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[Invited] HTS field coils with robust design for a superconducting wind turbine generator

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The EU-funded EcoSwing project aims at demonstrating the world's first superconducting low-cost and lightweight wind turbine generator. This generator will use field coils based on second generation (2G) HTS wire which are manufactured using Pro-Line HTS tapes. During the development subscale test coils with different number of turns were produced and tested in liquid nitrogen as well as cooled by conduction in vacuum and variable temperature. Design details and test results will be reported. After the successful test of these subscale coils the design for the generator coils could be finalized and a first full size coil was manufactured for the type testing. The generator coils have an overall length of 1.4 m and incorporate several hundred meters of tape for realizing about 200 turns. The type test proved that the performance of the coil at operating temperatures and magnetic fields reached the desired values so that the series production of coils for the generator was started. The current status of this production will be shown together with results of type and routine testing. This work was supported by the European Union's Horizon 2020 research and innovation program under grant agreement No. 656024.

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