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ENERGY SERVICES IN THE FIELD

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The best way to understand this idea is through examples.

Energy efficiency is not energy conservation. Energy conservation is reducing or going without a service to save energy. For example: turning off a light is energy conservation. Replacing an incandescent lamp with a compact fluorescent lamp (which uses much less energy to produce the same amount of light) is energy efficiency. Both efficiency and conservation can reduce greenhouse gas emissions.

Lighting costs U.S. businesses and consumers more than $50 billion each year (18% of the total energy use of buildings. The strategic use of research dollars can trim billions from this annual energy bill and prevent unnecessary carbon dioxide emissions. Berkeley Lab's early work on the electronic ballast illustrates the potential payoff from conducting lighting research and working with industry toward commercialization of new products.

Although the concept for an electronic ballast originated with work performed at General Electric in the 1950s, Sam Berman and Rudy Verderber, two Berkeley Lab scientists, were the first to recognize that electronics had advanced enough to allow the creation of a commercially usable electronic ballast. They also realized that a significant energy payback would make this technology a financially viable product.

The U.S. Department of Energy (DOE) began funding the electronic ballast program at Berkeley Lab in 1977. From 13 applicants, the Lab selected two small entrepreneurial firms, Iota Engineering and Luminoptics and gave them technological support as they developed the first products. Initial demonstration tests were done in a PG&E utility office in San Francisco. The testing proved that electronic ballasts operate well in a typical building environment and reduce lighting energy use appreciably.

Other lighting equipment companies jumped into the market offering electronic ballasts of their own design, and over time, the market share of the electronic ballast gretoday, more than three hundred companies manufacture and sell electronic ballasts. Verderber and other Berkeley Lab researchers traveled around the United States and to Canada, Mexico, Europe, South America and Japan to publicize the new technology. They also aided the companies who were not involved in the original Berkeley Lab program, testing their ballasts and advising them on potential improvements.

The biggest breakthrough came when electronic ballasts were included in California's Title 24 building energy efficiency standards. Today, more than half of all states have standards requiring the use of electronic ballasts in commercial buildings.

Research suggests that lighting controls with dimmable lighting systems can result in an additional 30 to 40 percent savings in lighting energy over current efficient technology. Energy savings accrue because an automated lighting control system can sense when daylight is entering the interior space, and respond by dimming the electric lights.