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CHARGING OF ELECTRIC VEHICLES FROM RENEWABLE ENERGY SOURCES

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Abstract

Various aspects of the charge of electric vehicles from power networks are considered. The factors of possible negative effect on electric networks during connection and operation of chargers of different power, including fast rate charge, is given. It is shown that in some cases the charge of electric vehicles from renewable power sources is more preferable, and sometimes has no alternative. Analytical relations are obtained for determining the required characteristics of renewable power sources. The character of the changes and the limit values of the charge currents and the required power of the network for reduced charging time are shown. References 11, figures 4.

Key words: electric transport, electric vehicle, charger, renewable energy sources.

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References

1. Shidlovskii A.K., Pavlov V.B. Features of creation and operation of intracity electromobile transport. *Pratsi Instytutu Elektrodynamiky Natsionalnoi Akademii Nauk Ukrainy*. 2014. No 39. Pp. 99–105. (Rus)
2. Shidlovskii A.K., Pavlov V.B., Pavlenko V.E. The analysis of the relation of combined system power supplies efficiency with control parameters. *Tekhnichna Elektrodynamika*. 2016. No 5. Pp. 29–31. (Rus)
3. Akhavan-Rezai, E., Shaaban, M., El-Saadany, E., Karray, F. Demand response through interactive incorporation of plugin electric vehicles. Power Energy Society General Meeting, 2015 IEEE. 2015. Pp. 1–5.
4. Biernat, P., Rumniak, P., Michalczuk, M., Galecki, A., Grzesiak, L., Ufnalski, B., and Kaszewski, A. Powertrain system with the ultracapacilor-based auxiliary energy storage for an urban battery electric vehicle. *The Archives of Transport*. 2013. No 3–4. Vol. 27–28. Pp. 45–64.
5. Carter, R., Cruden, A., and Hall, P. Optimizing for efficiency or battery life in a battery/supercapacitor electric vehicle. *IEEE Transactions on Vehicular Technology*. 2012. Vol. 61.
No 4. Pp. 1526–1533. DOI:
https://doi.org/10.1109/TVT.2012.2188551

6. Michalczuk, M., Grzesiak, L., and Ufnalski, B. Experimental parameter indentification of battery-ultracapacitor energy storage system. 2015 IEEE 24th International Symposium on *Industrial Electronics*
(ISIE), Buzios, Rio de Janeiro, Brazil. 2015. Pp. 1260–1265.
7. Michalczuk, M., Ufnalski, B., Grzesiak, L.M., and Rummiak, P. Power converter-based electrochemical battery emulator. *Przegl ad Elektrotechniczny*. 2014. Vol. 90. No 7. Pp. 18–22.
8. Reininger, C. and Salmon, J.: Systems feasibility study for implementing electric vehicles info urban environments. 2015 9th *Annual IEEE International Systems* Conference (SysCon), Vancouver, Canada. 2015. Pp. 734–739.
9. Wang, T., Deng, W., Wu, J., and Zhang, Q.: Power optimization for hybrid energy storage system of electric vehicle. IEEE Conference and Expo *Transportation Electrification Asia-Pacific* (ITEC Asia-Pacific), 2014
, Beijing, China. Pp. 1–6. DOI:
https://doi.org/10.1109/ITEC-AP.2014.6941224

10. Global EV Outlook 2016. International Energy Agency. www.iea.org
11. International standard “IEC 62196-1” Plugs, socket-outlets, vehicle couplers and vehicle inlets – Conductive charging of electric vehicles. Typeset and printed by the IEC Central Office Geneva, Switzerland. ICS 29.120.30; 43.120.

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