TAKING THE PULSE OF ELECTRICAL TRANSFORMERS

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When the electricity grid goes down, leaving consumers and businesses in the dark, the blame often lies with a faulty transformer. It's a costly problem: each year the Ontario economy loses millions of dollars thanks to outages caused by ageing transformers. That's why a multi-centre research team headed up by UW's Magdy Salama has developed technology to track the health of transformers.

The first step was to analyze different indicators of transformer health, from oil temperature to the condition of the insulation, to figure out which ones are most likely to predict transformer failure. Using this data, the researchers then designed a unit that tracks those measure and signals when a transformer needs maintenance.

But monitoring the health of transformers is just one half of the solution. The other half is using that information to keep the grid functioning. Salama and his colleagues developed ways to automatically respond to signals from the health-tracking units, reconfiguring the electricity system until ailing transformers can be repaired.

Since transformers cost anywhere from a few thousand dollars to hundreds of thousands of dollars each, extending their lifespan this way can save the electricity system significant amounts of money. Most importantly, though, this technology promises to reduce interruptions in the electricity supply, creating a more secure and reliable grid.

Partners: Hydro One Networks, Moloney Electric Inc., Siemens, Ontario Centres of Excellence