

The IEA HTS Roadmap and the European status of Electric Power Sector Applications

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The changes affecting the electric power sector worldwide offer an unprecedented opportunity to transform the future grid. Increasing needs for flexibility, reliability, and resilience in the transmission and distribution system require technologies and techniques not conceived of when much of the current infrastructure was deployed. During this period of transition, the deployment of new technologies will play a critical role in shaping the future grid. High Temperature Superconductors (HTS) are potentially key in the suite of technologies that can help facilitate grid modernization, reduce losses and hence CO₂ emissions and increase energy security.

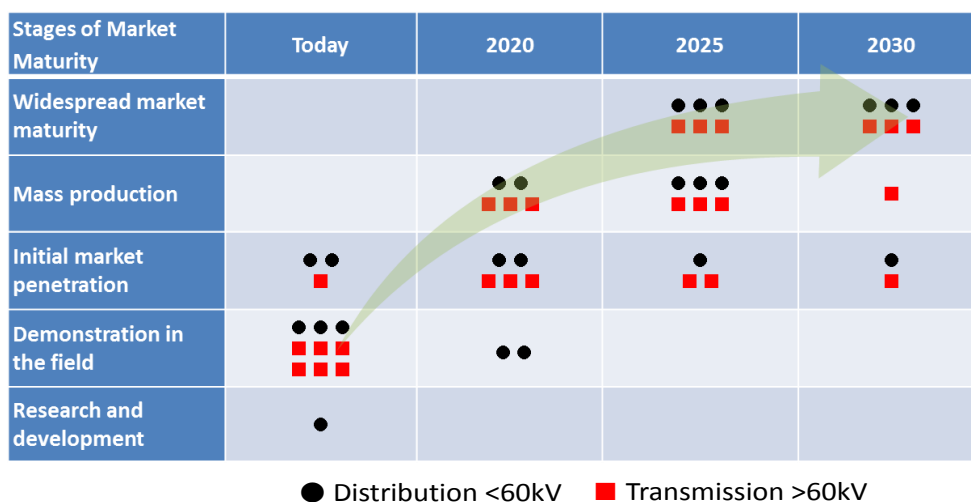
About thirty years of research and development have brought new equipment based on HTS to the threshold of greatly improving electricity transmission and distribution. Indeed, HTS wire and electric grid application development have progressed along the technology commercialization pathway and there are large demonstration projects for several applications.

The HTS Technology Collaborative Program (HTS TCP) of the International Energy Agency (IEA) is working to assessing the Impacts of HTS on the Electric Power Sector and to identify and evaluate the potential applications and benefits of superconductivity and the technical, economical and regulatory barriers to be overcome for achieving these benefits.

This talk will introduce the Roadmap of HTS applications in the electric power sector, 2015-2030 that was developed by the HTS TCP in order to outline the state-of-the-art of where the HTS industry is at present and what steps it should take to reach market maturity and hence to realize widespread adoption of superconducting based devices.

Moreover, special attention will be paid to key research and demonstration projects across Europe where HTS power equipment such as cables and fault current limiters have demonstrated that both these HTS power applications fulfill all operating requirements.

After summarizing the recent advances of HTS applications in the power sector this talk will introduce and discuss the main challenges, the enabling technologies, and the future perspectives for successful development and commercialization of HTS power equipment.



HTS Roadmap: Current and expected commercialization status of HTS cables at the transmission and distribution level. Each circle or square represents a data point from a respondent.