

ENERGY BEHAVIOR MODIFICATION *The Failure and Arrogance of Centrally Planned Energy-Efficiency Programs*

KEY FACTS: • Energy-efficiency programs generally have many of the same problems as Duke Energy's heavily criticized Save-A-Watt program.

• Energy-efficiency programs force consumers to pay an extra hidden tax on their utility bills to subsidize financial incentives for the purchase of energy-efficient goods and services.

• In simple terms, energy-efficiency program proponents do not think consumers invest in energy efficiency as much as they should (as defined by proponents) due to their unrealistic expectations regarding the rate of return that can be achieved from energy-efficiency investments.

• Proponents ignore the innumerable reasons why consumers may choose not to buy, for example, a more expensive, more efficient appliance that would eventually save them money. These reasons could include such things as the quality of the appliance, opportunity costs, and risk.

• The problems with energy-efficiency programs also are numerous and include:

⇒ Energy-efficiency gains come at the expense of overall economic efficiency. Consumers pay for the energy-efficiency investments that businesses have previously rejected as being an inefficient waste of resources.

⇒ There is no way to know what kind of gains in energy efficiency there would have been absent the incentives.

⇒ The effectiveness of these programs is a guessing game.

⇒ The programs create a disincentive for individuals and businesses to invest in energy efficiency on their own.

⇒ The programs steer individuals into buying goods and services that are less efficient than what would have been purchased.

⇒ The poor are unlikely to be able to take advantage of incentives yet they are forced to pay for the subsidies used by the wealthy.

• The legislature has a simple choice next year: Get rid of the failed and arrogant policy of centrally planning the purchase of home appliances and other energy-efficient investments, or do nothing and continue believing that North Carolinians are ignorant.

200 W. Morgan, #200
Raleigh, NC 27601
phone: 919-828-3876
fax: 919-821-5117
www.johnlocke.org

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On July 28, 2008, the North Carolina Utilities Commission began its hearing on Duke Energy's Save-A-Watt plan.¹ As with other government mandated energy-efficiency programs, consumers would be forced to pay a hidden fee (i.e., a tax) on their electricity bill to subsidize this energy-efficiency program.² Specific program measures would include financial incentives for customers to purchase energy-efficient goods or services, such as energy-efficient appliances.

Save-A-Watt has received tremendous criticism,³ as it should, because Duke would receive an excessive amount of money to run this program. This *Spotlight*, however, is not about the Save-A-Watt program. Instead, it is focused on government-mandated energy-efficiency programs in general. Much of the criticism being levied on Save-A-Watt is applicable to any mandated energy-efficiency program.

Specifically, this *Spotlight* will highlight the faulty rationale and arrogance of adopting centrally planned energy-efficiency programs and some of the many problems these programs face.

The Government's Behavioral Modification System

The Proponents' Rationale for Central Planning

There never was any real reason provided during the discussion of Senate Bill 3 (the 2007 legislation⁴ that authorized energy-efficiency programs) as to why government intervention was necessary to increase energy-efficiency purchases. Legislators from both parties did not bother to ask this fundamental question. The notion that such programs were needed was taken for granted.

In the energy-policy research, the gist of the argument made by many energy-efficiency program proponents is that a market failure exists when it comes to energy efficiency. As described in a report by the Lawrence Berkeley National Laboratory (LBNL), which does energy-efficiency research for the United States Department of Energy, proponents believe that there is an "efficiency gap" that exists "between levels of investment in energy efficiency that appear to be cost effective ... and the (lower) levels actually occurring."⁵

Since there is less investment in energy efficiency than what these proponents would like, they deem it *prima facie* evidence of a market failure. Of course, proponents determine, in their arrogant belief that they know more than individual consumers, what in fact is cost effective to each individual.

In fact, energy-efficiency program proponents explain this "efficiency gap" by blaming consumers. As the argument goes, many consumers do not purchase more expensive and more efficient appliances even though they would save money over time (due to lower electricity bills) because consumers expect an unrealistically high rate of return on the investment. Therefore, a new and hidden energy-efficiency tax on electricity bills is necessary to create incentives to get consumers to act properly.

The LBNL report sheds some further light on the real government intervention justification. "Proponents of government intervention believe that substantial market barriers [such as lack of information] prevent socially desirable levels of investment in energy efficiency."⁶ Therefore, a "market failure" exists so long as consumers do not buy the proponents' "socially desirable" level of energy-efficient goods and services.

Proponents simply do not like what consumers, as a whole, are doing when it comes to energy efficiency. Since consumers do not do the "right thing," the government needs to step in. Proponents try to justify the intervention with weak assertions of market failures, when the problem really is their distaste for tolerating consumer behavior and their failure to recognize that consumers are not some homogenous group. The reality is that to proponents there is a market failure because the market fails to generate the outcome they personally desire.

Duke Energy, in testimony from one of its experts on the Save-A-Watt program, explains the behavioral modifica-

tion purpose of energy-efficiency programs:

Over time, the Duke Energy Carolinas' energy-efficiency programs can affect the nature of the energy-efficiency market such that customer *behavior*, vendor *behavior*, and even manufacturer *behavior* is altered. Where significant momentum is generated with respect to the adoption of increased energy efficiency, it is possible to transform efficiency markets such that customers begin to demand more efficiency from their vendors, equipment providers, and manufacturers.⁷ (Emphasis added.)

Consumers Ain't Stupid

To energy-efficiency program proponents, the public is getting in the way of maximizing energy efficiency.⁸ As stated earlier, they presume that the only reason consumers do not purchase an energy-efficient good or service is due to an expectation of receiving an unrealistically high rate of return from energy savings.

However, there are an endless number of *rational* factors that go into a purchasing decision. There may even be some irrational reasons (from some people's perspective), but freedom means allowing individuals to make consumer decisions to meet one's unique needs or desires. The government has no business or the ability to try to steer consumer decisions or to correct their "mistakes."

In the instance when a consumer actually does choose a lower-cost, less energy-efficient appliance, some of the infinite reasons might include:

Quality: Consumers might have the audacity to choose a less energy-efficient appliance due to better quality. In its latest report on washing machines, *Consumer Reports* states:

Washers have become more efficient in the last 10 years. But some new ones are having a tough time meeting new federal energy rules without sacrificing cleaning. Our latest tests found huge performance differences among machines But several major manufacturers are meeting the new standard in part by lowering wash-water temperatures, which often lowers performance.⁹

Opportunity Cost: Just because a consumer could eventually save money by purchasing a more energy-efficient appliance due to lower energy costs does not mean it is the best financial decision for that individual. In particular, there is the issue of opportunity cost—the amount of money a consumer is giving up by not taking an alternative action.

For example, if the price difference between two refrigerators is \$100, the consumer must decide between spending that \$100 on the more efficient refrigerator and using it to invest in stocks or some other investment. If the rate of return from energy savings is 5 percent for the refrigerator and the rate of return on the stocks is 10 percent, then looking at rate of return alone, investing in stocks is the better financial choice for that \$100.

Risk: Consumers consider the level of risk associated with a transaction: the higher the risk, the higher the return. If purchasing a particular energy-efficient good or service poses a high level of risk, the rate of return expected will increase. A good or service with a lower rate of return may be more desirable because of the nature of the risk.

The types of risk are numerous. For example, a new line of energy-efficient appliances may not meet the promised efficiency standards that occurred in the controlled settings where the efficiency ratings were calculated. There may be technical problems with a new model that lead to high maintenance costs for the consumer. The product simply may not perform as well as desired.

Another critical risk factor is the price of energy. A consumer may choose to forego buying an energy-efficient ap-

pliance because savings may be less than expected due to lower energy prices in the future. When a person purchases an energy-efficient appliance with the expectation of significant savings in electricity or other energy costs, they are in fact betting on future energy prices. However, over the last quarter century, average electricity prices (in real terms; i.e., adjusted for inflation) have been declining.¹⁰

Cash Flow: For many people, spending money on energy efficiency is not possible because the money has to be used for immediate needs. Not everyone has money lying around to invest — sometimes people have to pay for critical services such as electricity, especially as the price of electricity is being artificially increased through energy-efficiency programs.

Irreversibility: If money is invested in a government bond, for example, the consumer can immediately convert the value of the bond back into cash. However, if money is invested in a new HVAC system, it is very difficult to sell the system and convert its value back into cash.

In a Cato Institute study, economist Ronald Sutherland explains that due to this irreversibility issue, “The literature indicates that an appropriate discount rate for residential energy-efficiency investments is at least 21-28 percent, if not higher.”¹¹

In other words, consumers *should* expect a very high rate of return (as much as 28 percent) before deciding to purchase an energy-efficient good or service because it is not as liquid an asset as a bond, mutual fund, etc.

Some Problems with Centrally Planned Energy-efficiency Programs

Energy Efficiency at the Expense of Economic Efficiency

Businesses already have a significant incentive to buy energy-efficient goods and services. When they decide against making an energy-efficiency investment, they do so because it would be an inefficient use of their resources.

When incentives encourage businesses to make energy-efficiency investments, proponents think that is great—their energy-efficiency goal has been achieved and everybody wins, including the businesses. However, that presumes that energy efficiency is the only goal that matters, even more important than the overall health of the economy.

Electricity consumers, including individuals and other businesses, are forced to subsidize the economically inefficient, energy-efficient investment that the businesses have rejected.

So instead of a business inefficiently using its own resources, electricity consumers are forced by the government to inefficiently use their resources on behalf of others. The tax paid by consumers for gains in energy efficiency is simply a vast diversion of resources so they can subsidize inefficiencies across the economy.

Imperfect Knowledge

There is no way for any energy-efficiency program administrator to know what kind of gains in energy efficiency would have occurred without government intervention. Proponents would lead the public to believe that an efficiency program administrator, such as Duke, can know exactly how well their incentives are working and the cost-effectiveness of saving as opposed to producing electricity. In the “Electricity Journal,” economist Larry Ruff captures the absurdity of this arrogance:

The cost-effectiveness of any specific [energy-efficiency] device in any specific application by any specific consumer depends on details of the device, the consumer, the application, the timing, the delivery method, etc., in ways that are not directly observable or controllable by the utility. There are now high information and transaction costs involved in implementing a utility [energy-efficiency] program—unless one is willing to accept the assumption ... that utilities

have, at near-zero cost, near-perfect knowledge of and control over the detailed preferences, options, and actions of millions of economic consumers.

There is a name for a utility with the knowledge and control necessary to implement a [energy-efficiency] give-away program efficiently: God. Even to come reasonably close to the truly cost-effective result in any but the simplest cases requires a degree of knowledge and control that is unrealistic for any real-world institution. Mere mortals or even utility regulators cannot hope to handle this job by centralized command-and-control methods.¹²

The following are some examples of the obstacles that exist in measuring the effectiveness of energy-efficiency programs and/or show how these programs can actually *reduce* energy efficiency:

Free Riders: Many individuals that take advantage of incentives would have made the investment anyway (they are referred to as “free riders”). Therefore, it would be inaccurate to attribute the energy-efficiency program for these energy-efficiency investments. Utilities may try to come up with some way of accounting for free riders, but if they did it would be no more than a guess. When guessing on what would be the minor energy savings, there is a fine line between forcing consumers to pay utilities for achieving reductions in energy use and between forcing consumers to pay utilities for “achieving” increases in energy use.

Discourages Unsubsidized Purchases: Many individuals that normally would purchase goods on their own will likely limit their purchases to what is being subsidized through incentives. As a result, many additional opportunities to make gains in energy efficiency would be lost due to the incentives.

Steers Individuals to Make Less Energy-Efficient Purchases: Individuals on their own may seek to make purchases that would achieve greater efficiency but because of the incentives are steered away from making those purchases.

For example, Piedmont Natural Gas Company (Piedmont) argued in one of its Save-A-Watt-related petitions that Duke’s plan “has an ‘electric only’ perspective.”¹³ One of the consequences of the plan includes:

... The displacement of highly efficient natural gas in space and water heating applications by the less efficient use of electricity and by increasing Duke’s need to construct additional generation capacity, including coal and gas-fired electric generation capacity, all of which will reduce efficiency in total energy use ...¹⁴

Artificially Increases Prices for Energy Efficiency: One way that energy-efficiency purchases would increase is if prices for energy-efficient goods and services declined. However, through subsidizing the purchase of energy-efficient goods and services, the prices would remain artificially high because the government would be driving up demand. This discourages individuals from acting on their own to purchase energy-efficient goods and services. Incentives would be “necessary” *because* of the incentives—there would be a vicious circle.

Rebound Effect: When consumers purchase a more efficient good, they may offset at least some energy reductions by using the good more frequently. This concept is known as the “direct rebound effect.” The degree of the direct rebound effect’s impact is a matter of dispute. A 2007 study¹⁵ by the UK Energy Research Centre (UKERC) indicates that the direct rebound effect from energy-efficiency improvements in developed countries can be as high as 30 percent—in other words, 70 percent of the potential savings would be achieved.

There is an assumption that when individuals do save money, they will somehow hold onto the savings or continue to invest in energy efficiency. In reality, many consumers that do obtain savings from energy efficiency may use it to purchase energy intensive goods and services. Also, if individuals do reduce demand, energy prices (not the prices of

goods and services) would decline, thus leading to more consumption. These effects are often referred to as the indirect rebound effect—they would reduce savings even beyond the impact of the direct rebound effect.

The data available on the impact of the total (direct and indirect) rebound effect show a major impact on expected savings, although it remains extremely difficult to quantify. Energy-efficiency program administrators would face this same problem quantifying the rebound effect, assuming they would even take it into account. According to the UKERC study:

The results demonstrate that the economy-wide rebound effect varies widely depending upon the sector where the energy-efficiency improvement takes place. While little confidence can be placed in the available estimates, several studies suggest that economy-wide rebound effects may frequently exceed 50% (i.e., less than half of the expected energy savings would be achieved). Moreover, these estimates do not take into account the amplifying effect of any associated improvements in the efficiency with which capital, labour or materials is used.¹⁶

Wealth Transfer from the Poor to the Rich: The individuals least able to take advantage of incentives are the poor. Yet low-income individuals, like all electricity consumers, have to pay a hidden tax to subsidize the energy-efficient subsidies for others, including the wealthy, to purchase energy-efficient goods and services.

Conclusion and Recommendation

The legislature should eliminate the provisions in Senate Bill 3 that authorize mandated energy-efficiency programs, including the Save-A-Watt program. One can be an energy-efficiency proponent without wanting government intervention.

Ironically, legislators who allege they believe in freedom and oppose central planning did not think twice about centrally planning consumer purchases of energy-efficient goods and services when passing Senate Bill 3. North Carolina, as a result of this law, will have bureaucrats planning the types of refrigerators and heat pumps people should buy. Consumers would contact Duke to see if their new light bulb is covered under Duke's policies, much like a patient contacting an HMO.

Energy efficiency is an important goal, but not when it comes at the expense of economic efficiency—but that is precisely what happens with energy-efficiency programs. Fortunately, there are numerous market incentives that can drive energy efficiency. Consumers want to save money, and manufacturers want to appeal to these consumers. Someone has to be living in a cave not to have already heard constant advertisements pushing energy efficiency.

The question is simple for the legislature: do they believe in central planning or individual freedom? They can keep Senate Bill 3 in its current form and believe that the government knows better than consumers what is best for them, or they can eliminate the energy-efficiency mandates and recognize that consumers, not government bureaucrats, are in the best position to make sound investments in energy efficiency.

Daren Bakst, J.D., LL.M., is Legal and Regulatory Policy Analyst for the John Locke Foundation.

End Notes

1. See, e.g., Order Granting Motion to Excuse Witness, In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, North Carolina Utilities Commission, Docket No. E-7, Sub 831, July 28, 2008, ncuc.commerce.state.nc.us/cgi-bin/webview/senddoc.pgm?dispfmt=&itype=Q&authorization=&parm2=BAAAAA01280B&parm3=000126792.
2. The Save-A-Watt program often is referred to as an energy-efficiency program (even in technical documents), however it does have some measures that technically fall outside the scope of what is considered an energy-efficiency measure (both as defined by Senate Bill 3 and in general usage).
Energy-efficiency measures are considered to be changes that reduce energy use for the same function. Save-A-Watt has features, as do other "energy-efficiency programs," that attempt to shift electricity use from peak demand to non-peak demand—this would not be an energy-efficiency measure.

For simplicity purposes though, this paper uses “energy-efficiency programs” interchangeably with “energy-efficiency measures.” This also is appropriate because energy-efficiency measures are the primary focus of Senate Bill 3 (and what will be the primary focus of in-state energy-efficiency programs) and these measures are the primary focus of “energy-efficiency programs” in other states. The paper also is clear up front and throughout the paper that it is concerned with energy-efficiency measures only.

3. See, e.g., John Murawski, “Duke chief prepares to defend green plan,” *The Charlotte Observer*, August 18, 2008, www.charlotteobserver.com/408/story/134245.html.
4. General Assembly of North Carolina, Session Law 2007-397 (Senate Bill 3), ncleg.net/gascritps/BillLookUp/BillLookUp.pl?Session=2007&BillID=sb+3&submitButton=Go.
5. Golove, William H., and Joseph H. Eto, “Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency,” Lawrence Berkeley National Laboratory, March 1996.
6. *Ibid.*
7. Testimony of Richard G. Stevie, Ph.D. for Duke Energy Carolinas, In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, North Carolina Utilities Commission, Docket No. E-7, Sub 831, April 4, 2008, p. 29, ncuc.commerce.state.nc.us/cgi-bin/webview/senddoc.pgm?dispfmt=&itype=Q&authorization=&parm2=FAAAAA89080B&parm3=000126792.
8. See, e.g., Steve Lohr, “Energy Standards Needed, Report Says,” *The New York Times*, May 17, 2007, www.nytimes.com/2007/05/17/business/17energy.html?ex=1337054400&en=59d98dea01c556ec&ei=5090&partner=rssuserland&emc=rss.
9. “Buying Advice: Washing Machines,” ConsumerReports.org, www.consumerreports.org/cro/appliances/laundry-and-cleaning/washing-machines/reports/how-to-choose/index.htm.
10. “Table 8.10 Average Retail Prices of Electricity, 1960-2007 EIA,” Annual Energy Outlook, United States Energy Information Administration, June 2008, www.eia.doe.gov/emeu/aer/txt/ptb0810.html.
11. Robert J. Sutherland, “The High Costs of Federal Energy Efficiency Standards for Residential Appliances,” *Cato Policy Analysis* No. 504, Cato Institute, December 23, 2003, www.cato.org/pubs/pas/pa-504es.html.
12. Larry Ruff, “Equity v. Efficiency: Getting DSM Pricing Right,” *Electricity Journal*, November 1992, pp. 27, 29.
13. Petition of Piedmont Natural Gas Company, Inc. for Establishment of a Generic Proceeding, In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, North Carolina Utilities Commission, Docket No. E-7, Sub 831, May 24, 2007, p. 6, ncuc.commerce.state.nc.us/cgi-bin/webview/senddoc.pgm?dispfmt=&itype=Q&authorization=&parm2=DBAAAA44170B&parm3=000126792.
14. *Ibid.*
15. Steve Sorrell, “The Rebound Effect,” UK Energy Research Centre, October 2007, www.ukerc.ac.uk/Downloads/PDF/07/0710ReboundEffect/0710ReboundEffectReport.pdf.
16. *Ibid.*