SMART METERS: DEVICES FOR A SMART ELECTRIC POWER GRID

by

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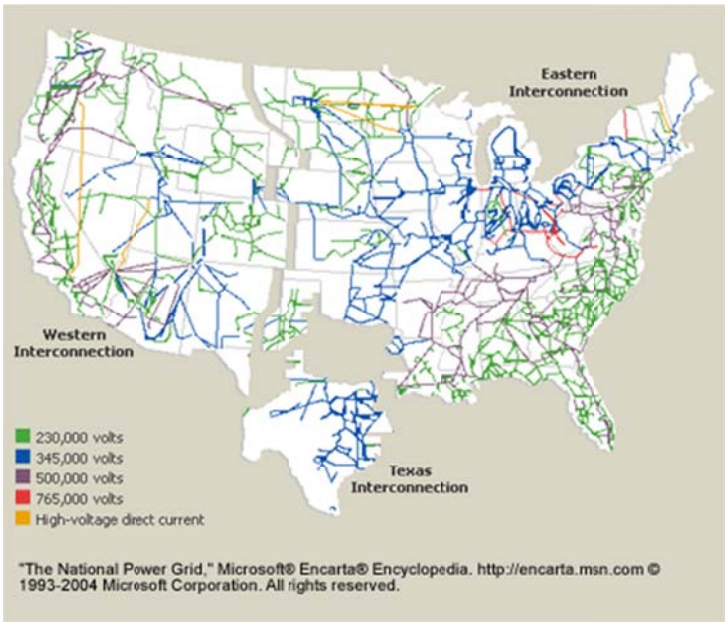
The electric power grid is the three large interconnected systems that move electricity. Electricity is generated at power generating stations and moved over the electric power grid to the customers. The "Smart Grid" uses digital information and control technology to improve grid reliability. It allows the utilities and their customers to communicate with the grid, that is, transmit information to the grid and receive information from the grid.

Figure 1. The National Power Grid

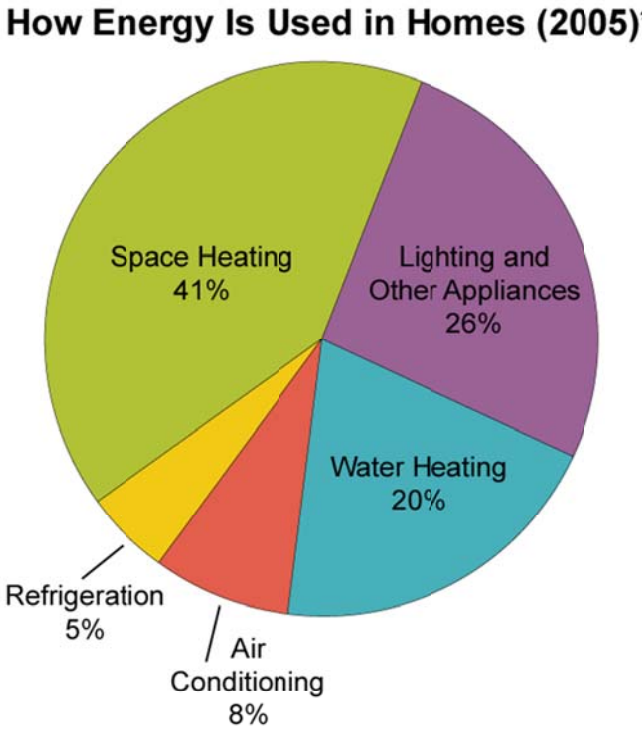


SOURCE: http://www.eia.gov/energy_in_brief/power_grid.cfm

Electricity is metered at the point of use or sale. It is this metering process that is now being made smart. Analog meters are being replaced with digital smart meters. Digital smart meters receive information and transmit it back. They are two-way communication devices that can be accessed remotely (http://energy.about.com/od/metering/a/Pros-And-Cons-Of-Smart-Meters.htm).

Utilities are replacing analog meters with digital smart meters that can be read remotely. The smart meters eliminate the need for manual meter reading and detect power outages at a location automatically. Eliminating the need for monthly meter reading reduces personnel costs as well as the pollution from their vehicles. Smart meters are devices that track and record a customer's electric use and transmit it back to the utility company. However, utilities will have to manage and store large quantities of metering data and protect the privacy of their customer's personal data.

Figure 2.



* 2005 is the most recent year for which data are available.

Source: U.S. Energy Information Administration, *Residential Energy Consumption Survey 2005.*

The smart meter technology provides real-time data for the utilities that can help balance loads and reduce outages. It can also help the consumer by educating them on how they are using electricity and potentially allowing them to adjust their usage and lower their electric bills. The technology can also be combined with other devices that would control as well as monitor. For example, once the usage got to a predetermined amount the system could turn off the HVAC equipment.

The smart metering has some challenges as well. The public is not always happy about having their personal data collected. Companies have to educate the public about what they are using the information for, as well as how they are going to protect it from misuse. There are often additional costs associated with the new meters that are passed on to customers. And, there is an environmental question about what is being done with all of the old meters.

In Louisiana, the Lafayette Utility System (LUS) had a $23 million dollar project to install new digital meters for electric and water service at businesses and residences. The project was going to have a 6-year payback by eliminating the need for manual meter reading. Supporters point out that the new meters will alert companies to outages/leaks quickly. Opponents focus on the data gathering and monitoring of their usage (http://www.theind.com/news/9967-smart-meter-opt-out-on-council-agenda).

The Louisiana State Energy Office (SEO) disseminates information about energy, energy efficiency, and sustainable construction. The information includes articles, facts, products, and applications being proposed, designed, and used.