

Universität Stuttgart



Fakultät für Informatik, Elektrotechnik und Informationstechnik

Kolloquium der Elektrotechnik und Informationstechnik: WS 2018/19

Ort: ETI-Gebäude, Adolf-Leonhard-Hörsaal (V47.03), Pfaffenwaldring 47, 70569 Stuttgart  
Zeit: Jeweils Dienstag, 16.00 s. t.

Im Rahmen des Kolloquiums der Elektrotechnik und Informationstechnik  
spricht am 04.12.2018

**Dr.-Ing. Pio Lombardi**

Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF, Magdeburg

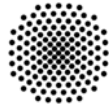
zum Thema

*„Flexibility options exploitation within Net Zero Energy Factory  
microgrids“*

### **Abstract**

Renewables will be the main sources for supplying energy (electric, thermal and gas) to end consumers. By 2050, the European Union aims to decarbonize the energy system by a carbon-free energy production. However, in order to integrate into energy systems (electric, thermal and gas) such a huge amount of volatile energy source more flexibility options are needed. Energy storage systems (ESS), multi energy systems (MES) are the most candidate options. Industrial manufacturing systems hide also a large potential of flexibility options, which could be offered to the system operators or be used within the manufacturing system for integrating the power generated by renewable into the manufacturing processes.

The aim of this study is to identify and to point out the flexibility options, which industrial microgrids might use for integrating volatile energy sources into the manufacturing process. The study analyzes the industrial microgrid from the point of view of a “net zero energy” concept and focuses mostly on the contribution that energy storage systems, production buffer stocks and smart transformers might offer for increasing the flexibility options.



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## Biographie



Pio Lombardi studied mechanical engineering at the Politecnico di Bari, Italy. He graduated in 2006 at the same university with the degree M.Sc. He joined the Chair of Electric Power Networks and Renewable Energy Sources at the Otto-von-Guericke University Magdeburg, Germany as a research engineer in 2006. At the same university he received his PhD. In 2011 he joined the Process and Plant Engineering of Fraunhofer Institute for Factory Operation and Automation IFF. His primary field of interest includes modeling, simulation and optimization of multi-energy systems within residential and industrial grids.

Since 2009 is Dr. Lombardi lecturer in “Power System Economics and special topics” at Otto von Guericke University Magdeburg (Germany) and in “Renewable Energy Systems” at Technical University of Wroclaw (Poland).

From 2014 to 2015 Dr. Lombardi has been lecturer in “Energy Meteorology” at the Applied Science University Magdeburg.

From 2018 is Dr. Lombardi lecturer in “Power system elements” and “Renewable energy systems” at Christian-Albrechts-Universität zu Kiel. He is national member of the Cigrè SC C6 on “Distribution Systems and Dispersed Generators”. He was secretary of the Cigrè Working Group C6.15 on “Electric Energy Storage Systems”, member of Cigrè Working Group C6.22 on “Microgrid Evolution Roadmap”, of C6.30 “The Impact of Battery Energy Storage Systems on Distribution Networks”.

Since 2018 is Dr. Lombardi member of Cigrè Working Group C6/C2.34 “Flexibility provision from distributed energy resources”. He is member of the VDE-ETG German Association for Electrical, Electronic & Information Technologies and member of the VDE-ETG taskforce on Energy Storage Systems. He is member of the Mediterranean Institute for Fundamental Physic (MIFP).

He is author of more than 45 scientific articles published in peer review journals and conferences. He is co-author of the book “Electric Energy Storage Systems: Flexibility Options for Smart Grids“, Springer Editor.