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LECTURE SERIES PRESENTS:

Mapping Energy Needs to Sustainable Solutions in the Developing World

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Rural households in developing countries have many unmet energy needs, including cooking, lighting, heating, transportation, and telecommunication. A variety of energy options have been proposed and implemented, but unfortunately, development projects commonly fail. An estimated 30% of water projects in sub-Saharan Africa have failed prematurely in the last 20 years, and only 10% of cooking stove programs started in the 1980s were operational two years after startup. Similar anecdotal evidence suggests a mixed record of success for other energy, infrastructure, and health projects in the developing world.

Project failure often originates from an incomplete understanding of local system influences, or contexts. Further, engineers are often not trained with methods and tools to understand an engineering problem that is far different from their day-to-day experiences. This talk will introduce systems-based thinking for understanding village energy needs and will demonstrate tools for comparing rural energy options. Drawing on principles in engineering, anthropology, and economics, Dr. Johnson will describe his methods and experiences working in eight developing countries across Africa, Asia, and Central America. Data will be presented from an in-depth field study of an isolated rural village in West Africa.

Dr. Johnson is a Postdoctoral Fellow with the Nation Science Foundation (NSF) and the American Society of Engineering Education (ASEE) at HOMER Energy. He received his Ph.D. in Mechanical Engineering, master's in Mechanical Engineering, and master's in International Development from Iowa State University.