

CABLE Conductor Manufacturing Prize



Team Name:	The MgB ₂ Crewe
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Submission Title:	Economical, Light Weight Superconducting Generators for Wind Energy



Description of Material

- *Material: magnesium diboride (MgB₂) superconducting cable*
- *Application market: the stators and rotors of wind turbine generators*
- *Application market size: for 40,000 5 MW wind turbines installed in 10 years worldwide*
- *Competing in Stage 2, Contest 3 (Beat a Conductor System!)*

Fabrication Approach

- Magnesium wire and boron powder are continuously fed into metallic tube
- Fabricate 'monofilaments' by wire drawing metallic tube filled with Mg+B
- Fabricate multifilamentary MgB₂ by bundling 'monofilaments' in another metallic tube and with wire drawing
- Fabricate MgB₂ cables with specified number of MgB₂ multifilamentary strands and apply insulation

Potential Impact

- Wind power generation does not emit any greenhouse gases
- To reduce LCOE of wind power, larger systems on taller towers offshore need to be built
- However, large systems (5-20 MW) are built with rare earth permanent magnets (RE-PM), a resource controlled by China
- Our solution is to build wind turbines free of RE-PM, using our MgB₂ superconductors