Getting It Right Matters: Why Efficiency Incentives Should Be Based on Performance and Not Cost

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ABSTRACT

At least 28 countries and regions offer government-sponsored incentives for energy efficiency, as well as a number of U.S. states and Canadian provinces. But, there has been little cross-fertilization of ideas and even less scientific evaluation of the results. This lack of dialogue and evaluation has led to disproportionate reliance on the simplest solutions, which generally base efficiency incentives on costs. (Sometimes, other performance parameters are also used in addition to costs.) This paper examines the practice and some of the theory that predicts the likely outcomes of different structures of economic incentives for efficiency. It shows how purely cost-based incentives, whenever they have been evaluated, have shown excessive levels of free ridership and failed to transform markets. It finds anecdotal evidence for mixed-performance and cost-based incentives working in some cases, but a paucity of evidence to corroborate these anecdotes. These results are contrasted to the experience with performance-based DSM programs, which have proven to be effective both at acquiring efficiency resources and transforming markets. This finding is consistent with analysis of the market barriers and market failures that efficiency confronts, and with the incentives to consumers and suppliers that are provided by the different types of incentives.

Introduction

While efficiency standards for buildings and appliances have produced the largest energy savings of any policy, regions that have employed financial incentives consistently over the years have shown that the savings for incentives are comparable to those from standards. For example, the California Energy Commission's compilation of cumulative accomplishments of both programs shows that the savings from incentives are at least 80% as large as the savings from standards (California Energy Commission, 2005).

A number of these incentive programs have been evaluated in detail. These evaluations show that not all programs are equally successful. Good program design makes a difference.

But since the purpose of almost all evaluations was to measure the energy savings and cost and effectiveness of *specific programs*, very little is said about the elements of *program design* that make a difference. As a result, there has been almost no discussion in the global literature on energy efficiency about general principles of program design that will maximize a program's cost effectiveness.

Getting it right is particularly important now as more and more utilities are moving towards implementing incentive programs, and as these state-level programs are supplemented by tax incentives at the state or provincial and national levels. And as most nations struggle with how to meet the greenhouse gas limitations of the Kyoto Protocol, more attention will be focused not only on the establishment of new financial incentives but also on designing new programs to maximize their effectiveness.

This paper attempts to categorize financial incentives in two primary ways, and to offer observations about the strengths and weaknesses of each of these choices. It summarizes the limited amount of existing research on the subject and lays out hypotheses that could guide further research. The primary distinctions we describe are performance-based incentives versus cost-based incentives and managed incentives versus long-term incentives.

Cost-based incentives provide a fixed fraction of the expenditures on efficiency, or in some cases the incremental expenditures on efficiency, as the incentive.

Performance-based incentives pay a fixed amount of money for meeting a specified performance level, or perhaps pay a fixed amount per unit of energy savings for products that meet or exceed a threshold. These amounts are the same irrespective of the incremental cost of achieving the efficiency, and are even available if the incremental cost turns out to be zero.

Managed incentives are programs in which an administrator actively manages the program to maximize its savings within a given cost budget. A managed incentive program may be marketed more heavily if it is below forecast and marketing support may be withdrawn if it is too far ahead of forecast (that is, threatening to bust the budget). In extreme cases, managed incentives can be changed in terms of the dollar amount or the qualifying level in response to market conditions.

Long-term incentives are fixed for a multi-year period. They are intended to give designers and manufacturers, as well as other elements of the supply chain some assurances that the incentives will be there in order to plan for investments that would not otherwise be justified in a business plan.

There has been very little direct use of long-term incentives to date, but a number of market transformation programs[1] have functioned, in a crude way, like long-term incentives because the qualifying levels were held constant for several years. Current tax incentives enacted in the U.S. Energy Policy Act of 2005 were designed as long-term (4-5 year) incentives, but due to perceived budget constraints were cut back to 2-year programs.

This paper concludes that performance-based incentives have been effective in the overwhelming majority of cases where they have been evaluated. Cost-based incentives, in contrast, have proven ineffectual or even counter-productive in the limited number of cases where they have been evaluated. This result is not unexpected from a theoretical viewpoint, as will be developed below.

We find that managed incentives and long-term incentives are generally complementary. Used together, they can provide a cost minimizing approach to promoting ever-improving levels of energy efficiency, including some very advanced levels.

Cost-Based Incentives Versus Performance-Based

Program Experience

Incentive programs to promote energy efficiency have been implemented in at least 28 countries and states/provinces around the world since the 1970s. Some of these programs have multiple objectives, not just energy savings—for example, Sweden's incentives for energy efficient construction are only a small part of a larger programs to enhance housing quality and

[1] This paper uses the term "market transformation" to mean programs aimed at introducing into widespread use products or buildings with levels of efficiency much higher than what is typically available in the marketplace before the program. (Keating, 1998)

home ownership—and others have been developed only as energy policies. Most of these programs were developed in an *ad hoc* manner, with little formal planning and almost no knowledge of what happened elsewhere in the world or previously in the same region. So this section begins with a review of programs that have had at least some level of evaluation.

In the late 1970's and early 80's, the U.S. offered tax incentives for energy efficiency and for solar energy that were based on a percentage of the cost of qualifying purchases. A nearly identical approach was proposed as part of a major energy bill (H.R. 6) that was considered by the U.S. Congress in 2004, and partially or wholly cost-based incentives were adopted in the Energy Policy Act of 2005 for solar energy and for home retrofits.

As will be discussed in Section B below, these incentives were a complete failure. The negative experiences were not entirely a waste, however. While no further economic incentives were established at the federal level for decades, states and utilities began developing incentives based on the experiences of the 1970's programs.

Many other countries or provinces adopted tax incentives in the 1980s, especially in the 1990s and later. These programs are not well described in the publicly available literature, and contacts with their designers suggests that they were enacted in response to political opportunity rather than as part of comprehensive energy policies in which the tax system was chosen for specific reasons as the means for providing the incentive, as opposed to other potential mechanisms (such as utility programs).

Given the unplanned or opportunistic nature of many of these incentives, the issues of the details of program design did not appear to be handled on a comprehensive basis. Thus, the fundamental design concepts of the programs appear to be reasonably good in some cases, but rather sloppy in others.

Many of the programs are a mix of performance-based and cost-based. The performance basis is established by setting a minimum target that qualifying equipment or buildings must meet; while the incentive itself is based on the cost of compliance or even the cost of the equipment or building overall.

Sales tax exemptions for equipment meeting efficiency specifications is a combination of a performance-based incentives and a cost-based incentive. The incentive is performance-based because the primary qualification criterion is energy performance. But it is cost-based because a more expensive product gets more of an incentive than a less expensive product even if the levels of energy efficiency are no different.

Several U.S. states have adopted similar programs: tax relief for products that meet a certain threshold. More than one state has provided sales tax exemptions for products meeting threshold levels that typically are set equal to the U.S. EnergyStar® level.

New York and Oregon offer incentives for "green buildings": commercial buildings that are certified for environmental performance (including energy efficiency). New York developed its own criteria, but Oregon provided the incentives based on the U.S. Green Buildings Council's "LEED™" rating. The New York green buildings proposal, as well as those of other states that have not yet adopted green buildings incentives, has a fixed budget available for complying projects. Each project must make an individual application to the administrator of the program and when the budget is exhausted, the incentive is no longer available.

This structure differs fundamentally from all of the other state tax incentives and from those proposed at the national level in the U.S. In all other cases, the incentive continues to be available no matter how many people apply for it.

One cautionary tale is Arizona's flexible fuel vehicle incentive. This incentive was set at a fairly generous level with the expectation that it would be available for all who applied. But the specification turned out to be easy to meet and the program began to cost much more than had been anticipated. In addition, while many flex-fuel cars were sold, the alternative fuel infrastructure did not develop, so the flexibility was not useful. As a result, lawmakers de-authorized the program.

Other than the U.S. tax incentives of the late 70's and early 80's, the authors have been unable to find any formal evaluation of financial incentive programs anywhere in the world. One of the reasons for this may be that so many of the programs are recent. But, another explanation looks at the political process for establishing national level tax incentives compared to the process used for establishing incentives with a particular administrative agency, such as a utility or energy office. The difference is that the tax incentive programs are one-time programs that are authorized legislatively. Politicians enact these programs to respond to policy needs or political pressures. It is not in their interest to have the programs evaluated, because the adverse consequences to a politician of a report showing that his or her program failed would be much greater than the positive consequences of a study showing that the incentives have succeeded.

In contrast, administrators of state energy programs face budgetary pressures every year in getting their budgets re-approved, and may face competitive pressures from other agencies that wish to operate the program instead. Or, they may be regulated utilities whose revenue base and profitability would be increased (or diminished) to the extent that they demonstrate success (or failure) at achieving public policy objectives. These parties benefit from accurate evaluations: they stand to win if the evaluations show programs are successful, and other parties stand to win if the programs are shown to be failures. Thus, many more such evaluations have been done.

Policy Considerations

Evaluations performed in the 1980s showed that the cost-based incentives established in the U.S. in the 1970s were a failure: the incentives were costly and either ineffectual or only minimally effective.

In the case of the solar industry, all of the respondents that the authors were able to talk to on this subject recalled that the tax incentive did not lead to lower market prices for the solar equipment. On the contrary, the net price after tax incentive remained the same while the cost of the available equipment went up. The industry developed a reputation for unreliability, partly as a result of the cost basis of the tax credits. We also found no one who would dispute that the cost-based structure led to problems of contractors "gaming" the system—charging higher prices to allow their customers to qualify for larger tax credits rather than reducing prices to attract more business.[2] This led to a boom and bust cycle for the solar industry, and left it in a weaker position with lower market share in 1990 than it had had before the incentives in 1975.

The result of the insulation tax incentives were less perverse but also ineffectual. The most rigorous evaluation study of this program, performed by the Oak Ridge National Laboratory, concluded that the incentive appeared to induce somewhat more energy efficiency

[2] The solar tax credit provided households that installed a solar hot water system with a credit worth 40% of the cost of the system up to a limit of $4,000. There were no performance requirements attached to qualification: the system did not even have to work. The immediate effect of this credit was that it allowed contractors and manufacturers to increase the price of their systems. Indeed, a $10,000 system could be marketed as providing the maximum allowable tax incentive of $4,000.

investments than would have occurred without it, but the difference did not achieve statistical significance. (Hirst, Goeltz & Manning 1982)

Other U.S. studies reached similar conclusions: a household survey conducted in 1983 found that 88% of the households qualifying for the credit said they would have made the improvement even without it; conversely, 85% of households claim they had installed energy efficiency measures that year but did not claim a tax credit. (Geller, Quinland & Nadel 2001) While such surveys often provide unreliable results[3] they do corroborate the statistical findings of negligible impact.

Some of the more recent studies show a statistically significant correlation between the existence of tax incentives and consumers' propensity to invest in efficiency. (Gillingham, Newell & Palmer 2004) But they did not examine whether energy savings were realized, only whether investments were made. This is a problem, because a consumer who buys insulation but leaves it uninstalled in his garage has made an investment but has not saved energy. Similarly, investments may be made in efficiency measures that were poorly chosen or poorly installed, resulting in little energy savings.

In the 1970s, the United States also enacted a 10% cost-based tax credit for business purchase of energy efficiency measures. The measures had to be included on an eligibility list. It appears, however, that the eligibility of each measure was established by the general description of the product rather than specific performance parameters. Again, follow up surveys suggest that the credit did not make much of a difference; that most of the measures were likely to have been installed without the credit. (Gillingham, Newell & Palmer 2004)

All of the evaluations the authors were able to find produced the same results: the net gains in market share for efficiency measures were small compared to the pre-existing levels, and they usually failed to achieve statistical significance. At best, the "signal" of incentivized energy efficiency barely emerges from the "noise" of free ridership.

There are obvious disadvantages from theory for basing incentives on costs, which are found to be even more serious in practice than one would expect. The most direct disadvantage is if the incentive is for people to spend money on efficiency, the incentive will produce additional spending. But it won't necessarily produce as big additional energy savings. More specifically, if an incentive of 50% of the cost of an efficiency project is suddenly established, the way for contractors and vendors to maximize profits is to attempt to capture the entire incentive by doubling price. For a typical firm with a 10% profit margin, doubling price while maintaining sales increases profits ten-fold. Of course, competition will tend to drive this price increase down, but competitive forces are not working properly in the first place: if they were, there would be no need to incentivize cost-effective measures. So it is clearly in the interests of a vendor to try to capture the full value of a cost-based incentive through price increases, and only lower prices if forced by competition.

Also, competitive forces will be restrained by the fact that the vendor with the highest-priced equipment can claim that his or her customers are eligible for the largest financial incentive! This equates to selling the tax incentive rather than selling the product. At the very least, a cost-based incentive reduces the pressures to price competitively because the consumer

[3] The cautionary example of over-reliance on studies that ask market actors whether they were motivated by financial incentives is that evaluations of refrigerator rebates showed that similarly high percentages of consumers claim they would have bought the more efficient product without the rebate, and manufacturers claim that they would have produced the product without the rebate, notwithstanding the fact that where rebates were not available, the efficient products were also not available.

reaps only a fraction of the benefits of cost reductions—the government pays for the rest. It is also important to note that tax incentives may be easier to sell than products because product promotion is provided free of charge through the IRS tax code, which many people–especially those who work for efficiency companies that can use the incentives to sell their products–watch quite closely. As a result, tax incentives themselves have very large "brand" recognition in the marketplace and products that are associated with them gain the direct benefit of substantial and broad free advertising. (Stone, 2006)

The most comprehensive evaluation of state tax credits that we were able to find was an ACEEE study published in 2002. (Brown et al. 2002) This study also points out the importance of getting the structure of tax incentives right. It states that cost-based incentives have failed to achieve their objectives whenever they have been evaluated. It suggests that mixed cost- and performance-based programs may succeed, but we do not have enough evidence to really know.

In contrast to the thin-to-nonexistent formal evaluations of cost-based or partially cost-based incentives, other than the analysis of the nationwide tax incentives of the 70s in the United States, performance-based incentives have been evaluated thoroughly Efficiency programs funded from the utility system and administered by state-designated agencies have been subject to detailed review that determines the cost and savings of the program, both from the perspective of the utility system and from the societal perspective. . While there are hundreds of such studies, there are not many review articles that summarize the results. One good review is Global Energy Partners 2003. Virtually all of these programs are performance-based. These evaluations can be interpreted as showing that:

- Performance-based incentives can achieve their objectives and save energy at a cost of 3 cents per kWh or less, after accounting for free ridership; and
- No adverse side effects were found, such as increases in prices for efficient products and services. Indeed, looking at the areas where programs have continued over time we find the reverse: that the programs increase the availability of efficient products/services and lower their cost.
- The market share of the incentivized product can be increased several fold with high statistical confidence.
- Programs must be simple to administer and easy to explain to the market.

This is not surprising based on a theoretical view: Basing the incentives on performance and not cost establishes competition among different suppliers of goods and services to meet the energy goal at the lowest cost. Even a partially cost-based incentive dilutes market competition. For example, if a program pays one half of the incremental cost of obtaining efficiency, then there is less incentive to do the no-cost and low-cost measures before doing the higher-cost items and the cost effectiveness of the overall solution is likely to suffer.

In most parts of the world where financial incentives have been tried, the first major reaction is to base the incentives on cost. A clearly articulatable but seldom spoken reason for this is the implicit assumption that the market barrier that incentives are trying to overcome is high first cost. A cost-based incentive is similar, in theory, to a subsidy for a non-cost-effective but socially-desired purchase. The theory is that by buying down the price of the preferred option, it can compete in the marketplace successfully.

By analogy, if the assumption is that the barrier to energy efficiency is that the customer demands a two-year payback, then the most obvious way to overcome the barrier is to buy down

the incremental cost. But since first cost is not the only, or even the most important, market barrier, covering a fraction of fixed cost doesn't address the whole problem.

The actual market barriers and failures that efficiency incentives are trying to overcome are very diverse. But perhaps the most important barriers relate to product availability, risk aversion by the decisionmaker, and bounded rationality, in which the decisionmaker does not have the information or the initiative to seek out the more efficient solution.

Financial incentives help overcome these barriers by drawing the market's attention to the opportunity for efficiency. They work for the same reason that computer manufacturers will sell a $700 computer with a $150 rebate rather than just mark the price down to $550 or why auto manufacturers rely on rebates to sell cars during periods of low sales. The incentives get people's attention. This attention applies not just to the consumer, but also to the distributors, retailers and manufacturers. If a financial incentive is available for a particular product or service, manufacturers and designers will know that this level of efficiency will sell better in the future and will prepare themselves to deliver it. With such product and services available, and with the additional attraction of the incentive, the consumer is more likely to make the efficient selection.

Cost-based incentives may also be attractive to policy-makers because they are easier to describe and administer. And since the evidence on their relative ineffectiveness has not been widely available, the reasons arguing against them may not be politically salient.

Finally, performance-based incentives help overcome the problems of risk aversion. If a utility or a state agency or the government is offering an incentive for a particular measure, it validates to the consumer that the measure is going to work. It's one thing for a utility or government agency to recommend to consumers to take a particular action, but if the recommender puts his money where his mouth is, that carries more weight. These considerations lead to the conclusion that it is probably not necessary that the incentive cover 100% of expected incremental cost.

Managed Incentives and Long-Term Incentives

Managed Incentives

Managed incentives refer to programs that are operated by an agency that has active oversight of the program design and its administration and implementation. Programs are managed in the sense that when they are unsuccessful in terms of marketing, different approaches can be taken, including alterations in the program design itself. Conversely, management sometimes may consist of shutting down programs that have become too successful in the sense that they have outrun their budgets. Or, in the case of programs run by investor-owned utility whose regulation ties revenues to sales, when lost revenues resulting from the program's success pass a threshold of pain.

A key element of management for many of these programs is formal measurement and evaluation of the programs' results at the end of the program year. These measurement studies look at statistically significant subsets of program participants and non-participants and try to establish, using conservative assumptions, how much energy was saved by the program compared to what would have happened in the absence of the program. These evaluations also calculate cost-effectiveness based on the cost to the program administrator and to the end user who makes the energy efficiency investment.

Managed programs can be very significant in terms of their effects on the marketplace. California, for example, will spend $2 billion on these programs in 2006-8.

The results of these relatively large-scale managed incentive programs yield very specific conclusions about program design. These are significant for two reasons:

- The programs have been subject to formal evaluation, and there are publicly available data, findings, and recommendations for program administration, and
- The magnitude of these programs is sufficient to produce measurable reductions in regional electricity and natural gas consumption.

Also, these programs are important because they fit into the context of matching incentives to the customer both with revenue sources for the program and appropriate regulation for the utility, such that the utility benefits financially from running a good program. (Bachrach, Carter & Jaffe 2004; Carter 2001) There are three elements of this match. First, utility revenues must be decoupled from sales. Second, distribution utilities must be authorized to collect a "wires charge" or "public benefits fund" of a fixed amount per kilowatt hour sold (regardless of which energy supplier is chosen by the consumer). Third, the distribution utilities should be permitted to share the savings from DSM compared to the larger amounts that would otherwise have been spent on energy supply contracts for the same amount of energy and peak capacity.

Approximately 2-3% of a typical utility bill goes to fund energy efficiency programs in California Programs of comparable magnitude exist in a handful of other U.S. states, but appear not to exist outside of the U.S. (This is not to say that there are no managed incentive programs elsewhere, but rather that there are no programs that even approach the magnitude of those in U.S. states where efficiency is a serious part of public policy.) These states where at least 1% of utility revenues are used to fund efficiency programs include California, New York, New Jersey, Massachusetts, Rhode Island, Connecticut, Vermont, Wisconsin, and Montana. Most of the budget in these states goes to retrofit incentives.

The experience of managed incentives programs has been summarized in a series of reports available online at www.eebestpractices.com. These reports discuss program designs in detail—getting the technical details right takes considerable effort--and draw general conclusions concerning program design and implementation. These conclusions appear to be valid advice both for managed programs and for long-term programs. The key recommendations we draw from these lengthy reports are to pay attention to:

- Communications and outreach to a wide variety of stakeholders,
- Accurate reporting and tracking of results,
- Third party verification of the quality of installation of energy efficiency measures, and
- The use of performance-based incentives, in which the incentive amount per home or per device is based on the gain in efficiency or the absolute amount of energy saved.

Market transformation. While managed incentives may change from year to year, some these programs have been designed to have long-term impact. Such programs are referred to as market transformation.

There are at least two different ways to achieve longer-term effectiveness, both of which guide the development of long-term incentives. One is to set demanding targets for efficiency

that will be in place for several years and over a wide market area. An example is the programs established by the Consortium for Energy Efficiency.

Another approach is to design programs that are intended to facilitate the transition to more stringent appliance energy efficiency standards and building codes.

Long-Term Incentives

The difference between long-term incentives and managed incentives, or the difference between incentives administered through a DSM-like system and those administered through a tax system, are not fundamental differences, but rather differences of degree. For example, DSM-sponsored market transformation programs have more in common with long-term incentives than they do with managed incentives. And several of the state and national tax incentive programs are functionally indistinguishable from DSM programs from the point of view of the energy end user.

The key difference between managed programs and long-term incentive programs is the very fact of management in the shorter-term programs. Management has the disadvantage that the market cannot rely on the program to make long-term investments in fundamentally different and much more efficient technologies. To solve this problem requires that analysts have sufficiently well designed programs and sufficient budgetary resources to be able to commit to supporting a higher level of efficiency for the longer time frame. In practice, since budgets are almost always limited, this reinforces the need to set ambitious levels of energy efficiency as program goals, because sufficiently ambitious goals will assure that not too many people apply for the incentive that the budget is overrun.

To the extent that long-term incentives are successful, they are likely to create a significant niche market for the higher levels of efficiency that were in practice unavailable before the program. Depending on the market's development, it may be appropriate to continue to support the same levels of efficiency through managed incentives.

Long-term incentives that are not funded through a public benefits charge or general government revenues will require some dedicated source of revenue. In many countries and regions, this can be the corporate income tax. Corporations are taxed on net profits, which mean revenues minus expenses. Energy costs are an expense that reduces reported profits and thus government revenues. Inducing corporate users of energy to use less means that net profits increase, so the government collects tax revenue at the marginal corporate tax rate on the value of all energy savings. This provides a revenue source that is directly coupled to the success of the long-term incentive.

It is mathematically possible to construct incentive levels so that they fully pay back government expenses for the incentive whenever the corporate tax rate is higher than about 5%-10%.[4]

Ambitious targets are needed to control the budgetary impact of the program. The whole point of the long-term program is to allow designers, manufacturers and the supply chain to make investments that rely on the continued existence of the incentive. If the level of efficiency demanded is too lenient, the number of applicants for the incentive can be much larger than expected. This creates a policy conflict: either the budget for the incentive is drastically

[4] For example, if efficiency has a 3-year payback and the incentive covers 33% of incremental cost, a $1 incentive leverages $3 of investment in efficiency and $1/yr of savings. If the corporate tax rate is 5%, the government is receiving a 5% return on investment, which is approximately equal to its cost of borrowing the incentive money.

exceeded or the government breaks faith with the firms that it is trying to influence by cutting short the incentive or reducing its value. Policymakers should not be presented with this sort of choice. Two things are needed here: high, but achievable, efficiency goals and long-term incentives. Whether or not the programs will succeed is dependent on the **perception** that there is a well designed "partnership" between both parties—one that requires financial investment from each for the benefit of both.

Of course, it is still possible that no matter how ambitious the goal, the program can be a runaway success. But with a very ambitious goal, policymakers will be able to justify the budgetary impacts because of the unexpectedly large and rapid energy savings and technology development that were accomplished.

Also, with long-term incentives, if the first cost barrier turns out to be a bigger problem than anticipated, a managed program can add temporary incentives to the long-term incentives in order to increase customer interest. But there does not need to be a commitment to the larger payment for the full term of the tax incentive.

The incentive should sunset (gradually over time perhaps, as is the case for renewable energy incentives in Germany) because the goal is to encourage continuous improvement in energy efficiency. An advanced energy efficiency building constructed in 1975 no longer looks advanced; while the most efficient refrigerator produced in 1975 would consume more than three times as much energy as the minimally required level of efficiency in the U.S. and other countries. By establishing a firm "sunset" date on the incentive, policymakers have the ability to evaluate what the appropriate target is for the next period.

It is also possible that market mechanisms will have rendered the need for incentives completely unnecessary. While there are hardly any examples yet of this having happened, there are potential mechanisms for commercial buildings and retrofit homes that could allow further efficiency gains to be made without the need for fiscal stimulus. (Majersik 2003, 2005; Chao & Parker 2000)

Policy Recommendations

The types of policies can be discussed at two levels. At the highest levels, the policies should be:

- An agency or agencies should be given the budget authority and charged with responsibility of developing managed incentives to encourage efficiency technologies that could be available in the very short term and that do not require major changes in practice. This could be done through the utility system or it could be provided through a government or non-profit agency.
- The government should develop long-term incentives that complement the managed incentives by establishing much more ambitious targets and relatively long-term commitments (4-7 years, for example) to the qualification level and the funding level. These could be provided through the tax code, or could be provided by the entity that administers DSM programs, or by some other organization.
- All of these polices should be coordinated so that they are mutually reinforcing and non-duplicative.

- Policies should be rigorously evaluated on a regular basis to determine if goals are being achieved and to ensure that results are manifested through metrics that are broadly applicable over the region (e.g., energy per capita).

At a more general level, it is possible to make recommendations about how these programs should be designed and administered.

- Set a whole building energy performance target (or tiers of targets) that qualifies for a fixed incentive measured in monetary value per dwelling unit or per square meter.
- Coordinate the methods for calculating energy consumption and energy savings and the methods for validating them—both on paper, through calculations, and in the field--in parallel with the procedures used for code or standard compliance.
- Ensure that incentive programs are designed to develop and enhance energy efficiency infrastructure—certified design professionals, energy analysts, and inspectors who can check plans and test buildings—whose service will have a market value when the program sunsets.
- Set ambitious targets for long-term incentives relative to the levels of efficiency achieved through managed incentives. Results of the managed incentives program can provide a distribution function of efficiency levels found in the field that can inform this selection.
- The incentives should be designed to cover a significant fraction but much less than 100% of the expected incremental cost of energy efficiency. It is reasonable to expect that the cost of efficiency will decline significantly through innovation and competition as well as through the learning curve effect of increased production of more efficient designs and products.
- The incentives should be evaluated rigorously after about 3 years and again after they expire.
- Do not assume that the mere promulgation of long-term incentives will cause their acceptance in the marketplace. Work with government agencies and others interested in promoting efficiency to publicize the tax incentives and to provide marketing and design assistance for those who may wish to try to comply.

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