

OTTER TAIL POWER COMPANY  
Docket No. EL13-016

Response to: South Dakota Public Utilities Commission  
Analyst: SDPUC Staff  
Date Received: 9/20/2013  
Date Due: 9/30/2013  
Date of Response: 09/30/2013  
Responding Witness: Kim Pederson, Manager Market Planning - (218) 739-8303

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Information Request No: SD-PUC-02-02

Please calculate the rate savings expected as a result of the program lifetime measures. For example, provide a statement similar to the following: “implementing this program will prevent rates from increasing by \$X/kWh” over a specific time period, including your calculations.

**RESPONSE:**

Otter Tail appreciates Staff’s inquiry and the difficulty of understanding rate impacts from investments in energy efficiency. Otter Tail presents four perspectives on this complex issue.

Scenario 1

Otter Tail’s 2012 sales in South Dakota totaled approximately 407,054,057 kWh. The 2014 projected net benefits from the SD energy efficiency program after carry charges and financial incentive are forecasted at \$1,980,271. Based on the 2012 sales the net benefits that South Dakota customers would receive from energy efficiency is \$0.00486/kWh ( $\$1,980,271/407,054,057=0.00486$ ). The details of this calculation are shown in Attachment 1 to IR SD-PUC-02-02, at the bottom of column V.

Using this very simplified approach, and assuming all else stays constant, one could deduce that implementing Otter Tail’s proposed 2014 EEP programs will prevent rates from increasing an estimated \$0.00486/kWh over the lifetime of the 2014 programs. Otter Tail cautions against using this oversimplified analysis because rates are impacted by a number of variables not included in this scenario.

Scenario 2

Otter Tail calculates and reports several cost effectiveness tests to ensure each energy efficiency program and the total energy efficiency portfolio are cost effective for South Dakota customers. The Utility Test compares the total avoided costs the utility would spend on resources and energy, over the lifetime of the measures, to the costs to

implement the energy efficiency measures. In theory, the avoided costs translate into benefits to customers.

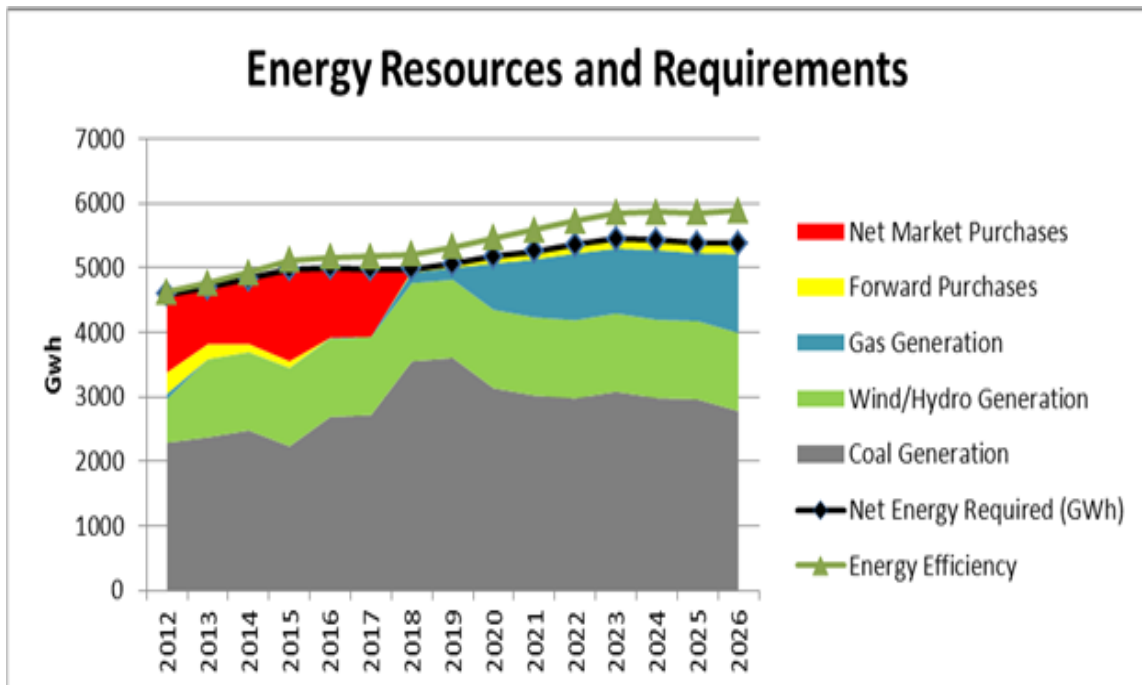
Attachment 1 to IR SD-PUC-02-02 shows the 2014 proposed programs, their savings, program costs, and benefits (avoided costs) over the lifetime for each year. Column V, Attachment 1 shows that when benefits are divided by program costs the benefits are 6.93 times greater than costs. Essentially all customers benefited 6.93 times more than the investment in energy efficiency. When factoring in program carrying charges and the projected financial incentive the utility may receive, the benefits are still 5.26 times program costs, shown in column V.

Scenario 3

Net benefits are actually costs that customers will not have to pay for energy or demand resources needed to supply the same level of energy. Energy efficiency delays or can eliminate energy and capacity purchases and new resources. Chart 1 is from Otter Tail’s Baseload Diversification Study filed in MN and approved by the MN Public Utility Commission on March 25, 2013.

This chart shows the effect of energy efficiency on the Otter Tail system as a whole. The chart includes energy efficiency initiatives in Otter Tail’s South Dakota and Minnesota jurisdictions. Without energy efficiency Otter Tail would have to purchase or build resources to meet the green triangle line. Because of energy efficiency, Otter Tail needs to plan to meet resources in the black diamond “net energy required” line. The difference between the two lines is energy savings achieved by Otter Tail’s energy efficiency programs in Minnesota and South Dakota.

Chart 1



While energy efficiency programs are primarily focused on saving energy, these programs also save customers costs by reducing system peak demand. Chart 2, also from Otter Tail’s Baseload Diversification plan, illustrates the impacts of demand side management (DSM) on Otter Tail’s system. DSM for Otter Tail’s three jurisdictions is represented. Demand reduction includes both load management and energy efficiency programs.

Chart 2

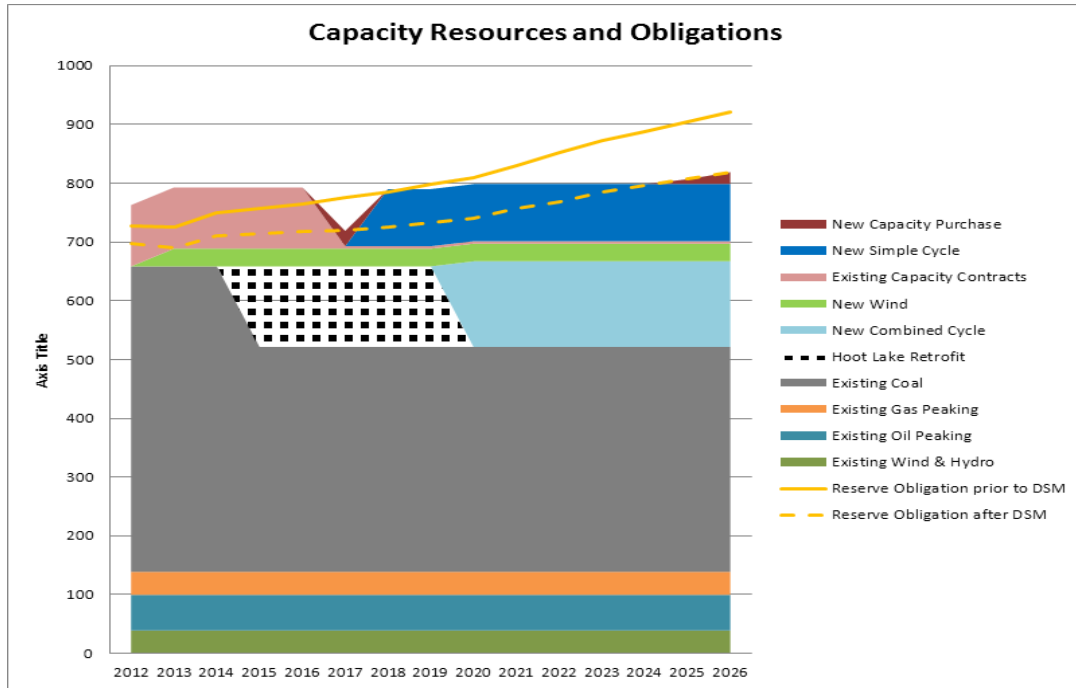


Chart 1 and 2 are important as they illustrate how energy efficiency delays or eliminates the need for future resources. Without energy efficiency Otter Tail would have to either purchase or build resources earlier than planned. South Dakota customers would be responsible for a portion of these investments.

Scenario 4

The Rate Impact Measurement (RIM) test, also called the, “non-participant test”, looks at the impacts to customers that do not participate in energy efficiency programs. The costs included in this test are program and lost revenue costs. Lost revenue reflects the revenue that the utility did not receive from its customers due to reduced sales from the implementation of energy efficiency. Generally the utility still has some fixed costs to recover, and the RIM assumes a rate increase is necessary to recover these costs.

The benefits included in the RIM test are the same as the Utility test described previously. The benefits include all the avoided energy, capacity, transmission and distribution costs that the utility no longer has to build during the measure life of the program. For Otter Tail’s 2014 – 2015 biennial plan, the RIM test was shown to be cost

effective throughout the plan. Table 1 shows the costs, benefits, and benefit/cost ratio for the RIM test, included in Otter Tail’s amended June 24, 2013 filing.

Table 1

<b>SD EEP Plan</b>	<b>RIM Costs</b>	<b>RIM Benefits</b>	<b>RIM Ben/Cost Test</b>
2014	\$2,100,391	\$2,445,583	1.16
2015	\$2,153,919	\$2,621,116	1.22
2014-2015	\$4,085,571	\$4,861,483	1.19

An additional variation of the RIM test is called, RIM Net Fuel. This test differs from the typical RIM test in that it does not include base fuel or fuel adjustment costs in the lost revenue calculation. Since base fuel and fuel adjustment costs are considered a pass through cost to customers and not utility revenue, the Rim Net Fuel test does not consider avoided fuel purchases as lost revenue. The benefit calculation for the RIM Net Fuel test is the same as the RIM and Utility tests. Table 2 shows the costs, benefits, and Benefit/Cost ratio for the RIM Net Fuel test.

Table 2

<b>SD EEP Plan</b>	<b>RIM Net Fuel Costs</b>	<b>RIM Net Fuel Benefits</b>	<b>RIM Net Fuel Ben/Cost Test</b>
2014	\$1,520,736	\$2,445,583	1.61
2015	\$1,574,265	\$2,621,116	1.66
2014-2015	\$2,971,671	\$4,861,483	1.64

The RIM test is typically considered a secondary cost effectiveness test.<sup>1</sup> As stated in the California Standards Manual, “Results of the RIM test are probably less certain than those of other tests because the test is sensitive to the differences between long-term projections of marginal costs and long-term projections of rates, two costs streams that are difficult to quantify with certainty”.<sup>2</sup>

**Conclusion**

There are many ways to analyze energy efficiency. The energy efficiency industry has adopted the five cost effective tests that Otter Tail has analyzed in the biennial plan filing.

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<sup>1</sup> The most common primary measurement of energy efficiency cost-effectiveness is the TRC, followed closely by the SCT. A positive TRC result indicates that the program will produce a net reduction in energy costs in the utility service territory over the lifetime of the program. The distributional tests (PCT, PACT, and RIM) are then used to indicate how different stakeholders are affected. Historically, reliance on the RIM test has limited energy efficiency investment, as it is the most restrictive of the five cost-effectiveness tests. *Understanding Cost-Effectiveness of Energy Efficiency Programs” Best Practices, Technical Methods, and Emerging Issues for Policy-Makers.* November 2008.  
<http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf>

<sup>2</sup> *California Standard Practice Manual - Economic Analysis of Demand-Side Programs and Projects.* page 18, Oct. 2001. [http://www.energy.ca.gov/greenbuilding/documents/background/07-J\\_CPUC\\_STANDARD\\_PRACTICE\\_MANUAL.PDF](http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF)

While these tests are widely accepted as a great indicator in evaluating cost effectiveness from several perspectives, these tests still do not provide an overall rate savings in \$/kWh. It is very difficult to quantify the exact rate reduction energy efficiency is responsible for. Many variable factors influence future costs such as; performance of the economy, interest rates, energy markets, environmental regulations, and general regulation. While the cost effectiveness tests do not provide an exact \$/kWh savings rate, the tests do ensure that Otter Tail's South Dakota programs are cost effective by delivering more economic benefit than costs to customers.