

June 7, 2009

To: Wayne Williams, Pennsylvania PUC

From: Chuck Goldman (Lawrence Berkeley National Laboratory), Snuller Price, Richard Sedano (Regulatory Assistance Project)

Re: LBNL Comments on Strawman Total Resource Cost Test Secretarial Letter dated May 24, 2009.

## **Summary**

Thank you for allowing us to comment on the strawman Total Resource Cost Test Secretarial Letter dated May 24, 2009 as part of our technical assistance to the PA PUC on energy efficiency. Overall, we believe that the Total Resource Cost test framework described in the strawman is sound and manageable in the short timeframe for roll-out of Act 129 programs in Pennsylvania.

We believe the point of measurement of cost-effectiveness at the overall plan level is the correct choice. This will allow flexibility to the EDC energy efficiency planners to develop the best programs, while at the same time allowing them to meet the requirement of offering energy efficiency programs to all customers including low-income customers and ensuring that the plans are cost-effective overall.

The strawman TRC Test definition also includes all of the necessary components of the avoided supply costs for the TRC test within the constraints of the Pennsylvania order. The majority of our specific technical comments are intended to clarify the description of the specific components of avoided supply costs. In a few cases, we propose an alternative method to compute them. We also clarify the point that only the incremental costs (and benefits) of energy efficiency should be included.

Finally, in our specific technical comments, we highlight several areas where the Commission may want to request that EDCs provide additional information that is necessary to help refine the TRC test framework over time.

## **Specific Technical Comments**

### Avoided supply costs

The avoided supply costs are referred to differently in several places in the document. We suggest they consistently be described as the reduction in forecasted zonal wholesale electric generation prices, ancillary services, losses, generation capacity (RPM), transmission capacity, and distribution capacity.

### Avoided Energy Costs

We believe that constructing the avoided supply costs of energy in three 5-year blocks is effective and will provide a result that reflects current market prices to the extent they are available and a long-term forecast beyond the available market period. The proposed approach will also result in a forecast of ‘hedged’ supply costs, which is the appropriate metric to use to value energy efficiency. The supply costs are hedged because they use today’s market prices for fixed price delivery of electricity (years 1 to 5) and natural gas (years 6 to 10) which should implicitly include any premium in the fixed price market product. Although we believe the formulation in the draft decision is appropriate, we do suggest the addition of several clarifications and changes to the proposed methodology.

We suggest restructuring the avoided supply benefits discussion to have two steps: (1) a forecast of annual avoided supply costs for on- and off-peak energy avoided and (2) a calculation of the best available energy efficiency savings load shape. As it is written, the class consumption profile is used as the appropriate shape (we assume based on data limitations) and it really should be the EE reduction shape. By setting up a structure with two steps, the PA PUC can improve upon the energy efficiency reduction shape over time as evaluation studies are conducted.

In several places, a load factor of the energy efficiency savings shape is used to convert avoided supply costs measured in terms of capacity such as the RPM capacity cost (\$/kW-year) to a \$/kWh estimate. The load factor of the best available energy efficiency shape should be used for this aspect of the analysis as well.

In years 1 through 5, it would also be useful for the PA PUC to clarify that if a utility spans more than one market zone in PJM, the zonal locational basis differences should be averaged based on the share of energy purchases by the EDC in each zone.

In years 6 through 10 the straw proposal includes the NYMEX gas price, along with the market heat rate of generation, to forecast avoided energy supply costs. We recommend that the PA PUC clarify how EDCs should construct the natural gas costs for natural gas delivered to Pennsylvania generators. We suggest including the Henry Hub forwards already specified in the strawman, plus the basis differential between Henry Hub and Pennsylvania (which we believe is the NYMEX Texas Eastern Zone M3 Basis Swap), plus the appropriate pipeline delivery tariff for electric generation. The PA PUC should also consider requesting that EDCs use average market data for the 30 days prior to a specific date so that short-term market volatility in the NYMEX market does not significantly affect the results.

In years 11 through 15, we would urge the PA PUC to clarify that the appropriate wholesale natural gas prices from the EIA Annual Energy Outlook are the costs for delivery to electric generation in the Mid-Atlantic zone, and that the method for calculating the avoided electricity costs is the same as that used in years 6 to 10 with a different natural gas price as the basis.

#### Generation Capacity Costs

The strawman proposal does not provide the details on how to include the generation capacity cost throughout the 15-year planning horizon. There is direction to use the PJM RPM market results, however, these are only available for approximately the first 5 years of the 15-year horizon. Beyond the available market data, we would urge the PA PUC to consider directing the EDCs to use the Cost of New Entry (CONE) for capacity developed with each PJM capacity auction. The assumption is that in the long-run, as growth absorbs the available capacity in the market, the price of capacity will increase to the cost of a new generation in the marketplace. The current value ranges from \$112.87/kW-year to \$122.040/kW-year depending on the location within PJM.<sup>1</sup>

### Transmission and Distribution Capacity Costs

The strawman approach for T&D capacity costs suggests the EDC use the posted PJM and EDC transmission and distribution tariffs respectively as an estimate of avoided costs. While the tariffs may serve as a proxy if better data is not available, in our view, the tariffs do not actually reflect the avoided costs of reduced T&D capacity from a TRC perspective. The appropriate measure of avoided costs should be a forward looking estimate of the avoided costs if the peak demands on the transmission or distribution system are reduced.

The established best practice to estimate Marginal Transmission Capacity Cost (MTCC) and Marginal Distribution Capacity Cost (MDCC) is the differential revenue requirement method. That is, the change in present value revenue requirement (PVRR) of the transmission-owner or distribution-owner for a change in peak load.<sup>2</sup>

The MTCC or MDCC is relatively simple to calculate if the future 5-year or 10-year planned transmission or distribution capacity expenditures are available. If an EDC does not have a capital expenditure plan, we would urge the PA PUC to consider adopting a proxy based on the results in other jurisdictions or the transmission and distribution tariffs until Pennsylvania-specific transmission costs and EDC-specific marginal distribution costs can be calculated.

The following table shows the calculation necessary to compute the MDCC for a utility.

---

<sup>1</sup> For the latest PJM CONE analysis, see <http://www.pjm.com/markets-and-operations/rpm/~media/markets-ops/rpm/rpm-auction-info/2012-2013-net-cone-calculation.ashx>

<sup>2</sup> See Section 3.5 of the Guide to Resource Planning with Energy Efficiency, A Resource of the National Action Plan for Energy Efficiency, November 2007

Example Marginal Distribution Capacity Cost (MDCC) Calculation		
A	Net Present Value Distribution Growth-related Capital Expenditures (1)	\$100 Million
B	Horizon for Net Present Value	5 Years
C	Forecast Inflation	2%
D	Post-tax Weighted Average Cost of Capital	8%
E	Average Load Growth per Year	50 MW
F	MDCC (\$/kW) MDCC = $A * (1 - (1+C)/(1+D))/E * 1000$	\$111 \$/kW
G	MDCC (\$/kW-year) (2)	\$27.83 \$/kW-year
(1) This should include only those distribution capacity investments necessary due to load growth. Costs for new customer connections should not be included. Additional transformers or new substations in areas with service should be included. Typically land costs are also excluded.		
(2) The annualized MDCC is the total MDCC (\$/kW) levelized over the horizon used to collect the capital expenditures (from B).		

### Ancillary Services Costs

In the strawman proposal, we would urge the PA PUC to consider specifying additional details on how to evaluate the avoided ancillary services costs. In the absence of EDC-specific ancillary services costs, we suggest the EDCs be directed to use the avoided cost of ancillary services in the Cost of New Entrant (CONE) analysis computed by PJM prior to each RPM capacity auction. The current value in the CONE analysis for ancillary services is \$2.199/kW-year throughout PJM.

### Tax Effects

In several places in the strawman, the PA PUC provides guidance on the treatment of tax effects. We would urge the PA PUC to consider one change. For evaluation of tax effects in energy efficiency cost effectiveness, most states include federal tax savings as a benefit to the state (and federal tax costs are a cost for the state), but exclude state tax savings and costs for the purposes of the TRC calculation. The assumption is that state taxes that are reduced as a result of energy efficiency will be offset by either increases in tax rates or structures, or a decrease in state services that affect the same population.

With this principle in mind, we suggest removing the Gross Receipts Tax savings as a benefit, but that the other tax and state funding be kept as described in the strawman. Namely, that the Act 1 funds be excluded from the TRC and the federal tax credits and ARRA funds are considered a benefit in the TRC.

## Net to Gross Ratio

The strawman describes three primary effects that the Net-to-Gross (NTG) ratio is designed to capture. However there are several additional effects, which the PA PUC may want to consider including. Because the three effects are part of a broader set, we suggest that definitions of various NTG factors be moved to a footnote as examples. We are also not sure that the pros and cons of research on NTG issues is needed or clarifies the PA PUC position.

The strawman proposal suggests that the NTG ratio be studied for the more ‘prevalent’ measures. To the extent possible, it might be useful to clarify the criteria to use to evaluate whether an efficiency measure is more ‘prevalent’.

Finally, although implicit, we think it should be clarified that the NTG adjustments based on additional research should be made on a going-forward basis and will not be applied to the program evaluation retroactively. This clarifies what we think the PA PUC intent is for the adjustment.

## Clarification of Incremental Costs

For the purposes of calculating the energy efficiency costs, only the incremental energy efficiency costs and savings should be used. This is implicit in the strawman, but we suggest adding it so that it is more explicit. For example, adding the word incremental to the following sentence on pg. 3.

“The costs calculated in the TRC will include the incremental costs of the various programs paid by an EDC... Thus, for example, the incremental equipment, installation, operation, and ....”

It may also serve the Commission to include a definition of incremental costs. In a nutshell, incremental costs are the additional costs incurred to purchase the efficient product or measure over and above the cost of a measure that would represent “standard practice” for replacing equipment at the end of their useful life (e.g. when they are being replaced anyway). For energy efficiency programs that offer early replacement of a measure or equipment, the incremental cost is the total cost of the efficient device.<sup>3</sup>

## Additional Clarifications

The weighted average cost of capital (WACC) is referred to in the strawman in several locations. We suggest consistently clarifying that it is the EDC’s post-tax weighted average cost of capital that should be used in all of the discounting.

---

<sup>3</sup> See Section 4.1 of the Guide to Resource Planning with Energy Efficiency, A Resource of the National Action Plan for Energy Efficiency November 2007 for a description of the appropriate incremental costs and savings to use for energy efficiency programs that rely on various types of market interventions (e.g. equipment replacement at end of useful life, retrofit applications).

The timeframe for the discounting is not always explicit and could be clarified. The appropriate time period for the discounted savings streams and discounted total costs is the expected useful life of the energy efficiency measure.

### Reporting

We also suggest that the Commission consider requesting EDCs to identify measures that are expected to have energy savings beyond the 15-year horizon, but do not value these savings.

Finally, to evaluate the avoided supply costs, the Commission should ask that the avoided supply costs, by time period, should be reported along with the details and data sources for their development. This will allow EDCs to compare the details of their respective methodologies and for the PA PUC to evaluate how the TRC test framework has been implemented to make any necessary modifications.