

Public Utilities Commission
2016 Report to the Colorado General Assembly
on
Demand Side Management (DSM)
Pursuant to § 40-3.2-105, C.R.S.

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Executive Summary

Each year, on or before April 30, the Colorado Public Utilities Commission (Commission) submits a report to the Colorado General Assembly describing the progress the state's investor-owned utilities (IOUs) have made toward meeting their Demand Side Management (DSM) goals. The statute requires electric utilities to meet two complementary goals: reducing overall energy use from customers and cutting peak demand, or the maximum amount of power the utility has to provide to meet customer need. This report summarizes results for the 2015 program year using information provided by the utilities in their annual DSM reports submitted to the Commission by April 1.¹

In the nine years since the passage of House Bill 07-1037, which enacted the energy efficiency statutes, Colorado's two electric IOUs have created \$1.2 billion in net economic benefits for customers with an overall investment of approximately \$413 million. While electric DSM continues to be cost effective and generate net economic benefits, the benefits per dollar invested have declined since 2009.

The Commission continues monitoring utility DSM filings and reports to understand how natural gas prices are impacting participation in and the cost-effectiveness of gas DSM programs. While they operate cost effective DSM programs, the smaller gas utilities (Atmos Energy, Colorado Natural Gas, SourceGas) continue to struggle to achieve their respective energy savings goal. In addition, Colorado Natural Gas and SourceGas did not meet their projected customer participation goals.

The Commission makes no recommendations to the General Assembly regarding statutory changes that would further the legislative intent of §§ 40-3.2-103 or 40-3.2-104, C.R.S. However, we note that the gas DSM statute requires gas utilities to spend a certain amount of money per year on DSM and does not provide the Commission with flexibility to adjust or amend the requirements in response to market conditions.

2015 DSM Results

In 2015, Public Service Company of Colorado (Public Service) exceeded its prorated electric energy savings goals. Black Hills achieved 103 percent of its electric energy savings

¹ A utility annual report compares actual performance to Commission-approved targets or goals as presented in the utility's most recent DSM Plan.

goals. Public Service met 87 percent of its demand reduction goals; Black Hills achieved 78 percent. Combined, the two electric utilities reduced annual energy use by 431.5 million kilowatt hours (kWh). Public Service avoided 296,163 tons of CO₂ emission in 2015.² Electric DSM investments totaled \$82.5 million and resulted in \$111.5 million of net economic benefits for customers.³

The Investor Owned Utilities administering natural gas DSM programs in 2015 spent a combined total of \$16.1 million, saved 696,807 dekatherms (Dth) of Natural Gas, and provided \$26.1 million of net economic benefits to customers. Black Hills and Public Service exceeded their 2015 Gas DSM Plan saving goals. Atmos Energy, SourceGas (now Black Hills Gas Distribution), and Colorado Natural Gas (CNG) fell short of their respective Commission-approved saving goals.

Introduction

Colorado's IOUs implement DSM programs pursuant to the directives in § 40-3.2-103, C.R.S., for gas utilities and § 40-3.2-104, C.R.S., for electric utilities. While differences exist between these statutes, they generally direct the Commission to:

- Allow utilities to establish DSM programs to achieve energy and demand savings;
- Afford opportunities for all customer classes to participate in utility run DSM programs;
- Ensure that DSM programs are cost-effective; and,
- Provide that DSM investments are at least as financially beneficial for utilities as other investments.

Each regulated electric and gas utility has filed its 2015 DSM Annual Report with the Commission. The annual reports provide the Commission with a comparison of DSM savings results to each utility's approved DSM Plan. The tables in this report compare the approved DSM budget with the actual DSM expenditures; the approved energy savings goal with the actual energy savings; the estimated demand savings goal with the actual

² Black Hills did not report avoided emissions. Public Service also reports the lifetime CO₂ emission savings for its 2015 electric program as 4,232,875 tons.

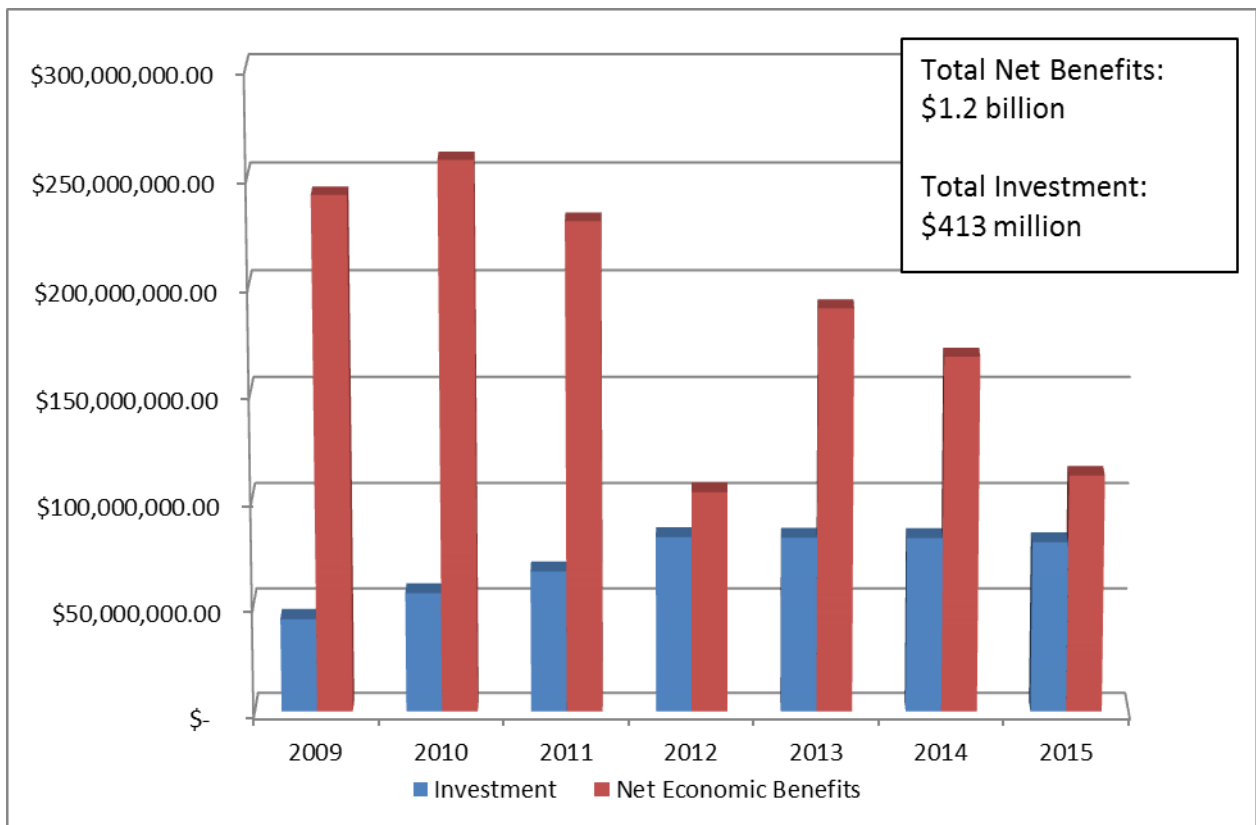
³ Net economic benefits show the monetary benefits to customers of utility investments in energy efficiency after subtracting the costs for those investments.

demand savings (for electric DSM plans only); and the planned benefit to cost ratio with the actual benefit to cost ratio. This information is presented by market segments, as defined by each utility, as well as for the overall DSM plan.

Investing in DSM and Cost-Effectiveness

DSM programs are one of the resources a utility can use to meet its customers' energy (or demand in the case of electricity) needs. Rather than increasing supply by building new power plants or selling and delivering more natural gas, DSM investments help utility customers reduce their energy consumption thus reducing the amount of energy that a utility needs to supply. DSM delivers benefits to the utility, to customers who participate in programs, to utility customers who do not participate in DSM programs, and to Colorado generally. For the electric utilities, these benefits include avoiding the building of a new power plant, reducing fuel usage and Green House Gas emissions, and delaying the construction of new transmission lines.

Figure 1: Combined Annual Investment in Electric DSM and Customer Net Benefits



While electric DSM continues to be cost effective and generate net economic benefits, the benefits per dollar invested have declined since 2009. In 2009, the electric utilities invested \$43.8 million dollars in DSM, resulting net economic benefits of \$242 million. In 2015, Public Service and Black Hills spent \$80 million and generated net economic benefits of \$111.5 million.

By law DSM must be cost-effective, which is defined as having a Total Resource Cost Test (TRC) value of greater than one. A TRC value above one indicates that DSM is a lower cost resource than a supply side alternative (e.g., a new power plant). In calculating a value, the TRC test counts the benefits and costs of a utility's investment in DSM from the perspective of the utility and all of its customers. Colorado uses a modified version of the TRC (thus called the MTRC) that includes a net measurement of the costs and benefits of some non-energy benefits that result from DSM, such as pollution reduction.

Background

Section 40-3.2-104(2), C.R.S., directs the Commission to permit electric IOUs to implement cost-effective DSM programs that reduce overall energy consumption (or use) from customers and reduce peak demand, or the maximum amount of power that the utility needs to have available to meet customer needs. Utilities must reduce energy use and demand each by five percent by 2018 from a baseline year of 2006. The statute also authorizes the Commission to establish other energy and demand goals, which it has done. The Commission establishes each utility's energy and demand savings goals based on consideration of the utility's historic achievement, its proposed DSM Plan, and the legislative direction that the Commission should take into account "the utility's cost-effective DSM potential, the need for electricity resources, the benefits of DSM investments, and other factors as determined by the commission."

The statute requiring gas DSM programs (§ 40-3.2-103, C.R.S.) establishes a minimum spending requirement for each utility, but does not prescribe any savings goals. Because Colorado gas utilities vary widely in the number and kinds of customers that they serve, the Commission's rules require that each utility shall propose gas savings goals consistent with its spending requirement under § 40-3.2-103(2)(a) C.R.S. as part of its DSM Plan filings. The

Commission approves final savings goals as part of its approval of a company’s DSM Plan.⁴ For many of the smaller gas utilities the minimum spending requirement dictates the amount of energy savings they strive to attain in their DSM program.

ELECTRIC DSM

Overall Results for 2015

Colorado’s electric DSM statute applies to Black Hills and Public Service. Their combined DSM investments resulted in net economic benefits of \$111.5 million. The 2015 electric DSM Plans continued to have success in addition to providing economic benefits to customers. Combined the two utilities reduced energy use by 431 million kWh.

The tables below present an overview of some of the results for each utility.

Results of Electric DSM in 2015 as a Percent of Goal

	Percent of Energy Goal Achieved	Percent of Demand Goal Achieved	Percent of Budget Spent
Black Hills	103%	78%	103%
PSCo	104%	87%	91%

Black Hills/Colorado Electric Utility Company LP

For its 2015 Electric DSM Plan, Black Hills Electric achieved 78 percent of its demand savings goal and 103 percent of its Commission established energy savings goal. The company spent 103 percent of its approved Electric DSM budget and created \$16.3 million while achieving an MTRC of 2.74. While this was below the proposed MTRC, an MTRC score above

⁴ The statute directs the Commission to adopt “DSM program expenditure targets equal to at least one-half of one percent of a natural gas utility’s revenues from its full service customers in the year prior to setting such targets”. Rule 4 *Code of Colorado Regulations* 723-4-4753(h)(I) of the Commission’s Rules Regulating Gas Utilities and Pipeline Operators, states that, “The utility’s annual expenditure target for DSM programs shall be, at a minimum, two percent a natural gas utility’s base rate revenues (exclusive of commodity costs), from its sales customers in the 12-month calendar year period prior to setting the targets, or one-half of one percent of total revenues from its sales customers in the 12-month calendar period prior to setting the targets, whichever is greater.”

one shows DSM programs are cost-effective. Based on its performance, Black Hills earned a disincentive offset of \$241,975 and a performance bonus of \$759,807.

Black Hills Energy 2015 Electric DSM						
Market Segment	Commission Approved Budget	Actual Expenditure	Energy Savings Goal (kWh)	Actual Energy Savings (kWh)	Demand Reduction Goal (kW)	Actual Demand Reduction (kW)
Residential	\$950,666	\$978,070	7,749,007	6,735,540	1,551	785
Nonresidential	\$3,522,555	\$3,626,297	15,569,837	17,404,277	4,529	3,906
Special (Low-Income/School Energy Education)	\$763,2612	\$804,207	1,673,550	1,686,706	936	807
Total	\$5,236,483	\$5,408,574	24,992,465	25,826,524	7,017	5,498

Public Service Company of Colorado

In 2015, Public Service achieved 104 percent of its prorated energy savings goal and 87 percent of its prorated demand savings goal. The company spent 91 percent of its approved budget. Public Service proposed an MRTC score of 1.73 in its plan and achieved an MRTC score of 1.66.⁵ Based on its performance, the company earned a total financial incentive of \$11,064,703 on an investment of just over \$87.1 million.

The Commission directed the Public Service to track and report the number of customers participating in its DSM program offerings.⁶ Based on its analysis, Public Service reports that overall 67.34 percent of its customers participated in its electric DSM programs in 2015. Approximately 855,572 out of 1.2 million residential customers participated in programs (70.54 percent). Only 27.54 percent of business customers participated in programs (26,841 out of a total of 97,464 business customers).

Despite only 28 percent of business customer participating in DSM measures, the business DSM program still reached 88 percent of its goal. Savings in the business segment were driven by the company's new construction and process efficiency programs. The residential segment achieved 125 percent of its goal.

⁶ See Decision Nos. C14-0731 and C14-0997 in Proceeding No. 13A-0686EG.

Public Service Company of Colorado 2015 Electric DSM						
Market Segment	Commission Approved Expenditure	Actual Expenditure	Energy Savings Goal (kWh)	Actual Energy Savings (kWh)	Demand Reduction Goal (kW)	Actual Demand Reduction (kW)
Business	\$47,022,790	\$42,444,014	260,893,380	228,917,215	40,424	36,832
Residential	\$25,626,280	\$25,045,421	135,601,572	170,083,064	38,062	34,663
Low Income	\$3,027,493	\$3,087,697	7,114,674	6,503,439	799	895
Indirect	\$5,919,135	\$4,128,322	3,066,995	53,507	165	5
Demand Response	\$13,731,985	12,420,232	227,146	145,366	15,486	10,536
Total	\$95,327,683	\$87,125,687	406,903,766	405,702,592	94,936	82,932

The following table shows that each segment of Public Service's 2015 DSM programs was cost effective, with an MTRC score above 1.

Market Segment	Planned Benefit to Cost Ratio	Actual Benefit to Cost Ratio
Business	1.62	1.54
Residential	2.28	2.24
Low Income	1.22	1.09
Demand Response	1.80	1.60
Average	1.73	1.66

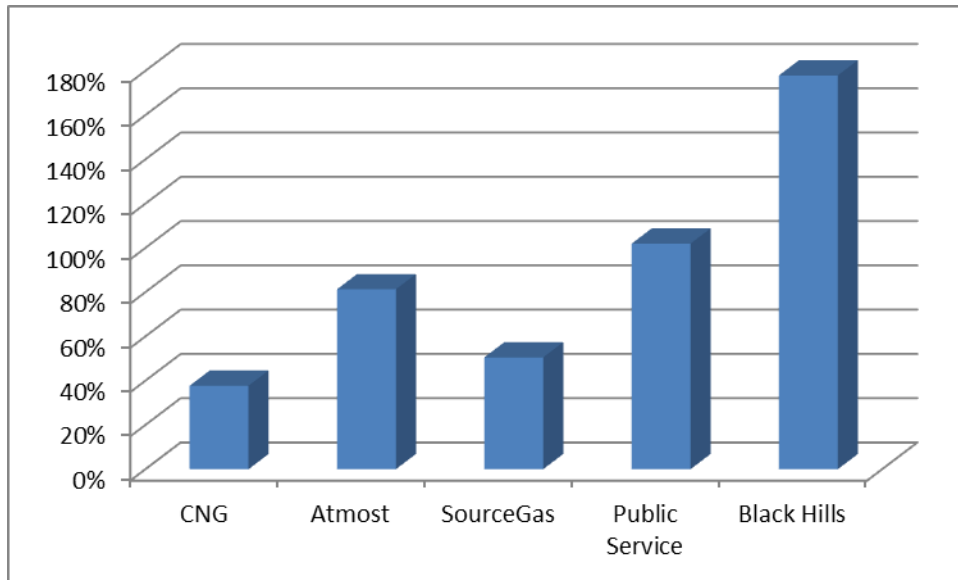
GAS DSM

Overall Results for 2015

Five IOUs administer gas DSM programs pursuant to § 40-3.2-103, C.R.S. Combined, the utilities spent \$16.1 million and saved 696,807 dekatherms of natural gas, which was 68 percent of their combined energy goals. All of the utilities had cost effective programs. Public Service and Black Hills exceeded their natural gas savings goals (expressed in therms or dekatherms). Atmos reached 81 percent of its savings target. CNG (38 percent of goal) and SourceGas continued to struggle with customer participation. SourceGas achieved 51 percent of projected customer participation goal with only the Income Qualified Program (81 percent) reaching more than 50 percent of the participation goal. The Commission notes

that, consistent with the intent of the statute, utility investments in gas DSM helps customers reduce their energy bills.

Percent of Gas DSM Energy Savings Goal by Utility in 2015



Atmos Energy Corporation

Atmos Energy achieved 81 percent of its approved 2015 gas DSM energy savings goal. Atmos Energy reached 105 percent of its participation goal, up from 68 percent in 2014. The company reports that savings from the low-income weatherization measures (i.e., the Income Qualified program) and high-custom efficiency drove overall portfolio performance. Atmos Energy's overall spending in 2015 came in at 79 percent of its approved budget. Atmos Energy did not earn a financial incentive in 2015.

Atmos Energy Corporation 2015 Gas DSM						
Market Segment	Proposed (Approved Expenditure)	Actual Expenditure	Energy Savings Goal (therms)	Actual Energy Savings (therms)	Planned Benefit to Cost Ratio	Actual Benefit to Cost Ratio
Energy Audit	\$41,056	\$16,215	7,370	720	0.46	0.18
Efficient Rebate Program	\$174,819	\$91,831	69,420	26,620	1.48	1.08
Income Qualified	\$292,830	\$278,352	77,200	81,346		1.20

Program/Fuel Conversion						
Energy Efficiency Kits	\$31,110	\$36,512	7,200	17,777	1.91	2.48
Custom Efficiency	\$104,555	\$86,373	24,500	24,479	1.01	1.45
TOTAL	\$644,370	\$509,283	185,690	150,925	1.41	1.23

Black Hills/Colorado Gas Utility Company LP

Black Hills Gas achieved 178 percent of its Commission approved natural gas savings goal and spent 124 percent of its approved budget.

Black Hills Gas states that its gas DSM investment resulted in \$590,525 in net benefits to customers. Based on its performance, the company earned a performance based bonus of \$118,105.

Black Hills Colorado Gas Utility Company 2015 Gas DSM					
Market Segment	Proposed (Approved Expenditure)	Actual Expenditure	Energy Savings Goal (Dth)	Actual Energy Savings (Dth)	Actual Benefit to Cost Ratio
Residential	\$738,600	\$937,869	30,095	46,749	1.11
Non-Residential	\$434,800	704,519	3,092	16,248	1.82
Special (Low-Income/School Energy Education)	\$290,600	\$205,4498	6,016	8,192	.68
Cross-Programs ⁷	\$276,200	538,804			
TOTAL	\$1,740,100	\$2,162,957	40,013	71,189	1.17

Colorado Natural Gas, Inc.

CNG achieved 38 percent of its energy savings goal for 2015 and spent 33 percent of its proposed budget. CNG made changes to its website and streamlined other processes in 2014 and 2015. The company projected 776 participants in its DSM programs, but actually had only 543 customers participate. CNG did not earn a financial incentive for 2015.

Colorado Natural Gas 2015 Gas DSM						
Market Segment	Proposed	Actual	Energy	Actual Energy	Planned	Actual

⁷ Black Hills defines cross-program expenses as training, marketing, and administration.

	(Approved Expenditure)	Expenditure	Savings Goal (therms)	Savings (therms)	Benefit to Cost Ratio	Benefit to Cost Ratio
Energy Audit	\$6,506	\$1,235	630	36	0.36	0.06
Efficient Rebate Program	\$80,233	\$20,957	16,500	3,168	1.35	1.35
Income Qualified	\$60,788	\$17,445	5,270	4,703	1.5	1.50
Energy Efficiency Kits	\$43,258	\$27,731	7,920	10,093	1.54	1.54
Custom Energy Efficiency Prog.	\$70,605	\$17,656	17,400	0	1.00	1.00
TOTAL	\$261,390	\$85,023	47,720	18,000	1.96	1.44

Public Service Company of Colorado

Public Service’s gas DSM investments were cost effective in 2015 and resulted in \$25.1 million in net benefits to customers. The company achieved 102 percent of its Commission approved goal for natural gas savings and spent 91 percent of its gas DSM budget. Public Service earned an incentive of \$3.2 million, including \$2,760,103 in an acknowledgement of lost revenue.⁸

In 2015, approximately 441,308 out of 1.3 million residential customers (or 35.19 percent) participated in some gas DSM measure. Only 386 out of 100,389 business customers (0.38 percent) took advantage of Public Service’s DSM programs, which were still cost effective.

⁸ 4 Code of Colorado Regulation (CCR) 723-4754(g)(I)

Public Service Company of Colorado 2015 Gas DSM						
Market Segment	Proposed (Approved Expenditure)	Actual Expenditure	Energy Savings Goal (Dth)	Actual Energy Savings (Dth)	Planned Benefit to Cost Ratio	Actual Benefit to Cost Ratio
Business	\$2,013,309	\$2,300,614	187,082	143,964	1.32	1.47
Residential	\$5,878,245	\$5,865,127	328,933	393,494	1.72	2.24
Low-Income	\$3,399,258	\$3,174,843	56,164	60,375	1.22	1.54
Indirect	\$1m840,042	\$1,539,931	14,646	183		
TOTAL	\$13,130,855	\$12,880,516	586,826	598,015	1.43	1.80

SourceGas Distribution LLC (Now Black Hills Gas Distribution, LLC)

SourceGas did not meet its Commission approved savings goal, which appears to result from lower than projected participation and savings in the company's rebate programs.

SourceGas Distribution LLC 2015 Gas DSM						
Market Segment	Proposed (Approved Expenditure)	Actual Expenditure	Energy Savings Goal (therms)	Actual Energy Savings (therms)	Planned Benefit to Cost Ratio	Actual Benefit to Cost Ratio
Energy Audit	\$40,411	\$33,829	5,670	2,325	0.43	0.35
Efficient Rebate Program	\$155,660	\$74,136	46,130	16,454	1.61	1.18
Income Qualified	\$253,099	\$205,302	59,550	49,229	1.55	1.11
Energy Efficiency Kits	\$10,313	\$0	2,660	0	2.03	n/a
Custom Program	\$329,042	\$145,330	98,000	39,094	1.52	1.72
TOTAL	\$788,525	\$458,596	212,010	107,101	1.58	1.24