

## Control of Electricity Load in Future Smart Cities

**Madsen, Henrik; Parvizi, Jacopo; Halvgaard, Rasmus Fogtmann; Jørgensen, John Bagterp**

*Published in:*

Book of Abstracts. DTU's Sustain Conference 2015

*Publication date:*

2015

*Document Version*

Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation (APA):*

Madsen, H., Parvizi, J., Halvgaard, R., & Jørgensen, J. B. (2015). Control of Electricity Load in Future Smart Cities. In Book of Abstracts. DTU's Sustain Conference 2015. [L-2] Lyngby: Technical University of Denmark.

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## Control of Electricity Load in Future Smart Cities

Henrik Madsen<sup>1</sup>, Jacopo Parvizi<sup>1</sup>, Rasmus Halvgaard<sup>1</sup>, John Bagterp Jørgensen<sup>1</sup>

<sup>1</sup>: DTU Compute

\*Corresponding author email: hmad@dtu.dk

Traditionally, electricity power production has been adjusted to balance the time-varying electricity load. However, a transition to a system based on an increasing, fluctuating and non-dispatchable renewable power implies that new methodologies for controlling the electricity load in future smart energy systems become crucial.

This talk describes methods for control of electricity loads in future smart cities. Smart cities offer possibilities for intelligent energy systems integration based on ICT. This includes methods for integrating large shares of, e.g., wind and solar power production. Hierarchies of aggregators and predictive controllers, for electricity loads in flexible demand side response in smart cities, are implemented to achieve a balance with the non-dispatchable energy production. Two distinct approaches are described: direct control of the load consumption of individual DERs, and indirect control by broadcasting an electricity price. The advantages and challenges of these two approaches are discussed, and examples of the suggested techniques are provided.