Montana-Dakota Utilities Co.
South Dakota Natural Gas Conservation Portfolio Plan
2015-2017
October 2014

Market Segment

Montana-Dakota's gas market in South Dakota is comprised of approximately 88 percent residential customers, 12 percent firm general customers and a minimal number of small and large interruptible customers. As of August 31, 2014 Montana-Dakota served 56,397 retail gas customers in South Dakota.

Montana-Dakota designed the portfolio to meet its customer needs in its South Dakota service area. With residential and small commercial customers representing nearly 100 percent of South Dakota customers, the programs are designed to offer applicable rebates for space heating equipment, programmable thermostats and a custom program for commercial customers.

Program Summary

The total cost of the Company's conservation portfolio for the program years 2015 through 2017 is estimated to be $542,100. The budget is comprised of incentive costs, educational and promotional costs, and administration costs. The program administration costs are made up of direct and allocated costs associated with program management including the rebate application process. Montana-Dakota will issue checks for all rebates issued to the customer or homebuilder.

The Gas Conservation programs, based on estimated participation rates, are expected to reduce natural gas requirements by 288,739 dk over the life of the installed equipment. A breakdown of participants, program costs, and dk saved over the program life is as follows:

	2015	2016	2017
Incentive	$120,000	$134,800	$149,300
Promotion/Education	35,000	37,500	40,000
Administration	8,000	8,500	9,000
Total Project Costs	$163,000	$180,800	$198,300
Participants	567	635	702
Program Life dk Saved	86,220	96,260	106,259

Natural Gas Program Portfolio Overview

The proposed portfolio offers residential space heating and programmable thermostat rebates. In addition, programs are available to small commercial customers for space heating and a custom program which offers rebates for projects that do not fall within the parameters of the prescriptive space heating programs is available to all commercial customers. The programs will be administered by Montana-Dakota's Energy Programs Department. The delivery of each program is self-directed by the customers as they are responsible for purchasing and installing the qualifying equipment with the contractor of their choice. In the case of the programmable thermostat, the rebate is also available to residents who self-install the thermostat. The rebate application forms are found on the Company's website and by mail if requested by the customer. The rebate will be paid only to the customer with the exception for new construction homes where the customer or builder is eligible to receive the rebate. Builder rebates will be capped at 25 for furnaces rebates and also programmable thermostat rebates. Below is a description of the programs with the applicable incentive levels and program qualifications.

Residential Space

This program offers rebates to Montana-Dakota residential customers installing high efficiency natural gas furnaces in single family dwellings.

Eligible Customers

This program shall be available to the following Montana-Dakota residential gas customers served under Residential Rate 60:

- Existing single family homes
- Existing multi-family homes where space heating systems serve only one unit
- New single family homes and multi-family homes where heating systems serve only one unit.

Included Programs

1. Furnace program is available to customers, for new construction and existing dwellings, that convert to natural gas heating or replace an existing furnace. The new furnace requires an AFUE of 95% minimum in order to qualify for the rebate.
2. The programmable thermostat program is available to new construction and existing dwellings installing an Energy Star rated programmable thermostat.

Program Incentives

Measures and associated incentive levels for this program are:

Measure	Incentive level
Furnace 95% AFUE and above New or Replacement	$300 per Unit
Programmable thermostats	$20 per Unit

Commercial Heating Programs
This program offers prescriptive rebates to Montana-Dakota commercial customers that install high efficiency natural gas space heating equipment.

Eligible Customers
This program is available to Montana-Dakota customers that are served under General Service Rates 70 and 72.

Included Program
1. Furnace Program is available to customers for new construction and existing facilities that convert to natural gas heating or replace an existing furnace. The new furnace requires an AFUE of 95% minimum in order to qualify for the rebate.

Program Incentives
Measures and associated incentive levels for this program are:

Measure	Incentive level
Furnace 95% AFUE and above New or Replacement	$300 per Unit

Commercial Custom Program
This program offers rebates to Montana-Dakota's commercial customers that install energy conservation measures not provided for in the prescriptive rebates listed above due to the variability in the energy savings and cost of the project. The Company will review each custom project individually and offer a rebate based on the amount of energy savings provided by the measure. Each custom project must pass the Benefit/Cost Test with a TRC of greater than 1.00 to qualify for a rebate. Preapproval by the Company is required on all custom projects prior to the start of the project.

The customer is responsible for submitting the rebate application and supporting documentation with a complete description of the proposed project including the equipment being installed, modified and/or replaced. Project descriptions must include engineering calculations with assumptions of energy savings. Preapproval is required prior to the start of the project. Measurement and verification of the energy savings may be required, which may include pre and post measurement of energy consumption. The Custom program rebate will be paid only to the customer.

Eligible Customers
This program is available to Montana-Dakota customers that are served under General Service Rates 70 and 72.

Program Incentives
The incentive levels for this program are project specific.

Other requirements under this program are:

- Equipment installed must be more efficient than the industry standard
- Simple Payback must be greater than 18 Months
- Rebate cannot exceed 50% of the incremental cost of the equipment
- Rebate will be based on the amount of energy saved
- Weatherization is not eligible for a rebate

Portfolio Summary

The following table summarizes the program participation, expense and dk savings over the life of the installed equipment. The total cost of each program includes incentive costs, promotional and administration costs. The promotional and administrational costs are allocated to each program based on anticipated participation.

Montana-Dakota Utilities Co.
Gas Utility - South Dakota
Conservation Portfolio Summary
2015 - 2017 Program Years

Programs	Total Participants	Total Energy Reduction	Total Cost	Lifetime Cost/Dk
Conservation Programs				
Residential Program				
Furnaces - 95+% AFUE - New	510	47,940	176,858	3.69
Furnaces - 95+% AFUE - Replacement	750	213,000	260,071	1.22
Programmable Thermostats	600	12,600	13,870	1.10
	1,860	273,540	$450,799	1.65
Commercial Program				
Furnaces - 95+% AFUE - New	5	479	1,734	3.62
Furnaces - 95+% AFUE - Replacement	36	10,220	12,486	1.22
Custom Efficiency	3	4,500	2,081	0.46
	44	15,199	$16,301	1.07
Energy Audit Program Costs			$75,000	
Total Programs	1,904	288,739	$542,100	$1.88

Benefit Cost Test

Montana-Dakota is proposing to continue the application of Rate 90 and the Company's portfolio will include three residential, three commercial programs and an education and outreach plan. The Company's focus is on offering programs that provide the opportunity to be implemented in the near term time frame and provide cash incentives to lower the upfront costs of purchasing energy efficiency equipment and make energy efficiency measures more cost effective to customers.

The programs were evaluated using five different cost-effectiveness tests:

- Participant Test considers the economic impact of a program on the

participating customers.

- Utility Test considers the impact on the utility.
- Societal Cost Test includes environmental externalities and considers the impact on the "society" (both the participating and non-participating customers).
- Ratepayer Impact Measure (RIM) Test includes quantifiable benefits and costs of a given program and considers its impact on ratepayers.
- Total Resource Cost Test (TRC) reflects the total benefits and costs to all customers (both the participants and non-participants).

The following section explains the process of evaluating the programs from each of the five perspectives. The inputs utilized in the Benefit Cost test are provided in Attachment B, pages 46 – 47. The primary inputs are the cost of gas, non-gas fuel cost (electric), average dk saved per participant, and the incremental cost for purchasing the installed equipment. The cost of gas inputs reflect Montana-Dakota's projected South Dakota retail rates projected for the 2014-2015 heating season escalated by 3.5% per year. The average dk saved per participant is based on the deemed database discussed further below and the incremental cost is derived from average costs of both the equipment removed and the newly installed equipment.

Participant Test

The Participant Test is a measure of the quantifiable benefits and costs brought about by a customer's participation in a DSM program. For purposes of evaluating the merits of a particular DSM program, quantifiable benefits include any incentives received by a participant and the reduction in a participant's gas bill through reduced requirements. Quantifiable costs include any costs the customer incurs in order to participate in a DSM program, such as increased appliance costs or the availability of a back-up fuel source. The merits of the DSM program are evaluated on the NPV of the annual benefits and costs over the years in the analysis horizon. The NPV determination is based on the utility discount rate and assumes the cash flows occur at the end of the year.

The following represents a simplified look at the equations used to evaluate the participant net benefit:

Net Benefit = Total Annual Benefits – Total Annual Costs

where:

Total Annual Benefits = Decatherm Savings (dk)
+ Incentive
+ Other Savings

Total Annual Costs = Direct Costs + Other Costs

A benefit/cost ratio greater than 1.00 for the Participant Test indicates the DSM program will result in savings to the participant over the life of the program.

Ratepayer Test

The Ratepayer Test is a measure of the quantifiable benefits and costs the utility incurs as a result of customer participation in a DSM program. For purposes of

evaluating the merits of a particular DSM program, quantifiable benefits include any reduction in natural gas requirements, along with a reduction in variable operation and maintenance costs. Quantifiable costs to the utility include lost margin, incentive, and administrative costs. The merits of the DSM program are evaluated on the NPV of the annual benefits and costs over the years in the analysis horizon. The NPV determination is based on the utility discount rate and assumes the cash flows occur at the end of the year. The following represents a simplified look at the equations used to evaluate the utility net benefit:

Net Benefit = Annual Cost of Energy Saved – Annual Project Costs

where:

Annual Cost of Energy Saved = Decatherm Savings (dk)
+ O&M Savings
Annual Project Costs = Total Project Costs

A benefit/cost ratio greater than 1.00 for the Ratepayer Test indicates the DSM program will reduce overall rates.

Societal Cost Test

The Societal Cost Test measures the net costs of a DSM program as a resource option based on the total costs of the program (both the participants' costs and the utility's costs). This test also includes a factor for environmental externalities. This test is a summation of the benefit and cost terms in the Participant Test and the Ratepayer Test. The merits of the DSM program are evaluated on the NPV of the annual benefits and costs over the years in the analysis horizon. The NPV determination is based on the utility discount rate and assumes the cash flows occur at the end of the year. The annual costs are discounted at the utility discount rate. The following represents a simplified look at the equations used to evaluate the total cost net benefit:

Net Benefit = Annual Cost of Energy Saved – Annual Project Costs

where:

Annual Cost of Energy Saved = Decatherm Savings (dk)
+ O&M Savings
+ Avoided Environmental Damage
Annual Project Costs = Total Project Costs

A benefit/cost ratio greater than 1.00 for the Societal Cost Test indicates the DSM program is beneficial to both the utility and its ratepayers on a societal cost basis.

Utility Test

The Utility Test is a measure of the quantifiable benefits and costs placed on ratepayers due to changes in the utility's revenues and operating costs as a result of the DSM program. The Utility Test includes the same benefits and costs as the Ratepayer Test. The merits of the DSM program are evaluated on the NPV of the annual benefits and costs over the years in the analysis horizon. The NPV determination is based on the utility discount rate and assumes the cash

flows occur at the end of the year. The annual costs are discounted at the utility discount rate. The following represents a simplified look at the equations used to evaluate the ratepayer net benefit:

Net Benefit = Annual Cost of Energy Saved – Annual Project Costs

where:

Annual Cost of Energy Saved = Decatherm Savings (dk)
+ O&M Savings
Annual Project Costs = Total Project

A benefit/cost ratio greater than 1.00 for the Utility Test indicates the cost of energy saved is greater than the cost of saving the energy.

Total Resource Cost Test (TRC)

The Total Resource Cost Test (TRC) reflects the total benefits and costs to all customers (participants and non-participants) in the utility service territory. The key difference between the TRC and utility test is that the TRC does not include program incentives, which are considered zero net transfers in a regional perspective. Instead the TRC includes the net measures costs and net avoided costs.

The merits of the DSM program are evaluated on the NPV of the net annual benefits and costs over the years in the analysis horizon. The NPV determination is based on the utility discount rate and assumes the cash flows occur at the end of the year. The annual costs are discounted at the utility discount rate. The following represents a simplified look at the equations used to evaluate the total cost net benefit:

Net Benefit = Annual Cost of Energy Saved – Annual Project Costs

where:

Annual Cost of Energy Saved = Decatherm (dk)
+ O&M Savings
Annual Project Costs = Total Project Costs net of incentive costs

A benefit/cost ratio greater than 1.00 for the TRC Test indicates the DSM program is beneficial to all customers both participating and non-participating.

While Montana-Dakota typically views programs as favorable when the benefit/cost ratio resulting from TRC tests are greater than or equal to 1.00, the Company also takes into consideration other factors before selecting a program to include in its portfolio. Other factors may include applicability to customer base, market transformation, composition of the portfolio, and behavior change. All programs included in the Company's portfolio result in TRC results of 1.00 or greater as summarized in Attachment B, page 3.

The table below summarizes the Total Resource Cost test ratios. The program modeling and summary of all benefit/cost ratios is detailed in Attachment B.

Program	Class	TRC Result
Total Portfolio		1.92
Furnace (95+%) – New	Residential	1.77
Furnace (95+%) – Replacement	Residential	1.99
Programmable Thermostats	Residential	1.64
Furnace (95+%) – New	Commercial	1.76
Furnace (95+%) – Replacement	Commercial	1.99
Custom	Commercial	2.16

A brief summary of the proposed portfolio versus the current portfolio is included in the table below. Montana-Dakota is proposing to discontinue the water heating program due to the fact that the program did not meet the benefit/cost requirements.

Residential Programs			
Program	**Current Program**	**New Program**	**Change**
Residential Space Heating – High-Efficiency Furnace (95+%) - Replacement	$300 cash incentive for the purchase of a replacement furnace with an AFUE rating of 95+%		No change
Residential Space Heating – High-Efficiency Furnace (95+%) - New	$300 cash incentive for the purchase of a furnace with an AFUE rating of 95+% on new installation		No change
High-Efficiency Water Heater Incentive (.67 EF)	$100 cash incentive for the purchase of a .67 EF water heater		Discontinued Program
Programmable Thermostats	$20 cash incentive for purchase of an Energy Star rated programmable thermostat		No change
Commercial Programs			
Program	**Current Program**	**New Program**	**Change**
Commercial Space Heating – High-Efficiency Furnace – New (95+%)	$300 cash incentive for the purchase of a furnace with an AFUE rating of 95+% on new installation		No change
Commercial Space Heating – High-Efficiency Furnace – Replacement (95+%)	$300 cash incentive for the purchase of a replacement furnace with an AFUE rating of 95+%		No change
Commercial Custom	Cash incentive levels are project specific and do not fall within the prescribed measures		No change

Promotion and Education

The goal of Montana-Dakota's conservation program promotional plan is to maximize customer program awareness and participation in the most economical manner. The promotional plan strives to balance the cost of the advertising/promotional measures with the expected results. Montana-Dakota's promotional plan for the South Dakota conservation programs will focus on awareness and increasing participation of these energy saving programs. The following outlines specific plans related to each marketing strategy:

- Newspaper inserts: Montana-Dakota plans to advertise the conservation rebate programs available to residential customers by developing a promotional brochure and inserting this brochure in the local newspapers two times per year. The target market for the newspaper inserts will be the residential customers at an estimated annual cost of $2,500 in Year 1 $3,000 in Years 2 and 3.

- Billboard advertising: Montana-Dakota plans to secure a one-year billboard contract. The billboards will focus on the overall message that rebates are available, as well as messages regarding specific programs. The target market for the billboard campaign is the residential customer and messaging will focus on raising awareness and provide additional reinforcement of the overall conservation rebate message. The estimated annual cost for billboard advertising is $5,500 in Year 1, $6,500 in Year 2 and $8,000 in Year 3.

- Bill inserts: Montana-Dakota plans to insert information regarding the conservation rebate programs in customers' bills a minimum of two times per year. If space is available, the conservation rebate insert will be utilized more than two times per year. This insert will target the residential customers and again reinforce awareness of the programs and augment the other forms of advertising.

- Dealer and builder meetings: Montana-Dakota plans to hold dealer and builder meetings within its South Dakota service territory. The purpose of these meetings is to provide the dealers and builders with information about the programs available to customers and to give them the tools and information to provide to the end use residential and commercial customers. The estimated annual cost of dealer & builder meetings is $1,000 annually.

- Energy Audits: Montana-Dakota plans to offer an Energy Audit program to all South Dakota natural gas customers, however, Montana-Dakota does not currently have a third party contractor in place for Rapid City and surrounding areas in Montana-Dakota's service area. The program is an indirect program which does not provide specific energy savings, however

an effective energy audit program can be a useful tool for customer education and awareness and serve as an informational program that leads to additional participation in other direct impact programs offered by the Company. Montana-Dakota included a budget of $25,000 annually for three years for this program in the portfolio.

Deemed Database

Demand-side management portfolios include demand-side resource designs and evaluation criteria, cost information, and other assumptions that vary by program. The majority of the information utilized to determine energy savings associated with a program is derived from the Technical Reference Manual (TRM) that was developed for the state of Minnesota by Franklin Energy Services, an independent third party, and is used by utilities in Minnesota as part of their Conservation Improvement Programs. Montana-Dakota adjusted the Minnesota TRM to reflect weather data specific to Montana-Dakota's South Dakota service area. Utilizing TRM allows Montana-Dakota to use a deemed savings approach to calculate energy saving and perform evaluation, measurement, and verification (EM&V) for prescriptive measures. The deemed savings approach to EM&V allows Montana-Dakota to keep program costs low while providing an appropriate level of verification for prescriptive measures.

The TRM uses generally accepted engineering algorithms, along with developed operating data and defined program parameters to determine the savings of each efficiency measure. The program parameters include baseline efficiency standards, high-efficiency standards, and incremental costs.

From each prescriptive rebate application, the Company will input equipment specific information such as equipment type and size and operating hours into the TRM database spreadsheet to calculate the dk savings for that measure. Attachment A provides examples of the calculated dk savings for each program and an electronic version of the TRM database will be provided to the Commission Staff upon request. The examples provided in Attachment A reflect the same equipment used in the technical assumptions for the Benefit/Cost model. For example, Attachment A, page 1 provides the dk savings for a residential furnace retrofit. The inputs into the calculation are the furnace size of 75,000 British Thermal Units (BTU) and 95 percent efficiency and the calculated savings is 14.2 MMBTU. One MMBTU is equivalent to one dk. Montana-Dakota chose these specific equipment types to model in the Benefit/Cost analysis as they are common sizes typically installed and representative of savings to be achieved through the portfolio.

Custom projects will be reviewed individually and the energy savings will be provided by the contractor from a credible source such as manufacturer data. Montana-Dakota will review and approve the energy calculations for each custom project.

Program Reporting

Montana-Dakota is proposing to file a report with the Company's annual CTA filings each year that will include the following components:

- Budget versus actual expenditures
- Natural gas savings
- Participation summary
- Program year actual benefit/cost analyses