

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

IN THE MATTER OF THE APPLICATION OF)
BLACK HILLS/COLORADO ELECTRIC)
UTILITY COMPANY, L.P., DOING BUSINESS)
AS BLACK HILLS ENERGY, FOR APPROVAL)
OF ITS ELECTRIC DEMAND SIDE)
MANAGEMENT (DSM) PLAN FOR)
CALENDAR YEARS 2009, 2010, AND 2011)
AND FOR APPROVAL OF AN ELECTRIC)
DSM COST ADJUSTMENT CLAUSE.)

Docket No. 08A-518E

Answer Testimony of

Howard Geller

on behalf of

**Southwest Energy Efficiency Project (SWEEP) and
Western Resource Advocates (WRA)**

March 16, 2009

1

2 **Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.**

3 A. My name is Howard Geller. I am the Executive Director of SWEEP, the Southwest
4 Energy Efficiency Project. My business address is 2260 Baseline Rd. Suite 212,
5 Boulder, Colorado 80302.

6 **Q. FOR WHOM ARE YOU TESTIFYING?**

7 A. I am testifying on behalf of the Southwest Energy Efficiency Project (SWEEP) and
8 Western Resource Advocates (WRA).

9 **Q. PLEASE DESCRIBE SWEEP.**

10 A. SWEEP is a private not-for-profit organization dedicated to advancing energy
11 efficiency in six states in the Southwest including Colorado. It receives the majority
12 of its funding from charitable foundations and the Federal government.

13 **Q. PLEASE DESCRIBE WRA.**

14 A. WRA is a private not-for-profit organization that uses law, economics and policy
15 analysis to protect land, water resources, and environmental quality in the Interior
16 West.

17 **Q. WHAT ARE YOUR PROFESSIONAL QUALIFICATIONS?**

18 A. I have 27 years of experience working on energy efficiency policy and program
19 design, analysis, evaluation and advocacy. Prior to founding SWEEP in 2001, I
20 served as Executive Director of the American Council for an Energy-Efficient
21 Economy (ACEEE) in Washington, DC. I have authored or co-authored four books
22 on energy efficiency and energy policy, and published dozens of reports and articles
23 on these topics. I have testified previously before the public utility commissions of

1 Colorado, Illinois, Maryland, Nevada, New Mexico, Utah, Wyoming and the District
2 of Columbia. Exhibit HG-1 summarizes my professional qualifications.

3 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

4 A. In my testimony I will comment on the 2009-2011 demand-side management (DSM)
5 plan submitted by Black Hills Energy (BHE) in this docket, along with the issues of
6 appropriate energy savings goals, incentive mechanism, and related issues.

7 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

8 A. First, I recommend that the Commission adopt the same energy savings goals in
9 percentage terms that it did for PSCO in its decision in Docket No. 07A-420E. These
10 are about twice the energy savings goals proposed by BHE over a ten-year period.
11 Second, I recommend adopting the same shareholder incentive mechanism for BHE
12 as the Commission adopted for PSCO, consistent with BHE's proposal in this area.
13 Third, I support the DSM program cost recovery policies proposed by BHE, including
14 prospective recovery of DSM program costs and a uniform DSMCA surcharge in
15 percentage terms applied to all customer classes.

16 Turning to the details of the DSM programs proposed for 2009-2010, I
17 recommend that the Commission direct BHE to expand a number of its proposed
18 programs, namely the residential lighting and cooling programs and the commercial
19 and industrial prescriptive and custom rebate programs. In addition, I recommend that
20 the Commission direct BHE to implement a second refrigerator recycling program, an
21 ENERGY STAR new homes program, and an air conditioner load control program.
22 Doing so will increase participation levels, energy savings, and the net economic
23 benefits resulting from the DSM programs.

1 In total, I recommend a DSM budget of about \$2.7 million in 2009 (for the
2 first 12 months of program activity), \$4.4 million in 2010, and \$4.5 million in 2011.
3 These values are about 55% higher than the total DSM budget proposed by BHE. I
4 estimate that the SWEEP/WRA alternative DSM plan will result in about 12.4 GWh
5 per year of savings from 2009 programs, and 18 GWh per year of savings from 2010
6 and 2011 programs. The energy savings levels are more than adequate to meet the
7 savings goals I recommend.

8 **Q. WHAT IS THE POLICY OF THE STATE OF COLORADO REGARDING**
9 **ENERGY SAVINGS AND PEAK DEMAND REDUCTION GOALS FOR**
10 **INVESTOR-OWNED ELECTRIC UTILITIES IN THE STATE?**

11 A. House Bill 07-1037, adopted by the Colorado General Assembly and approved by
12 Governor Ritter, directs the Public Utilities Commission to establish energy savings
13 and peak demand reduction goals for investor-owned electric utilities (see section 40-
14 3.2-104, paragraph 2 of that law). The statute states, “The energy savings and peak
15 demand reduction goals shall be at least five percent of the utility’s retail system peak
16 demand measured in megawatts in the base year and at least five percent of the
17 utility’s retail energy sales measured in megawatt-hours in the base year. The base
18 year shall be 2006. The goals shall be met in 2018, counting savings in 2018 from
19 DSM measures installed starting in 2006. The Commission may establish interim
20 goals and may revise the goals as it deems appropriate.”

21 **Q. WHAT ENERGY SAVINGS AND PEAK DEMAND REDUCTION GOALS**
22 **HAS BLACK HILLS ENERGY PROPOSED?**

23 A. Black Hills Energy (BHE) witness Daunis indicated that the company’s 2009-2011
24 DSM plan is consistent with meeting the minimum requirements of HB 07-1037,

1 namely a five percent reduction from 2006 peak demand and energy by 2018.
2 Regarding the specific energy savings levels in the plan, the goal of saving 8.12 GWh
3 in 2009 (assuming 12 months of program activity) is equivalent to about 0.41% of the
4 2006 energy sales and the goals of savings 12.4 GWh in both 2010 and 2011 are
5 equivalent to saving about 0.60% of 2006 energy sales. Furthermore, in response to
6 CPUC Data Request 1-7, BHE indicates it intends to save a total of 93.9 GWh in
7 2018 as a result of DSM programs implemented during 2009-2018. This is equivalent
8 to 5.15% of the utility's retail energy sales in 2006. This is slightly greater than the
9 statutory minimum of 5% savings that year.

10 **Q. WHAT ENERGY SAVINGS GOALS DID THE COMMISSION ADOPT FOR**
11 **PUBLIC SERVICE COMPANY OF COLORADO (PSCO)?**

12 A. In Decision No. C08-0560 in Docket No. 07A-420E, the Commission adopted energy
13 savings goals for PSCO each year for 2009-2020. The goals start at saving 0.53% of
14 sales in 2009 and then increase to 0.76% of sales in 2010, 0.80% of sales in 2011,
15 0.85% in 2012, 0.90% in 2013, 0.95% in 2014, 1.00% in 2015, 1.05% in 2016, 1.10%
16 in 2017, 1.15% in 2018, and 1.20% in 2019 and 2020. The goals are expressed as a
17 percent of actual sales each year, not of sales in the base year (2006). Furthermore,
18 the shareholder incentive structure adopted by the Commission for PSCO is tied to
19 achievement of these energy savings goals. The incentive structure encourages PSCO
20 to exceed these energy savings goals by increasing the amount of the incentive as
21 energy savings increases. The maximum incentive is provided if PSCO achieves
22 150% of the energy savings goal in any particular year.

1 Q. **DID THE COMMISSION ESTABLISH ENERGY SAVINGS GOALS FOR**
2 **PSCO THAT EXCEEDED THE MINIMUM ENERGY SAVINGS**
3 **REQUIREMENTS SPECIFIED IN HOUSE BILL 07-1037?**

4 A. Yes it did. The total energy savings in 2018 if PSCO exactly meets the goals
5 established by the Commission during 2009-2018 is 2,834 GWh. This is equivalent to
6 10.4% of PSCO's retail energy sales in 2006.

7 Q. **DO YOU RECOMMEND THAT THE COMMISSION ESTABLISH ENERGY**
8 **SAVINGS GOALS FOR BHE THAT ARE EQUIVALENT TO THE GOALS IT**
9 **ESTABLISHED FOR PSCO?**

10 A. Yes I do. BHE has determined through its market potential study that there is a very
11 large potential for cost-effective energy savings in its Colorado service area. In
12 particular, the market potential study found an economic potential to save 457.2 GWh
13 in 2017 (see Appendix A to the 2009-2011 DSM Plan submitted by BHE). This is
14 equivalent to 25% of the Company's retail electricity sales as of 2006. House Bill 07-
15 1037 states that, "It is the policy of the State of Colorado that a primary goal of
16 electric utility least-cost resource planning is to minimize the net present value of
17 revenue requirements." Maximizing the implementation of cost-effective energy
18 efficiency measures and programs, i.e., those with benefit-cost ratio of greater than
19 1.0 using the Total Resource Cost test, will contribute to achievement of this policy
20 objective.

21 I recommend the Commission adopt the same energy savings goals in
22 percentage terms for BHE as the Commission adopted for PSCO in Docket No. 07A-
23 420E. Using the same cumulative goal of saving 10.4% of 2006 sales through DSM

1 programs implemented in 2009-2018, BHE's cumulative goal would be to save about
2 190 GWh in 2018.

3 **Q. WHAT HAS PSCO OFFERED TO PURSUE IN TERMS OF ENERGY**
4 **SAVINGS GOALS AND HOW DOES THAT RELATE TO THE GOALS YOU**
5 **RECOMMEND FOR BHE?**

6 A. In the rebuttal testimony of PSCo witness Debra Sundin in Docket No. 07A-420E,
7 PSCO offered to attempt to achieve 50% of the economic potential identified in its
8 market potential study over a 10 year period. This level of savings was the basis for
9 the Company's Enhanced DSM plan. The level of savings that PSCO said it is willing
10 to strive to achieve over 10 years, 50% of the economic potential, is more than the
11 savings goal I recommend for BHE which is only about 40% of the economic savings
12 potential identified in BHE's market potential study. Thus the savings goals I am
13 suggesting are conservative as a fraction of BHE's economic savings potential,
14 relative to what PSCO believes it can achieve as a fraction of its savings potential.

15 **Q. IS IT REASONABLE TO SET THE SAME ENERGY SAVINGS GOALS FOR**
16 **BHE AS FOR PSCO GIVEN THAT THE TWO UTILITIES HAVE A**
17 **DIFFERENT LEVEL OF HISTORICAL EXPERIENCE IMPLEMENTING**
18 **DSM PROGRAMS?**

19 A. Yes I believe it is reasonable to set the same energy savings goals for the two utilities
20 in spite of differing level of experience with DSM. First, as noted by BHE witness
21 Arnall, the Company operating as Aquila, Inc. had active DSM programs during
22 1996-2004. The fact that the Company did not operate DSM programs during 2005-
23 2008 suggests that there is less awareness and use of energy efficiency measures
24 among its customers, which in turn implies greater energy efficiency potential in the

1 future relative to a service area such as PSCO's where DSM programs were operated
2 continuously and were ramped up, not down, in recent years. While it may take more
3 time for BHE to introduce and grow DSM programs from a "zero base" compared to
4 PSCO which had a broad base of program prior to 2009, this is compensated for by
5 the point above which suggests greater remaining energy savings potential in the
6 BHE service area. Furthermore, BHE points out in the testimony of witness Stone
7 that it has considerable experience implementing comprehensive DSM programs in
8 Iowa, and this experience should help the company as it reintroduces DSM programs
9 in its Colorado electric service area.

10 **Q. PLEASE COMMENT ON THE LEVEL OF ENERGY SAVINGS THAT**
11 **OTHER UTILITIES WITH COMPREHENSIVE, WELL-FUNDED, AND**
12 **EFFECTIVE DSM PROGRAMS ARE ACHIEVING?**

13 A. First, the 2006 report of the Energy Efficiency Task Force convened by the Western
14 Governors' Association states, "Leading electric utilities in the country are investing
15 2-3 percent of their revenues on DSM programs. These programs in turn save the
16 equivalent of around 0.8-1.0 percent of electricity sales each year." The report also
17 states that "DSM programs typically save electricity at a total cost of \$0.02-0.03/kWh
18 (utility plus participant costs), meaning that improving end-use efficiency is the least
19 expensive electricity resource."¹

20 Second, there are examples of utilities in the southwest region that have
21 ramped up their DSM programs in recent years and are achieving energy savings
22 close to or within this range. For example, Arizona Public Service Company saved
23 about 274 GWh per year from its DSM programs in 2007, nearly 1.0 percent of the

1 utility's retail electric sales as of 2006.² Nevada Power Company estimates it saved
2 about 155 GWh per year (about 0.75 percent of 2006 retail electricity sales) from
3 DSM programs implemented in 2007. Nevada Power also exceeded its goal of saving
4 183 GWh per year (about 0.89 percent of 2006 sales) from DSM programs in 2008.
5 Sierra Pacific Power Company, another utility in Nevada, set a goal of saving 76.6
6 GWh per year from DSM programs in 2008, about 0.85 percent of 2006 sales, and
7 also exceeded this goal by a wide margin.

8 Third, the American Council for an Energy-Efficient Economy (ACEEE)
9 recently reported on energy efficiency achievements of DSM programs in leading
10 states.³ ACEEE's summary, presented in Exhibit HG-2, shows that a number of
11 utilities (or third party administered DSM programs) are now achieving 1 percent or
12 greater energy savings from DSM programs implemented annually. For example,
13 investor-owned utilities in California saved over 1.5 percent of electricity sales from
14 programs implemented in 2007. In Vermont, the organization Efficiency Vermont,
15 which receives ratepayer funds to implement DSM programs statewide, is in the
16 process of reducing electricity use by 3.5 percent from programs in 2007-08, a
17 savings of 1.75 percent annually.

18 Fourth, a number of states have set energy savings goals or requirements for
19 utility DSM programs well above the level of savings proposed by Black Hills. In
20 New Mexico, amendments adopted in 2008 to the Efficient Use of Energy Act require

¹ *Energy Efficiency Task Force Report*. Clean and Diversified Energy Initiative, Western Governors' Association, Denver, CO, Jan. 2006. <http://www.westgov.org/wga/initiatives/cdeac/Energy%20Efficiency-full.pdf>

² H. Geller and J. Schlegel. "Update on Utility Energy Efficiency Programs in the Southwest." *Proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings*. Washington, DC: American Council for an Energy-Efficient Economy. Aug. 2008.

³ M. Eldridge, et al. *Energy Efficiency: The First Fuel for a Clean Energy Future. Resources for Meeting Maryland's Electricity Needs*. Report No. E082. Washington, DC: American Council for an Energy-Efficient Economy. Feb. 2008. <http://aceee.org/pubs/e082.pdf>

1 utilities to achieve energy savings of 5% of 2005 sales by 2014 and 10% of 2005
2 sales by 2020, from DSM programs implemented starting in 2007. Minnesota is
3 requiring its electric utilities to save 1.5% of retail sales each year; Illinois has
4 adopted energy savings goals that ramp up to 2.0% savings per year by 2015; and
5 New York has set a goal of reducing projected electricity use in 2015 by 15%.⁴
6 California also adopted a goal of savings 10% of electricity sales over a ten-year
7 period.

8 **Q. HAS BHE PROPOSED SHAREHOLDER INCENTIVES FOR ITS DSM**
9 **PROGRAMS AND IF SO WHAT INCENTIVES HAS THE UTILITY**
10 **PROPOSED?**

11 A. BHE witness Arnall has proposed that BHE be given the same incentives
12 that the Commission approved for PSCO in Docket No. 07A-420E. This incentive
13 structure includes a fixed bonus if the utility achieves at least 80% of its energy
14 savings goal in any year along with a sliding scale bonus based on the level of energy
15 savings achieved. The maximum bonus is provided if the utility achieves 150% of its
16 energy savings goal. The bonus is also capped at 20% of the expenditures on DSM
17 programs in any one year.

18 **Q. DO YOU SUPPORT ADOPTING THIS INCENTIVE STRUCTURE FOR**
19 **BHE?**

20 A. Yes I do. I believe this incentive structure is sound in that it provides the utility a
21 reasonable opportunity to profit from its DSM investments, while at the same time
22 tying the amount of incentive to the achievement of energy savings and net economic
23 benefits for customers. I believe the incentive cap balances the interest of consumers

⁴ S. Nadel. 2007. "Energy Efficiency Resource Standards Around the U.S. and the World." Washington, DC: American Council for an Energy-Efficient Economy. Sept. 2007.

1 and the utility in a reasonable manner. Also, I believe it is logical to provide both
2 investor-owned electric utilities in the state with the same incentive structure, as well
3 as other DSM policies such as energy savings goals and cost recovery procedures that
4 are the same. Therefore, I support BHE's proposal regarding shareholder incentives.

5 **Q. WHAT DOES ADOPTING THE INCENTIVE STRUCTURE PROPOSED BY**
6 **BHE IMPLY FOR ENERGY SAVINGS GOALS?**

7 A. I believe that adopting the incentive structure supported by BHE, namely the
8 incentive structure the Commission adopted for PSCO, suggests that the Commission
9 should adopt the same energy savings goals in percentage terms for the two utilities
10 given that a utility's actual incentive level is tied to its actual energy savings relative
11 to its savings goal. It would be unfair to PSCO to set lower energy savings goals in
12 percentage terms for BHE but then use the same incentive structure for the two
13 utilities. Doing so would make it easier for BHE to obtain the same level of incentive
14 in percentage terms as PSCO. Likewise it would be unfair to BHE to set higher
15 energy savings goals in percentage terms for BHE but then use the same incentive
16 structure for the two utilities as it would make it harder for BHE to obtain the same
17 level of incentive as PSCO. In other words, adopting the same incentive structure (as
18 BHE recommends) is further rationale for adopting the same energy savings goals for
19 the two utilities in percentage terms.

20 **Q. HAS BHE PROPOSED A COST RECOVERY POLICY FOR ITS DSM**
21 **PROGRAMS AND IF SO WHAT COST RECOVERY POLICY HAS THE**
22 **UTILITY PROPOSED?**

23 A. BHE witness Arnall recommends adopting the same DSM cost recovery policy,
24 namely prospective recovery of projected DSM program expenses along with

1 asymmetric application of interest to any deferred balance in the DSM account, which
2 the Commission approved for PSCO.

3 **Q. DO YOU SUPPORT THIS PROPOSAL?**

4 A. Yes I do. First, I think it is a fair policy. Second, as I noted above, I think it makes
5 sense to adopt the same basic DSM policies for both investor-owned electric utilities
6 in the state. Also, I support adopting the same policy on payment of any shareholder
7 incentive that BHE earns as the Commission adopted for PSCO in Docket No. 07A-
8 840E.

9 **Q. HAS BHE PROPOSED A TARIFF DETERMINATION AND COLLECTION**
10 **POLICY FOR ITS DSM PROGRAMS AND IF SO WHAT TARIFF POLICY**
11 **HAS THE UTILITY PROPOSED?**

12 A. BHE witness Arnall proposes using the same DSMCA tariff mechanism that was in
13 place previously for the company. Tariff determination and recovery would be
14 updated to reflect prospective recovery of DSM costs once the 2009-2011 DSM plan
15 is approved by the Commission. The same tariff amount in percentage terms would
16 be applied to all customer classes.

17 **Q. DO YOU SUPPORT THIS PROPOSAL?**

18 A. Yes I do. As I understand it, this is the same DSM tariff policy that PSCO uses
19 following review and approval by the Commission. As I noted above, I think it makes
20 sense to adopt the same basic DSM policies for both investor-owned electric utilities
21 in the state. Also, I think it is fair for all customer classes to pay the same DSM
22 surcharge in percentage terms as all customers benefit from the avoided energy costs,
23 avoided capital costs, and avoided emissions from DSM programs. As long as BHE is
24 implementing a diverse and comprehensive set of DSM programs that give all

1 customers an opportunity to participate, it is reasonable to ask all customers to pay
2 the same amount in percentage terms; i.e., low-income households and large
3 industrial customers would be treated equally and would pay the same percentage
4 increase in their utility bills for the purposes of DSM cost recovery and payment of
5 any shareholder incentive that the Company earns.

6 **Q. TURNING TO THE DETAILS OF BHE'S 2008-2011 DSM PLAN, WHAT IS**
7 **YOUR OVERALL ASSESSMENT OF THE ELECTRIC DSM PROGRAMS**
8 **PROPOSED BY BHE?**

9 A. I think BHE has made a good start at developing a comprehensive set of DSM
10 programs and I support all of the programs proposed by company. All the programs
11 are likely to achieve energy savings and peak load reductions, and do so cost
12 effectively, in my view. However, I think that a number of the programs can and
13 should be expanded upon in ways that I explain below. Furthermore, I think there are
14 additional cost-effective DSM programs that BHE should implement in order to take
15 advantage of cost-effective energy efficiency opportunities that exist in its service
16 area, in order to maximize program participation, energy savings, and net economic
17 benefits for its customers. Note that all of my comments on specific programs assume
18 three full years of program activity; i.e., implementation of the 2009-2011 plan
19 starting in mid-2009 and continuing through mid-2012.

20 **Q. WOULD BHE NEED TO EXPAND ITS DSM PROGRAMS, RELATIVE TO**
21 **THE PLAN IT SUBMITTED, IN ORDER TO MEET THE ENERGY**
22 **SAVINGS GOALS YOU RECOMMEND?**

23 A. Yes it would. The level of energy savings indicated by the goals depends
24 on future electricity sales. Based on the sales forecast BHE provided in response to

1 staff data request CPUC 1-7, the goal for 2009 would represent total energy savings
2 of 10.2 GWh per year, the goal for 2010 would represent total energy savings of 15.2
3 GWh per year, and the goal for 2011 would represent total energy savings of 16.5
4 GWh per year. Thus, BHE would need to increase the total amount of energy savings
5 during 2009-2011 by 23-33%, relative to the savings estimated for its proposed DSM
6 plan, in order to achieve the energy savings goals I recommend.

7 **Q. TURNING TO SPECIFIC DSM PROGRAMS, DO YOU HAVE COMMENTS**
8 **ON THE PROPOSED RESIDENTIAL HIGH EFFICIENCY LIGHTING**
9 **PROGRAM?**

10 A. CFLs are a very cost effective energy efficiency measure at this time.
11 However, the CFL program proposed BHE is too modest in my view. This type of
12 DSM program, featuring manufacturer and retailer incentives so that the customer is
13 offered a discounted CFL at the point of sale, has been very effective in other
14 jurisdictions.⁵ Other utilities in the region that have successfully implemented this
15 type of program include Nevada Power Company and Arizona Public Service (APS).
16 In March 2007, APS won an ENERGY STAR Partner of the Year award from the
17 U.S. EPA and Department of Energy for its CFL buydown program. APS, which
18 serves about 1.0 million households, projects that its customers purchased 3.5 million
19 CFLs through its home lighting program by the end 2007, less than three years after
20 the program began.⁶ This is about 3.5 lamps per household on average. Nevada Power
21 Company distributed over 1.5 million CFLs through its program in 2007 alone,
22 equivalent to over 2 lamps per household. Likewise Public Service Company of New

⁵ H. Geller. 2005. *Policies and Programs for Increasing the Adoption of High-Efficiency Lighting in Homes in the Southwest*. Boulder, CO: Southwest Energy Efficiency Project. Oct.

http://www.swenergy.org/pubs/Lighting_Policy_Report.pdf

⁶ See Geller and Schlegel, Reference 2.

1 Mexico is planning to stimulate the adoption of about two CFLs per household on
2 average through its 2009 CFL incentive program; i.e., in just one year of program
3 activity.

4 In contrast, BHE is proposing to stimulate the adoption of only about 0.7
5 CFLs per household per year through its home lighting program during 2009-2011, or
6 about 2 CFLs on average over a three-year period. This is much less than what other
7 utilities in the region have achieved or are planning to achieve. I recommend that this
8 value be increased to at least 1.2 CFLs per household per year, meaning a target of
9 disseminating at least 100,000 CFLs per year. Doing so would significantly increase
10 the total energy savings achieved by BHE's overall DSM portfolio given that this
11 program provides more savings than any other single program. Higher CFL sales and
12 customer participation could be achieved through increased marketing, involving
13 more retailers in the program, and removing restrictions in the program. Regarding
14 the latter, the program design presented by BHE states that households would be
15 prohibited from obtaining more than one rebate per year. This restriction could be
16 eliminated, as is the case in other CFL incentive programs such as the program being
17 implemented by PSCO.

18 I estimate that the budget for the home lighting program would need to be
19 increased by about \$80,000 per year to accommodate this higher level of participation
20 and CFL sales. Scaling up the program in this manner would provide more energy
21 savings and should also improve the benefit-cost ratio by spreading the marketing and
22 administration costs over a greater number of participants.

23 **Q. DO YOU HAVE COMMENTS ON THE SCHOOL-BASED EDUCATION**
24 **PROGRAM?**

1 A. This type of DSM program, involving education as well as distribution of low-cost
2 energy efficiency measures to fifth or sixth grade students, has been successfully
3 implemented by many other utilities. The contractor that most utilities use has
4 considerable experience in program implementation and evaluation, and the program
5 is implemented on a turn-key basis with this contractor.

6 I have two comments on the proposed program. First, I recommend using the
7 experience of other utilities to estimate an energy savings impact from the program,
8 rather than assuming zero savings as BHE had done in its DSM plan. Xcel Energy,
9 for example, is assuming average savings of about 315 kWh per year per student/kit
10 in its school-based education program in New Mexico. I recommend that BHE use a
11 similar savings assumption in its DSM plan, with post-implementation program
12 evaluation carried out to revise this value once actual energy savings results are
13 obtained. Second, I recommend expanding the program if possible by involving more
14 classes and students. BHE is proposing to serve only 750 students per year. Xcel
15 Energy, for comparison, is planning to serve about 3,000 students per year in its 2009
16 program in New Mexico—four times the number that BHE is targeting. To place
17 these figures in perspective, Xcel Energy serves 20% more total customers in New
18 Mexico than does BHE. Thus Xcel expects much greater participation in its school
19 education program than does BHE. Once again increasing program scale should
20 reduce the cost per participant and increase the benefit-cost ratio by spreading
21 management and administrative costs over more participants. While I believe it
22 should be possible to scale up the program, I do not have a specific recommendation
23 for doing so at this time.

1 **Q. DO YOU HAVE COMMENTS ON THE HIGH EFFICIENCY COOLING**
2 **PROGRAM?**

3 A. The basic program design involving rebates for high efficiency air conditioners, heat
4 pumps, and evaporative cooling equipment, along with incentives to contractors for
5 following quality installation procedures, is sound in my view. However, I
6 recommend adoption of additional incentives and higher incentives in some cases.
7 First, I recommend adding an incentive of \$600 for central air conditioners and heat
8 pumps with an SEER rating of 16 or greater and an EER of 13 or greater. Right now
9 the program only has a \$400 incentive for units with a SEER=15 and EER=12.5, or
10 greater. Second, I recommend paying higher incentives for evaporative cooling
11 equipment, namely a rebate of \$300 for a basic evaporative cooler and \$750 for a
12 whole house system with an effectiveness rating of at least 85%. There is
13 considerable energy and peak demand savings from using evaporative cooling rather
14 than central air conditioning, and consequently more generous incentives should be
15 offered to promote greater reliance on this cooling technology. Third, I recommend
16 allowing builders to participate in the program, not just residential customers.
17 Installing a high efficiency air conditioning system or evaporative cooler in new
18 homes is just as valuable as doing so on a replacement basis in existing homes.

19 In order to accommodate these changes, I recommend increasing the overall
20 budget for the program by about 20% or \$50,000 in 2009 and \$100,000 in 2010 and
21 2011. Total energy savings and peak demand reduction should increase by a
22 proportionate amount in particular by stimulating purchase of more evaporative
23 coolers. Evaporative coolers offer greater energy savings per unit than do high
24 efficiency central air conditioners.

1 Q. **DO YOU HAVE COMMENTS ON THE PROPOSED BUSINESS**
2 **PROGRAMS?**

3 A. Apart from CFLs, commercial and industrial sector incentive programs are the “bread
4 and butter” for utility DSM programs these days. BHE’s DSM potential study showed
5 that the commercial sector offers higher economic savings potential in percentage
6 terms, compared to the residential or industrial sectors. The business programs
7 proposed by BHE are consistent with what other leading utilities are offering in some
8 respects. However, I recommend increasing the participation level and impact of both
9 the prescriptive and custom incentive programs proposed by BHE. This can be
10 accomplished through increased marketing, increased technical assistance for
11 businesses, and if necessary paying higher rebate levels.

12 In terms of specific recommendation, I recommend that BHE offer discounted
13 energy audits and other technical support to all business customers, not just to non-
14 profit organizations as is currently stated in the DSM plan. This would increase the
15 understanding of energy efficiency opportunities by all customers, and thus program
16 participation. Second, business customers should be directly contacted to encourage
17 program participation. Third, many smaller businesses have a difficult time
18 participating in traditional utility rebate programs due to lack of time, lack of know-
19 how, and lack of money available for undertaking energy efficiency projects.

20 Consequently, some utilities include a direct installation component or separate
21 program for small businesses as part of their suite of business energy efficiency
22 programs. This means hiring a contractor (or multiple contractors) to conduct
23 marketing, provide free audits, and install energy efficiency measures for free or at a
24 deep discount (e.g., paying an incentive of 70-80% of the installed cost) for small

1 businesses. In addition, some utilities offer to finance the remainder of the project
2 cost with a low interest or zero-interest loan. This type of program minimizes the
3 “hassle” and upfront monetary cost for small businesses, resulting in much greater
4 program participation by small businesses compared to rebates alone. Programs along
5 these lines have been successfully implemented by Xcel Energy and by utilities in
6 Arizona, New England and California.⁷ In addition, I recommend offering the
7 prescriptive rebate program to industrial customers, not just to commercial customers.
8 The DSM plan suggests it is only available to commercial sector customers, although
9 I understand that this was not BHE’s intention.

10 In order to accommodate these modifications, I recommend that the
11 Commission direct BHE to increase the budget for the commercial prescriptive rebate
12 program, the commercial custom rebate program, and the industrial efficiency
13 program by 30%, meaning a total budget increase of \$225,000 in 2009, \$442,000 in
14 2010, and \$455,000 in 2011, relative to the budgets proposed by BHE for these three
15 programs. The amount of energy savings should increase by at least 30% as a result
16 of more outreach and technical assistance, and through economies of scale and
17 spreading management and administrative costs over more participants.

18 **Q. ARE THERE ADDITIONAL ENERGY EFFICIENCY PROGRAMS THAT**
19 **YOU RECOMMEND BHE IMPLEMENT?**

20 **A.** Yes there are. I recommend that the Commission direct BHE to implement a
21 refrigerator recycling program, an ENERGY STAR new homes program, and an air
22 conditioning load control program for its residential customers.

⁷ APS, for example, has proposed a small business direct installation program to reduce barriers and increase participation of small businesses in its DSM programs. See Arizona Public Service Company, APS Non-Residential DSM Programs, 13 Month Filing. March 23, 2007, <http://images.edocket.azcc.gov/docketpdf/0000069201.pdf>

1 Q. PLEASE PROVE THE RATIONALE FOR AND YOUR SPECIFIC
2 RECOMMENDATIONS REGARDING A REFRIGERATOR RECYCLING
3 PROGRAM.

4 A. This type of DSM program, involving a utility funding the pickup and recycling of
5 older, inefficient refrigerators that are in working condition, is being successfully
6 implemented by other electric utilities in the region including Public Service
7 Company of New Mexico (PNM), Nevada Power Company, Rocky Mountain Power
8 (Utah), and the municipal utility in Fort Collins, CO. The program is implemented
9 through a turn-key contractor who has many years of experience running this type of
10 program. Payments to the contractor are tied to the contractor's performance and
11 energy savings achieved. For PNM's 2009 program, the estimated benefit-cost ratio
12 under the total resource cost (TRC) test is 3.36.⁸ PSCO included a refrigerator
13 recycling program in its 2009-2010 DSM plan. Using more conservative assumptions
14 than PNM, PSCO estimates the benefit-cost ratio under the TRC test will be 2.17 in
15 2009 and 2.21 in 2010.⁹ While lower than PNM's benefit-cost ratio, the program is
16 still very cost effective with benefits exceeding total costs by more than a factor of
17 two. A refrigerator recycling facility has been installed in Albuquerque, New Mexico
18 as a result of PNM beginning its program. BHE could make use of this facility for its
19 program, or use a recycling facility in the Denver area if one is opened there as a
20 result of PSCO's new program.

21 Based on the experience of other utilities, I recommend a target of having the
22 contractor pickup and recycle 1,000 refrigerators per year during 2009-2011. With

⁸ Supplemental testimony of Steven M. Bean, Public Service Company of New Mexico, Case No. 08-00204-UT, March 12, 2009, p. 12.

⁹ 2009/2010 Demand-Side Management Biennial Plan – Electric and Natural Gas. Xcel Energy, Denver, CO, Aug. 2008. p. 261.

1 this level of participation, I estimate an annual program budget of about \$200,000.
2 Using the same unit energy savings value assumed by other utilities such as PSCO or
3 PNM, a program of this size should result in about 620,000 kWh of electricity savings
4 per year from each year of program activity.

5 **Q. PLEASE PROVE THE RATIONALE FOR AND YOUR SPECIFIC**
6 **RECOMMENDATIONS REGARDING AN ENERGY STAR NEW HOMES**
7 **PROGRAM.**

8 A. Homes can remain in use for 100 years or more, and it is more cost effective to “build
9 them right” than to try to go back and retrofit energy efficiency measures after a
10 home has been constructed; e.g. it is much easier to install insulation correctly in
11 walls during construction than to try to do so in an existing, poorly insulated home. In
12 Pueblo, new home construction is occurring and expected to continue in the future
13 due to factors such as the expansion of the Fort Carson military base and new
14 industries coming into the area such as the Vestas wind tower manufacturing facility.
15 Furthermore, constructing ENERGY STAR or better new homes is cost effective and
16 is a common component of DSM portfolios today. For example, both PSCO and
17 PNM will be implementing ENERGY STAR new homes program in 2009. Rocky
18 Mountain Power has been implementing a very successful ENERGY STAR new
19 homes program in Utah for a number of years.

20 This type of program provides incentives to builders for constructing new
21 homes that meet or exceed the ENERGY STAR new homes performance criteria.
22 ENERGY STAR homes programs also provide training to builders and contractors,
23 and promotion to the home-buying public. I recommend that BHE use the approach
24 that PNM is taking in its 2009 program, namely a three tier incentive structure with

1 incentives of say \$500 for just meeting the ENERGY STAR requirements (a HERS
2 score of 85 or lower), an incentive of \$1,000 for twice the energy savings (A HERS
3 score of 70 or lower), and an incentive of \$1,500 for a highly efficient new home with
4 a HERS score of 50 or lower. These incentives would apply to single family homes;
5 lower incentives would be offered for multi-family housing. Note homes just meeting
6 the 2006 model energy code get a HERS score of 100, and the HERS score declines
7 as energy efficiency improves relative to this benchmark. The program would be
8 offered to new homes that include central air conditioning or a whole house
9 evaporative cooling system in lieu of central air conditioning. The program also could
10 be implemented and marketed jointly with the ENERGY STAR new homes program
11 implemented by the gas utility in the Pueblo area, which I understand is PSCO.

12 While it is difficult to estimate participation level given the downturn in
13 housing construction, I recommend a modest target of 100 new homes in 2009 and
14 200 homes per year in 2010 and 2011. Both single family and multi-family units
15 would be eligible to participate. Including administration, marketing, training and
16 incentives, I estimate an overall program budget of \$120,000 in 2009 and \$240,000
17 per year in 2010 and 2011. Energy savings should be around 120,000 kWh per year
18 from the 2009 program and 240,000 kWh per year from the 2010 and 2011 programs.

19 **Q. PLEASE PROVE THE RATIONALE FOR AND YOUR SPECIFIC**
20 **RECOMMENDATIONS REGARDING AN AIR CONDITIONER LOAD**
21 **CONTROL PROGRAM.**

22 A. This type of DSM program is also very common within comprehensive DSM
23 portfolios these days, e.g., it is part of PSCO's current DSM program portfolio and
24 has been for years. BHE indicates in Appendix A of its Electric DSM Plan that 28%

1 of its residential customers have central air conditioning. These roughly 24,000
2 households provide an opportunity for the utility to reduce its summer afternoon peak
3 demand through air conditioner control and cycling. Furthermore, the fact that the
4 utility is in the process of installing AMI equipment on a large scale increases the
5 potential for two-way communication and air conditioner control.

6 I recommend that BHE implement an air conditioner load control program
7 along the line of PSCO's at a minimum. It may be possible to implement a more
8 sophisticated program using the AMI equipment at least in homes in Pueblo, and this
9 possibility should be investigated. But the installation of AMI equipment should not
10 be used as an excuse for delaying implementation of this important and cost-effective
11 DSM strategy. Given that BHE serves about 5.8% as many households with central
12 air conditioning compared to PSCO (i.e., 24,000 vs. 410,000 housing units), I
13 recommend that BHE scale up to installing controls on the same fraction of air
14 conditioners that PSCO is planning to install controls on during 2009-2010, by the
15 second year of this effort. This implies installing 1,130 controls in 2010 and the same
16 number in 2011. I further recommend installing half as many controls, 565, in the
17 first year of the program. This would mean a goal of controls on 2,825 central air
18 conditioners by the end of 2011 or about 12% of all central air conditioners found in
19 homes in the BHE service area today.

20 Based on costs for the air conditioner load control program in PSCO's 2009-
21 2010 DSM plan including planning, program delivery, marketing, customer
22 incentives, equipment and installation, and M&V activities, I estimate a total program
23 budget for BHE of \$300,000 in 2009, \$490,000 in 2010, and \$540,000 in 2011 given
24 the participation levels proposed above. And using PSCO's peak reduction value 1.06

1 kW per air conditioner at the customer level, the total peak demand savings would be
2 599 kW in year one, 1.80 MW in year two, and 2.99 MW in year three
3 (reductions from controls installed cumulatively). Thus addition of this program
4 would significantly increase the peak demand reduction achieved by BHE's overall
5 portfolio of DSM programs. For example, with the assumptions above the total peak
6 reduction at the end of the three-year DSM effort would increase from about 3.85
7 MW as stated in the BHE plan to 6.84 MW.

8 The energy savings would be minimal as this is a peak demand reduction
9 rather than energy savings initiative. But the program should be very cost effective
10 nonetheless; e.g., PSCO estimates its 2009 Savers Switch air conditioning load
11 control program will have a benefit-cost ratio of 4.21 under the modified TRC test.

12 **Q. DO YOU HAVE COMMENTS ON OTHER ASPECTS OF THE DSM PLAN**
13 **SUBMITTED BY BHE?**

14 **A.** Yes I do. First I have some comments on the cost effectiveness methodology used by
15 BHE for evaluating DSM programs. As explained in its Energy Efficiency Plan, BHE
16 has included a value for avoided environmental externalities in its determination of
17 program benefits, specifically a value of \$0.005 per kWh saved. This is appropriate
18 given House Bill 07-1037 and I believe the specific value used by BHE is reasonable.
19 However, apart from this proxy for environmental externalities, BHE has not
20 included a non-energy benefits adder in its benefit-cost analysis. I recommend that
21 the Commission direct BHE to do so in the future, and to use the same adder as the
22 Commission approved for PSCO in its decision in Docket No. 07A-420E, namely an
23 adder of 10% to the energy system benefits in general along with allowing inclusion
24 of specific non-energy benefits where appropriate on a program-by-program basis.

1 Second, BHE has requested that Commission allow it to shift budgets among
2 programs as necessary to achieve maximum impacts and meet energy savings goals. I
3 support this request with the caveat that the utility still be held responsible for
4 implementing cost effective programs. In addition, I support the policy adopted for
5 PSCO that low-income customers be given special attention and that BHE like PSCO
6 be allowed to implement programs for low-income customers in the future that do not
7 necessarily have a benefit-cost ratio in excess of 1.0 using the TRC test.

8 As in the case of PSCO and gas utilities in the state, I also recommend that the
9 Commission allow BHE to incur costs in excess of its approved DSM portfolio
10 budget without seeking further Commission approval as long as the portfolio as a
11 whole is cost effective. Given that BHE will be reinitiating DSM programs, there is
12 uncertainty about customer interest and what level of participation to expect. BHE
13 should have the ability to expand programs if customer interest exceeds what is
14 anticipated. I recommend that this budget flexibility be up to 125% of the annual
15 budget for the portfolio of programs. This is the level of budget flexibility allowed for
16 gas DSM programs in Colorado.

17 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

18 A. First, I recommend that the Commission adopt the same energy savings goals in
19 percentage terms that it did for PSCO in its decision in Docket No. 07A-420E. These
20 are about twice the energy savings goals proposed by BHE over a ten-year period.
21 Second, I recommend adopting the same shareholder incentive mechanism for BHE
22 as the Commission adopted for PSCO, consistent with BHE's proposal in this area.
23 Third, I support the DSM program cost recovery policies proposed by BHE, including

1 prospective recovery of DSM program costs and a uniform DSMCA surcharge in
2 percentage terms applied to all customer classes.

3 Turning to the details of the DSM programs proposed for 2009-2010, I
4 recommend that the Commission direct BHE to expand a number of its proposed
5 programs, namely the residential lighting and cooling programs and the commercial
6 and industrial prescriptive and custom rebate programs. In addition, I recommend that
7 the Commission direct BHE to implement a second refrigerator recycling program, an
8 ENERGY STAR new homes program, and an air conditioner load control program.
9 Doing so will increase participation levels, energy savings, and the net economic
10 benefits resulting from the DSM programs.

11 Exhibit HG-3 compares the budgets by program for BHE's proposed 2009-
12 2011 DSM plan and the SWEEP/WRA alternative plan. In total, we recommend a
13 budget of about \$2.7 million in 2009 (for the first 12 months of program activity),
14 \$4.4 million in 2010, and \$4.5 million in 2011. These values are about 55% higher
15 than the total DSM budget proposed by BHE. Considering the 2009 projected sales
16 revenue of \$167.9 million (see testimony of BHE witness Arnall), the DSM budget I
17 am recommending for 2009 represents 1.6% of the projected revenues. Assuming
18 sales revenues increase 2% per year in 2010 and 2011, the DSM budget I am
19 recommending in 2010 and 2011 represents about 2.6% of projected revenues. For
20 comparison, PSCO is planning to spend \$50.8 million or about 2.2% of projected
21 revenues on electric DSM programs in 2009 and \$63.6 million or about 2.7% of
22 projected revenues on electric DSM programs in 2010.¹⁰

¹⁰ See Recommended Decision of Administrative Law Judge G. Harris Adams Accepting Stipulation and Granting Application, Decision No. R08-1243 in Docket No. 08A-366EG before the Public Utilities Commission of the State of Colorado, Nov. 28, 2008.

1 Exhibit HG-4 compares the estimated energy savings by program for BHE's
2 proposed 2009-2011 DSM plan and the SWEEP/WRA alternative plan. Energy
3 savings are first year savings only, by program year. In total, I estimate that the
4 SWEEP/WRA alternative plan will result in about 12.4 GWh per year of savings
5 from 2009 programs, and 18 GWh per year of savings from 2010 and 2011 programs.
6 These values are 45-53% higher than the savings BHE estimates its proposed DSM
7 plan will achieve. Furthermore, the savings levels are more than adequate to meet the
8 savings goals recommended above. If these savings levels were achieved, BHE would
9 exceed the energy savings goals I recommend by about 21% in 2009, 18% in 2010,
10 and 9% in 2011.

11 **Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

12 A. Yes it does.

Exhibit HG-1

Statement of Qualifications

Howard Geller

Dr. Howard S. Geller is the Executive Director of the Southwest Energy Efficiency Project (SWEEP), a public interest venture he founded in 2001. Based in Boulder, Colorado, SWEEP promotes policies and programs to advance energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming.

Dr. Geller is the former Executive Director of the American Council for an Energy-Efficient Economy (ACEEE). He established ACEEE's Washington, D.C. office in 1981, stepping down as Executive Director in February 2001. He built ACEEE's reputation and influence through technical and policy assessments, advice to policy makers, development of energy efficiency programs, consumer guides, and conferences.

Dr. Geller has advised and conducted energy efficiency studies for utilities, governmental organizations, and international agencies. He has testified before the U.S. Congress on energy issues many times and has influenced energy legislation including the National Appliance Energy Conservation Act of 1987 and the Energy Policy Act of 1992. He has served as an expert witness on energy efficiency and resource planning issues before the utility commissions of Colorado, Illinois, Maryland, and the District of Columbia.

Dr. Geller is author or co-author of four books. His most recent book, *Energy Revolution: Policies for a Sustainable Future*, was published in 2003 by Island Press. In addition to his work in the United States, Dr. Geller has spent over three years working on energy efficiency issues in Brazil. He helped to establish Brazil's National Electricity Conservation Program (PROCEL).

Dr. Geller was awarded the 1998 Leo Szilard Award for Physics in the Public Interest by the American Physical Society in recognition of his contributions to national appliance efficiency standards and more efficient energy use in general. Dr. Geller also received the 2007 Mary Kilmarx award for his work on energy and utility policy from NARUC. Dr. Geller is a member of the editorial advisory board for the journal *Energy Policy*.

Dr. Geller received his PhD in Energy Policy from the University of Sao Paulo in Brazil in 2002. He holds a Masters degree in Mechanical and Aerospace Engineering from Princeton University (1979) and he received a Bachelors degree from Clark University (1977) where he majored in Physics and Science, Technology, and Society.

Exhibit HG-2

Energy Efficiency Policies in Leading States (ACEEE)

Connecticut: Connecticut has operated utility-administered energy efficiency programs for many years. In 2005, the Connecticut legislature modified its Renewable Portfolio Standard to include efficiency. Starting in 2007, the state's utilities must procure a minimum 1% of electricity sales from "Class III" resources such as energy efficiency and combined heat and power, rising by 1% per year to 4% in 2010. In 2007, the Connecticut legislature substantially increased efficiency efforts in the state still further, requiring the state's utilities to acquire "all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible." Initial proposals by the state's utilities to meet this mandate call for tripling energy efficiency spending in the state over a five-year period, and reducing sales below current levels by 2017 (Sosland 2008).

Massachusetts, New York and New Jersey: Massachusetts is in the process of adopting legislation similar to a draft bill in Connecticut requiring utilities to acquire all cost-effective efficiency (as of this writing, the bill has passed both houses of the legislature and a conference committee hopes to soon work out a final bill). State officials, utilities and others are discussing programs and policies that would immediately double energy efficiency spending and savings, reducing electricity use by 1.5% per year by 2010, and continued increases thereafter that could exceed 2% per year (Sherman 2008). In New York, the Public Service Commission is midway through a docket that will direct how the state and its utilities will meet Governor Spitzer's goal to reduce electricity use by 15% in 2015 from forecasted levels. Draft strategies involve a combination of state and utility programs, building codes, and equipment efficiency standards. In New Jersey, the legislature authorized the Board of Public Utilities to set energy savings targets for utilities that will require reducing electricity use by 20% by 2020 from forecasted levels. In all three states, these recent policy initiatives are expected to help meet targets established in the multi-state Regional Greenhouse Gas Initiative.

California: California has been pursuing efficiency policies for many years, using efficiency to reduce electricity use approximately 15% over the 1973-2003 period. About half of these savings came from utility energy efficiency programs and the balance from state energy codes and equipment efficiency standards (Rosenfeld 2007). In 2004 the state Public Utilities Commission set energy savings goals for investor-owned utilities for 2004 through 2013, which are expected to save more than 1% of total forecast electricity sales per year. Savings from efficiency measures installed in 2007 under investor-owned utility efficiency programs totaled 3,703 million kWh, which is over 1.5% of electricity sales by these utilities (CPUC 2008). In the next few years California will need to further expand their energy use reduction efforts to meet climate change goals enacted into law in 2006 which calls for reducing greenhouse gas emissions to 1990 levels by 2020.

Minnesota and Illinois: In 2007, these two states both set mandatory energy savings targets for utilities. The Minnesota legislation, which was championed by Governor Pawlenty, calls for electric and gas utilities to reduce consumption by 1.5% per year with efficiency. At least 1% per year must come from efficiency programs, the balance can come from codes, standards, education programs and other measures. The Illinois legislation establishes steadily increasing targets, starting at 0.2% of electricity sales in 2008 (utilities previously had no significant programs) and ramping up to 2% per year in 2015 and beyond.

Vermont: The state Public Service Commission established Efficiency Vermont (EV), an independent "efficiency utility" that delivers efficiency programs statewide. Efficiency Vermont is administered by a very experienced local non-profit organization that is contractually required to achieve energy and demand goals. Over the 2000-2007 period, EV efficiency program savings were equal to about 7% of Vermont's 2007 electricity requirements. For 2007-2008, EV ramped up its program to reduce consumption over two years by 3.5% of sales, an average of 1.75% annually (VEIC 2007). These savings are being achieved entirely by EV programs, without taking credit for savings from codes and standards.

Source: M. Eldridge, et al. *Energy Efficiency: The First Fuel for a Clean Energy Future. Resources for Meeting Maryland's Electricity Needs*. Report No. E082. Washington, DC: American Council for an Energy-Efficient Economy. Feb. 2008. <http://aceee.org/pubs/e082.pdf>

Exhibit HG-3

**Estimate of DSM Program Budgets: BHE Plan vs. SWEEP/WRA Alternative
(1000 \$)**

Program	BHE Plan			SWEEP/WRA Alternative		
	2009	2010	2011	2009	2010	2011
Low-income assistance	341.4	351.7	362.2	341.4	351.7	362.2
School energy education	61.9	63.7	65.6	61.9	63.7	65.6
Res. high efficiency lighting	172.6	174.8	177.1	252.6	254.8	257.1
Res. high efficiency cooling	273.1	536.3	552.1	323.1	636.3	652.1
Comm. prescriptive rebate	327.0	654.0	673.6	425.1	850.2	875.7
Comm. custom rebate	202.1	377.2	388.5	262.7	490.4	505.1
Comm. commissioning	40.2	95.5	98.3	40.2	95.5	98.3
Comm. new construction	64.1	128.3	132.1	64.1	128.3	132.1
Industrial energy efficiency	221.6	443.3	456.6	288.1	576.3	593.6
Refrigerator recycling	--	--	--	200.0	200.0	200.0
ENERGY STAR new homes	--	--	--	120.0	240.0	240.0
Air conditioner load control	--	--	--	300.0	490.0	540.0
TOTAL PORTFOLIO	1,704.1	2,824.8	2,906.2	2,679.2	4,377.2	4,521.8

Exhibit HG-4

**Estimate of Energy Savings: BHE DSM Plan vs. SWEEP/WRA Alternative
(GWh per year)**

Program	BHE Plan			SWEEP/WRA Alternative		
	2009	2010	2011	2009	2010	2011
Low-income assistance	0.50	0.50	0.50	0.50	0.50	0.50
School energy education (1)	--	--	--	0.24	0.24	0.24
Res. high efficiency lighting	3.35	3.35	3.35	5.58	5.58	5.58
Res. high efficiency cooling	0.79	1.59	1.59	0.95	1.91	1.91
Comm. prescriptive rebate	1.43	2.86	2.86	1.86	3.72	3.72
Comm. custom rebate	0.71	1.42	1.42	0.92	1.85	1.85
Comm. commissioning	0.19	0.37	0.37	0.19	0.37	0.37
Comm. new construction	0.11	0.22	0.22	0.11	0.22	0.22
Industrial energy efficiency	1.05	2.11	2.11	1.36	2.74	2.74
Refrigerator recycling	--	--	--	0.62	0.62	0.62
ENERGY STAR new homes	--	--	--	0.12	0.24	0.24
Air conditioner load control	--	--	--	--	--	--
TOTAL PORTFOLIO	8.12	12.40	12.40	12.45	17.99	17.99

(1) BHE does not assume any energy savings from the school education program while SWEEP/WRA recommends assuming some savings for the program.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

DOCKET NO. 08A-518E

IN THE MATTER OF THE APPLICATION OF BLACK HILLS/COLORADO ELECTRIC UTILITY COMPANY, L.P. D/B/A/ BLACK HILLS ENERGY FOR APPROVAL OF ITS ELECTRIC DEMAND SIDE MANAGEMENT (DSM) PLAN FOR CALENDAR YEARS 2009, 2010, AND 2011 AND FOR APPROVAL OF AN ELECTRIC DSM COST ADJUSTMENT CLAUSE

AFFIDAVIT OF HOWARD GELLER

COMES NOW Howard Geller, of proper age and duly sworn, and states that the attached Testimony in the above-captioned matter was prepared by him or under his supervision and control and that it is true and correct to the best of his knowledge and belief, and would be the same if given orally under oath.

Howard Geller
Howard Geller

STATE OF COLORADO)
) ss.
COUNTY OF BOULDER)

SUBSCRIBED AND SWORN to before me this 16th day of March 2009.
Witness my hand and official seal.

My commission expires: 12/21/2011

Pauline C. Anderson
Notary Public



CERTIFICATE OF SERVICE

I hereby certify that on this 16th day of March 2009, the original and 7 copies of the **Answer Testimony of Howard Geller on Behalf of SWEEP and WRA** were sent to Doug Dean, Director, Colorado Public Utilities Commission, 1560 Broadway Suite 250, Denver CO 80202 and a copy was e-mailed to each of the following:

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