

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

DOCKET NO. 09AL-299E

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IN THE MATTER OF ADVICE LETTER NO. 1535 BY PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 7 ELECTRIC TARIFF TO REFLECT REVISED RATES AND RATE SCHEDULES TO BE EFFECTIVE ON JUNE 5, 2009

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STATEMENT OF POSITION OF THE  
SOUTHWEST ENERGY EFFICIENCY PROJECT

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**I. INTRODUCTION**

The Southwest Energy Efficiency Project (“SWEEP”) is advocating that the Public Utilities Commission of Colorado (the “PUC”) send a strong price signal to residential electricity consumers of the Public Service Company of Colorado (“PSCo” or the “Company”) in order to encourage more efficient use of electricity, reduce growth in peak demand, and thereby reduce the need for costly new generation and other electricity supply resources in the future. Such price signals will lower the cost of supplying electricity over the long run and provide other economic, social, and environmental benefits including reduced fossil fuel use, reduced pollutant emissions including greenhouse gas emissions, and lower electricity bills for low-income households on average, relative to the more modest inverted block rate design proposals put forward by PSCo or other parties in this docket.

**II. SWEEP’S INVERTED BLOCK RATE DESIGN PROPOSAL**

SWEEP is proposing a four-tier summer rate and a two-tier winter rate. Given the final revenue requirement value that parties in this docket were provided, our preferred summer

inverted block rate proposal is: \$0.04325/kWh for the first block (up to 200 kWh per month), \$0.06487/kWh for the second block (201 – 700 kWh per month), \$0.08649/kWh for the third block (701 – 2,000 kWh per month), and \$0.12974/kWh for the highest block (over 2,000 kWh per month). Our proposed inverted block rate for winter months is \$0.04325/kWh for the first block (up to 700 kWh per month) and \$0.06487/kWh for consumption over 700 kWh per month. This satisfies the Company's residential sector revenue requirement based on the elasticity assumptions we have made. As discussed below, there are a number of advantages to this rate structure relative to other inverted block rate proposals put forward by PSCo or other parties in this docket.

**A. SWEEP'S PROPOSAL WILL CONSERVE MORE ENERGY AND RESULT IN A GREATER REDUCTION IN PEAK DEMAND.**

SWEEP's inverted block rate proposal provides greater incentives for consumers to conserve energy and use electricity more efficiently, relative to proposals made by other parties in this docket. This is because we propose more blocks and a greater price differential between blocks, as well as a tiered structure in the winter as well as the summer. Using the same price elasticities as PSCo, we estimate using PSCo witness Faruqui's model that our proposal will result in a 1.2% reduction in residential electricity use and a 3.2% reduction in summer peak demand, compared to flat rates (Collins Answer testimony, Exhibit No. RSC-4). For comparison, PSCo estimates that its inverted block rate proposal will result in only a 0.6% reduction in electricity consumption and 1.8% reduction in summer peak demand. An additional 0.6% energy savings is significant given that PSCo's residential customers pay about \$850 million per year for electricity (base rates and fuel costs combined). In addition, because our summer tiered rate proposal has greater differential across blocks compared to the four tier proposal of PUC staff, it

will result in a greater reduction in summer electricity use and peak demand than would staff's proposal.

SWEEP also estimated energy savings and peak demand reduction using higher price elasticities for the third and fourth blocks; elasticity estimates that we believe are justified given the economic literature (Collins Answer Testimony, pages 9-11). With these higher price elasticities, we estimate our preferred inverted block rate structure will result in a 2.1% reduction in energy usage and a 5.3% reduction in peak demand, relative to maintaining flat rates.

**B. SWEEP'S PROPOSAL MORE ACCURATELY REFLECTS MARGINAL COSTS.**

SWEEP'S inverted block rate proposal is consistent with charging the full marginal cost to the highest use customers in the summer. PSCo has estimated that the marginal cost of generation in the summer is about 13 cents per kWh (Brocket Direct Testimony, Exhibit No. SBB-5). As we noted in our testimony, this is a conservative estimate as it does not include marginal transmission costs or the fact that fuel costs per kWh can be significantly higher for marginal generation in the summer compared to fuel costs at other times of the year. In our rate proposal we only apply the Company's estimated marginal cost to the highest block, which affects about 3.2% of customers in the summer but who nonetheless account for about 14% of total residential electricity use. These customers tend to be more affluent than customers on average, and can better afford the higher rate on their marginal electricity use. We balance use of the summer marginal cost for the highest consumption block with much lower rates for consumption in the first and second blocks, such that the total amount of revenue is equal to the approved revenue requirement.

**C. SWEEP'S PROPOSAL BETTER REFLECTS THE IMPACTS OF HIGH ENERGY CONSUMPTION HOUSEHOLDS ON THE UTILITY SYSTEM.**

Sweep's inverted block rate proposal is fair in that it charges customers who place the highest demand on the system in the summer more for their marginal electricity use. Central air conditioning is far from universally used by PSCo's residential customers. According to Xcel Energy's most recent home energy use survey, only about 57% of their residential customers have central air conditioning or a central heat pump. But very high use customers such as those consuming over 2,000 kWh per month in the summer are much more likely to have central air conditioning than lower use customers who may be consuming less than 700 kWh per month. PSCo itself estimates that a typical central air conditioner consumes about 2,750 kWh per year, or an average of about 700 kWh per month in the four summer months (Collins Cross Examination, Hearing Transcript, Volume 3, pages 87-88, 160-161). This means that very high use households in all likelihood have central air conditioning. Furthermore, households with central air conditioning have higher peak-to-average demands than households without central air conditioning, and thus place greater costs on the electric system. It is reasonable to charge these households significantly more for their marginal electricity use than what households without central air conditioning are charged. In addition, air conditioning is one area where customers do have the ability to conserve energy if they so choose in response to a price signal; i.e., by raising the summer thermostat setting at times, by closing registers in unoccupied rooms, or by turning off air conditioning when no one is home (Collins Cross Examination, Hearing Transcript, Volume 3, page 135).

**D. SWEEP'S PROPOSAL PROVIDES MORE INCENTIVES FOR CUSTOMERS TO RESPOND TO PRICES.**

SWEEP's block rate proposal gives more customers a price incentive to conserve energy than does PSCO's or OCC's block rate proposal. PSCO and OCC both propose a two tier block structure in the summer with the cutoff of the first block at 500 kWh per month. SWEEP's preferred four block rate summer proposal has the first block end at 200 kWh per month. This means that SWEEP's proposal has fewer customers who have their entire energy consumption in the first rate block, compared to PSCO or OCC's proposal.

Furthermore, under the SWEEP proposal more customers will find that they have the ability to move into a lower block at the margin (i.e., move marginal consumption out of the fourth block and into the third block, or out of the third block and into the second block) than under the PSCO or OCC proposal. This is the case because providing more blocks means that more customers will find that their marginal electricity use is close to one of the cutoff points. Under PSCO's or OCC's proposal there is no additional price signal for customers consuming over 500 kWh per month. A customer using 2,200 kWh per month, for example, has little or no possibility of reducing his/her usage below the 500 kWh level necessary to achieve a lower rate. On the other hand, the same customer can move marginal consumption to a lower rate by reducing electricity use just 10% under the SWEEP proposal. In effect, medium and high users have a flat rate above the 500 kWh per month level and thus no additional price incentive to reduce electricity use other than that provided by the flat rate alone under the PSCO and OCC proposals. In addition, the rate differential between the first and second blocks is relatively small under the Company's proposal which further reduces the customer's financial incentive to conserve energy and adopt efficiency measures.

**E. SWEEP'S PROPOSAL BENEFITS LOWER INCOME HOUSEHOLDS.**

SWEEP's block rate proposal benefits low usage customers, which tend to be lower income. Lower income households consume less electricity throughout the year than non low-income households (Collins Answer Testimony, Exhibit RSC-8). This difference is most pronounced in the summer, presumably because of less use of air conditioning by lower income households compared to middle and upper income households. Under our proposal, a household consuming just 75 kWh per month would see a 22% reduction in its annual electric bill compared to a 16% reduction under PSCo's proposal, a household consuming 300 kWh per month would see a 11% reduction in its annual electric bill compared to a 7% reduction under PSCo's proposal, and a household consuming the average of 687 kWh per month in the summer and 605 kWh per month in the winter would see a 5% reduction in its annual electric bill compared to a 1% reduction under PSCo's proposal (see Revised Hearing Exhibit 103).

These larger bill reductions for average and below-average electricity consumers are made possible by the higher increases for high usage customers in our proposal. A household consuming 2,000 kWh per month would see a 13% increase in its annual electric bill under our proposal compared to a 7% increase under PSCo's proposal, and a household consuming 4,000 kWh per month would see a 27% increase in its annual electric bill under our proposal compared to a 9% increase under PSCo's proposal (see Revised Hearing Exhibit 103). But it should be noted that only about 3% of households consume 2,000 kWh per month or more, and these tend to be very affluent households that have more floor area, more appliances, and use central air conditioning. In general, such households can afford to pay higher electricity bills and/or can find ways to conserve energy or increase energy efficiency in order to lower consumption and electric bills in response to the strong inverted block price signal proposed by SWEEP.

SWEEP's proposal encourages high usage households to conserve energy and invest in energy efficiency measures to reduce electricity consumption without lowering service or comfort levels. On average such households are larger and have more lights and appliances than low or moderate consumption households. By sending these price signals to high use customers, it increases the likelihood that they will take action to conserve energy and/or invest in efficiency measures such as CFLs, ENERGY STAR appliances, building envelope retrofit, or higher efficiency cooling equipment. Such actions will directly benefit the customer as well as yield indirect benefits for the utility system and thus customers in general. In effect, the SWEEP proposal concentrates a large portion of the rate increase on higher consumption households because they tend to be more affluent households, they contribute a disproportionate share to peak demand and peak demand growth, and because such households have both the means and the opportunities to utilize energy more efficiently.

**F. SWEEP'S PROPOSAL PROVIDES NON-ECONOMIC BENEFITS.**

SWEEP'S proposal, by allowing for greater energy savings and peak demand reduction compared to PSCo's proposal, provides other benefits in addition to the economic benefits of lower electric bills and less need for costly expansion of the electric system in the future. These non-economic benefits include lower fossil fuel consumption and reduced pollutant emissions including lower greenhouse gas emissions. Thus our proposal would contribute more to meeting the state's climate-related goals as stated in Governor Ritter's Climate Action Plan, than would PSCo's or OCC's proposal.

**G. SWEEP'S PROPOSAL SENDS A CONSISTENT MESSAGE TO CONSUMERS.**

Regarding the issue of rates in winter months (actually eight months outside the summer period), SWEEP advocates a two tier structure with a much reduced differential relative to what we propose for the summer months. We believe it is important to send consumers a consistent message about electricity rates year round, namely that the price per kWh increases as more electricity is consumed. In contrast, the rate structure advocated by PSCo and OCC would have tiered rates start in June, end in September, start in June again, end in September, etc. which in our view would be inconsistent and potentially confusing for consumers. By adopting mild inverted block rates outside of the summer, consumers would be given a price signal year round that encourages them to conserve energy and thereby lower their utility bills. And as we noted above, average and below average consumption customers will see a larger reduction in their utility bills in the winter under our proposal than under the winter flat rate proposal made by either PSCo or OCC (see Revised Hearing Exhibit 103). This in turn will benefit lower income households as a whole because on average they consume less electricity than middle and upper income households.

We are not advocating that more revenue be collected from residential consumers in the winter months compared to what PSCo proposes. In fact we estimate that our two tier proposal will result in about \$271.0 million in revenue from residential customers in winter months (see Exhibit 106). In contrast PSCo estimates that its one tier proposal will result in about \$275.5 million in revenue in winter months (see Exhibit 105). However, we propose collecting this revenue in a slightly different fashion than PSCo with two tiers of approximately 4.3 and 6.5 cents per kWh, instead of one tier at 4.9 cents per kWh. Also, we note that our winter block rate

proposal is simpler and has less differential across the blocks than the four block winter proposal advocated by the PUC staff. We think our more modest winter tiered rate proposal is preferable given that peak load occurs in the summer and that system expansion is caused primarily by load growth in the summer.

PSCo has raised an issue of SWEEP's upper winter tier being above what the Company has indicated is the marginal cost of electricity supply in the winter. We note, however, that estimating marginal cost is more of an art than a science. SWEEP, along with the PUC staff, take issue with the Company's calculation of winter marginal cost which assumes zero loss of load probability to winter months and thus assigns all marginal generation costs to summer months. New baseload or intermediate load generation will be used to serve both summer and winter loads, and some of this cost in our view should be assigned to the winter period (Collins Cross Examination, Hearing Transcript, Volume 3, pages 154-157). Thus we believe the Company is underestimating the total marginal cost of electricity supply in the winter. Given the uncertainty in the winter marginal cost and our contention that the Company has underestimated it, we do not believe it is a fundamental flaw to collect a modest portion of revenue at a cost that may be higher than the winter marginal cost as estimated by the Company, as long as the total amount collected does not exceed the approved revenue requirement.<sup>1</sup>

Our four tier summer rate proposal was criticized by PSCo and by OCC as being too complicated and potentially confusing to consumers. We disagree and point out that many Colorado households have a successfully dealt with a four block rate design as utilized by Denver Water and other water utilities in the metro Denver region as the method for charging

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<sup>1</sup> We note that according to our calculations, the amount of revenue collected at the higher tier in the winter is about \$88 million compared to total revenue from the residential class of about \$558 million (see Exhibit 106).

households for water consumption. In addition, we note that a number of other states including California, New Mexico, and Utah have adopted inverted block rate structures with three to five tiers in the summer (UT) or year round (CA and NM) for major investor-owned utilities, and there does not appear to be significant confusion or objections from consumers affected by such rates. On this issue, it stretches credibility to say that customers will understand a two tier system, but not a four tier system. Either a customer understands tiered rates, or he/she does not.

Moreover, we strongly recommend that a concerted consumer education campaign be undertaken to inform consumers about the new rate structure including explaining to customers: a) that rates in the lower consumption blocks have been reduced relative to flat rates while rates in the upper consumption blocks have been increased, and b) that saving energy will effect usage in the tail block and thus be more valuable for most customers than was the case with flat rates. In addition, the education campaign should explain to consumers the steps that can be taken to conserve energy and minimize electricity use in ones tail block (Collins Cross Examination, Hearing Transcript, Volume 3, pages 143 and 152). Conducting this sort of education campaign is also endorsed by PSCo witness Faruqui (Faruqui Cross Examination, Hearing Transcript, Volume 5, pages 188-89, 205). A well-designed education campaign along these lines would reduce any confusion that might arise and would smooth the transition from flat rates to inverted block rates.

### III. CUSTOMER FIXED CHARGE

SWEEP is advocating maintaining the customer fixed charge at \$6.25 per month instead of raising it to \$6.75 per month as advocated by PSCo. SWEEP believes that collecting more revenue in the variable charge and less in the fixed charge will encourage greater conservation

and energy efficiency. In particular we estimate that this particular policy (maintaining the fixed charge at \$6.25 per month rather than increasing it to \$6.75 per month) will lead to about a 0.3% reduction in electricity use and peak demand (Collins Answer Testimony, pages 21-22). To be clear we are not advocating reducing revenue for the Company, only that slightly more revenue be collected from variable (per kWh) charges and that revenue from the fixed charge remain basically the same.

#### IV. ELASTICITY ADJUSTMENT

The issue of whether or not to include a price elasticity adjustment in inverted block rate design is one of the more contentious issues in this docket. SWEEP agrees with PSCo that it is appropriate to include an elasticity adjustment when moving from flat rates to inverted block rates. This concept is supported by economic theory, and will increase the likelihood that PSCo will be able to recover its fully allowed revenue from the residential class. Given that a primary purpose of inverted block rates is to encourage customers to conserve energy and use energy more efficiently, we believe it is reasonable for the Commission to take the projected demand response into account when changing from flat rates to inverted block rates.

If the Commission supports the principal of including an elasticity adjustment in rate design, the question becomes what elasticity values to assume. We believe the elasticity values put forward by the Company are reasonable if not conservative. We also believe an argument can be made for using somewhat higher elasticities for the upper tiers of our summer four block rate proposal, consistent with the position of PSCo witness Faruqui that it is logical to assume higher elasticity values as electricity consumption increases (Collins Answer Testimony, pages 10-11). However, we employed the elasticity values estimated and used by the Company (not higher

values) in our calculation of appropriate rates to meet the final revenue requirement amount provided to the parties in this docket (see Revised Hearing Exhibit 106).

## V. TIME OF USE RATES

SWEEP acknowledges that time of use (TOU) rates can send more accurate price signals to consumers about the cost they are placing on the utility system than do inverted block rates. However, there are substantial costs for installing the new meters that would be necessary to implement TOU rates in the residential sector. It is not known at this time if this is a cost-effective proposition; i.e., whether or not installing these meters provides economic benefits that exceed the costs (Collins Cross Examination, Hearing Transcript, Volume 3, page 128). Furthermore, it will take several years at best to answer this question and then install the new meters and implement TOU rates for all residential customers, if research shows that implementing TOU rates is cost effective. In the mean time (and perhaps for the long term), it makes sense to “not let the perfect be the enemy of the good.” Adopting strong inverted block rates, as proposed by SWEEP, will provide a wide range of benefits as described above and will do so at virtually no cost to the utility system as a whole (i.e., implementing inverted block rates does not require any upfront capital investment).<sup>2</sup>

The question of the relative merit of inverted block rates vs. TOU rates for the purpose of supporting plug-in hybrid and electric vehicles was raised at the hearing. SWEEP acknowledges that inverted block rates, independent of the details of the rate structure, could provide a disincentive to adoption of plug-in hybrid and electric vehicles because adoption of these

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<sup>2</sup> There would be a modest cost for reprogramming the company’s billing system, but there is no hardware cost associated with implementing inverted block rates.

vehicles would significantly increase a household's total electricity demand, and thus increase consumption in the more expensive tail block under inverted block rates. To address this concern, we suggest that households be offered an optional TOU rate if and when plug-in hybrid and electric vehicles become a reality, in conjunction with adoption of inverted block rates as the standard residential tariff.

## VI. DEMAND RATCHET FOR BUSINESS CUSTOMERS

SWEEP does not support the 75% demand ratchet proposed by PSCo for SG, PG and TG customers. The Company's demand ratchet proposal is not based on the principal of charging customers based on cost causation. Also, it will discourage customer investment in energy efficiency and renewable energy. Customers that adopt substantial energy efficiency and/or peak demand reduction measures, or major on-site PV or other renewable energy projects, will be penalized financially if their utility bills did not reflect their full reduction in energy use or peak demand, at least for the first year after the investment is made. This would be the case if the energy efficiency or renewable energy project results in more than a 25% reduction in energy use and/or peak demand. SWEEP recommends that the Commission reject the 75% demand ratchet. Business customers should be charged based on their actual energy use and peak demand, not on previous levels of energy use and peak demand.

## VII. INNOVATIVE RATES FOR COMMERCIAL AND INDUSTRIAL CUSTOMERS

In the Answer Testimony of Dr. Richard Collins, SWEEP discussed the innovative rate design adopted by BC Hydro for industrial customers. This rate design assigns customers a baseline electricity demand based on average monthly consumption over the previous 12 months.

The rate design is a two tier rate structure with a lower rate for consumption up to 90% of the baseline and a much higher rate for consumption above 90% of the baseline. This rate structure provides a strong economic incentive for energy efficiency by increasing the marginal cost of electricity for the vast majority of industrial customers. SWEEP recommends that the Commission study this rate design concept further and consider directing PSCo to adopt it in the future.

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Respectfully submitted on behalf of the  
Southwest Energy Efficiency Project

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