

HTS Cable Technology – a Chance for Addressing the Challenges of Energy Transition

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Abstract – The transition of our energy systems to achieve decarbonization and climate neutrality will require substantial changes in the generation and distribution of electric power. With the abandoning of localized power generation in large power plants close to consumers and shift towards distributed generation from renewable sources, the complete electrical transmission grid infrastructure has to be strengthened by gigawatt power lines. HTS power cables are offering unique opportunities to transport extremely high power in a small cross section and without interfering with the environment. Since there is no emission of heat or electromagnetic fields, HTS cables can be laid in narrow trenches. The small footprint of HTS cables and the transmission of high power at lower voltage level, allow considerable cost savings which can outweigh higher costs of the more complex HTS cable installations and lead to a reduced total cost of ownership of a HTS cable system. This will be demonstrated for the case of an urban high-power line in the Bavarian capital of Munich, where an industrial consortium is designing and testing the components for a 12 km long HTS power cable in the framework of the SuperLink project. Hence, we will evaluate how HTS transmission cables can address the challenges of rebuilding the electrical energy system.

Keywords (Index Terms) – Transmission cables, power distribution, energy transition.

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