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PEARL Supplements NEMA Sustainability Report on Electrical Equipment Manufacturing

AURORA, CO November 18, 2013 – A new report that focuses on sustainable designs for electrical equipment from the National Electrical Manufacturers Association (NEMA) helps manufacturers understand sources of “embedded energy,” but readers also will have to look at a recent white paper from the Professional Electrical Apparatus Recyclers League (PEARL) to fully understand the “carbon footprint” of standard electrical equipment. Taken together, the two papers offer the electrical industry the clearest view yet of how sustainable designs, recycling, and remanufacturing can save on energy consumption.

NEMA’s report, “Exploration of Carbon Footprint of Electrical Products,” is the product of research conducted by the Massachusetts Institute of Technology (MIT) Materials Systems Laboratory under contract with NEMA. It describes a novel method that can be used to assess the environmental impact of electrical products. Dubbed the Product Attribute to Impact Algorithm (PAIA)-based model, the method maps product characteristics to potential energy use and greenhouse gas emissions—also known as the carbon footprint—for a range of products throughout the electrical industry sector.

The report recognizes the potential of refurbishing and/or reuse but does not account for these in its application of the method for life-cycle assessment; instead, its discussion of end-of-life options is limited to either dismantling for recycling or ultimate disposal, or both. Similarly, because of a lack of data, the study does not account for the benefits of materials recovery and remanufacturing despite research from William Hauser and Robert T. Lund of the Department of Manufacturing Engineering at Boston University that shows remanufacturers recover on average between 85 and 95 percent of the energy and materials in the products they rebuild.

PEARL’s white paper, “Reconditioning: The Ultimate Form of Recycling,” fills in the remanufacturing and recycling blanks, offering an analysis of the energy use and greenhouse gas emissions involved in reconditioning the common 3000 kVA transformer, a ubiquitous piece of equipment used by utility companies across North America.

Following the same statistical approach promoted in NEMA’s paper, PEARL’s analysis begins by looking at the raw steel and aluminum required to build a 3000 kVA transformer, as well as the greenhouse gas emissions associated with extracting and manufacturing the materials. Together, these consume just under 30,000 kWh and produce 63.4 tons of CO₂—roughly the equivalent of the emissions produced by 16 cars driven for an entire year.

Reconditioning the same transformer, however, would require a minimal amount of electricity for the bake oven used to dry the transformer and to power the test equipment, along with a gallon of solvents for cleaning the parts and some insulating material used to refurbish the housing. The associated greenhouse gas emissions are negligible, especially compared to those associated with building a new transformer.

About PEARL:

Founded in 1997, the Professional Electrical Apparatus Recyclers League (**PEARL**) creates, collects, and disseminates information, policies, procedures, and standards to ensure the proper recycling and reuse of electrical power equipment. Its 70+ corporate members must meet strict technical, safety, and operational requirements.



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