Energy Efficiency and the Spectre of Free-Ridership

Stephen Heins, Orion Energy System

Is a Kilowatt Saved Really a Kilowatt Saved?

Applying a "best practices" analysis to the sacred cow of "free-ridership" as it relates to public benefits and utility energy-efficiency programs yields some important results. This analysis is all the more important, because energy efficiency with a measurement, verification, and sustainability protocol is emerging as the single best investment option for economic development and emission reduction in such diverse economies as the European Union, Canada, China, New England, and the western U.S.

One of the most vexing problems surrounding the issues of free-ridership is definitional. To the economic purist, the textbook definition of free-ridership is a person who consumes a good without paying for it. For a variety of reasons, the working definition of free-ridership as it pertains to public benefits and utility energy-efficiency programs is significantly different. In this case a free-rider is someone who would install an energy-efficiency measure without any program incentives because of the return on investment of the measure, but receives a financial incentive or rebate anyway. This definition has been adopted by utilities, program directors, and regulatory bodies that are currently discussing energy-efficiency programs.

These two definitions have very little to do with each other. In fact, the useful economic concept of free-ridership has been appropriated and re-interpreted for the needs of policy-makers. While it is true that utilities and regulators need a way to distinguish the actual impact of their energy-efficiency programs on the market, employing the concept of free-ridership to do this is both confusing and inappropriate.

Then, there is the matter of public and political perception. In a previous era, "energy-efficiency programs" were just a fancy way of describing a social program or corporate welfare. These prejudices are slowly disappearing, thanks in part to better measurement technology and an understanding of the relationship between the cost of building new power plants and employing energy-efficiency programs as a new source of energy.

In a recent news release, California's Flex Your Power stated that energy efficiency costs one-fifth as much as a new power plant. A more recent study implemented for the Northeast Energy Efficiency Partnership, Inc. (NEEP) concluded that investments in energy efficiency are 67% cheaper than the avoided cost of electric supply. In other words, the cost/benefit analysis of the two approaches to new sources of electricity suggests that energy-efficiency programs are 33% the cost of the new power.

Externalities (i.e. a cost or benefit that falls on people who do not participate in the transaction) is another source of concern for regulators and administrators of any public benefits or mandated utility energy-efficiency program. Administrators accrue the cost of issuing the rebate and the benefit of the reduced consumption on the electric system. Some argue that energy-efficiency programs funded by system-benefits charges constitute a negative externality for consumers, since public benefits charges are added to all customers' electric bills. Only then are these charges used to fund public-purpose energy-efficiency and renewables programs.

Contrary to that argument, reducing electricity demand has a profound effect on the future of adequate supplies of electricity and the overall costs of generating and transmitting

electricity, especially when demand has been going up 2.2% per year for years and the average age of the current fleet of power plants is 39.5 years.

Therefore, the economic and social value of energy efficiency to customers is that it reduces the need for new power plant construction with its accompanying production of new emissions. In addition, it benefits all customers regardless of their participation in the energy-efficiency program in their home or business. For these reasons, it should be clear that free-ridership issues for energy efficiency programs do not arise out of externality concerns.

If energy-efficiency programs do not create free-riders from public good or externality concerns, what is the source of concern for utilities, regulators, and/or program administrators? In the early years of energy efficiency programs, when most programs were administered by utilities, their focus was on resource acquisition. In the mid-1990s when market restructuring became a major initiative of the utility industry, the goal of energy efficiency often became "market transformation."

A major component of this out-dated philosophy was to deploy energy-efficiency rebates and incentives to get customers to purchase products and services, which would otherwise be prohibitively expensive for consumers or did not provide a reasonable rate of return for businesses. These market transformation programs, in other words, sought to pick winners among energy-efficiency products. Moreover, they typically focused on large-ticket items such as boilers, air-conditioning systems, etc., that had large up-front costs and limited returns.

This approach forced program administrators to develop a program rationale to justify this approach. To this end, program administrators often created payback standards for efficiency funding, which penalized lower-cost projects or projects with over-sized benefits. In addition, the standards were based on the belief that businesses should implement measures that meet a certain arbitrary payback standard without any incentive, and often, the payback standards were set too high.

For example, the dividing line for energy-efficiency incentives in Oregon is one year, which means any project with a better return on investment than one year does not qualify for program monies. On the other hand, Wisconsin has established a 50% return on investment rule, which will not fund projects with a less than two-year payback.

Business Incentives

In the business world, the decision-making process for capital expenditures is much different than some program directors think. Energy-efficiency projects have to compete with all other capital initiatives, including investments in new production assets or processes, which are usually given first priority. Under these scenarios, incentives are often required for energy-efficiency products and services, even those with significant benefits, to be chosen by businesses. "I suspect that time horizons are a major culprit in sustaining the dichotomy of "free ridership" definitions as applied to EE market transformation programs," stated Christopher Russell, director of Industry Sector for the Alliance to Save Energy. "We are all aware of the business community's need to earn MORE, and earn it NOW."

As utilities and states move out of the electricity restructuring period and increasingly turn to energy efficiency as another source of energy, it should be remembered that a resource cannot be counted until it's purchased and installed by a consumer. According to Jon Wellinghoff, longtime energy-efficiency advocate, "Energy efficiency is viewed by both utilities and regulatory commissions very differently than supply-side measures. And it shouldn't be.

Utilities should be required to acquire demand-side measures in the same manner as they acquire those on the supply side if the demand measures can be provided as "utility grade" i.e. reliable and predictable and persistent for a specified period of time."

The Minnesota Public Service Commission has adopted a very sane approach to the free-rider issue. They assume that "free drivers"— people or companies that install the energy efficiency measure as a result of the indirect effects of the energy efficiency program but never collect a rebate or incentive—offset each other. Ultimately, the whole free-rider issue hinges on the fact that it is notoriously difficult to measure.

Does anyone actually think that General Motors or Ford spent much time worrying about the "free-riders" of their Employee Discount Sales last summer once they decided to offer it. It was just a part of increasing overall auto sales.

Utility Disincentives

Why does our energy markets reward new generation when energy sources, including renewables, are expensive and a new cycle of power plant and transmission line construction looms ahead? Since the cleanest, least-expensive kilowatt-hour is the one not used, why doesn't the market regimen provide utilities receive the same return on investment for provable energy efficiencies as they receive for new or existing sources of electricity?

In most cases, the public service commissions for the states usually accept the notion that the utilities should not be allowed to administer and implement conservation efforts, usually to avoid having the "fox watching the henhouse". Then, there is the whole notion of measuring and verifying results, which has vexed regulators and electrical engineers forever.

During the California energy crisis, the state was able to reduce demand by 5% within the first year of the crisis, with as much as a reduction 10% in overall electrical consumption possible for California over the next decade. New evidence is emerging that California could cost-effectively reduce its electricity needs by at least 5,900 MW—the equivalent of 12 large power plants— over the next decade. The net benefits to California would be an estimated $12 billion and the environmental benefit is equally as large. Imagine the economic and environmental benefits nationally if we coordinate efforts throughout the U.S. "Electricity prices will cause a shift in expenditures to energy-efficient equipment," says Mary Novak, managing director of energy services at Global Insight, an economic consulting firm. "You get a permanent effect in businesses and a transitory effect in consumers."

Conclusion

Ultimately, what makes the idea of utility programs for energy efficiency so compelling is that it establishes practical rules, whereby large energy efficiencies could be achieved in the business sector. The potential for such an approach is enormous, because

1. It is not being done to any extent now;
2. Utility programs can help increase market penetration, because utilities know their industrial customers best;
3. With the opportunity for profit, utilities could provide the necessary personnel and capital to test new and existing technologies, because they would receive a return on investment for them;

4. They can provide their business and industrial customers with objective advice about the array of energy efficiencies, helping them identify the most appropriate for each customer.

Finally, the best measurement of the any energy-efficiency program's effectiveness, other than money spent, is the total of electricity saved. In the 21st century, existing and available technology and energy efficiency expertise could stem the growth of electricity consumption and the need for new power plants. The inappropriate use of the concept of free-ridership and the prejudice against electric utilities shouldn't be allowed to impede the progress of thoughtful deployment of energy efficiency throughout the U.S, especially when it is likely to have "a permanent effect in businesses."