

“Carbon Footprint” Estimation Methodology

An Exploration into Environmental Assessment of Electrical Products

Regulatory trends and market dynamics have steadily increased the need for manufacturers to measure the environmental impacts of their products. The goal of “Exploration into Environmental Assessment of Electrical Products,” a NEMA strategic initiative, was to design and test a tool for this process that focused on energy use and greenhouse gas (GHG) emissions—i.e., the “carbon footprint.” Benefits of this project include insight into the risks and opportunities for carbon mitigation within the industry.

An array of variables and supply chain considerations can contribute to a product’s GHG emission potential, but cataloging every process and material input and capturing their carbon impacts in an estimation procedure can be costly and resource-intensive. A more efficient approach involves using the best available data to screen out less significant factors and identify the principal drivers of energy use and GHG emissions over a product’s life cycle—then examine the effect of changes in those factors. Various methods and guidelines have been developed to assist industry in these efforts, but none that are specifically oriented toward the electroindustry. The NEMA carbon footprint estimation methodology fills the void within the context of existing methodologies designed for other sectors and products.

Purposes of addressing the carbon footprint concept for electrical products:

- Enhance the electrical industry’s understanding of and ability to influence its environmental impact
- Develop a consistent methodology for mapping product characteristics to environmental impacts, with a focus on energy use and GHG emissions
- Provide a means of highlighting the value of representative NEMA products in mitigating the carbon footprint of key “downstream” applications

Methodology and results:

- Expert contractor support from Massachusetts Institute of Technology, augmented by technical data and insight from member firms
- An electroindustry-based method for exploring the relative contribution of a product’s components, materials, manufacturing, and use on energy consumption and GHG emissions.
- A tool for use by NEMA members to determine the principal drivers of the “carbon footprint” of an electrical product or system.
- A comprehensive report that describes the methodology, provides high-level guidance for its application, and presents the results obtained from analysis of energy efficient lamps, small and medium motors, lamp ballasts, and electrical connector products.

NEMA members have also proactively sought to reduce the presence of hazardous substances in electrical products, consistent with the goals of RoHS and REACH in the EU and proposed reform of the *Toxic Substances Control Act* in the U.S.

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