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Pyroelectric energy conversion using asymmetric crystalline polymers

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One little-known method of energy conversion technology uses a special class of ferroelectric polymer materials called pyroelectrics (PEs). The principle relies on the reversible interaction between temperature and the electrical response of a bulk ferroelectric. For these materials, a change in the bulk temperature results in the build up of a net concentration of surface charges. In this talk, I will introduce the scientific merit as well as the socioeconomic ramification of Pyro-E's core technology. Our goal is to provide a unique solution to boost the efficiency of small, distributed energy systems. Recently, advances in photovoltaics have led a paradigm shift towards direct energy conversion. This shift also points to the need for effective thermal-electric conversion where no solution currently exists for one of the largest and most accessible energy source in the country. That is, the US in 2010 released 56 percent of the total energy produced into the atmosphere in the form of waste heat and pollution. Yet, no viable solution exists given the engineering challenges in manufacturability and cost The broad, long-term objective of Pyro-E is to, with its product, achieve cost-parity with turbines for power generation, 4-times longer life, and the equivalent savings on maintenance. This provides benefit to society in the form of cheaper energy, less reliance on fossil fuel, and improved environmental quality.

Biography

Kevin Lu is the principal founder of Pyro-E Technologies. He provides the technical expertise in product development and patents. Recently, he had been a recipient of the federal SBIR program that sponsored projects centered on waste energy recovery. In addition to company operations, Dr. Lu is serving on the technical review board for the Ben Franklin Fund in Philadelphia, PA. Dr. Lu graduated from the University of California, Los Angeles, in 2008 and he now holds adjunct professorship at Rutgers University.

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