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Future Electronic Networks for Sustainable Energy Abundance

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Abstract: Today, only around 20% of the total human energy consumption is from electricity. Anticipated energy transition and increased energy consumption (e.g. data centers) may require 5-10 times larger electrical systems in the next 25 years! The future additional networks for making, moving and serving of electrical energy could be developed by using existing electronic technologies, instead of utilizing outdated, constant frequency synchronous AC electro-mechanical power grid. The basic premises are that to optimize the utilization of primary energy sources there will be a power electronics converter at every source, and to optimize the performance of final energy consumers there will be a power electronics converter at every load. Thence, to optimize the energy routing between source and load converters, and optimize utilization of electrical cables between them, the proposed power system architecture could be based on point-to-point energy transfer between intelligent electronic energy routers.

Biography: Dr. Dushan Boroyevich received Dipl. Ing. degree from the University of Belgrade in 1976 and M.S. degree from the University of Novi Sad in 1982, in Yugoslavia. He received his Ph.D. degree in 1986 from Virginia Tech. Between 1986 and 1990, he was an Assistant Professor and Director of the Power and Industrial Electronics Research Program at the University of Novi Sad. He then joined the Bradley Department of Electrical and Computer Engineering at Virginia Tech as Associate Professor. He retired from Virginia Tech in 2024, but continues to be active in consulting and promoting new electronic energy networks for energy transition. He was the President of IEEE Power Electronics Society for 2011-12. Dr. Boroyevich has been a mentor for 60 Ph.D. and 50 M.S. students.



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