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Editor's Column

by Peter Palensky

Industrial Electronics and Sustainable Electricity

Achieving ambitious decarbonization and emission goals always requires—besides efficiency improvements and many other elements—a massive integration of renewable and clean energy, such as solar and wind. These types of generation are typically connected to the grid via power electronic converters, one of the core competencies of the IEEE Industrial Electronics Society (IES). The continuing innovation in the field of power electronics is the enabler for better, more flexible, and more affordable green energy in our electricity mix.

Today, new types of semiconductors open up new applications at all voltage levels. For instance, in this issue, Rong Zeng et al. explain in "Integrated Gate Commutated Thyristor-Based Modular Multilevel Converters" how integrated gate commutated thyristor-based modular multilevel converters can be used for ultrahigh-voltage applications. An increased share of renewable generation, however, also constitutes a challenge to our grids. In "Voltage Stabilization," Jiefeng Hu et al. write about one of the limiting factors in renewable energy rollout: voltage problems in the feeders due to photovoltaic generation.

This growing number of power electronic converters will need control and management if they are to contribute to an available, affordable, and sustainable power system. Yonghao Gui et al., for instance, discuss controls aspects of modern inverters in "Control of Grid-Connected Voltage-Source Converters." The basis of all analysis in this direction is how to model and describe these complex system components. Giovanni De Carne et al. contribute the article "Which Deepness Class Is Suited for Modeling Power Electronics?" which serves as a guide for choosing the right model for grid integration studies. Being clear on what is needed for a certain study can not only speed up a model's numerical performance but also shorten its development time.

We regularly feature articles in *IEEE Industrial Electronics Magazine* that contribute to a sustainable future, and we need all the disciplines that we bundle in the IES: Industrial communication networks are needed to coordinate renewable resources, computational intelligence will help to detect and use opportunities in ever more complex power systems, and ubiquitous data acquisition will shed light on the inner mechanisms and feed into the models of our energy system. A magazine can help to inform our community about the latest developments, innovations, and discoveries in this field, and I am happy to feature four great articles on those topics in this issue. And as the field of industrial electronics innovates, so do we in the way we publish our findings.

I am still digesting the many impressions I received at the IEEE Panel of Editors meeting in early April in Chicago. One of the dominating topics was open access (OA) publications. Inspired by societal demands such as Plan S—an OA initiative originating from the European Research Council—the IEEE has developed a number of fantastic options to satisfy the need for openly available and still high-quality scientific and industrial media. Currently, the IEEE Societies and other organizational units are implementing OA strategies, and I will report soon in this column about the future of publishing with the IES.

Another exciting and welcome trend is the growing awareness of the need for reproducibility. Papers can describe how an algorithm or method might be structured and show its internals. But giving readers a chance to try it out for real is a different level for communicating scientific content. The IEEE cooperates with Code Ocean, which provides a cloud- and container-based executing platform. Authors can post their algorithm code there, and readers can execute and validate it in a comfortable way.

Yet another great tool is IEEE DataPort, where data sets can be stored for sharing with other researchers. The data sets receive a digital object identifier and, in that way, are even referenceable. *IEEE Access*, for instance, accepts supplemental material (e.g., code, data, and even videos) for its article submissions and supports Code Ocean and IEEE DataPort.

I believe that open minds need open communication, and it is great to see how this resonates within the IEEE publishing team. Sometimes it is good to be part of a bigger family. You can move more.

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