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High-Efficiency and High-Performance Power Electronics for Power Grids and Electrical Drives

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Message from the Guest Editor

Power electronics has radically transformed the way we condition electrical energy in both stationary and non-stationary applications. Over the years, we have witnessed a significant increase of power converter ratings and of the associated losses. However, the urge for a sustainable future requires further efficiency increase by either reducing losses or improving the performance under the same level of consumption.

In this regard, the use of wide bandgap power devices and multilevel/multiphase power converters should be fostered. Also, advanced converter topologies can process only a lower percentage of load power, down to the limit of differential power. As for the electrical drives, ELMT can reduce losses keeping the same load power, whereas MTPA techniques can reduce the current needed to obtain a given load torque level. Power electronics is also crucial to implement efficient demand response and power flow management, especially in micro/nanogrids, which are progressively shifting from AC to DC distribution. Other interesting and efficient devices are smart transformers.

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Message from the Editor-in-Chief

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