M E M O R A N D U M

TO:
FROM: **Geoff Crandall, Jerry Mendl**
DATE: **May 28, 2010**
SUBJECT: **SPIFF and the Total Resource Cost Test**

Several interesting issues were raised in our discussion last Friday, May 21, regarding the SPIFF in conjunction with traditional customer-oriented programs and the treatment of SPIFFs in the Total Resource Cost Test (TRC). The primary issue was whether SPIFFs should be treated differently under the TRC based on whether the incentive was retained as profit by the installer or transferred to the customer to offset measure costs. A secondary issue was whether SPIFFs that failed to increase participation rates would receive different TRC treatment than those which were successful. Having had more time to consider the issues and arguments that were raised, we believe that:

- The SPIFF will not affect the cost of the measure from the TRC perspective.
- The SPIFF will affect the overall cost of the program to implement the measure(s), and will probably reduce the cost effectiveness of the program (as measured by the TRC ratio). However, it may increase the net savings (in dollars and energy), depending on its success at increasing participation.
- The TRC will be the same whether the SPIFF is retained by the installer as profit or transferred to the customer as a reduced purchase cost.

The following discussion will hopefully help illustrate the SPIFF – TRC issue. For purposes of the illustration, assume an energy efficient device with an incremental cost of $1000 and a net present value of the utility energy savings (avoided cost) of $1500. Please see Table 1, which summarizes the cases A-G which are described below. Note that on a per measure installed basis, the measure cost for TRC purposes is constant, as is the system benefit per measure installed. The TRC ratio varies as a result of the program-related costs associated with increasing the participation levels, i.e., how much money is expended by the utility to operate and promote programs to induce customers to install the energy efficient devices.

Table 1
Summary Cases A-G

	(A) Measure Level TRC	(B) Measure Level TRC with rebate (w/o program cost)	(C) Program Level TRC, Traditional program directed toward customers (w/ program cost)	(D) Program Level TRC, Traditional program plus Failed SPIFF, retained profits	(E) Program Level TRC, Traditional program plus Failed SPIFF, transfer payments	(F) Program Level TRC, Traditional program plus Successful SPIFF, retained profits	(G) Program Level TRC, S Traditional program plus uccessful SPIFF, transfer payments
Incremental Measure Cost	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Customer	$ 1,000	$ 500	$ 500	$ 500	$ 250	$ 500	$ 250
Rebate		$ 500	$ 500	$ 500	$ 500	$ 500	$ 500
SPIFF Transfer					$ 250		$ 250
Program Costs							
Program dollars			$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
Participants	1,000	1,500	15,000	15,000	15,000	25,000	25,000
Program cost $/measure			$ 67	$ 67	$ 67	$ 40	$ 40
SPIFF Admin cost $/measure				$ 10	$ 10	$ 10	$ 10
SPIFF retained profit				$ 250		$ 250	
SPIFF $/measure				$ 250	$ 250	$ 250	$ 250
TOTAL COST PER MEASURE	$ 1,000	$ 1,000	$ 1,067	$ 1,327	$ 1,327	$ 1,300	$ 1,300
TOTAL BENEFIT (Avoided System Cost) PER MEASURE	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
BENEFIT COST RATIO	1.50	1.50	1.41	1.13	1.13	1.15	1.15
NET BENEFITS	$ 500,000	$ 750,000	$ 6,500,000	$ 2,600,000	$ 2,600,000	$ 5,000,000	$ 5,000,000

Discussion of cases:

Table 1 starts with the simplest TRC calculation in case A, which essentially assumes that there is a zero cost utility program to raise customer awareness of energy efficiency devices. Case B assumes that the utility offers a rebate, but expends no money to promote the rebate program to customers. Case C represents a traditional program, in which the utility incurs costs to manage and promote the rebate program directly to its customers. Cases D and E represent the traditional program, with the addition of a SPIFF directed toward trade allies, in which we assume that the SPIFF fails to increase the participation rate. Case D assumes the trade ally retains the SPIFF as added profit, while case E assumes the SPIFF is transferred to the customer in the form of an offset to measure costs. Cases F and G represent the traditional program, with the addition of a SPIFF directed toward trade allies, in which we assume that the SPIFF is successful at increasing the participation rate. Case F assumes the trade ally retains the SPIFF as added profit, while case G assumes the SPIFF is transferred to the customer in the form of an offset to measure costs.

A. Measure level TRC: Applying the TRC at the measure level indicates that the total benefit would be $1500, the total cost $1000, for a B/C of 1.5. While customers may invest $1000 to implement this measure, many do not have sufficient incentives or available cash to do so, and participation would be low. For the purposes of illustration, assume that 1000 people would participate in implementing the measure.[1]

B. Measure level TRC with rebate: To enhance participation, the utility may provide a rebate to the customer to offset customer cost. Assume that the utility provides a $500 rebate while incurring no program costs. The rebate decreases the cost to the customer, but does not reduce the incremental cost of the resource from a TRC perspective. The benefit from each installed measure still would be $1500, and the incremental cost would be $1000 ($500 customer cost plus $500 rebate). The net result is a B/C of 1.5, as in case A. However, some of the system benefit ($1500 of avoided cost) is used to provide an incentive to the customer. From a customer perspective, the customer's cost has been reduced to $500. From the utility's perspective, the utility has now invested $500 (in the form of a rebate) to obtain $1500 of system avoided cost. With the rebate, one would expect the participation to be greater, but still not very high unless the rebate program is marketed. In other words, some additional people may hear about the rebate and participate, but it would be a low number without marketing. For the purposes of illustration, assume that 1500 people would participate in implementing the measure with a rebate.

C. Program level TRC, traditional program directed at customers: To make sure that customers (potential participants) are aware of the program, the utility expends some money to administer, advertise and otherwise promote its program to its customers. Most of the program cost will be incurred as a fixed cost (i.e., the cost will not vary significantly with the number of customers who participate). For the purpose of

[1] Since these participants would implement in the absence of incentives and the utility program, they would be free riders when they participated in a program. We have not adjusted the B/C analysis for free riders in this illustration.

illustration, assume that the program costs are $1,000,000. The program cost would be $1,000,000 whether 10,000 or 15,000 customers became participants and implemented the measure. The cost per measure installed would vary between $100 (for 10,000 participants) and $67 (for 15,000 participants). For the sake of the illustration, assume that as a result of a $1,000,000 program cost expenditure, the participation level increased to 15,000 participants, or $67 program cost per participant. The program cost reduces the TRC ratio at the program level TRC. The measure cost is still $1000, with $500 from the customer and $500 from the rebate. The program cost is $67, for a total program level TRC cost of $1067 per measure. The benefits per measure remain unchanged at $1500. So the TRC ratio drops to 1.41, but the participation increases dramatically to 15,000 for the purposes of the illustration. From a customer perspective, the customer's cost is still $500. From the utility's perspective, the utility has now invested $567 (in the form of a rebate and program costs) to obtain $1500 of system avoided cost.

Programs with both customer and trade ally incentives: Regardless of the customer incentives and promotional program, customers may be unaware of, or overwhelmed by, the energy efficiency program. Trade allies, such as equipment vendors, designers, installers and so forth, often determine which equipment choices are offered to customers and often have input to the customers decision making. If trade allies have an incentive to encourage energy efficient devices, the theory is that they will be more likely to provide them as alternatives to their clients. The trade ally incentives (SPIFF) will encourage the trade allies to become co-advertisers of the utility program and of energy efficient alternatives, providing an added and potentially powerful opportunity to influence customer choices toward more efficient devices. For the purposes of illustration, assume a SPIFF incentive of $250 is provided to the trade allies for each measure installed. The discussion on May 21 debated over the TRC implications of the trade ally retaining the SPIFF to enhance his profits versus transferring the SPIFF to the participant. We have concluded and our illustration will show that it makes no difference to the TRC calculation. The discussion also included cases in which the SPIFF had no effect versus those that it did. Our illustration shows the obvious – the more effective the SPIFF, the more that energy efficient devices will be implemented and the greater the benefits for the SPIFF and customer programs.

D. Program level TRC, with failed SPIFF and retained profits: In this case, we assume that the SPIFF has failed to increase the number of participants and that the trade ally keeps the SPIFF to enhance his profits. This is a worst case scenario – the SPIFF adds $250 program cost to each measure installed, but the program fails to produce any additional participants. Building onto my previous example, there are still 15,000 participants resulting from the customer-oriented program, meaning that those program costs are still $67 per installed measure. We've also assumed a SPIFF program administrative cost of $10 per installed measure and a SPIFF incentive cost to the utility of $250 per installed measure. This results in program costs of $327 ($67 customer program + $10 SPIFF program + $250 SPIFF incentive retained by the trade ally). The measure cost is still $1000 ($500 customer cost plus $500 rebate). Under this worst case scenario, the customer still pays only $500 for the measure. The utility invests $827 to obtain a system benefit of $1500. The TRC drops to $1500/$1327, or 1.13. It is still greater than 0, and still is less expensive than not doing the program at all and building supplies instead.

However, it would not be a good value to implement the SPIFF portion of the program, which in this case adds to the cost with no improvement in the results.

E. Program level TRC, with failed SPIFF and transfer payments: In this case, we assume that the SPIFF has failed to increase the number of participants as above, but that the trade ally transfers the SPIFF to reduce the cost of the measure to the customer. The SPIFF adds $250 program cost to each measure installed, which is used to reduce the measure cost, but the program fails to produce any additional participants. Building onto our previous example, there are still 15,000 participants resulting from the customer-oriented program, meaning that those program costs are still $67 per installed measure. We've also assumed a SPIFF program administrative cost of $10 per installed measure and a SPIFF incentive cost to the utility of $250 per installed measure. This results in program costs of $327 ($67 customer program + $10 SPIFF program + $250 SPIFF incentive transferred to the participant). The measure cost is still $1000 ($250 customer cost plus $500 rebate plus $250 transfer payment). The measure cost does **not** change – it is paid for by the customer and the utility (rebate plus transfer payment). Under this scenario, the customer now pays $250 for the measure. The utility still invests $827 to obtain a system benefit of $1500. The TRC stays at $1500/$1327, or 1.13, as it was for the failed SPIFF with trade ally retained profit scenario. It shows that for calculating the program TRC, it does not matter whether the SPIFF incentive is retained by the trade ally or transferred to the customer, at least assuming the worst case that it doesn't result in higher participation. However, it would not be a good value to implement the SPIFF portion of the program, which in this case adds to the cost with no improvement in the results.

F. Program level TRC, with successful SPIFF and retained profits: In this case, we assume that the SPIFF increased the number of participants to 25,000 and that the trade ally keeps the SPIFF to enhance his profits. The SPIFF adds $250 program cost to each measure installed, but the program adds 10,000 more participants. Building onto the previous example, there are now 25,000 participants over which to spread the fixed customer-oriented program costs, meaning that those program costs dropped to $40 per installed measure. We've also assumed a SPIFF program administrative cost of $10 per installed measure and a SPIFF incentive cost to the utility of $250 per installed measure. This results in program costs of $300 ($40 customer program + $10 SPIFF program + $250 SPIFF incentive retained by the trade ally). The measure cost is still $1000 ($500 customer cost plus $500 rebate). Under this scenario, the customer still pays only $500 for the measure. The utility invests $800 to obtain a system benefit of $1500. The TRC improves to $1500/$1300, or 1.15.

G. Program level TRC, with successful SPIFF and transfer payments: In this case, we assume that the SPIFF increased the number of participants to 25,000 as above, but that the trade ally transfers the SPIFF to reduce the cost of the measure to the customer. The SPIFF adds $250 program cost to each measure installed, which is used to reduce the measure cost, but the program adds 10,000 more additional participants. Building onto

our previous example, there are now 25,000 participants over which to spread the fixed customer-oriented program costs, meaning that those program costs dropped to $40 per installed measure. We've also assumed a SPIFF program administrative cost of $10 per installed measure and a SPIFF incentive cost to the utility of $250 per installed measure. This results in program costs of $300 ($40 customer program + $10 SPIFF program + $250 SPIFF incentive transferred to the participant). The measure cost is still $1000 ($250 customer cost plus $500 rebate plus $250 transfer payment). The measure cost does **not** change – it is paid for by the customer and the utility (rebate plus transfer payment). Under this scenario, the customer now pays $250 for the measure. The utility still invests $800 to obtain a system benefit of $1500. The TRC stays at $1500/$1300, or 1.15, as it was for the successful SPIFF with trade ally retained profit scenario. It shows that for calculating the program TRC, it does not matter whether the SPIFF incentive is retained by the trade ally or transferred to the customer, as long as the number of participants was the same regardless of whether the SPIFF is retained or transferred.

There are in our view a couple of observations worthy of consideration.

1. While we have shown that the TRC calculation is indifferent to whether a SPIFF incentive is retained by the trade ally as additional profit or transferred to offset the customer measure cost, that is only true when the resulting change in participation is the same. In practice, one might argue that the participation would improve more by reducing customer cost than by providing more incentive to the trade ally, or visa-versa. The argument could go either way – adding incentives for the trade allies should result in more customer awareness and greater willingness of the trade ally to push the energy efficient device. How much of an impact it would have would probably depend on the profit margins already existing for devices of varying efficiency. If their most profitable device was the most energy efficient, the trade ally may chose to transfer the SPIFF payment to reduce customer cost – to provide the customer more incentive to purchase the device that already provide the trade ally with the best profit margin. Conversely, if the trade ally had the best profit margin with a minimally efficient device, the SPIFF incentive may be most effective to improve the trade ally's profit margin to be as good or superior to the other less efficient devices.

2. Second, note that the benefit cost ratio drops dramatically in our illustration from 1.41 to 1.13 with the addition of the failed SPIFF. This is due to the added cost of $250 for each measure installed, but with no commensurate benefit from increased participation. We wondered why the successful SPIFF did not greatly improve the B/C ratio, raising it only to 1.15. We believe that is a result of the fact that every measure, including those that would have previously been installed without the SPIFF, incurs the additional SPIFF incentive cost. The margins by which the measures including SPIFF pass the TRC are less, but the net benefits may be much greater because there are more participants.

3. Third, as one measure of the net benefits, consider that as long as the TRC is greater than 1.0, the energy efficiency program is providing a resource at lower cost than the supply (avoided cost of supply is greater than the cost of the energy efficient resource). Thus

maximizing the TRC ratio is not the same as maximizing the net benefit. As can be seen from the Table 1, the maximum B/C of 1.5 occurs when the measure can be implemented without a rebate or with a rebate without program cost. The B/C ratio of 1.5 means a $500 net benefit per measure installed, but unfortunately results in $500,000 to $750,000 in net benefits as a result of the low participation levels. Adding a customer promotional program reduces the B/C to 1.41, but increases participation to yield a net benefit of $6.5 million. Adding SPIFF without increasing participation cut the net benefit to $2.6 million, while adding SPIFF and increasing participation raised the net benefit to $5.0 million.

4. Fourth, the customer oriented program costs and the SPIFFs can be adjusted in alternative program designs to generate the greatest impact on the number of customers in the lowest cost way. The program TRC ratios and the net system benefits are quite affected by the change in program and incentive costs. Obviously, it is more efficient to accomplish substantially the same result at lower cost. This is illustrated by Table 2, setting the SPIFF at $100 substantially improves the net benefits and TRC benefit-cost ratios (assuming an identical response from the trade alleys). Implementing and monitoring and evaluating program designs, and then (perhaps) further modifying them, are necessary steps toward the optimization of the incentives and program costs.

Table 2
Summary Cases A-C, D' – G'

	(A) Measure Level TRC	(B) Measure Level TRC with rebate (w/o program cost)	(C) Program Level TRC, Traditional program directed toward customers (w/ program cost)	(D') Program Level TRC, Traditional program plus Failed SPIFF, retained profits	(E') Program Level TRC, Traditional program plus Failed SPIFF, transfer payments	(F') Program Level TRC, Traditional program plus Successful SPIFF, retained profits	(G') Program Level TRC, Traditional program plus Successful SPIFF, transfer payments
Incremental Measure Cost	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Customer	$ 1,000	$ 500	$ 500	$ 500	$ 400	$ 500	$ 400
Rebate		$ 500	$ 500	$ 500	$ 500	$ 500	$ 500
SPIFF Transfer					$ 100		$ 100
Program Costs							
Program dollars			$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
Participants	1,000	1,500	15,000	15,000	15,000	25,000	25,000
Program cost $/measure			$ 67	$ 67	$ 67	$ 40	$ 40
SPIFF Admin cost $/measure				$ 10	$ 10	$ 10	$ 10
SPIFF retained profit				$ 100		$ 100	
SPIFF $/measure				$ 100	$ 100	$ 100	$ 100
TOTAL COST PER MEASURE	$ 1,000	$ 1,000	$ 1,067	$ 1,177	$ 1,177	$ 1,150	$ 1,150
TOTAL BENEFIT (Avoided System Cost) PER MEASURE	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
BENEFIT COST RATIO	1.50	1.50	1.41	1.27	1.27	1.30	1.30
NET BENEFITS	$ 500,000	$ 750,000	$ 6,500,000	$ 4,850,000	$ 4,850,000	$ 8,750,000	$ 8,750,000

Table 2 is the same as Table 1, except demonstrating the effect of a $100 SPIFF and assumes an identical response from trade alleys.