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Editorial

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Editorial

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Transition from the existing to future energy systems is an emerging topic in many fields of engineering industry. Since the civil engineering industry is strongly tied to the power systems engineering industry there is a constant need for joint research on applications of new energy systems. It is mandatory for civil engineers to constantly upgrade their knowledge on innovative energy technologies. Due to the very frequent innovations and large-scale technology transitions in the field of power and energy systems, *Proceedings of the Institution of Civil Engineers – Energy* has created this themed issue. The aim is to help civil engineers to evaluate the implications in decision making towards the application of the concept of green and reliable energy. The selected frontiers, related to power production, transmission and distribution systems, are addressed in this themed issue.

The first paper (Lei *et al*., 2021) examines customer service devices with focus on dynamic voltage restoration (DVR). DVR functions are very important for overcoming the supply voltage sags often occurring in distribution systems. The operation of sensitive loads, such as specific industry machinery and medical equipment, could be significantly disturbed by supply voltage sags. The use of DVR devices is expected to become more common in future urban distribution systems. When voltage sag occurs, the DVR device becomes activated. The activation of DVR is followed by the flux induced in the series transformer. The possibly very high direct current (DC) component of the flux could cause a high inrush current leading to incorrect operation of the DVR device. The authors proposed a novel control method for elimination of the DC component of the flux, improving the accuracy of previous solutions. The proposed method has been validated by the results of experimental testing.

In the second paper (Guo *et al*., 2021), a feasibility study on a new energy multi-feed DC grid connection is presented. The case study of a transmission system in China is considered as a role model. The large geographical distance between the energy-rich areas and the economically developed areas in China demands innovative solutions related to high-voltage power transmission. The feasibility study results show that multi-infeed DC has great advantages over other approaches in large-scale regional new energy long-distance transmission. The presented study results could significantly impact the civil engineering solutions related to the planning and construction of the corresponding power transmission system infrastructure.

Energy production has been identified as the major source of greenhouse gases. The following papers deal with innovative energy production technologies. A new technology in the reforming of methane and carbon dioxide into hydrogen based on non-thermal plasma is elaborated in the third paper (Liu *et al*., 2021). This topic is currently a hotspot in environmental research worldwide. The conversion efficiency of methane and carbon dioxide, as well as the selectivity and productivity of hydrogen are analyzed in this study. The proposed technology has the potential to greatly reduce energy consumption and to make use of carbon dioxide, consequently providing environmental and economic benefits. The research results have shown that the problems related to carbon deposition and catalyst deactivation can be alleviated by the proposed reforming method. The authors of the fourth paper (Messerle *et al*., 2021) present plasma–fuel systems (PFS) for pulverised-coal ignition to improve energy efficiency of power stations and empower clean coal technologies. Plasma-assisted coal combustion represents an effective and ecologically friendly technology. The PFS have been tested for different types of power-generating coals in 30 power stations located in eight countries (Russia, Kazakhstan, Korea, Ukraine, Slovakia, Mongolia, Serbia and China). It has been found that PFS improve coal combustion efficiency, while decreasing harmful emissions from pulverised-coal-fired thermal power plants.

The final paper (He, 2021) deals with standardisation and digital management of wind farms with the aim to improve operation and maintenance issues. The existing information systems for monitoring wind farm operation are having difficulties spotting equipment problems in advance. There is a gap in communication among machine manufacturers, operators and third-party operation and maintenance. An information management platform is proposed in this paper to empower digital modelling of wind power assets and total life-cycle monitoring using big data technology. The proposed digital model of a wind farm consists of electronic

operation tickets, remote video security supervision, intelligent maintenance and fault diagnosis, digital data information, a networked communication platform and standardised information sharing. The main goal of the information management platform is to enable the concept of trouble-free wind farms.

I hope you find these papers interesting and stimulating. As Guest Editor I would be pleased to receive comments on this issue. I invite all readers to check the most recent articles Ahead of Print on the journal's Virtual Library homepage.

REFERENCES

Guo Y, Zhang X and Zhao L (2021) Feasibility study on new energy multi-feed direct current grid connection. *Proceedings of the Institution of Civil Engineers – Energy* **174(2)**: 57–66, https://doi.org/10.1680/jener.19.00017.

He J (2021) Enhancing standardisation and digital management of wind power. *Proceedings of the Institution of Civil Engineers – Energy* **174(2)**: 84–94, https://doi.org/10.1680/jener.20.00016.

Lei H, Zheng X, Sang Z *et al.* (2021) Magnetic flux control in an urban distribution network based on load optimisation. *Proceedings of the Institution of Civil Engineers – Energy* **174(2)**: 49–56, https://doi.org/10.1680/jener.19.00012.

Liu H, Guo D, Ma X, Wang Y and Xie J (2021) Effect of non-thermal plasma on carbon dioxide reforming of methane to hydrogen. *Proceedings of the Institution of Civil Engineers – Energy* **174(2)**: 67–78, https://doi.org/10.1680/jener.19.00030.

Messerle V, Ustimenko A and Lavrichshev O (2021) Plasma–fuel systems for clean coal technologies. *Proceedings of the Institution of Civil Engineers – Energy* **174(2)**: 79–83, https://doi.org/10.1680/jener.19.00053.