

Benefits of Using HEMS Technology Products

Bill Melendez

The HEMS-DR™ home wireless energy conservation network has benefits for everyone. Being that this is a new market, it may not be as obvious to see the advantages both economically and politically associated with deploying our technology.

With the advent of increasing utility prices, comes the need to curtail and manage electricity usage within homes. The American home is becoming increasingly automated through its “always on” appliances which create phantom loads and electricity consumption. When one adds the comfort needs associated with air conditioning and heating during hot summer months or cold winter seasons; the continuous use of computers, stereos, televisions, video players, and a host of other “entertainment “ devices, it becomes evident that reigning consumption is a difficult and emotional issue.

According to the Consumer Electronics Manufacturers Association (CEMA) in Arlington, Virginia “nearly three-fourths of American adults know about home automation system and a majority are interested in owning products that use technology to manage a wide range of tasks.” Studies conducted throughout the United States have documented the conservation benefit of energy management via control of individual electric heating/air conditioning units in the residential multifamily housing sector. The U.S. Department of Energy, Division of Buildings and Community Systems, conducted a multiphase study at the Manhattan Plaza complex in New York City from 1978 through 1981. This study found that Energy Management Systems reduced electricity consumption by approximately 20% in the apartments. Another study done by ConED in the Chicago area (under the Energy Smart Pricing Plan) found participants reduced consumption by 20% at savings of 15% for the first two years the program was in effect. This was accomplished by providing technology that allowed participant behavior modification.

Consumers “demonstrated encouraging attitudes towards the need for efficiency: 75 per cent of respondents are willing to make lifestyle changes to save energy. The most significant barrier to energy efficiency is lack of information; 60 per cent would like more accessible information on day to day energy usage; 82 per cent would like a smarter meter to help monitor consumption. It is clear from this study that consumers are keen to use energy efficiency more efficiently given the right tools.

In order to better manage their energy consumption, two thirds of respondents would like more information on the day-to-day practicalities of energy consumption, such as a weekly/monthly profile of their domestic energy use, or clear costs of running individual appliances. An overwhelming 82 per cent responded that a little screen in the home (smart meter), which enables consumers to monitor household energy consumption would assist them in helping change their day-to-day behavior. Only 3 per cent of respondents felt that they would

have no problem understanding how to use a smart meter, with just 7 per cent concerned about the look of the meter. “LogicaCMG’s report dated May 2006

There are many ways and options currently on the market for curtailing electricity consumption. Most system requires continuous or knowledgeable interaction to make the money savings effective. As with any system that requires human involvement, energy management can easily become a victim of human habits and attitudes. What is needed is a truly automated approach to energy management that is transparent to the homeowner and modifies the family lifestyles and habits. As in the Energy Smart Pricing Plan study and the LogicaCMG’s report, the key is changing understanding and, ultimately, attitudes about energy usage.

Our concept of energy management is focused on such system. We believe that any electricity saving methodologies should take into account the family needs and lifestyle. Part of the responsibility of such management system would be to educate each member of a household on the advantages of reducing energy consumption and providing technology that not only educates, but also automatically implements those energy saving methodologies that resulting in a positive experience for the homeowner and household.

Commercial and Consumer Benefits.

There are many benefits to consumers that become apparent once an EMS is implemented and operational within a home environment. The following is a short list of obvious benefits – many more can be added to the list depending on what sensors are used and the extent of control the homeowner desires.

- Individual room temperature control regardless of how many HVAC units the home has or the architecture of the building. No more hot or cold zones or inadequately air-conditioned rooms. No more air-conditioning rooms even when not being used.
- Management of electricity consumption / electricity cost budgeting which directly impacts homeowner utility costs. On a large scale, electricity consumption at the regional grid level can be more readily controlled. Costs savings through better consumption management at the regional grid level can be passed to consumers.
- Consumer attitudinal change towards the usage of home electricity to one similar to the usage of car gasoline. Electricity is viewed as a resource to be used judiciously. Electricity is used only when needed and based on current rates and outside environmental conditions. Consumer view of energy as a precious commodity is re-enforced and rewarded through cost savings and sense of accomplished duty.
- Consumer empowerment and collaboration with the utility in load management and demand response requirements. Rolling blackouts can be minimized or eliminated and pricing rates can be implemented so consumers have more choice in costs associated with electricity usage depending on demand. Consumer can and will support initiatives that benefit their need for electricity.

- Community and local and national economic savings, energy independence and patriotism (national economical interests), living in harmony with nature due to fewer emissions (see Environmental benefits).
- For the energy providers there is an additional benefit ingrained in implementing our technology. Our non-intrusive, convenient technology can save energy, save money for consumer, and extent profitability for electricity providers.
 - (1) By having more electricity available for spot market and peak demands
 - (2) By creating an opportunity for a new source of revenue
 - (3) By providing cost saving services to energy customers thus increasing loyalty
 - (4) By providing energy customers the most comprehensive and effective home conservation solution

Environmental Benefits.

An additional benefit is minimizing of fossil fuel usage at the generation point. Since burning of fossil fuel contributes to global warming issues, reducing the need for more electricity within a region or state through EMS benefits all concerned citizens. EMS then must include the end consumer to be effective in combating emission pollutants that poison the atmosphere and contribute to global warming. An EMS multiplied by thousands of residential and business premises collectively contribute to reduced consumption and the need for more power generation.

According to the **Alliance to Save Energy**, energy production and use account for nearly 80 percent of air pollution, more than 88 percent of greenhouse gas emissions, and more environmental damage than any other human activity

(<http://www.ase.org/content/article/detail/671>).

An average house releases 22,000 pounds of carbon dioxide (CO₂) annually compared to a typical car's 11,500 pounds of CO₂, estimates the U.S. Environmental Protection Agency (EPA). Every kilowatt-hour (kWh) of electricity you avoid using saves more than 1-1/2 pounds of CO₂ from being pumped into the atmosphere. If over the next 15 years, Americans bought only Energy Star products [reduced consumption]; we would shrink our energy bills by more than \$100 billion and eliminate as much greenhouse gas pollution as is produced by 17 million cars for each of those 15 years!

Behavior Modification.

There are various possible scenarios to consumer behavior modification. The main one used today by utilities is the use of an Internet connected programmable thermostat. With the consent of the homeowner, the utility raises or lowers the temperature and thereby eliciting a cost savings and reduction in energy consumption.

As stated in the “Energy Pulse 2005” study “Americans want to help conserve energy. They just want it to be easy to do so. They want to do it through buying more energy-efficient products — not changing their behavior.”

The study also asked consumers what message would be most effective in convincing Americans to purchase energy-efficient products or to participate in more conservation activities. The winner: *a message centered on U.S. national interests*, not cost-savings or environmental benefits. It’s worth noting that this particular question was fielded both before Hurricane Katrina and after, with negligible difference in results.

The nation’s economy is perceived to be more important than personal savings for most Americans. It’s possible that U.S. consumers mentally link their personal financial well-being to the nation’s economic health.

-- <http://www.prsa.org/viewNews.cfm?pNewsID=266>

These statements point to a marketing strategy program that encompasses the desire of consumers be involved in doing something about national security/national interests while providing incentives for implementing energy management networks as a solution to these issues. Modifying consumer behavior so that they purchase HEMS-DR™ network products may well be found in the current need of the American people for curtailing foreign oil dependency while minimizing global air pollution. This is extremely difficult proposition since diminishing foreign oil dependency increases dependence on fossil fuels for electricity generation. A balance is offered through the use of HEMS-DR™ type home network products.

Conclusions.

Some conclusions can be surmised from the above information; mainly that consumers have an interest in energy conservation due to national interests and that, given the choice of buying and implementing energy management devices, they prefer hassle free non-intrusive methods that don’t impact greatly into their lifestyles.

Of those devices that are “do-it-yourself”, they must be extremely simple and convenient to implement. Otherwise, consumers prefer outside installers that have a full range of support and customer services such as those provided by Best Buy and Circuit City for home networking.

About the Author: Bill Melendez has a background in RF and RF systems, both management and product R&D, engineering, marketing, and sales. This is Bill’s third startup experience. He has been President of an Advertising company and has VP level experience. As a military officer in the US Army Signal Corps, he received training in Communications-Electronics. Bill has over 8 years in utility market and approximately 15 years in RF systems. He current holds an MBA from the University of Maryland .