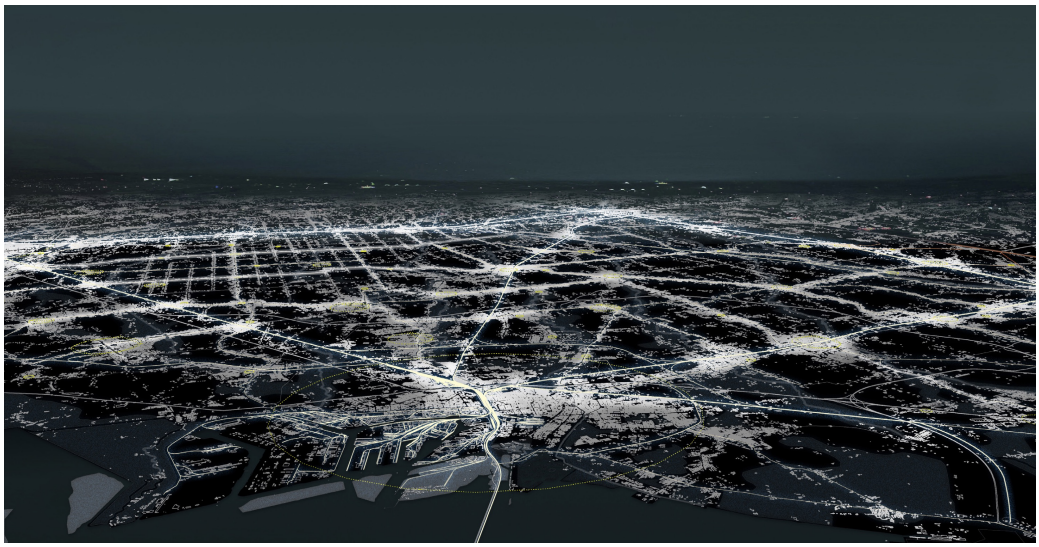
SPACE-ENERGY Patterns. Developing a conceptual tool for Energy Sensitive Urban Design

Keywords: Urban morphology, pattern, energy transition, performative design.

Urbanism Department / Environmental Technology and Design

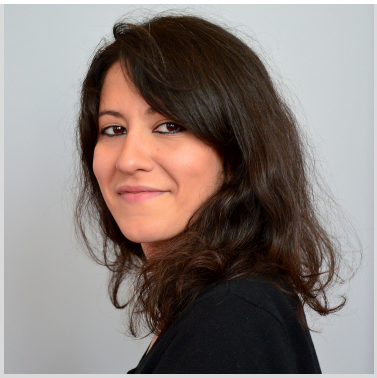
Area of Research: Urbanism



Research Summary: Energy Transition towards a Co^2 carbon free society is considered one of the principal challenges of the coming decades. In this process technical, social and economic transformations are engaged, framing new spatial processes and configurations in urbanized areas at different scale levels. Urbanized areas account for substantial portion of energy demand, and meanwhile they will play a fundamental role as spatial structures for production, storage and exchange of energy within this new transition. In this context, how the Energy Transition strategies are going to re-shape cities physical form, uses and spatial qualities need to be investigate. The study focuses on the concept of Energy Sensitive Cities to explores the reciprocal relations between design of urban space and development-application of new energy strategies in a long sustainable perspective. Within the NWO Urban Europe ERA NET 'Spacergy' international project, the research has the specific objectives:

- To recognize morphological factors which play a role in the performance of the built environment as energy consumer, re-user and generator.
- To identify energy patterns and potentials to re-think forms and use of space from the scale of the neighbourhood to the scale of the city
- To develop a conceptual tool and guidelines for the implementation of Energy Sensitive Urban Design approach.

Research Methodology: Based on literature review, identification of urban morphological proprieties which have impacts on the energy performance. Mapping and analytical correlation of urban form and energy performative factors to define Space-Energy Patterns in Zurich. Scenarios development involving the stakeholders in three urban areas under transformation in the cities of Zürich, Almere, Bergen, and development of guidelines to improve the performance of space-energy patterns.



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Main Question:

How can urban design contribute to realise Energy Sensitive Cities in the Energy Transition process?

Deliverables: *Critical review of urban-energy strategies and spatial dimensions for implementation*