

Wednesday, 30.9., 2:00 p.m. CET

Power Electronic DC Converters for a medium-voltage DC Underlay Grid Enabling High-Power Fast Charging in Cities

Abstract

Interconnecting AC distribution networks with a medium-voltage DC (MVDC) underlay grid offers high capacities that are required for fast charging infrastructure. In addition, the MVDC underlay grid offers greater interoperability and reliability for other energy sectors, renewables, energy consumers, as well as prosumers.

The architecture and the components of the underlay grid are presented. The interphases between the MVDC underlay grid and the high-voltage AC and DC, as well as the low-voltage DC grids, for example in homes and buildings, are presented



Rik W. De Doncker (M'87-SM'99-F'01) received his Ph.D. degree in electrical engineering from the KULeuven, Belgium. In 1987, he was appointed Visiting Associate Professor at the University of Wisconsin, Madison. In 1988, he joined the GE Corporate Research and Development Center, Schenectady, NY. He led research on drives and high-power soft-switching converters, ranging from 100 kW to 4 MW for aerospace, military, industrial and traction applications. In November 1994, he joined Silicon Power Corporation (formerly GE-

SPCO) as Vice President Technology, developing world's first medium-voltage static transfer switch.

Since Oct. 1996, he is professor at RWTH Aachen University, Germany, where he leads the Institute for Power Electronics and Electrical Drives (ISEA). In Oct. 2006 he was appointed director of the E.ON Energy Research Center at RWTH Aachen University, where he also founded the Institute for Power Generation and Storage Systems (PGS). He is director of the RWTH CAMPUS Cluster Sustainable Energy and leads the German Federal Government BMBF Flexible Electrical Networks (FEN) Research CAMPUS. He has a doctor honoris causa degree of TU Riga, Latvia.

He has published over 400 technical papers and is holder of more than 40 patents. Dr. De Doncker is recipient of the IAS Outstanding Achievements Award and the IEEE Power Engineering Nari Hingorani Custom Power Award (2008). In 2009, he led a VDE/ETG Task Force on Electric Vehicles. In 2010, he became member of the German National Platform for electro-mobility. He is the recipient of the 2013 Newell Power Electronics IEEE Technical Field Award, and the 2014 IEEE PELS Harry A. Owen Outstanding Service Award. In 2015 he was awarded Fellow status at RWTH University. In 2016 he became member of the German Academy of Science and Technology (ACATECH). 2017 he became Member of the International Advisory Board of French automotive research institute VEDECOM. He has been awarded the 2020 IEEE Medal in Power Engineering.