



TSB Materials for Energy Project

Nanocomposite Electrical Insulation Materials Development and Scaling for HVDC Power Transmission Applications

In collaboration with:



Objectives

This project addresses the need to achieve systematic processing and production of nanocomposite electrical insulation materials for the reliable manufacture of high performance next generation high voltage direct current (HVDC) power transmission equipment.

Major enhancements in performance and properties of key components in new HVDC electrical insulation systems are essential for long-term growth of on-shore and off-shore HVDC systems in the UK and Europe which will rely on point-to-point and multi-terminal schemes.

This project is strategically important because it addresses the production of nanocomposite electrical insulation materials and components by establishing property and process design rules for reliable production and processing that are capable and to demonstrate this by the manufacture and realistic testing of a high voltage nanocomposite resin bushing.



Identifying key components in HVDC LCC schemes where solid insulating materials could play a critical role in increasing their power densities, along with ensuring their long-term reliability is critical.

There are several areas that have been identified as important opportunities for the deployment of high performance thermosetting insulation materials where significant improvements can be made through use of nanocomposites. Examples include:

1. Converter Transformer bushings
2. Valve subcomponents
3. Valve through wall bushings
4. HVAC & HVDC substation plants subcomponents

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