Is it Time to Ditch the TRC?
Examining Concerns with Current Practice in Benefit-Cost Analysis

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ABSTRACT

For the past two decades, the Total Resource Cost Test (TRC) has been regulators' principal test for assessing energy efficiency program cost-effectiveness and approving utility funding. However, the TRC as commonly applied today has fundamental problems. In particular, it usually ignores non-energy benefits that are often critical to market acceptance of efficiency measures and increasingly emphasized in program delivery. For example, a residential weatherization investment must typically be justified by energy savings alone, even if improved comfort was more important to the home-owner.

This problem could theoretically be solved by including in the TRC the monetary value of non-energy benefits. However, determining which benefits drive consumer decisions and estimating the value of factors such as improved comfort, health and safety, worker productivity, etc. is so difficult, expensive and controversial that this solution is simply not practical.

Use of the TRC is also inconsistent with treatment of supply alternatives. For example, when a regulator approves a utility purchased-power contract with a customer with an on-site generator, there is no consideration given to what the customer costs or other benefits from that equipment might be. All that is considered germane is the purchase price to the utility for that resource. Why should regulators apply a more stringent standard to utility investment in energy efficiency resources?

While there are other venues (e.g., public policy modeling and planning) where including a TRC perspective is still helpful, we believe it is time to emphasize the program administrator cost test when making utility system resource decisions.

Introduction

Utility regulators and other policy-makers typically require that initiatives to promote energy efficiency and other demand-side investments are shown to be "cost-effective" before they are approved. In 1983, the California Public Utilities Commission and California Energy Commission jointly published what is now widely referenced as the California Standard Practice Manual. The manual identified and defined five cost-effectiveness tests: the Participant test, the Ratepayer Impact Measure (RIM) test, the Total Resource Cost (TRC) test, the Societal test, and the Program Administrator Cost Test (PACT).[1] Almost all jurisdictions use one or more of these tests. Many have historically referenced the California Standard Practice Manual in documenting how such tests are to be applied.

Over the more than 25 years since the California Standard Practice Manual was first published relatively little has changed with respect to how cost-effectiveness screening of

[1] In the most recent version (2001) of the California Standard Practice Manual, the Societal test is treated simply as a variant on the TRC and the Utility Cost Test (UTC) was renamed the Program Administrator Cost test.

efficiency programs and other demand-side management initiatives is conducted. Although the Manual has been updated twice – once in 1988 and again in 2001 – the changes did not materially affect the definitions of the different tests (CPUC/CEC 2001). More importantly, there has been relatively little change in the way different states and provinces have used the tests.

In contrast, efficiency programs have changed substantially with respect to the kinds of measures being promoted, the ways in which they are promoted and the breadth and depth of their impacts. In addition, the policy imperatives for more aggressive efficiency programs – including growing concerns about global climate change – have become even more compelling. The thesis of this paper is that such changes necessitate a re-examination of how cost-effectiveness screening of demand-side investments is conducted. In particular, we suggest that there is a need to reconsider the current reliance on the TRC for determining whether an energy efficiency measure or program is cost-effective. While our thesis applies to any government initiative, the focus of this paper is on efficiency programs funded by electric and gas rate-payers and approved by public utility commissions.

The Five Cost-Effectiveness Tests

The reason the California Standard Practice Manual describes five different cost-effectiveness tests is that cost-effectiveness can be viewed and assessed from at least that many different perspectives. All of the tests compare the net present value of a stream of benefits over the life of an investment with the net present value of a corresponding stream of costs.[2] What follows is a brief description of each of the five tests, as well as a summary table that compares the key benefits and costs that are included in each test. Note that there are a number of nuances about the tests, including such things as discount rates and how taxes (and tax credits) are treated, that we do not address as the principal focus of this paper is on higher level issues.

Participant Test

The Participant Test measures cost-effectiveness from the perspective of the efficiency program *participant*. It simply compares the bill savings (using retail rates) that the customer will realize over the life of an efficiency upgrade to the cost incurred by the customer to make the upgrade (i.e. net of any financial incentive the program provides).

[2] In many cases, there is no "stream of costs" because all costs are realized immediately at the time of purchase. However, in other cases, there are costs that occur over a number of years.

Ratepayer Impact Measure Test

The RIM Test measures whether billing rates will go up or down as a result of an efficiency program. Put another way, it measures whether *non-participants* in a program will be better or worse off as a result of the program. This is why it is sometimes also called the Non-Participant Test. It compares the value of avoided supply investments by the utility – including avoided energy costs, avoided transmission and distribution costs and avoided generation costs – to the sum of program costs and utility lost revenues from reduced sales.

Total Resource Cost Test

The TRC Test theoretically measures cost-effectiveness from the combined view point of program participants and non-participants. We say theoretically because in practice the TRC measures secondary fuel, water or other resource savings using avoided costs for such resources rather than retail prices for such resources as in the Participant Test (Fulmer & Biewald 1994). In short, the TRC compares the value of avoided energy and other resources from all sources with the full cost of the efficiency measures plus all non-measure program costs.

Societal Test

The Societal Test is a variant on the TRC.[3] It is intended to represent a broader *societal* view of cost-effectiveness. To that end, it is the same as the TRC except that it theoretically adds environmental and other non-energy benefits and costs to society into the calculation. We say theoretically because, as discussed more fully below, other non-energy benefits such as improved comfort, building durability, health and safety, worker productivity, public image and others are seldom addressed.

Program Administrator Cost Test

The Program Administrator Cost Test (previously known as the Utility Cost Test) measures cost-effectiveness from a *utility* perspective. It compares the value of the utility's avoided costs with the cost to the utility of acquiring the efficiency resources that produce those avoided costs. Thus, its primary differences from the TRC are that (1) it does not include any energy benefits for fuels the utility does not provide; (2) it does not include any other resource benefits such as water savings; and (3) it does not include any customer contributions to the cost of an efficiency investment.

[3] Indeed, the California Standard Practice Manual no longer lists it as a separate test.

Table 1. Summary of Key Benefits and Costs Included in Different Tests

	Partic. Test	RIM Test	TRC Test	Societal Test	PACT Test
Benefits[4]					
Primary Fuel(s) Avoided Supply Costs		✓	✓	✓	✓
Secondary Fuel(s) Avoided Supply Costs			✓	✓	
Primary Fuel(s) Bill Savings (retail prices)	✓				
Secondary Fuel(s) Bill Savings (retail prices)	✓				
Other Resource Savings (e.g. water)	✓		✓	✓	
Environmental Benefits				✓	
Other Non-Energy Benefits			rarely[5]	in theory only	
Costs[6]					
Program Administration[7]		✓	✓	✓	✓
Measure Costs					
Program Financial Incentives		✓	✓	✓	✓
Customer Contributions	✓		✓	✓	
Utility Lost Revenues		✓			

Which Tests are Predominant?

We have not conducted a comprehensive assessment of which jurisdictions are currently using which tests. However, based on both our own extensive experience with regulatory practice in a variety of jurisdictions and research on this question in recent years by the American Council for an Energy Efficient Economy (Amann 2006; also unpublished research) and the Regulatory Assistance Project (unpublished), several general conclusions can be drawn.

To begin with, many states and provinces require utilities or other program administrators to assess cost-effectiveness from multiple perspectives – often all five perspectives represented by the tests identified above. This is not because those jurisdictions require programs to pass all five tests in order to be approved. Rather, it is usually to provide useful insight into a range of issues programs might raise. For example, if a program fails the RIM test miserably, a regulatory agency may still approve the program but require that other actions are undertaken to

[4] We use the term "primary fuel(s)" to represent the fuels provided by the utility running the efficiency program; the term "secondary fuel(s)" refers to fuels not provided by the utility. For example, for an efficiency program run by an electric only utility, electricity savings are "primary fuel savings" and gas or fuel oil savings are "secondary fuel savings".

[5] Although not officially part of the California Standard Practice Manual definition, the original discussions underlying the TRC and the conceptual rationale for adding the participant's out-of-pocket costs to the utility's program costs are supportive of incorporating participant non-energy benefits into the calculation. At various times a number of states have attempted to measure and include these types of benefits, but the near-universal practice these days is to ignore them in the calculation of the TRC.

[6] Just as savings of secondary fuels and other resources are benefits captured by different tests, any increases in secondary fuel costs or other resource use would be captured as either increased costs or negative benefits. Such increases would be estimated using avoided costs or retail prices in the same way as the benefits from reductions in use of such resources would be estimated for the different tests.

[7] We use the term "administration" here to include all program costs other than financial incentives for efficiency measures. This includes program management, administration, marketing, training, evaluation, etc.

minimize concerns about inequities between participants and non-participants (e.g., ensuring that there is a broad enough range of programs offered so that all customers have the opportunity to participate in at least one over a reasonable period of time).

That said, most regulators rely primarily on one test to determine whether a program or portfolio of programs should be approved. In most jurisdictions with operating efficiency programs, that principal test is either the Total Resource Cost Test or Societal Test (NAPEE 2008). One or the other of those tests are the principal test used in most New England states, New York, New Jersey, Wisconsin, Missouri, California, Ontario, Quebec, British Columbia and elsewhere . A few jurisdictions, including Michigan and Connecticut, rely principally on the UCT. Although a few states (e.g. Florida) relied on the RIM test in the past, we are unaware of any states with significant energy efficiency programs that rely primarily on the RIM test today.

Concerns about the TRC and Societal Tests as Currently Applied

We have two fundamental concerns about the TRC and Societal Tests as they are currently applied:

1. Most non-energy benefits are not factored into the tests.
2. Supply investments are not subjected to the TRC, making the hurdle to pass screening greater for demand-side investments than for supply-side alternatives.

Failure to Address Non-Energy Benefits

Most efficiency measures have significant non-energy benefits. Sometimes this is just a natural by-product of the measure. For example, reducing the leakiness of a home improves comfort at the same time it saves energy. Similarly, day-lighting not only saves energy, it has been shown to improve worker productivity. On the other hand, the marriage of efficiency and other desirable attributes is sometimes an intentional result of manufacturers', designers' or builders' marketing or sales strategies. Often, such market players sell an "entry-level" product that is as basic and inexpensive as possible – usually meaning it is also inefficient; they also often bundle efficiency upgrades with other attractive features and market this bundle as a "premium" product. Consider refrigerators. It is impossible, to find two refrigerators that are identical other than in their efficiency ratings. More efficient refrigerators often have more shelves, better drawers, better aesthetics, etc. The bottom line is that efficiency is rarely the only attribute of a product that is of interest to either consumers or those who are selling to them.

If a market is valuing non-energy attributes that are by-products of or bundled with efficiency, a good efficiency program will factor those non-energy attributes into its design. Thus, many of today's most sophisticated energy efficiency programs intentionally emphasize the selling of non-energy benefits. For example, the fundamental design philosophy underlying the residential Home Performance with ENERGY STAR programs is that we should be selling consumers on all the things about which they may care, including comfort, building durability, and indoor air quality as well as efficiency. Evaluators of ENERGY STAR Homes (new construction) programs often assess whether builders are selling such homes on their non-energy benefits. An evaluation of Efficiency Vermont's 2004 program which showed that more than 60% of builders promoted increased comfort and lower maintenance costs as additional benefits of buying ENERGY STAR homes – a three-fold increase over 2001 – was seen as partial

evidence of program success (Kema 2005). Similarly, most leading programs targeting commercial and industrial customers attempt to understand the business interests of those customers and find ways efficiency investments can help address those interests. Sometimes that is just by saving money on energy bills, but more often than not reducing waste streams, improving worker productivity or other factors are at least as important.

The TRC test as originally conceptualized was a robust test looking at "total" costs and benefits. Over time, however, it became apparent that measuring and quantifying "non-energy benefits" was very difficult and often controversial for regulators to accept as a legitimate factor to consider in utility regulation. As a result, the use of non-energy benefits atrophied, and today non-energy benefits are rarely incorporated into cost-effectiveness screening under the TRC or even under the Societal Cost Test. In contrast, the full retail cost of an efficiency investment (i.e. including both the participant's and the utility's contribution) is easy to quantify, and is virtually always used in TRC or SCT analyses. The end result is that cost-effectiveness screening becomes an inherently skewed comparison: all the costs are compared to just a portion – i.e. the energy portion – of the benefits.

There have been attempts to address this issue. For example, for the past decade in Massachusetts, the regulators have explicitly allowed the utilities to conduct studies of non-resource benefits and include the value of such benefits in their cost-effectiveness screening. However, with rare exceptions, the utilities have not factored such benefits into their analyses. In the past, regulators in Washington, D.C. have allowed a non-resource benefit adder to be applied to low income programs. However, such examples are very rare.

Inconsistency in Treatment of Demand and Supply Options

As noted above, supply investments are not subjected to TRC or Societal cost-effectiveness screening. For example, when a regulator approves a utility purchased power contract from a customer with an on-site generator, there is no consideration given to what the customer costs of installing or operating that equipment might be. All that is considered germane is the cost to the utility of purchasing that power resource from the customer. Similarly, in utility cost-recovery under a "renewable portfolio standard", regulators do not use the provider's investment costs for the renewable facility to screen out sources of supply. Instead they focus on the cost of the resource to the utility system. The same basic principle applies to independent power plant generators bidding into a power pool. No one cares what the cost of constructing the plant may have been. No one cares whether the plant operators need to generate revenue by selling gypsum from the plant's scrubber or waste heat in order to competitively price its power. No one cares whether any government subsidies (in any of their myriad forms) were essential to making the price of power competitive. All that matters is the final price for purchasing power from the plant. Simply put, applying a TRC screen to utility energy efficiency programs imposes a cost-effectiveness burden that is not applied to any other utility system resource.

Why TRC Failings Matter

The asymmetrical inclusion of participant costs while failing to include most participant non-energy benefits in cost-effectiveness screening fundamentally biases regulatory decisions against efficiency investments. The practical effect of such biases would not be great if the magnitude of the unquantified non-energy benefits were small. However, numerous studies suggest that they are actually quite large. For example, a U.S. Department of Energy evaluation of low income weatherization suggests that the value of non-energy benefits was slightly greater than the value of the energy benefits (Schweitzer & Tonn, 2002). A federally funded study of the cost-effectiveness of commercial building commissioning – a service promoted by numerous rate-payer funded efficiency programs – found non-energy benefits to be on the order of 50% of the value of energy savings in existing buildings and more than five times the value of energy savings in new construction (Mills et al. 2004). One study of 52 industrial energy efficiency improvements also found non-energy productivity benefits to be more than 120% of the value of the energy savings; another concluded that total savings from industrial energy efficiency projects are typically two to four times the value of the energy savings (Elliott, Laitner & Pye 1997) her study estimates that non-energy benefits across a wide range of efficiency programs range in value from 50% to more than 100% of the energy benefits (Skumatz 2006).

Because they can be so large, omitting such benefits from cost-effectiveness screening can significantly reduce the magnitude of savings that are realized from efficiency program portfolios by reducing the number of measures that can be promoted within programs or rejecting cost-effective programs altogether.

Consider a program designed to promote the purchase of efficient residential water heating equipment. If avoided supply costs were \$0.14 per kWh,[8] \$115 per peak kW, and \$1.35 per therm – all approximately what is currently estimated in New England (Hornby et al. 2009) and higher than many other parts of the country – the net present value of the benefits of upgrading from a standard new electric water heater to a heat pump water heater would be roughly \$3000, or about three times the incremental cost of a standard unit. Thus, a program administrator faced with such avoided costs could justify offering rebates for heat pump water heaters.[9] However, under the TRC or Societal Cost Test as they are typically used, the same program administrator would not be permitted to offer the very same rebate to a consumer who preferred instead to install a \$6000 solar water heating system – even if the savings were slightly greater and the customer was willing to bear all of the added expense because it valued highly the ability to show off its commitment to the environment to its neighbors. While some of us may not support assigning a high value to such an attribute, the reality is that some people do. We use this somewhat extreme example to make the point that if we ignore the value that some people put on such attributes, we essentially begin using our personal values rather than market values to determine what is cost-effective. The result will be efficiency programs with at least somewhat lower levels of participation and savings.

Now consider Home Performance with ENERGY STAR programs. A good program in a northern climate should achieve on the order of 500 to 750 kWh and 300 therms of energy savings per home. This level of savings typically costs \$7000 to \$10,000 per home plus another \$1000 to \$2000 per home for marketing and administering the program. Using the same avoided supply costs described above, the net present value of the energy benefits would be on the order

[8] Roughly \$0.03 of this is for environmental externalities.
[9] Assuming the program could be run for an administrative cost of less than \$2000 per home.

of $5500 to $6500, depending on how much of the electric savings were cooling savings.[10] That is not enough to justify a program under the TRC test. This is not an extreme example. It addresses the largest energy end use of the residential sector in a large portion of the U.S. and all of Canada.

In the past, when efficiency programs were never funded anywhere close to levels necessary to achieve even all the efficiency that was cost-effective under the restrictive application of the TRC or SCT, such concerns may not have been as important. However, in the current era in which the policy imperatives for truly pursuing all cost-effective efficiency are more compelling than ever and several jurisdictions are actively pressing to determine how much efficiency savings can be achieved, restrictive applications of cost-effectiveness screening standards has become highly problematic. How can we talk about figuring out how to do deep energy retrofits if we cannot even justify the 25% to 30% heating savings values achieved by current Home Performance with ENERGY STAR programs?

Possible Solutions

Conceptually, we see three potential solutions to this problem:

1. Adjust the TRC so that only the "energy portion" of measure costs are included in the test;
2. Fix the TRC and Societal Tests by quantifying – even in approximate ways – and including in cost-effectiveness screening all non-energy benefits; or
3. Change the test being used – specifically, relying instead on PACT.

Each of these options has its proponents. Each also has both advantages and disadvantages. These are discussed briefly below.

Using Only the "Energy Portion" of Measure Costs in the TRC

If the problem with the TRC is that it compares total costs to only the energy benefits, then one option is to assess how much of the total cost is attributable to energy savings and use that energy portion of the total cost in the TRC cost-effectiveness calculation. This could theoretically be done by conducting studies on the factors that contributed to consumer decisions to make an efficiency investment and estimating the portion of the decisions that were attributable to interest in energy savings. Such an approach has recently been put forward for consideration in a docket of the Vermont Public Service Board.[11]

This approach would be a significant improvement over the current situation in that it would at least transform the TRC from a biased test to a comparison of apples (energy costs) to apples (energy benefits). This could enable some important and societally cost-effective efficiency programs that would otherwise fail the TRC as it is commonly applied to pass screening. Consider the Home Performance with ENERGY STAR program discussed above. If the average measure cost was $8500 per home, the average program administration cost was

[10] Assumes a real discount rate of 6%. The low end of the range assumes an average life of 10 years for the electric savings (mostly lighting) and 20 years for the gas savings. The high end of the range assumes significant cooling savings (with 15 year life) as well.

[11] http://psb.vermont.gov/docketsandprojects/eeu/screening

$1500 per home and the average energy benefits were $6000 per home, the program would fail the TRC with -$4000 in net benefits. However, if participant surveys suggested that, on average, only half of the participant cost should be attributed to an interest in energy savings (the remainder being associated with improved comfort and other benefits, the "adjusted measure cost" would be reduced to $4250. At that cost, the $6000 in energy benefits would exceed the $5750 ($4250 plus $1500 in administration costs) in "energy related costs", making the program cost-effective.

However, this approach also has some disadvantages. For one, it would also require potentially significant additional expenditure on evaluations. Such research would ideally need to be undertaken for numerous programs and markets. It may also need to be undertaken numerous times for the same market as programs evolve. Participants in the first year or two of a program may be fundamentally different than those in later years. The program could also change in ways that result in different customer perceptions of value. Moreover, market research into consumer decisions should ideally be undertaken retrospectively.[12] That is, one would ideally have a cadre of program participants to survey. This raises questions about how program administrators would assess *new* programs that have not yet been tested in the field, and more importantly, how regulators would view proposals from program administrators to pursue new programs that required significant non-energy benefits to pass screening. If the default would be for program administrators to not propose such programs and for regulators not to approve them, progress will have been very limited. In addition, the approach could still result in sub-optimal levels of efficiency investment because using customers' assessments of why they purchased a product to adjust cost rather than capturing the actual value of those benefits is likely, in at least some cases, to result in cost reductions that are worth much less than the full value of the non-energy benefits.[13] Finally, the process for getting such a different approach adopted by regulators could be difficult and lengthy.

Taken together, these disadvantages likely mean that efforts to address non-energy benefits through adjustments to the cost side of the equation are likely to be a sub-optimal but workable solution for only a limited set of markets or programs in only a few jurisdictions.

Quantifying All Non-Energy Benefits

The second option for fixing the TRC is to tackle the benefits side of the equation. Specifically, regulators could theoretically require that all non-energy benefits are estimated and factored into TRC screening.

Like the approach discussed above, this approach would also lead to a more balanced assessment of costs and benefits. From the perspective of pure economic theory, it is the best approach in that it ensures that both all societal benefits and all costs are factored into decision-making. Again, consider the Home Performance with ENERGY STAR program discussed above. We have already shown that an average per home measure cost of $8500, average per participant administration cost of $1500 and average per home energy benefits of $6000 would

[12] In theory, one could conduct prospective market research about customers' willingness to pay. However, such assessments are likely to be less accurate than research on reasons why consumers *did* pay, in part because actual participants are likely to be different (demographically or otherwise) than those surveyed prospectively.

[13] Consider a case in which health and safety benefits were large enough to fully offset measure costs, but the consumer assigned only 20% of the reason they invested in the measures to such benefits. In that case, this approach would understate the value of the non-energy benefits by a factor of 5.

lead to a program failing the TRC with - $4000 in net benefits. However, if participant non-energy benefits such as improved comfort, health and safety, building durability and other factors were estimated to be worth the same as the energy benefits (i.e. another $6000), a corrected TRC test would appropriately show the program passing screening with $2000 in net benefits.

That said, this approach also has a number of disadvantages. First, if the aim was to comprehensively value all – or even just the most important – non-energy benefits, a potentially enormous additional investment in evaluation could be required. The fact that such benefits can vary from customer to customer, change as programs mature, and change as program designs themselves change only adds to the complexity and cost. Second, it is impossible to fully understand the full range of non-energy benefits that are valued by participants in large portfolios of efficiency programs. We are likely to only try to quantify those we already know – meaning we will understate the true value of such benefits. Third, just as with the adjustment to costs described above, valuation of non-energy benefits should ideally be performed retrospectively. It may be difficult to introduce new programs that rely on untested non-energy benefits. Fourth, because methods for quantifying non-energy benefits are imperfect, the results could be very controversial. Imagine, for example, attempts to quantify the health and safety benefits associated with replacing boilers with cracked heat exchangers. Finally, the regulatory process for considering this approach to fixing the TRC is likely to be extremely difficult, with regulators in many jurisdictions resisting the formal inclusion and monetization of factors they consider outside the realm of utility regulation.

The bottom-line is that while this approach is theoretically ideal, it is also likely to be so complex, controversial, and expensive that it is unworkable. It is almost certain that no jurisdiction will "go all the way" or even "most of the way" to fully address non-energy benefits in cost-effectiveness screening.

Switching to the Program Administrator Cost Test

The alternative to the two options for fixing the TRC is to replace it with a different test, specifically the PACT.[14]

This approach has a number of advantages. First, it is much simpler. There is no need to quantify non-energy benefits, which means much less complexity and controversy. Second, it is much less expensive. Not only do we not need to add potentially enormous new evaluation costs, we can even modestly reduce some existing expenditures because we no longer need to routinely estimate the full cost of efficiency measures since the PACT is concerned only with program spending.[15] Third, this approach would create some symmetry with how supply-side investments are assessed. Finally, while one should not underestimate the difficulties in persuading regulators to change the test that they use, for all of the reasons noted above we expect this approach could be adopted more easily, more comprehensively and more quickly than the other options discussed above.

[14] The PACT could be supplemented with the Societal test when benefits external to the utility system need to be considered.

[15] There would still be some value to estimating full measure incremental costs. In particular, such estimates could be useful in informing program design, including incentive levels. However, such work would not need to be as routine or comprehensive as it is today.

Again, it is worth considering the Home Performance with ENERGY STAR program discussed above. It would fail the TRC as commonly applied today because the full $8500 customers paid on average for improvements to their home, plus the average program administration cost of $1500 per home, exceeds the average $6000 in energy benefits. Under the PACT, as long as the program provided a rebate of no more than $4500, it would pass cost-effectiveness screening.

The principle disadvantage of this approach is that it could theoretically result in the promotion of some efficiency measures that are not cost-effective from the perspective of society as a whole, even after accounting for non-energy benefits. However, the PACT ensures that all programs are cost-effective from an all rate-payers' perspective. By definition, any investment made by an efficiency program participant will be cost-effective from its perspective as well (otherwise they would not have made the investment).

In our view, switching to the PACT is the most workable solution for the purpose of selecting among utility resource options in the regulatory context.[16] Because so many measures have non-energy benefits, many of which are very large, we suspect that the potential for promoting some investments that are not societally cost-effective would be swamped by the significant increase in societal benefits that would accrue from pursuing investments that are societally cost-effective (when considering non-energy bnefits) but would have failed the TRC.

Conclusions

We believe it is clear that the TRC,[17] as currently applied, has significant flaws. Because of the asymmetrical application of the TRC test to energy efficiency resources, but not other utility resource options, efficiency resources are systematically disadvantaged. While historically this has had a rather limited practical impact (because energy efficiency programs have tended to pass both the TRC and PACT), that situation is beginning to change. As we move into an era of greatly expanded energy efficiency objectives, this additional burden for energy efficiency programs will likely result in substantially less energy savings being realized than if we were truly pursuing all cost-effective energy efficiency. If non-energy benefits are roughly equal to energy system benefits of typical efficiency investments, failing to account for such benefits is tantamount to reducing the cost-effectiveness of such programs by half. The "flip side" of that statement is that if participant costs are half the total cost of the installed energy efficiency measure, including those costs in the TRC greatly reduces the apparent cost-effectiveness of the energy efficiency program relative to other utility resource options. Maintaining the current TRC cost-effectiveness regime will mean that the savings realized will ultimately be substantially less than they would be if we were truly pursuing all cost-effective efficiencies. Given the currently very compelling policy imperatives for maximizing the amount of energy savings we can achieve, it is critical that this issue be addressed.

Given the options before us, switching from reliance on the TRC to the PACT appears the best way to address the problem both comprehensively enough and expeditiously. This is not to say that there is no role for a TRC type of analysis. There may well be important policy questions that would benefit from a more thorough assessment of the TRC perspective. There

[16] There are other purposes (e.g. macroeconomic modeling; overall public policy analysis and planning; etc.) for which a more comprehensive analysis of all energy and non-energy benefits and costs is very appropriate. We do not seek to minimize the importance of such analyses.

[17] And by extension, the Societal Test.

may also be value in furthering our understanding of the nature and value of non-energy benefits – to inform program design if nothing else. Such work could conceivably lead to more workable adjustments to the TRC in the future. However, we believe that the theoretically perfect solution is not attainable. Even if it was, we cannot afford to wait a decade for it to develop. This all suggests that a switch to primary reliance on the PACT for utility resource selection (supplemented as necessary by the Societal Test) is the best course of action today.

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