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Smart energy cities in a 100% renewable energy context

Jakob Zinck Thellufsen, Henrik Lund, Peter Sorkns, P.A. stergaard, M. Chang, David William Maya-Drysdale, S. Nielsen, S.R. Djrup, Karl Sperling

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Author ORCID	0000-0001-6119-4572
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Abstract

The transition towards renewable energy will operate on different geographical scales. Many of the concrete steps will address the local level; however, these have to align with the broader energy perspective. It is therefore necessary to develop methods that enable cities to assess the compatibility of the local renewable energy strategy to the surrounding national and global energy systems. This paper presents a methodology to design Smart Energy Cities within the context of 100% renewable energy at a national level. Cities and municipalities should act locally with regard to local demands but acknowledge the national and global context when addressing resources, industry and transport. The method is applied to the case of transitioning the municipality of Aalborg to a 100% renewable smart energy system within the context of a Danish and European energy system. The case demonstrates how it is possible to transition to a Smart Energy City that fits within a 100% renewable energy context of Denmark and Europe. The suggested methodology is framed in a way that makes it applicable to other cases globally.

Keywords: 100% renewable energy, urban energy transition, urban energy planning, Aalborg, Denmark, European en

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