

**Dual Mandates or Dueling Mandates:
Federal Energy Efficiency Programs and The Recovery Act**

By

Joshua Sklarsky

S.B. in Planning
Massachusetts Institute of Technology
Cambridge, MA (2009)

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

Master in City Planning

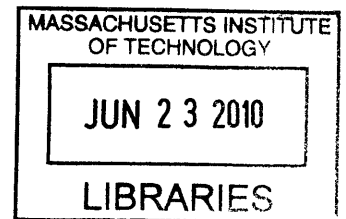
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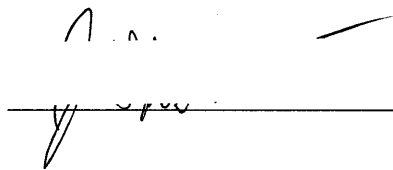
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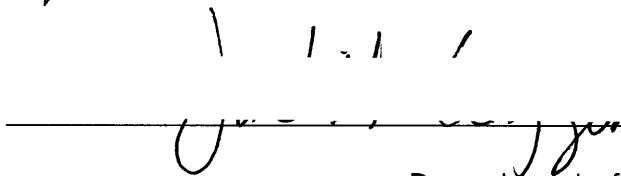


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Abstract

In February 2009, President Barack Obama signed the American Recovery and Reinvestment Act (ARRA) into law, providing billions of dollars in funding for federal energy efficiency programs. ARRA represented different things to different people and the programs it funds are being used to accomplish more than just the economic stimulus and job creation goals that led to its signing. The Obama Administration has embarked on a journey to develop a self-sustaining energy efficiency retrofit market. Doing so will require more than meeting the quantitative goals of current federal energy efficiency programs. Overcoming the barriers of implementing large-scale programs run by the federal government will not necessarily abolish the barriers to scaling up a private sector market for energy efficiency. The current wave of investment in energy efficiency can be viewed as an opportunity to learn about *how* and *why* we are succeeding in some places and not in others, so as to better inform the design of future programs and policies.

Thesis Supervisor: Judith Layzer
Title: Associate Professor of Environmental Policy, MIT

Thesis Reader: Susan Tierney
Analysis Group, inc., Boston MA

Acknowledgements

There are too many people without whom I would not have completed this thesis, or my degrees whilst at MIT. This page does not contain enough space for all the words needed to express my gratitude nor can it hold all the names deserving of thanks. So instead, I offer this Wordle¹:



¹ Image created using the web app available at <http://www.wordle.net>

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“Creating a new energy economy isn't just a challenge to meet, it's an opportunity to seize -- an opportunity that will create new businesses, new industries, and millions of new jobs ... and this may be our last chance to seize it.”

- Barack Obama
August 2008, Langsing, MI

Introduction

President Barack Obama campaigned for office on themes of hope and change, offering a vision of what the country would look like if he could achieve his policy goals. Environmental issues, clean energy and green jobs played were a major part of this theme. He constructed a narrative that melded together elements of stories told by environmental advocates, green jobs advocates, and advocates for energy independence, among others. The first legislative priority for his administration was to tackle the economic recession. The American Recovery and Reinvestment Act (ARRA, better known as the economic stimulus plan) was decidedly an economic policy initiative. However, it provided an opportunity for funding programs central to realizing the purportedly synergistic goals for the economy, the environment, and energy security.

With an unprecedented level of funding for energy efficiency programs, some viewed the Recovery Act as a renewed commitment from the federal government to funding clean energy programs. To others, it represented a down payment on the clean energy economy, meant to catalyze a private market for energy efficiency services and renewable energy technology. Either way you look at it, one message is clear – the billions of dollars that ARRA is investing in energy efficiency and renewable energy has the potential to make a sizable difference, but it will not provide enough savings in greenhouse gas emissions to meet the targets set for climate change mitigation.

Funding from the Recovery Act will not be able to pay for energy efficiency retrofits beyond the three-year period for which it was designed. During this time, however, that is exactly what ARRA is meant to do – provide funding for projects that will create jobs. The reality is, job creation for economic stimulus is ARRA’s primary *raison d’être*, not reducing fossil fuel based energy consumption. Creating jobs that are only temporary because they are wholly dependent on government subsidy is not ideal in any situation. One of the many reasons that energy efficiency became an attractive sector for targeting job growth through the stimulus was the potential for tapping into the nascent retrofit market that could flourish after the recovery period had ended.

Energy efficiency has long been recognized as a key factor in emissions reduction and energy independence strategies. Though energy efficiency is often considered the most cost-effective way to reduce energy consumption, it has remained a niche market due to a number of well-documented barriers, ranging from high initial costs to long-term payback periods. It is also true that if all barriers were suddenly removed and the market did explode, there would not be enough labor supply to meet consumer demand. Because the Recovery Act has created a large demand for energy efficiency, the Obama Administration has identified the lack of labor as one of these obstacles, rather than as a symptom of the barriers.

The current level of consumer demand for energy efficiency may be artificially high because much of the capital comes from stimulus funds. A longer-term goal of the Administration’s use of energy efficiency programs for job creation is to break down these barriers in hope that a retrofit market will sprout up and support the jobs initially created by the stimulus bill. President Obama and his administration have repeatedly referred to this process as “market transformation.”

Eliminating these barriers in an attempt to transform the market is not an easy task. While breaking down barriers is a prerequisite for the development of a market, the former does not obviate the need for the latter. In other words, it has not yet been demonstrated on a large scale that with barriers eliminated there is enough intrinsic motivation among homeowners to invest in residential energy efficiency retrofits. Currently, the primary macro-level motivation for funding energy efficiency is the economic benefits of job creation. Yet, the

private actors who will be provide the demand for energy efficiency in this transformed market will likely be motivated by the financial, if not environmental, benefits associated with energy savings.

How will we be able to tell that the market has been transformed? Will we simply know it when we see it? Current evaluations of federal energy efficiency programs focus too narrowly on impacts and process, which rely on the quantitative metrics of administrative efficacy. Proving that these programs can create jobs and save energy may show that public funding for efficiency works, but that will not necessarily demonstrate nor explain any explosion in the private market.

More important than discovering how many jobs we can create and how much energy can be saved, may be discovering what we've learned from trying to do both. Rather than focusing on how effective or efficient the current specific implementation of programs are, we can view ARRA as an experiment in putting the pieces all together, from which lessons can be drawn. There are certain things that we can learn only from doing. Early stages of implementing these programs on a large scale show that there is much to be learned still.

When the Recovery Period is over, will we be able to say that we accomplished something more than simply putting the economy back on track to grow? We won't know unless ask the "why" questions, the "how" questions, and the "so what" questions. Only then will we begin to understand how to make the transformation to a clean energy economy a reality. We must use this as a learning opportunity for doing things better in the future, because the current initiatives may not be enough and the process will take longer than the three years ARRA has allotted.

Background

As the title on the cover page might suggest, this thesis was at one point intended to be a study about how federal programs designed to achieve one set of goals evolve when mandated to achieve a new end that may be at odds with the original intent. The two mandates come from the authorizing statutes of energy efficiency programs like the Weatherization

Assistance Program (WAP) and the Energy Efficiency and Conservation Block Grant (EECBG) program, and the Recovery Act, which added a few new goals to any programs that it funded.

Since it was either at or in cities that these programs are implemented, I wanted to know what motivated cities' decisions to choose one project over another? Did they want to achieve the same things as the federal government wanted and does that matter? Thinking about what the federal government wants to achieve raised a number of new questions. One particular puzzle that many have been struggling to wrap my mind around is how tradeoffs are being made between environmental goals and economic goals of energy efficiency programs. By trying to do more than one thing with these programs, will it be easier to achieve both, or will succeeding at one come at the expense of the other?

Funds from the stimulus have been slow to make their way into the hands of the people implementing the programs on the ground. In addition to prolonging the stimulus effect, this made it difficult to collect information on how cities are implementing their stimulus-funded energy efficiency programs. Though I found this particular issue interesting, it would be naïve to suggest that this problem of dueling goals is either new or that it is unique to the programs in question. In fact, the mandates are not simply dual - they are multiple. This is not uncommon when it comes to federal energy policy.

Observing the Department of Energy develop a new block grant program for energy efficiency and conservation, I learned firsthand that interpreting the intent of Congressional legislation – as federal agencies are ought to do – is a difficult process. In an essay added to the revised edition *Implementation* (Pressman and Wildavsky 1984), Browne and Wildavsky (1983) shed some light on why:

The objectives of public policy are likely to be multiple, conflicting, and vague. The price of agreement among stakeholders is likely to be vagueness, allowing them to fight their battles another day. Policy and program objectives are multiple so as to create a sufficiently broad coalition of support. Contradiction comes in because objectives held by different interest groups (for example, lowest cost per person placed versus finding jobs for the hard-core unemployed; quality versus cost of medical care) may well be opposed.

Prior to the energy crisis of the 1970s, there was no coordinated national energy policy, nor was there a need for one in the eyes of many. In *Energy Politics*, David Henry Davis (1992, 20) explains that this is because different energy issues and fuels are completely independent of one another. He likened energy politics to a “five-ring circus with a sideshow.” The different interest groups that affected energy policy for many years were only those in the individual, segmented energy industries. Davis (1992, 6) also notes that this was “a small world of its own, a subgovernment [*sic*] tightly closed against the intrusion of outsiders. For long, it was a world usually unnoticed by political scientists and average citizens, and those involved in the process did not seek attention.”

Energy Policy Overview

In next few pages, I will give a brief overview how things have changed since the energy crisis, with different groups of outsiders intruding and becoming stakeholders in energy policy processes. This change began in the 1970s, which saw the first attempts at developing a comprehensive national energy policy that ultimately led to the creation of the U.S. Department of Energy. Many of the individual policies and programs from that time were meant to address the effects of the 1973 OPEC oil embargo (Fehner and Holl 1994). This effort resulted in policies and programs aimed at making our energy supply sources more stable and secure, while reducing the burden of higher prices at the pump. The Weatherization Assistance Program was created in the same period in order to relieve the burden of high energy prices for those below the poverty line.

Our early national energy policies have some of their origins in economic policy but only as a result of foreign policy issues. Over the years, as different issues have come to the attention of the public, the context for energy policy has changed. Because energy is so ubiquitous, it has become in some ways a blank slate upon which the issues of the day are scribbled.

There have been three main categories of issues that energy policy has touched over the years: environment, security, and economy. Energy independence and security seems to be a consistent theme that unifies politicians at least in the description of the end goal. The means to achieve it – off-shore drilling vs. off-shore wind development for example – is often debated.

As President Obama has noted, “[w]e’ve heard promises about energy independence from every single President since Richard Nixon” (Obama 2008).

Environmental issues and economic issues as related to energy policy on the other hand, tend to rise and fall out of the public debate. Amory Lovins (1976) was one of the first of many prominent writers and thinkers to discuss the economic benefits as well as the environmental benefits of revamping our approach to energy production, distribution, and consumption. Many others have made the argument that there are both economic and environmental benefits to making our energy system cleaner and more efficient, including Paul Hawken (1993; 1999), William McDonough (2002), and Thomas Friedman (2008).

Just over the past decade, we can see how these three issues have played a role in national policy discussions. A look at the Gore-Lieberman platform from the 2000 presidential campaign reveals an emphasis on the need to reduce “climate-disrupting and health-threatening pollution.” When suggesting, “new environmentally-friendly technologies can create new jobs for American workers,” they do so in the context the things must be done to protect to protect the environment.

In the 2004 election season, both the Democratic Kerry-Edwards (2004) ticket and the incumbent Republican Bush-Cheney (2004) campaign discussed energy issues almost exclusively in terms of national security, following 9-11 and the divisive war in Iraq. Aside from a reference to the energy industry lobby, the Democratic Platform does not mention energy once under the section titled “Protecting the Environment.” National security was a much higher priority at the time, so energy independence became the spin that politicians used for furthering their energy agendas.

In the 2008 campaign, the Obama-Biden campaign used energy issues to discuss a variety of other policy initiatives, particularly economic ones. Their “New Energy for America” (2008) plan addresses issues of energy independence and security, climate change, air quality, and job creation. The economic goals of a clean-energy agenda are much more prominent in the Obama-Biden plan than in the Gore-Lieberman platform, where they were treated almost as a bonus benefit of energy efficiency and renewable energy.

Green Collar Jobs

One reason Barack Obama focused on bringing together his economic goals with his environment and energy goals was the growing influence over the past decade of the “green jobs” movement. Green collar jobs are ones that are often directly involved in clean-energy sectors; for example, manufacturing and installing renewable-energy technologies or conducting an energy audit would be considered green collar jobs. Though, they are not limited to energy sectors; they could be jobs in the water sector or dealing with the waste stream and recycling, or supporting sustainable agriculture, among others. As the U.S. economy has exported many of its manufacturing jobs and has increasingly outsourced IT jobs to companies overseas, there has been tremendous support behind the development of jobs that cannot be exported. Recognizing that certain green jobs are not easily outsourced, environmentalists and labor unions have started working together forming organizations that have played a prominent role in the politics of energy and economic policy.

One such group is the Apollo Alliance, which first brought together leaders from the labor movement, the business community, and environmental activists in 2001 to promote green jobs and a clean energy economy. Another prominent group advocating for green-collar jobs is Green For All, which was founded by Van Jones as an outgrowth of the Green-Collar Jobs Campaign he worked on with the Ella Baker Center. Jones’s book *The Green Collar Economy* (2008) lays out a vision for how developing a clean energy economy powered by green jobs in away that could solve many of the problems facing society today. He emphasizes the need for green collar jobs to help address issues of economic and social inequality.

ARRA

As the green jobs movement grew, so did many of the problems Jones and others were trying to solve. Gasoline prices were rising with no end in sight during the summer of 2008. The U.S. was still involved in two wars in the Middle East. The climate crisis was not getting any better. The already slumping economy worsened in the aftermath of the housing market collapse and the federal government faced backlash over its bailout of the banks on Wall Street, leading to calls for a bailout of main street grew. All of this contributed to the opening of a policy window for the Obama-Biden green-economy agenda.

Given the severity of the recession, economists were calling for a stimulus package as large as one trillion dollars, saying that at “that more than 50 percent of [it], whatever its size, should be devoted to spending” (Uchitelle 2008). While economists were debating the size of the stimulus package and the general types of spending it should include, advocates of all kinds saw this moment as “an opportunity ... to push their pet solutions” and to “push attention to their special problems,” which is what John Kingdon (1995, 165) defines a policy window. Kingdon’s (1995, 84-89) discussion of the “garbage can model” also helps describe how various programs ended the bill now known as the American Recovery and Reinvestment Act of 2009 (ARRA). He notes: “[w]ho is invited to or shows up for a meeting (i.e., who the participants are) affects the outcome dramatically. Which solutions are ready for airing and which problems are on people's minds are crucial” (Kingdon 1995, 86).

Two problems that were on most people’s minds at the time were high unemployment rates and high gas prices, or in other words, jobs and energy. The U.S. Conference of Mayors and the Apollo Alliance were among the advocacy organizations that showed up, with solutions in hand. Manny Diaz, Mayor of Miami and president of the U.S. Conference, promoted a \$90-billion package called the “MainStreet Stimulus Plan,” which included funding for clean energy programs that would create jobs and was adapted from other policy proposals the group had pushed for in the past (U.S. Mayors 2008).

Perhaps more influential in Washington was the \$50 billion Apollo Economic Recovery Act, which the Apollo Alliance modeled after their long-term *New Apollo Program* (2008) and their earlier *New Energy for America* (2004) report. Their plan was based on the precept that an “[i]mmediate investment to rebuild our infrastructure to be greener and more efficient will create hundreds of thousands of jobs today, save billions of dollars in lost energy costs tomorrow, and reduce our carbon footprint over the long term.” According to an article on the Apollo Alliance’s website (Schneider 2009), Senate Majority Leader, Harry Reid said:

This legislation is the first step in building a clean energy economy that creates jobs and moves us closer to solving our enormous energy and environmental challenges ... We’ve talked about moving forward on these ideas for decades. The Apollo Alliance has been an important factor in helping us develop and execute a strategy that makes great progress on these goals and in motivating the public to support them.

Others, too, took advantage of the unique moment, and like many other large spending bills, the Recovery Act contains its share of pork – a Wall Street Journal (2009) editorial referred to the bill as a “40-year wish list” of Democratic interests. Perhaps because their message resonated with many themes from his campaign, President Obama and his team latched on to the notion that a stimulus package could “pour billions of dollars into a jobs program to jolt the economy and lay the groundwork for a more energy-efficient one” (Broder, 2008), as the New York Times described it.

The final bill, known as the American Recovery and Reinvestment Act of 2009 (ARRA), included over \$110 billion in grants, loan guarantees, and tax incentives for clean energy investments. Two grant programs in particular have received a fair amount of attention as the face of these efforts. Both the Weatherization Assistance Program (WAP) – funded at \$5 billion - and the Energy Efficiency and Conservation Block Grant Program (EECBG) – appropriated \$3.2 billion - provide grants for energy efficiency programs implemented in communities around the country.

Weatherization Assistance Program

The Weatherization Assistance Program was first authorized as part of the Energy Conservation and Production Act, which passed in 1976 along with a spate of other energy-policy bills responding to the 1973 oil crisis. According to the original program guidance released by the Federal Energy Administration in 1977, WAP was meant “to assist in achieving a healthful dwelling environment and maximum practicable energy conservation in the dwellings of low-income persons, particularly elderly and handicapped low-income persons, in order both to aid those persons least able to afford higher energy costs and to conserve needed energy” (Federal Energy Administration 1977). The program was an outgrowth of a program established by Maine to address the oil crisis, where the combination of high oil prices and cold winters led to economic uncertainty. (U.S. Department of Energy 2008).

The program has evolved over the years and has been modified through reauthorization in a number of pieces of legislation. Although one of its main goals is now to increase spending in the local economy by saving residents money on their energy bills, supporting communities

through job creation was never an explicit goal until the program received funding from ARRA. In fact, the weatherization program started out as a subsidy for volunteer work; the law required that program funds be spent only on weatherization materials and not on labor.

Over the years the budget for WAP has grown, reaching \$200 million annually for most of the past decade. The program also leverages funds from other sources, such as the Low Income Heating and Energy Assistance Program (LIHEAP) and the Petroleum Volatility Escrow (PVE) funds. The DOE distributes the money to state agencies, often housing authorities, through a formula grant process. States are then responsible for funding local agencies that perform the work. According to the Department of Energy, the program weatherized a total of 6.4 million homes between 1977 and 2008, saving on average \$437 per home on heating and cooling costs annually (ORNL 2010).

EECBG Program

Unlike the 32-year old Weatherization Assistance Program, the idea for a block grant program for energy efficiency was conceived in 2007 by the U.S. Conference of Mayors and announced at their 75th annual winter meeting that year. The program would be modeled after the successful Community Development Block Grant Program administered by the Department of Housing and Urban Development to “provide funding directly to cities, counties and states to support local efforts to improve community energy efficiency, reduce greenhouse emissions, and stimulate the deployment of new technologies, practices and alternative/renewable energy supplies” (Palmer 2007). According to their 10-Point Plan, it was to be the mayors’ number one priority for 2008.

That effort bore fruit before 2008 even began. In December 2007, President George W. Bush signed into law the Energy Independence and Security Act (EISA). Senator Robert Menendez of New Jersey, the author of the EECBG provision, quoted then-President of the U.S. Conference of Mayors Douglas Palmer in a press release referring to the program as his organization’s own. This bill directed the energy secretary to establish the Energy Efficiency and Conservation Block Grant (EECBG) Program. It mandated that states, cities, counties, and Indian tribes be given grants to 1) reduce fossil-fuel emissions, 2) reduce total energy consumption, and 3) improve energy efficiency.

In EISA, Congress described in detail the criteria for a formula that would be used to distribute the amount of money available in grants. According to the law, every single city with 35,000 persons or more is eligible to apply for a direct grant from the Department of Energy (DOE). Additionally, large counties and Indian tribes are eligible for grants, as are states and territories. Smaller cities and counties are eligible for sub-grants through their state energy office. Congress laid out fourteen categories of eligible uses for the program funds, ranging from hiring consultants for planning purposes to retrofitting street lamps with light emitting diodes (LED).

The program got off to a slow start. Despite a \$10-billion authorization over five years, no appropriations for the program were made in fiscal year 2008. Nevertheless, in early 2009 ARRA authorized another \$3.2 billion for energy efficiency and conservation block grants. This had far reaching effects for the EECBG Program. Because no money for EECBG had been appropriated, no program guidance or formal documentation had been published by the DOE prior to the Funding Opportunity Announcement (FOA) on March 26, 2009—a month after ARRA passed.¹ The FOA added the job creation emphasis to the program and laid out a number of “core principles” that were meant to guide local governments throughout the program and planning process.

Since the program is brand new, no previous program guidance exists to compare the current implementation to. It is evident from the following two principles that the goals of the Recovery Act are central to how the program is being implemented now: “Invest funds in programs and projects that create and/or retain jobs and stimulate the economy while meeting long term energy goals;” and “Target programs and projects that will provide substantial, sustainable and measurable energy savings, job creation and economic stimulus effects” (National Energy Technology Laboratory 2009). Meanwhile, the first two desired outcomes of EECBG-funded projects are “Increased energy efficiency, reduced energy consumption and reduced energy costs through efficiency improvements in the building, transportation and

¹ In fact, the official program guidance was not released until April 21, 2010, which is more than a year after the first and potentially only funding opportunity was announced for EECBG formula grants.

other appropriate sectors;” and “New jobs and increased productivity to spur economic growth and community development” (National Energy Technology Laboratory 2009).

Environmentalists, clean-energy experts, and climate scientists have been suggesting that large investments like those made in ARRA need to be made in energy-efficiency programs and renewable-energy technology. Authorizing the EECBG program at \$10 billion over five years was a step in this direction. However, no appropriations bill ever backed up that plan, and no DOE budget proposal has yet to request funding for the program. If not for the economic crisis prompting the Recovery Act, it is possible this program would remain unfunded until its authorization expires. The fact that the program was only was funded under ARRA does not mean that Congress had no intention to fund it whatsoever, but it does say something about priorities – Congress was much more willing to provide billions of dollars for energy efficiency and conservation when the main point of the appropriation was to create jobs, than when purposes of the program are “only” about saving energy, reducing fossil-fuel emissions, and becoming more energy independent, and secure.

Tradeoffs

If Congress prioritized the economic recovery over the longer-standing goals of energy efficiency and conservation programs, in funding decisions, should this affect how those programs are implemented? Energy efficiency programs have always had multiple goals that would shift up down the priority ladder. Most of the desired outcomes could be described as co-benefits, though. That is, accomplishing one goal, like maximizing energy savings to reduce homeowners’ monthly costs is, will have a positive impact on another goal like reducing pollution from emissions in the fuel burning process. At the very least, no two goals were entirely mutually exclusive. For example, reducing the number of barrels of oil imported to cover the heating needs of New England would require replacing boilers and/or increasing thermal insulation of the home. If a secondary or tertiary goal is to reduce peak energy use in summer, the winterization of oil-heated homes could either help by reducing the need for air conditioners on hot days because of the insulation upgrade, or it simply wouldn’t have an impact if only the boiler was replaced and is not used anyway in the summer.

When ARRA introduced job creation – goal that is being quantitatively assessed by the White House Office of Management and Budget (OMB) along with workers’ wages – to energy efficiency programs, it was not immediately clear what impact this would have on the other goals, such as reductions in total energy consumption. Despite the repeated mantra of “green jobs” suggesting that these two goals are directly in tune with one another, we are beginning to find that there are tradeoffs. Simply creating jobs is not enough. Congress ensured that all funds from ARRA be spent in compliance with the Davis-Bacon Act, which requires a local prevailing wage to be established and maintained for federal contract work, thus preventing wage depression in times of recessions. The problem for programs like WAP is that higher labor costs leave fewer funds available for materials such as higher-grade insulation, thicker windows, or more efficient furnaces. When shifting the focus of a program to jobs from energy savings, the source of labor supply can also impact the results. The areas that are in need of the most jobs may not line up geographically with the areas that have homes that have the highest potential to benefit from an energy efficient retrofit.

Programs like EECBG and WAP were not designed to be tools for large-scale job creation. Yet they were funded through ARRA, which placed an emphasis on creating good-paying jobs. Investing sums of money that far exceed the current labor capacity in these programs to create a demand for energy efficiency work requires existing organizations to hire more people and may lead to new business development. However, accomplishing the economic goals of the recovery act can sometimes come at the expense of environmental goals. Recognizing that tradeoffs exist and why they occur is necessary for advocates, policymakers, and program implementers to set appropriate expectations and find balance in how they each pursue their objectives.

Expectations

Striking the right balance between these tradeoffs is difficult for much the same reason that interpreting legislative intent was – there are competing goals and interests at stake. Beyond structuring and implementing the Recovery Act, these tensions are also present in the visions the various stakeholders have for ARRA. We will not be able to understand the impacts

of these tradeoffs until we can look back at the implementation of the Recovery Act and evaluate performance. ARRA meant different things to different people who expected different outcomes. This section will look at how some of these goals differ between long-term and short-term.

Long-term

Even among groups that all advocated for clean energy programs to be included in the stimulus package, each put a slightly different spin on their praise of the Recovery Act's signing as to what the bill means for the long-term objectives they strive to meet.

Environmental advocacy organizations like the Sierra Club and Greenpeace praised the bill for its potential to help the economy while protecting the climate through reducing "our dependence on dirtier energy sources" (Sierra Club 2009), which represents "a substantial down payment on America's new energy future" (Greenpeace 2009).

Meanwhile, the Coalition for Energy Efficiency, representing groups that would be involved in actually doing much of the retrofit work funded through the stimulus bill, focused both on ensuring that "the new law's energy efficiency investments are deployed rapidly for the most immediate possible benefits to workers and consumers," as well as on what this would mean for the future of their industry. Steve Cowell (Alliance to Save Energy 2009), CEO of Conservation Services Group, added:

The economic recovery legislation is merely the first step in the essential transition to a sustainable energy economy... We look forward to working with the president and Congress to develop the next steps, including implementing long-term energy and climate policies, which will make energy efficiency the cornerstone of our national growth and prosperity. We must implement these programs and strengthen others, especially in industrial energy efficiency and the public buildings sector, where more opportunity exists.

Phil Angelides, chairman of the Apollo Alliance (2009), praised the bill's signing by recognizing the broad coalition of support for bringing together economic and energy policy goals:

Across the nation, business, labor, environmental and community organizations have come together to create an unstoppable momentum that is making good, green-collar jobs the focal point of America's economic recovery. We must now turn our attention to the energy and climate initiatives that are needed this year to bring our critical mission to rebuild America's economy from launching point to full speed.

This selection of quotations is neither exhaustive nor exclusive. These individuals and organizations may agree with the statements made by their fellow supporters of stimulus funded energy efficiency. What this does show, however, is that each of these groups approached their support from a slightly different angle. These different expectations mean that there will be different measures of success in the long run.

Short-term

While the quotes above demonstrate broad aspirations for what the economic stimulus could accomplish, more concrete short-term goals were being discussed for the Recovery Act from the outset. Because energy efficiency programs like these had never been run on such a massive scale, impact estimates were being made based on smaller scale implementations of these programs. In order to serve as a stimulus of economic activity, funds appropriated through ARRA needed to make their way from the federal government and into the ground. Funding "shovel ready" projects became a cornerstone of the Recovery Act in its early days.

Many of these were simply projects that city or state governments had at one point planned to implement but lacked funding. In its efforts to help lobby Congress on behalf of a stimulus bill, the U.S. Conference Mayors (2009) conducted a survey and compiled a list of shovel ready projects from 779 of its member cities into a report titled "Ready to Go." The list included over 1,300 projects listed under "Energy Block Grants and Green Jobs" that would create an estimated 150,000 jobs, and cost approximately \$30 million.²

While the U.S. Conference of Mayors report focused on cities, the Department of Energy sought recommendations from planning organizations that looked at things from a broader scope, like the National Associations of State Energy Offices (NASEO) and the American Council for an Energy-Efficiency Economy (ACEEE) to help plan for energy efficiency investments from

² Not every project listed in the report included job creation estimates.

ARRA.³ Research from institutions like the Center for American Progress also played a large role in informing the soon-to-be Obama Administration on how funding projects like these on a large scale could lead to job creation and economic stimulus.

Using data from the U.S. Bureau of Economic Analysis, the authors of a report from Center for American Progress and the Political Economy Research Institute calculated that nearly two million total jobs could be created through the investment of \$100 billion in a green stimulus program (Pollin et al. 2008, 9). This works out to approximately \$50,000 spent per job created. The NASEO-ACEEE recommendations for energy provisions in a stimulus package amounted to \$30.595 billion, which they suggested could create a net total of 298,000 jobs over the course of 2009 and 2010. They used an input-output model that assumed the federal dollars would be matched at a ratio of 1:1 or higher. According to their accounting, the biggest job creation numbers would result from reinvestment of the avoided costs from saving energy, to the tune of 190,000 net jobs each year from 2012-2020. These numbers all stem from economic models, since NASEO's report on "State Energy Office Clean Energy Projects For Immediate Implementation" did not include job creation estimates for each of the projects.

The report does take into consideration saved costs from anticipated energy savings, as measured by the DOE using data from previous years' implementation of the Weatherization Assistance Program. They cite data that suggests spending \$2,500 on a home energy retrofit can save a homeowner 30 percent on their energy bill, which gets pegged at an average of 5 percent of annual income. This leads to \$900 in savings for a household that spends \$3,000 annually on energy bills. Of course, when dealing only with energy bills, the savings on electricity and heating bills are directly correlated to the number of kilowatt-hours and/or therms saved, which have direct impacts on the quantities of greenhouse gas emissions avoided.

Estimates derived from these numbers can be misleading, as some of the unanticipated changes to the program are likely to drive up the cost required to achieve a 30 percent savings level in a home retrofit. Furthermore, studies like these did not take into consideration the fact that the majority of funding avenues, even according to their own suggestions, serve residential

³ Tierney, Susan. Personal Communication. April 27, 2010.

buildings primarily for low-income residents only. While low-income households tend to spend a higher percentage of their income on energy costs, the total amount of kilowatt-hours they consume is far less than wealthier residential households. This means less energy is saved, resulting in smaller cost savings.

Since many of these estimates were made, the Department of Energy has dealt with a number of issues previously unaccounted for challenges associated with the rapid scaling of energy efficiency programs. As new realities have set in, expectations changed. For example, the initial goal that President Obama had for WAP was to retrofit one million homes each year. In a discussion paper (Weatherization Assistance Program 2008) about what it would take to reach that goal, it was estimated that \$4.5 billion in funding would be needed for 2009, followed by an additional \$9 billion in 2010 and \$10.5 billion (adjusted for inflation) for each of the five years after that. The Recovery Act provided \$5 billion in funding for a period of three years, changed the maximum allowed expenditure per household to \$6,500 from a \$2,500 base, and required Davis-Bacon wages to be used for the first time in the program's 32-year history. The Department of Energy now estimates that the stimulus funds will be able to weatherize approximately 650,000 homes over the three-year ARRA performance period.

Transforming the Market

Estimating the impacts of the recovery effort was a rather quantitative endeavor and focused heavily on the direct impacts of the stimulus. Everyone wanted to talk about how many jobs would be created, how many homes could be weatherized, and so on. While important – if only as a function of the media attention – those who were thinking more broadly about the stimulus package vis-à-vis clean energy recognized the bill as a crucial moment in the move to a different energy system than currently present. They all refer to a change in the status quo – something that must take place somewhere in between creating jobs through the immediate retrofits of homes and realizing a completely energy independent economy that runs on non-polluting fuels and provides sustainable jobs that cannot be exported overseas.

On the day President Obama signed the stimulus bill into law, he remarked “we are taking a big step down the road to energy independence, and laying the groundwork for a new,

green energy economy that can create countless well-paying jobs” and “[i]n the process,” he said, “we will transform the way we use energy” (Obama 2009). In that speech he referred more directly to renewable energy and smart grid technologies. However, the message carried over to energy efficiency programs. In the program guidance for EECBG, the Department of Energy (2010, 5) encouraged grantees to “[e]nact policies that transform markets” and specified “[w]idespread use of innovative financial mechanisms that transform markets” as a desired program outcome.

But what does it mean to transform the market, and how will we know once it is transformed? During the campaign speech in which Obama made explicit his vision for a clean energy future, he described the transformation in the following passage:

[B]reaking our oil addiction is one of the greatest challenges our generation will ever face. It will take nothing less than a complete transformation of our economy. This transformation will be costly, and given the fiscal disaster we will inherit from the last Administration, it will likely require us to defer some other priorities.

It is also a transformation that will require more than just a few government programs. Energy independence will require an all- hands-on-deck effort from America -- effort from our scientists and entrepreneurs; from businesses and from every American citizen. Factories will have to re-tool and re-design. Businesses will need to find ways to emit less carbon dioxide. All of us will need to buy more of the fuel-efficient cars built by this state [Michigan], and find new ways to improve efficiency and save energy in our own homes and businesses. (Obama, Lansing 2008)

While Obama described *what* needed to happen, he did not explain *how* it should happen. He did differentiate between the role of government programs and private actors. Currently the Recovery Act is ensuring that a more than just “a few government programs” are working toward this transformation. The period of performance for the stimulus is only intended to be three years, ending sometime in 2012. What happens after that is up in the air.

Some believe federal investments in efficiency programs like EECBG should continue at a rate similar to appropriations in ARRA. Twenty-nine Senators in total have signed on to support the U.S. Conference of Mayors effort to fund the Energy Efficiency and Conservation Block Grant Program at \$3.2 billion in the FY 2011 appropriations bill (DeHaney-Howard and McCarty 2010). Of the various attempts at developing a climate bill that includes a cap and

trade system for carbon emissions, some have included provisions that would perpetually fund energy efficiency programs like EECBG with revenue from permit auctions.

Appropriations for FY 2011 are still unknown, and the chances of passing a climate bill, with a revenue generating cap and trade system to fund energy efficiency and renewable energy no less, seem to vacillate daily. However, it is clear from the language used by the Obama Administration in program guidance, task force reports, speeches, etc., the White House is anticipating a large drop off in federal funding for efficiency programs after the Recovery Period. They hope that a self-sustaining energy efficiency market will develop through the three-year recovery period that no longer needs federal support.

There is a big difference between sustained government funding of energy efficiency and a self-sustaining industry in the private market. The main driver for funding efficiency programs at their current levels has been the promise of job creation. While local institutions and communities are the beneficiaries of this investment, job creation only works on the macro scale as an incentive for continuing the programs. An individual is more likely to make a decision about an energy retrofit based on costs and savings. For the private market to pick up the investments, or for the market to be transformed, there needs first to be a proven market for the services, where consumers have the incentive to seek out efficiency services. It is not clear that current investments through ARRA, which are focused on job creation, will adequately deal with this issue.

Recovery Through Retrofit

In an attempt to address these concerns, Vice President Biden commissioned the White House Council on Environmental Quality (CEQ) and the Middle Class Task Force to produce the *Recovery Through Retrofit* report, released in October 2009. The report identified three market barriers to mobilizing a national energy retrofit market: 1) inadequate access to information 2) inadequate access to financing and 3) the need to further develop labor markets. However, the solutions they lay out will not necessarily be enough to fully develop the market.

The report recommends that energy performance labeling can help overcome the first barrier. Information access is important and labeling is being experimented with in some cities (Lubber and Hunt 2010, 28). However, this won't solve all the information access problems.

Nearly one-third of households in the U.S. are renter-occupied (American Housing Survey 2007, 1), which is another barrier altogether – a split incentive between the landlord who owns the building and the equipment to be retrofit and the tenant who pays the monthly utility bills.⁴ In addition, truly changing the way energy information is accessed will require changes to how the electric and gas utility industries are regulated, which will likely require a different approach in each state.

The second barrier addressed in the report is the difficulty for home-owners to provide the up-front capital costs of investing in energy efficiency measures. The highest profile effort to overcome any of these barriers has been the support of Property Assessed Clean Energy (PACE) financing programs. Despite a strong push by the Obama Administration, the rollout of PACE financing programs around the country has run into some setbacks. Within the same month as the Department of Energy's (2010) release of its guidance for PACE, Fannie Mae and Freddie Mac decided that it would not support energy efficiency liens that receive higher priority than their own mortgages prompting some cities to suspend their programs (Timiraos 2010). DOE's guidance on PACE for EECBG program implementation may have also come too late for it to have a large-scale impact on cities' energy efficiency strategies in the near future. The guidance document was released in May 2010 while the original application deadline for local governments to apply for EECBG grants was in June 2009. The experience from the difficulty in implementing PACE recommendations shows that before rolling out new and innovative models on a national scale, lessons need to be learned from the pilot programs first.⁵ It also highlights the need to pay more attention to tailoring programs to fit their regional and local communities. Furthermore, access to capital alone is not enough to motivate all owners to go through an energy efficiency retrofit, particularly in split-incentive situations. A recent UC Berkeley study looked at programs that attempt to overcome the first cost barrier of efficiency retrofits found the following about participation rates:

⁴ For an in-depth discussion of the split-incentive barrier and potential solutions such as "green leases" I recommend reading *Overcoming Barriers to Energy Efficiency for Rental Housing* (Williams 2008).

⁵ For a more detailed analysis of PACE programs and the challenges cities and states are running into as they begin to roll out, I recommend reading another thesis recently submitted to the MIT Department of Urban Studies and Planning by Jacquelyn Dadakis MCP '10, titled *Picking Up the Pace: A New Tool for financing Energy Efficiency and Distributed Renewable Energy*.

It is important to remember that financing only addresses the barrier of first cost, and only for those who qualify. There are still a variety of other barriers. Many people are not motivated enough to deal with the transaction costs of arranging a project and signing up for a loan, even if it is a “good deal.” It may not be worth the effort for them. As energy prices rise, this may change somewhat, but transaction costs and lack of information may still dominate the decision making of the majority of people without further intervention. (Fuller 2009, 13)

Fuller’s finding suggests that something more needs to be done besides removing a traditional barrier like access to capital in order to create an ecosystem where energy retrofits are commonplace.

To address the third barrier, the “Retrofit Through Recovery” plan essentially employs an “if you build it they will come” model – except its only about building the builders. The solution section is titled “Mobilize a skilled national energy retrofit workforce and expand good, green job opportunities for all American workers,” while the actual recommendation is titled, “Develop Consistent Workforce Certifications and Training Standards” (Council on Environmental Quality 2009, 11). The problem is, simply improving training standards and increasing output from workforce development programs will not necessarily mobilize the workforce nor will it expand job opportunities alone. When ARRA was signed, the impending influx of federal funding for retrofit work created a large imbalance between supply and demand, and these kinds of workforce training programs were necessary. During the period of performance for Recovery Act funded programs there should be enough demand to warrant investing in the labor force to perform energy efficiency retrofit work, but this could lead to an oversupply of labor if demand backed by private capital does not take over for direct federal spending.

To be sure, all of the solutions outlined in the report are necessary pieces to put in place for a large-scale energy efficiency industry to be successful. However, alone they will not necessarily “unlock private capital and mobilize our communities” to create the “self-sustaining home energy efficiency retrofit industry” (Council on Environmental Quality 2009, 1) that is sought by the Obama Administration.

There have been two other major initiatives seeking to help bolster the future market for energy efficiency retrofits. One currently underway is an attempt to create a program modeled after the well-publicized “cash for clunkers” rebate program for energy efficiency upgrades to homes. Legislation to create this new program, now called “Home Star,” is working its way through Congress (Office of the Press Secretary 2010a). The final version of the program, should it be authorized, may look very different from the White House proposal, however it will likely provide for rebates to homeowners who wish to make their homes more energy efficient. The rebates may be dependent on how deep of a retrofit is performed and who performs the work. There is also meant to be some type of labeling system associated with the different levels of retrofits performed. This would help to address two of the three barriers identified in the *Recovery Through Retrofit* report.

Of the \$3.2 billion that ARRA designated for the Energy Efficiency and Conservation Block Grant Program, Congress stipulated that \$400 million be used for competitive grants. On the fortieth anniversary of Earth Day, Vice President Biden announced that the DOE had awarded \$452 million⁶ in grants as part of the “Retrofit Ramp-Up” program established with DOE’s competitive EECBG funds (Office of the Press Secretary 2010b). The two main goals of the “Retrofit Ramp-Up” initiative, according to the Department of Energy’s funding opportunity announcement (EMCBC 2009) were to:

- 1) Fundamentally and permanently transform energy markets in a way that make energy efficiency and renewable energy the options of first choice; and
- 2) Sustain themselves beyond the grant monies and the grant period by designing a viable strategy for program sustainability into the overall program plan.

This approach is more directly geared toward finding innovative ways to transform the market and create a self-sustaining industry. Unfortunately, the funding for these programs only covers 25 communities.

⁶ While \$400 million were appropriated specifically for competitive grants in ARRA, the original formula for EECBG in EISA required that two percent of the formula funds be set aside be allocated through a competitive process to local governments not eligible for direct formula grants from DOE, thus accounting for the additional \$52 million.

The biggest promise from this program is the opportunity it provides for discovery. If successful, the models introduced through this program could be adapted for use in other parts of the country. Unlike the potentially premature recommendation to use PACE, the Retrofit Ramp Up models could and should be completed and evaluated prior to any attempt at replicating them. But will the ways in which these programs are usually evaluated allow us to discern *why* or *how* these new innovative approaches may or may not work?

Measuring Success

Oak Ridge National Laboratory (ORNL) is currently conducting a national retrospective of the Weatherization Assistance Program for the Department of Energy. The two main components of the evaluation are an impact analysis and a process evaluation. According to the ORNL website, the impact analysis aims to address how much of the energy savings in homes served by WAP can be attributed to the program and whether or not the measures were cost actually cost effective. Meanwhile, “comprehensive process evaluation will address program characterization, operation, training, and quality assurance” and “provide a snap-shot of the pre-ARRA WAP in Program Year 2008” (Oak Ridge National Laboratory). The current round of evaluation will not address how the program is being implemented under ARRA. That means it cannot address the issues faced when expanding the program as rapidly as it has been for the past year.

Though plans for the ARRA period evaluation of WAP are not yet complete, we do know that more data will be available to use for the evaluation, such as jobs created and preserved as well as information about the wages paid to workers. While the evaluations have not yet been fully planned or publicized, the Office of Weatherization and Intergovernmental Programs (OWIP) at DOE has released the plan for monitoring the use of ARRA funds flowing through its programs. Much of the plan is concerned with data collection and oversight. There is a section describing the collection of best practices (OWIP 2009), however it seems mostly focused on the process and technical aspects of administering the grants. This will certainly help evaluate progress on the Obama Administration’s goal for accountability and transparency, but may not prove as useful for identifying the keys to driving a national energy efficiency retrofit market.

The focus on quantitative measures of performance is not new and was in fact built into the design of the EECBG programs for the purpose of evaluation and improvement. When describing the program, the senators supporting EECBG appropriations for FY 2011 said, “EISA ensures that program resources are results-oriented, with recipients reporting each year on their energy efficiency gains” (DeHaney-Howard and McCarty 2010). However, the program so far has not been implemented as designed. The EECBG program was authorized for five years in EISA. Because grantees would receive program funds each year, DOE could withhold funds after the first year based on failure to meet targets. So far this has not been possible, with the funds coming only in one lump sum through ARRA. Initially, DOE had attempted to mimic this process through a staged disbursement schedule that would obligate only half of a grantee’s reward if the total amount exceeded \$2 million until after the first performance review had been completed. As pressure mounted for the federal government to spend money quickly to stimulate the economy, DOE began obligating 100 percent of the funds when grant applications were approved.

If the EECBG program received funds consistently year after year as was intended, there would be a learning process involved as each of the grantees and the individuals who administer them on the local level would gain experience through each iteration, building capacity to run these programs. But even this type of feedback loop like the reporting metrics now required focus mainly on meeting legal obligations. They do not really address the bigger picture issues like market transformation. This is in part because the data collected is mostly quantitative

Recommendations

One of the problems with using quantitative evaluations is that they do not necessarily help us learn about the conditions for success of a given program. Recognizing that current stimulus funding alone may not be enough to completely transform the energy efficiency retrofit market allows us to take a step back and look beyond the immediate goals of ARRA. There will inevitably be some measure of success from this great experiment in large-scale energy efficiency deployment. If the U.S. Department of Energy uses this opportunity to

evaluate ARRA qualitatively and not just quantitatively, they may be able to learn not just where the successes were, but what the conditions were leading up to the success. This kind of evaluation would allow for better knowledge sharing among cities and will help inform policy and program design at both the federal and local levels.

In order to do this, DOE needs to ensure that its grant monitors are doing more than simply looking for compliance in their site visits. They should use their monitors as field researchers to gather additional information that cannot be captured in an online reporting system. These data could include things like the policies the city or state already had in place prior to ARRA, the structure of the utility companies, the demographics in the areas where the programs are being run, and so forth. It would also be important to gather information on areas where programs are not taking off or are not accomplishing their intended goals.

Some of these things can be accomplished given information that already exists. Having already missed the opportunity to provide guidance on best practices for the first round of EECBG funding, DOE should conduct an in-depth review of all the first-round applications to determine a snapshot of what the current state for local energy efficiency planning is like. One interesting way to use this data is to test the ability of certain programs to be replicated. If a program that is known to have worked in the past in one place made its way into the application of a few other cities, their projects could be tracked to determine if the program is a viable model to be transferred from one city to another.

Comparing projects from city to city does require some quantitative measurement. Making a comparison though, is not incredibly useful if the methodologies employed by each city for measuring and verifying energy savings are different. Rather than allowing cities and states to develop their own system, DOE should invest in the development of a standardized method that should be used by all grantees.

While planning for a large retrospective evaluation will help understand how to make the transition to a self-sustaining energy efficiency industry in the long run, there are a number of things that could be done differently in the nearer term should programs like the EECBG be continued. First, a learning process like the one built into the original program design should be included. This would encourage grantees to improve from year to year and to examine their

own goals and achievements. In addition, the EECBG program should no longer be considered a true entitlement program or the Department of Energy should have more discretion over the acceptable uses of funds rather than making them explicit in statute. Currently DOE can only advise cities on how to use their funds. If a city's proposal falls within the legal guidelines, there is little DOE can do, even if the city could be doing more.

Finally, one challenge that needs to be addressed in the next round of federal energy efficiency funding has to do with the relationship between the public funds and the utility companies, which may require some regulatory changes. In many states, utility companies are required to run energy efficiency programs. One of the ways regulators have been able to encourage the utility companies to invest in these programs is to build in efficiency measure to the rate structure so that it becomes part of their revenue stream, which is based on anticipated, or past energy use. This only works well if the utility companies can get credit for the efficiency they are partly responsible for. Utility companies were not eligible for funds through programs like EECBG, which provides exogenous reductions in energy consumption as far as they are concerned. If "too much" efficiency is done in addition to the utility programs, they may lose revenue from reduced consumption. This may end up providing a disincentive from the federal government for utility companies to do the efficiency work mandated by their state's regulatory body.

Concluding Thoughts

It is easy to point out the many things that Department of Energy did poorly or could have done better in the first year of the recovery period. However, despite the bad press that the Department of Energy has had to deal with over the past year and a half, the difficulty in scaling up the federal investment in energy efficiency programs has not gone unnoticed by all. At a Senate Energy and Natural Resources Committee hearing on DOE's Implementation of Recovery Act, Chairman Jeff Bingaman (2010) made the following remarks:

The scale of the investment the Department [of Energy] has been asked to manage here is very substantial. In many cases, programs were either never funded before, or were funded at a level that is a fraction of what was provided in the Recovery Act. This was a particular

challenge for state and local officials, who faced constrained local budgets, even as they tried to scale up their management of new Federal funds and the reporting and accountability requirements that went with those Federal funds.

However, I believe the care the Department and its partners in the States exercise in setting up these programs will pay great dividends over the long term. The energy infrastructure needs in this country are so substantial that I think we can only regard these investments as an initial down payment. If we can get the market incentives as they should be and provide some of the initial support that is needed, I believe there are substantial private-sector funds ready to be invested in these areas.

We've heard testimony before this Committee that scale of potential for investment in the energy sector dwarfs previous investments that were made in information and biotechnology. These are two areas where the has [sic] led the world. If we are to similarly lead in clean energy, and reap the associated benefits in economic and energy security, it will take a sustained commitment and an urgency of purpose to do that.

I would like to conclude with a few thoughts on Senator Bingaman's statement. First of all, I think Senator Bingaman is right in pointing out that sacrificing some level of expediency for Recovery Act expenditures was necessary and will ultimately prove beneficial. This reflects recognition that not all the goals first set out by the White House and Congress could be achieved simultaneously - achieving some goals needed to come at the expense of others.

Second, in order to move the clean energy market beyond public investment only as Bingaman describes, there will need to be more than incentives and initial support alone. There also needs to be sufficient demonstration that the initial investment has been worthwhile. However, there are two different things that need to be demonstrated, though they are related. If a case is to be made for further public investment, then evidence needs to be provided to support the causal chain in the programs' logic models. This will also require addressing the attribution problem so as to show that public investment through the Recovery Act actually did achieve the goals it set out to, exogenous factors notwithstanding.

The next piece of the puzzle relates directly to how the goals are defined. The goals set forth for the Recovery Act that require counting the number of jobs created are much more important from a policymaker's perspective if looking for continued public investment. This aspect is also important to everyday people who judge the success of the policymakers at the polls. However, as Senator Bingaman alluded to, the ultimate goal is for the private sector to

continue much of the work, so that efficiency becomes a sustained part of our energy infrastructure. In order for this to happen, the most important decision-maker is not the Congressperson nor is it the DOE official; it is the private citizen who must decide whether or not to invest in an energy efficient retrofit of a personal home or a commercial building.

While creating large numbers of jobs and increasing aggregate incomes are laudable goals when considering the public good as policymakers are ought to do, to the private citizen, the individual's own finances are far more important. Since private actors will drive the market demand for energy efficiency services, demonstrating that energy efficiency is a sound financial investment is more important. Successful financing for energy efficiency projects relies on the relationship between the cost of the measure and the avoided cost of the energy expenditure. Verified energy savings are directly proportional to the avoided cost of energy.

Making the case for these two separate paths forward requires proving the success of two different outcomes, which require measuring two different outputs – job creation and energy savings. Maximizing one of these outputs does not always or necessarily yield a maximum result for the other output, and vice versa. Consequently one output must be prioritized over the other.

I think that there is reason to believe we can achieve multiple goals for a more secure, economically sound, and environmentally sustainable future through energy policy. However, there needs to be an understanding that there is no panacea, and that changing the direct goals of programs can impact how they are implemented which will have unanticipated effects on their outcomes. Properly evaluating the energy efficiency programs being run today will be essential for learning how to better design programs to achieve the policy goals we ask them to accomplish.

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