ABSTRACT OF POSTER

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Title of Poster

EnerGstor – New Wayside Energy Storage System

In today’s electric rail transit systems, vehicles are normally equipped with a regenerative braking system. The power generated from braking vehicles is fed back into the power supply and distribution network for use by other vehicles drawing power at the same time.

If other vehicles are not available to use this regenerated power, the voltage on the distribution network rises to the point where the braking vehicles must terminate regeneration to the network. In these cases, the braking train will dissipate the kinetic energy as heat either through on-board resistors or friction brakes or through wayside resistors. In either case, the energy is lost.

EnerGstor is Bombardier’s new wayside energy storage system based on supercapacitor technology, which captures and stores the otherwise unusable regenerated braking energy and recycles it back into the system. EnerGstor technology provides both economic and environmental benefits. The potential economic benefits include reducing the capital cost of a new transit system (or extension of an existing system) and reducing the ongoing energy costs of transit system operation. Potential environmental benefits include reduced losses (increased efficiency) of the electric power distribution system, reduced carbon emissions (depending on the source of electrical energy) and reduced waste heat generation.

The EnerGstor solution is based on modular design which allows system to be properly sized for any application. Each EnerGstor unit consists of one or more power cells. Each power cell consists of a power converter controlling its own set of energy storage modules. The power cells are monitored by a common supervisory controller. The supervisory controller also provides optional wireless communication capability between the EnerGstor solution unit and the outside world. EnerGstor technology can be monitored and controlled locally or remotely through the internet or other network.

EnerGstor was designed, assembled and tested at Kingston (Ontario) by Bombardier Energy Management Team.

In this poster, the system concept and the main features of EnerGstor will be presented. A case study based on field measurements will be demonstrated. Test results from a 1kWh prototype unit installed at Bombardier’s Kingston (Ontario) test track will be presented as well as the actual energy savings.