resource efficient cities;
- the smart city and resource efficiency.

Not all topics are covered in this issue. However, the seven papers in this issue address a wide range of them. In the first paper, Groth et al. discuss the role of cities in urban energy generation [3]. Despite that energy generation has got somehow detached from cities in the last century, many new technologies of renewable energy production and ambitions towards sustainable cities bring energy generation back on the urban agenda. Groth et al. review the activities in six European medium-sized cities. How these new trends as for example decentralised energy production fits with spatial planning and urban development processes is discussed by Hooimeijer et al.. In two cases from the Netherlands they show how the mere technical side of implementing decentralised district heating systems can be integrated with a bottom-up planning approach of new urban districts [4].

Campillo et al. review progresses in energy efficiency retrofitting of buildings, showing initiatives going beyond mere insulation, e.g. integrating renewable energy generation [5]. Examples include several cases from Sweden. Taking into account the very low replacement rate of buildings in Europe, renovation is a key topic towards resource efficient cities. This gets also clear from Rocco's article on energy efficiency policies in Stoke-on-Trent, a former industrial city in England [6]. Stoke-on-Trent faces a major challenge because of its poor private housing stock, where an above-average share of population is affected by fuel poverty. The city is actively engaging in many schemes and applying for national funding for various innovative renovation projects. However, Stoke-on-Trent is also in a fierce competition with other English cities, as the main part of national funding is given to successful bids. Santiago de Compostela in Galicia, Spain, is also working with energy renovation, though with a different challenge.

The city with its many historic and protected buildings make specific renovation techniques necessary, as Fernández Maldonado et al. write in their contribution [7]. Although the city has taken energy

considerations into its local plan, implementation measures are very narrowly defined, not taking the full potential for climate adaptation into account.

A quite similar sideline fate has the industrial energy use in regards of its relations to urban planning, as revealed by the paper of Romein [8]. Industrial energy use accounts for about a fourth of the total energy use in Europe. Despite the manifold efficiency increases in the past decades – and deindustrialisation in many European countries – industrial energy use has almost never been tackled in urban planning, despite the high potential as shown by two case studies. The ambition is a (partially) circular economy, (re-)using energy and resources instead of emitting or discarding them. A critique of our current production and consumption system is also emphasized in the final paper [9]. Read et al. suggest a global view on resource consumption, question how 'fossil-free' renewables really are and highlight the paradoxes of rebound effects as part of energy efficiency gains and replacements. Without taking these into account, "energy efficiency will not be efficient".

Six of the seven papers are built on the work done in PLEEC. At the end of the issue a short note on the project can be found, summarizing its main findings [2]. The PLEEC project has made a valuable contribution to show where planning practice in regards to cities' energy efficiency stands today in Europe and so do the papers of this special issue. All of the cities mentioned in the contributions make major investments in alleviating climate change. However, a close follow-up of its impacts and an alignment with other policy areas is crucial to achieve real progress avoid backlashes in other spheres of the system.

The work on PLEEC has shown that we are not at the end of the story. Rather, we are at the stepping stone of urban climate and energy policies becoming increasingly integrated in regional and national energy networks - not just as passive recipients but also as entrepreneurs responsible for new ideas and practices.

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