The Department of Energy: Under-the-Radar, Overly Burdensome

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In the regulatory world, generally the Environmental Protection Agency (EPA) receives the lion's share of criticism and scrutiny. Sometimes the scrutiny is from industry and business groups, and in other instances, from progressives and environmentalists for alleged lax regulation. As much as EPA is in the headlines, the Department of Energy (DOE) is typically buried somewhere in the classifieds of the regulatory arena. After examining the data on the regulatory costs, consumer impacts, and employment, that needs to change.

Since 2007, DOE has finalized rules with $8.2 billion in annualized regulatory costs, with a net present value impact exceeding $158 billion. The burdens are often justified by the agency since the purported benefits are said to exceed the costs. Yet, there have been few retrospective reviews analyzing whether the benefits of the energy savings exceed the costs to the manufacturer, and eventually, the higher prices to the consumer, such as $464 more for a new water heater.

This study (using publicly available DOE cost-benefit analyses) examines the cumulative impact of DOE regulations since 2007, including effects on consumers, various states, and industries. It looks specifically at the industry most often targeted by DOE rules, air conditioning and heating, and determines whether a past air-conditioning rule delivered on its promised benefits. The American Action Forum (AAF) found wide disparities between DOE's projected level of product shipments versus actual figures, calling the agency's benefit figures into question.

Cumulative Burdens

The Office of Information and Regulatory Affairs (OIRA) acknowledges that DOE has imposed the third-highest cost burden from 2002 to 2012, behind only EPA and the Department of Transportation. Given the recent push by the Obama Administration to increase energy efficiency across the economy, in an effort to curb emissions of greenhouse gases (GHG), the pace of DOE rules has increased substantially.

The chart below details the number of "major" DOE rules that OIRA has approved from 2007 to 2014, with the corresponding net present value (NPV)(unadjusted for inflation) published cost of the measures.

Year	Major Rules	NPV Cost (in millions)
2007	2	$504
2008	2	$92
2009	5	$22,736
2010	2	$32,776
2011	4	$38,351
2012	1	$5,033
2013	2	$6,561
2014	8	$37,400
Totals:	**26**	**$143,455**

As the chart displays, DOE has imposed substantial burdens on the manufacturing sector and consumers who must eventually pay higher prices. The above figure even excludes significant final rules from 2015. The agency is now averaging 3.25 major regulations annually since 2007 (compared to five a year from EPA). On an annual basis, all rulemakings (proposed and final) from the agency from 2007 to 2015 have imposed more than $9.5 billion in economic costs. This compares to an estimated $32 billion in benefits, but both figures are subject to a large amount of uncertainty on an *ex ante* basis (before-the-fact). The eight major DOE rules approved in 2014 was a record, according to OIRA, and there does not appear to be a slowdown anytime soon. The latest Unified Agenda outlined 11 new major rules from DOE that could be completed before 2016. For comparison, the Clinton Administration approved just six major DOE measures during its eight years in office.

Consumer Impact

Imposing $9 billion in annual economic costs since 2007 might sound like a striking headline figure, but what does that portend for the average consumer? It means, as DOE often concedes: higher prices and fewer choices. In 2014, AAF issued "The Consumer Price of Regulation," detailing how 36 recent regulations could increase prices for everyday Americans by more than $11,000. Although corporations are often viewed as the targets of federal rules, the costs imposed must be borne by someone, and typically, consumers pay higher prices.

Energy regulations featured prominently in last year's report and the administration routinely concedes that prices will rise from regulation. For example, in its 2011 rule requiring more efficient refrigerators, the administration noted that the average price could increase by $83. In addition, in its recent proposal for hearth products (heating equipment), the agency admitted per unit prices could escalate by $101. Here is the agency's standard language: "Customers affected by new or amended standards usually *incur higher purchase prices* and lower operating costs."

However, most of DOE's analysis presumes an average homogenous consumer who is comfortable with a higher purchase price in exchange for keeping the product long enough to reap potential energy savings. As Sofie Miller of the George Washington Regulatory Studies Center has found, however, adjusting discount rates can turn a rule with benefits into a measure with net costs for society. Due to the higher purchase price, these efficiency regulations can have regressive effects, disproportionately burdening low-income households.

Looking broadly, a sample of the ten largest DOE rules since 2009 reveals that consumers could bear $2,380 in higher prices because of regulation. Below are the largest rules with the corresponding consumer impacts and links to the agency's regulatory impact analyses:

Regulation	Annual Cost (in millions)	Price Increase
Refrigerator Efficiency Standards	$1,569	$83
Water Heater Efficiency Standards	$1,285	$464
Fluorescent Lamp Efficiency Standards II	$841	$12
Fluorescent Lamp Efficiency Standards I	$700	$3
Electric Motor Efficiency Standards	$517	$313
Walk-In Cooler Efficiency Standards	$511	$1,086
Lamp Ballast Efficiency Standards	$363	$10
Residential Furnace Fan Efficiency Standards	$358	$75
Small Electric Motor Efficiency Standards	$263	$247
Commercial Refrigerator Efficiency Standards	$261	$85
Totals:	**$6,666**	**$2,380**

At more than $2,300 in escalating prices, the demands in regulation often result in a lighter wallet for consumers. Granted, few consumers will purchase all of the products outlined above, but a hypothetical purchase of a refrigerator, furnace fan, and water heater could easily equal a regressive "regulatory tax" of more than $620. In most instances, the consumer would have no knowledge that federal regulations drove up the price of the item.

Employment Impact

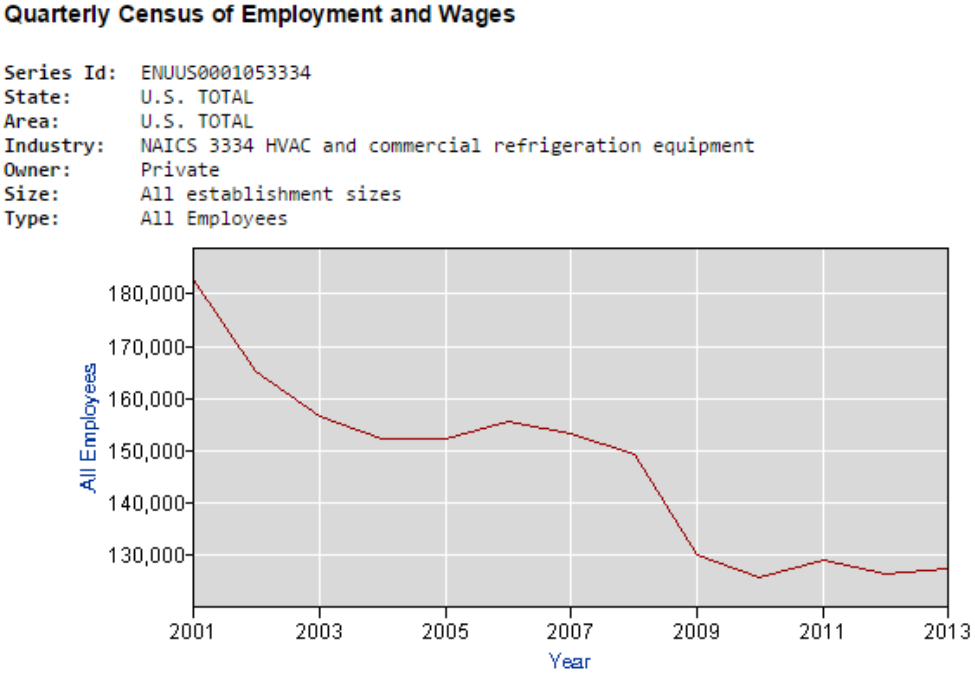
Beyond the cumulative impact and higher consumer prices, there are significant impacts on industry employment. DOE routinely admits that its rules could cause industry employment to decline and result in substantial outsourcing. In one recent air conditioning rulemaking, the administration wrote, "It is possible the small manufacturers will choose to leave the industry or choose to be purchased by or merged with larger market players." In another proposed rule, this one for furnaces, DOE noted conversion costs would total 18 percent of revenue for small businesses and just three percent for large businesses. As a result, some entities "may re-evaluate the cost-benefit of staying in the MHGF [mobile home gas furnaces] market." It is only because these statements are buried in hundreds of pages of regulatory analysis that their implications are not spread across the country for the public to learn. The result is that many small entities will go out of business – and jobs will be lost – because of a federal rule.

Quantifying these statements is often difficult, but occasionally, the agency will put a number to these words. In one efficiency standards rule for hearth products, DOE predicted industry employment could drop by 51 to 908 employees. This might seem like a paltry number, but consider that overall employment in the hearth industry is projected to be 1,565 employees by 2021.

In a proposed rule for commercial refrigeration equipment, the administration outlined five industry employment scenarios. The best cases resulted in either no job losses or moderate gains of 253 jobs. In all other possibilities, employment could decline by 3,672 jobs if "all existing production were moved outside of the United States." Indeed, outsourcing is also a common theme in DOE regulatory impact analysis. And although

one regulation rarely leads to 3,600 job losses immediately, DOE is keenly aware that its rules can have profound employment implications.

One theme through many of the rules highlighted here is the target industry: heating, ventilation, and air conditioning, or HVAC. This is a broad portfolio with more than 125,000 American jobs, but one that is subject to frequent DOE regulation. An examination of its employment levels during the last decade reveals that some factor, or combination of factors, has severely cut into its domestic labor totals. AAF took the following figure directly from the Bureau of Labor Statistics (BLS):



Since 2001, the HVAC and commercial refrigeration equipment industry has shed 55,572 jobs, or more than 30 percent of its total. Even more striking, the decline began well before the Great Recession, with substantial losses between 2001-2005, when the economy was growing. Furthermore, despite the economic recovery (albeit tepid), the industry has not witnessed a strong rebound in employment.

Undoubtedly, regulations are a factor in the employment declines. Since 2010, regulators have imposed $4 billion in final rule annualized costs on the industry, and this is solely the agency's reported cost. It likely excludes secondary costs, the monetary impact of employment losses, and the burden of hiring regulatory compliance officers. Thus, DOE imposes a

"regulatory tax" on the industry of at least $1 billion each year. That's one billion dollars in new rules each year for an industry that generates $6.5 billion in annual wages for employees. Although the industry isn't writing a check for this amount, someone must pay for these burdens: employees, shareholders, or consumers through higher prices. The NPV burden for final rules since 2010 is even more staggering, at $76.6 billion for the HVAC industry.

That's hardly the end of new regulations on these companies, however. In proposed form, during the last two years, the administration projects $1.2 billion in additional annual burdens from just six new rules. On an NPV basis, this could add another $22.6 billion in costs to the industry. Tallying both final rules and measures still in their proposed form, DOE has imposed roughly $5.3 billion in annual burdens and nearly $100 billion in NPV costs on the HVAC industry. Given the president's commitment to regulation and energy efficiency, it is likely these numbers will escalate causing a combination of lower worker pay, diminished shareholder returns, or fewer employees.

A Retrospective: Questionable Assumptions

Every administration touts the benefits of its regulatory agenda. This is typically accomplished by adding the monetized benefits of the largest major rules (measures with annualized costs or benefits exceeding $100 million) and comparing that sum to monetized costs. The Obama Administration's new Social Cost of Carbon (SCC) offers another tool to justify expensive regulation. For example, depending on the discount rate, its SCC calculation for the "Clean Power Plan" varies from $6.4 billion annually to $61 billion. With a few rare exceptions, most new standards proclaim that benefits always exceed costs. However, these figures are a prospective estimate of benefits and costs. Rarely do agencies or outside scholars dig through the actual, post-implementation data to determine if the projections are accurate. For two rules, the 2001 standard to raise air conditioning efficiency by 30 percent and a 2009 conservation standard for microwaves, AAF found significant discrepancies between agency projections and actual results.

It is difficult to untangle the effect of federal regulation on the economy after implementation, which is one reason why prospective estimates are

widespread and retrospective studies are relatively few. However, a recent study has offered some evidence that energy efficiency programs fail to deliver the promised benefits. The study on home weatherization programs found, "[T]he costs still substantially outweigh the benefits; the average rate of return is approximately -9.5% annually." However, it does not appear that these findings are giving regulators pause.

Rather than examine the macroeconomic impact of these efficiency rules, AAF examined estimates of product shipments. For example, if DOE projected 16 million shipments of new energy efficient microwaves, but for various reasons, either because the regulation increased the price of the product or other macroeconomic forces, shipments were actually below nine million, the benefits to the economy would be far less. This is due to consumers holding their "inefficient" products longer, reducing new sales, and cutting the possible energy saving and environmental benefits of the newer, more efficient products. Regulators are fully aware that regulations raise the price of goods, incentivizing consumers to purchase fewer products, but it appears that agencies routinely discount this effect, lowering the actual benefits of regulation.

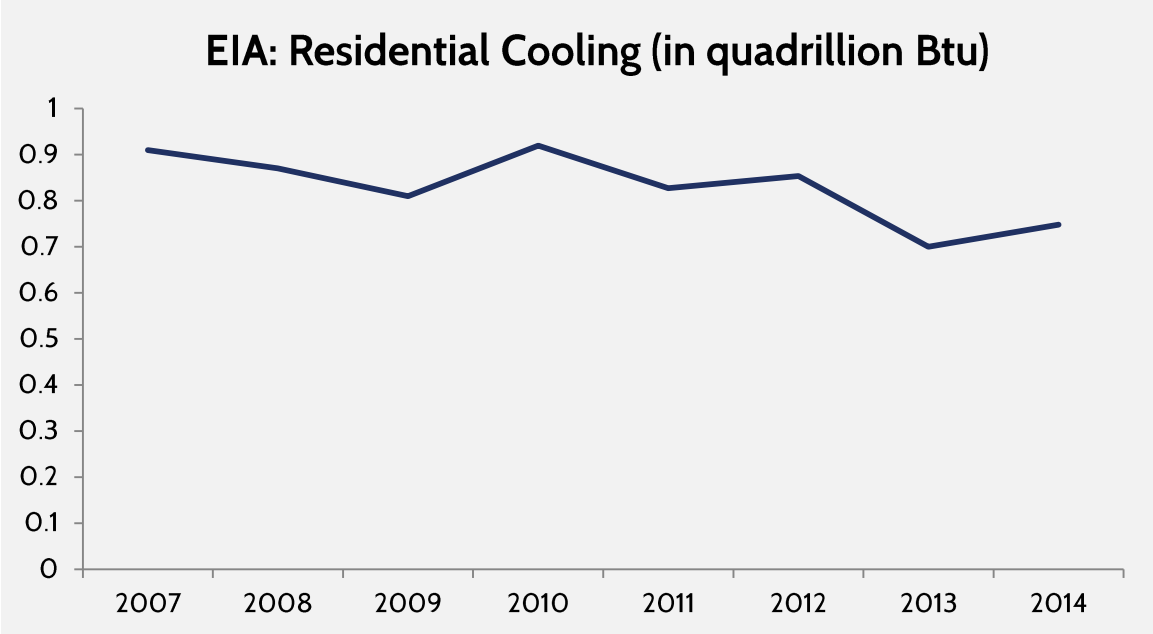
Air Conditioning Rule

The 2001 efficiency rule for air conditioners went through a winding road on its way to boosting standards by 30 percent. The original 2001 rule raised efficiency by 30 percent, but a 2002 amendment set the achievable limit at 20 percent. After court action, the more stringent standards were adopted and set for implementation in 2006 (see footnote 216).

The 2006 standards claimed that they would save three quads (three quadrillion BTUs) of energy over the lifetime of the rule. Additional standards in a 2011 rule claimed to save up to 4.22 quads of energy by 2045. According to initial figures from the Energy Information Administration (EIA), however, residential cooling savings have been mixed, partly because the number of newer units is lower than what the agency originally predicted.

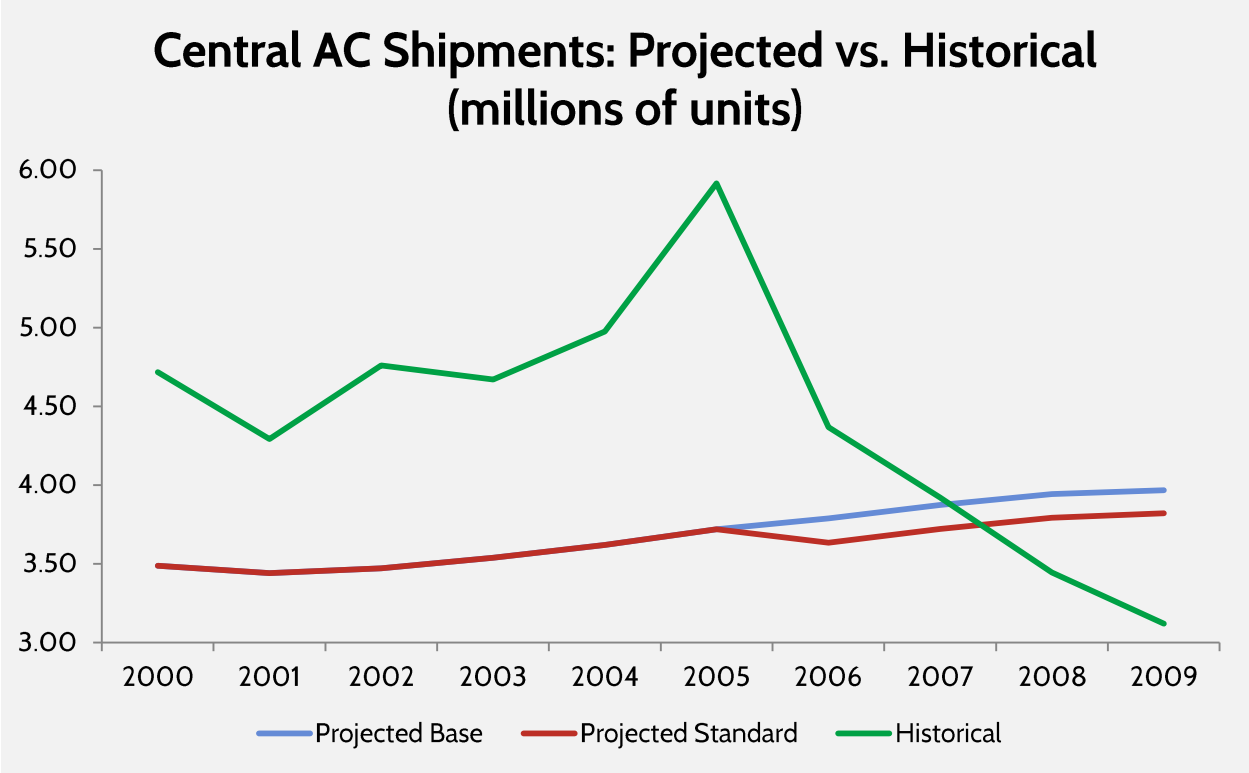
The 2006 standards helped to create a sharp drop in the number of air conditioning shipments. The agency anticipated a slight drop of 130,000 shipments. Instead, shipments declined by more than 1.55 million,

according to agency and industry estimates. Thus, the energy required for residential cooling use likely didn't decline as expected between 2007 and 2010; it increased. See below.



From 2007 to 2010, energy use for residential cooling increased from 0.87 quadrillion BTUs to 0.92 quadrillion BTUs, or 5.7 percent. This, despite the economic recession. For comparison, total U.S. energy use fell five percent from 2008 to 2009. During the horizon listed above, residential cooling has declined slightly. Although it is difficult to attribute all of the decline to the two major regulations, one cannot ignore, however, a slight increase in residential cooling usage from 2007 to 2010 that should at least invite scrutiny about the initial benefits of the rule, especially when projected shipments fell so precipitously.

The initial DOE analysis conceded that consumers would "forgo the purchase of more efficient air conditioners and heat pumps due to their higher purchase price." The extent of this decline, and the shaky assumptions from DOE are illustrative. See below.



The data above compares DOE's analysis of its 2011 air conditioning rule to the 2006 standards. In the former, DOE included historical data on shipments of air conditioners. AAF compared this data to the initial projections from the earlier 2006 standards. DOE was hardly accurate with its projections. In 2005, there was a tremendous surge in purchases, the year before the new measures took effect. That year, purchases eclipsed 5.9 million, a record since 2000. On the contrary, DOE initially projected just 3.7 million.

As noted, the agency predicted a slight drop in shipments when the rule was scheduled to take effect, but only a decline of 2.1 percent. What happened in reality? A decline of 26.1 percent, at a time when the average unemployment rate hovered between 4.4 and 4.8 percent. The following year, from 2006 to 2007, when the economy was still strong, shipments fell by another ten percent, compared to DOE's projection of a two percent increase in shipments. For perspective, from 2005 to 2009, the agency projected new energy efficient air conditioner shipments would increase by 2.6 percent. Instead, they declined by 2.8 million shipments, or 47.2 percent.

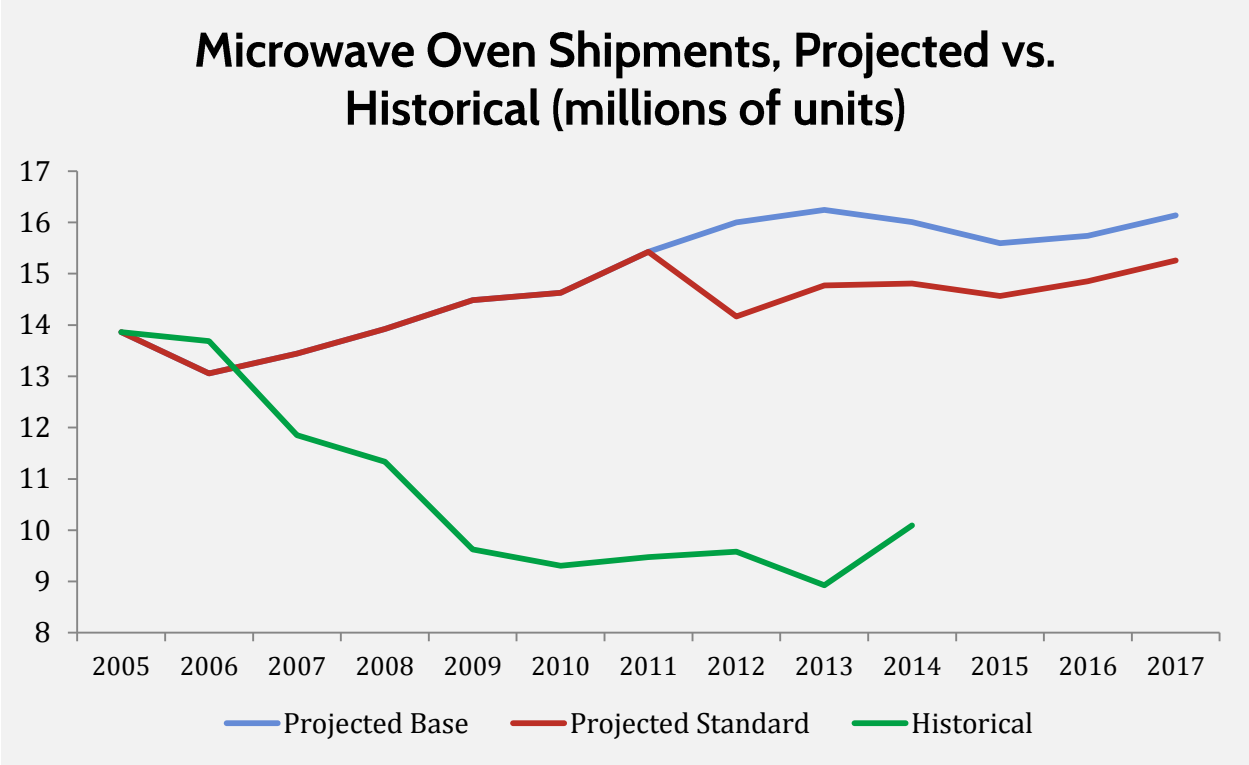
This data should call into question the assumptions of one of the most prolific regulators in the nation, an agency that has added $158 billion in cumulative costs since 2007 alone. Consumers shouldn't be blamed for forgoing the purchase of more efficient, but far more expensive air conditioners. The initial DOE rule projected price increases ranging from $144 to $213, with the expectation that the average consumer would keep the new unit for 18.4 years.

What does the extreme drop in shipments mean for the overall benefits of the regulation? According to OIRA, the 2006 standards will impose $1.1 billion in annual costs and just $1.2 billion in annual benefits. Thus, it wouldn't take too many erroneous assumptions for the costs to easily trump the benefits of the regulation. Take 2008 and 2009 as examples. Between those two years, average shipments were 13.6 percent lower than projections. A crude way of addressing the benefits suggests that a 13 percent decline in shipments would yield just $1.07 billion in benefits during that time. If costs were as projected, or even 5 percent lower, then they likely exceeded benefits from 2008 to 2009. In other words, DOE's shipment projections could easily turn a rule that barely had net benefits for society into a regulation that imposes more costs than benefits.

Microwave Rule

In 2009, DOE finalized a rule covering various consumer products, including dishwashers, dehumidifiers, microwaves, ranges, and ovens. Although the rule's annual costs and benefits were less than $100 million and thus not economically significant, the benefit-to-cost ratio was projected to be a positive 2:1. However, for the microwave portion of the rule, DOE's initial estimates on shipments of newer, more efficient, machines were off the mark.

The following chart compares DOE's projection of microwave oven shipments from 2006 to 2017. As detailed below, the agency's projection, compared to industry data on shipments, is drastically different.



In 2009, the year of the rule, DOE projected 14.4 million microwave shipments. On the contrary, that year there were just 9.6 million shipments, a difference of 33 percent. In 2014, manufacturers were projected to ship 14.8 million efficient microwaves, compared to the actual amount of roughly ten million, a difference of 48 percent. Examining the history of microwave shipment projections versus reality yields an average disparity of 34 percent.

What does this mean for benefits? Although the rule didn't divide its original cost-benefit analysis among all of the product classes, it's difficult to believe the original benefit claims are true if shipments are significantly lower than projections. However, if shipments among all regulated products were 34 percent lower than DOE's original estimate, it's not difficult to believe an actual cost-benefit ratio closer to 1:1, or half of the agency's original projection.

Conclusion

Whether it's air conditioning units or microwaves, actual data on deliveries reveal that DOE incorporates several false assumptions into its estimates, significantly over-counting benefits. Beyond the agency's assumptions,

there are real consequences from the cost side of the ledger. At more than $155 billion in total costs in recent years, these burdens have a profound impact on manufacturers' employment and consumer prices.