KIT GRACE Science School

Resilience Thinking in Urban and Regional Planning

Sustainable Integration of Sustainable Energy Technologies

Date: weekly appointment 02/11/2020 to 20/02/2021
Lecture times: Thursdays, 9.45 am – 11.15 am
Place: online via Zoom
Lecturer: Dr. rer. nat. Sadeeb Simon Ottenburger
Dr. rer. pol. Ado Ampofo and
Dr. phil. Ulrich W. Ufer
Credits: 2

Motivation and Background

The term resilience is used in various contexts where it is mostly considered within the boundaries of the system under consideration. Resilience thinking seeks to sensitise for relations between physical resilience and issues of urban well-being and for interdependencies between local urban resilience and global sustainability.
Relevance of resilience thinking is emphasised in the UN Sustainable Development Goals – especially Sustainable Cities and Communities and Climate Action – and the UN Sendai Framework for Disaster Risk Reduction, which explicitly mentions resilience as a key priority. Thus, resilience and system transformations must be considered together if sustainability developments should prevail in the long-term.
The unpredictability of future urban supply risks is enormous: In a world of changing boundary conditions (e.g. climate change) and fundamentally changing socio-technical urban systems, neither the frequency nor the consequences of various future threats can be reliably determined. Furthermore, cities tend to get smarter in the sense of becoming more digitalised and automated with more and more interconnected systems including critical services. This may eventually lead to accelerated failure propagation throughout interdependent infrastructures as a consequence of a single power failure.
In principle, a renewable and decentralised energy system allows an incredibly vast number of possibilities of integrating energy sources, storages, and cellular structures. If we think about densely populated and built areas as cities, developing urban resilient energy systems is a tough challenge and should go hand in hand with urban and regional planning.

Content

Participants will get to know concepts of urban resilience and apply resilience thinking to sustainable urban planning, e.g. to the resilience of urban energy systems in view of shock scenarios like pandemics and multiple hazards.
In the first part of the lecture resilience thinking allows to consider new links between energy systems and urban and regional planning and emphasises the connection between design and management of a renewable energy system and urban resilience. In principle, some of those concepts are also applicable to other networked supply infrastructures as e.g. the water supply network.
In the second part, long-term economic challenges and concepts resp. for building resilience in different regions in the world especially in Europe and North Africa.
The third part engages resilience thinking from the perspective of urban technology assessment by focusing on the socio-technical nature of urban systems, on uncertainty in urban development and on agents of resilience in smart cities.

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Structure

The lecture is split into three parts:

Part 1: Smart Urban Resilience and Renewable Energy System Design
Lecturer: Dr. rer. nat. Sadeeb Simon Ottenburger

Sadeeb S. Ottenburger is mathematician and works in the field of smart resilience engineering at the Institute of Energy Technology and Safety at KIT. Main aspects of his research address the relationship between design and management of supply systems with respect to resilience improvements and thereby deal with different optimization issues.

Part 2: Socio-economic Dimension of Resilience Planning
Lecturer: Dr. rer. pol. Ado Ampofo

Ado Ampofo is an environmental scientist, mathematician and economist. One focus of his work is urban and regional planning in North Africa. Here, he accompanies several projects with regard to sustainable and resilient urban development.

Part 3: Urban Technology Assessment
Lecturer: Dr. phil. Ulrich W. Ufer

Ulrich Ufer is senior researcher at the Institute for Technology Assessment and Systems Analysis at KIT. His research addresses spatiotemporal aspects of urban development, urban innovation and urban social movements.

Certification

Prerequisite for receiving credits is the regular attendance of the lecture and the successful participation in the oral examination.

Registration

Please register via online form.

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