# HTS Power Technology for Future DC Power Grid

Liye Xiao, Shaotao Dai, Liangzhen Lin, Zhifeng Zhang and Jingye Zhang

***Abstract***—The increasing depletion of fossil fuels and growing environmental pressures lead the mankind towards transiting from the use of traditional energy sources to that of renewable energy-based clean energy. The renewable energy has the feature of instability, which thus brings significant challenges on the real-time power balance and power dispatching. Therefore, in order to secure the power supply, one needs to upgrade the grid by selection of reasonable grid structure and operation mode. In this paper, a multiple-level direct current (DC) loop grid which would be the suitable mode for the future power grid is suggested, and then the HTS DC power technology such as the HTS DC power cable and DC fault current limiter for the future power grid are discussed. Besides, we will report on the test and operation of a 360m/10kA HTS DC cable which is being built and would be used for an electrolytic aluminum plant of Zhongfu Group in Henan Province, China.

***Keywords*** - Renewable Energy, DC Power Grid, HTS DC Power Transmission Cable, HTS Fault Current Limiter

IEEE/CSC & ESAS EUROPEAN SUPERCONDUCTIVITY NEWS FORUM, No. 22, October/November 2012. Reference No. ST312; Category 6.
The published version of this preprint appeared in *IEEE Transactions on Applied Superconductivity* 23, 5401506 (June 2013).