

**Montana-Dakota Utilities Co.  
South Dakota Natural Gas Conservation Portfolio Plan  
2012-2014  
October 2011**

**Market Segment**

Montana-Dakota's gas market in South Dakota is comprised of approximately 88 percent residential customers, 11 percent firm general customers and less than 1 percent small and large interruptible customers. As of August 31, 2011 Montana-Dakota served 53,937 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 99 percent of South Dakota customers, the programs are designed to offer applicable rebates for space heating and water heating equipment, and a custom program for commercial customers.

**Program Summary**

The total cost of the Company's conservation portfolio for the program years 2012 through 2014 is estimated to be \$330,752. 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 rebate debit cards for all residential rebates under \$1,000 when issued to the customer while the commercial rebates and residential rebates paid to homebuilders will be paid in the form of a check.

The Gas Conservation programs, based on estimated participation rates, are expected to reduce natural gas requirements by 203,930 dk over the life of the installed equipment. A breakdown of participants, program costs, and dk saved over the program life is as follows:

	2012	2013	2014
Incentive	\$64,650	\$79,400	\$94,800
Promotion/Education	16,750	22,750	24,750
Administration	9,083	9,216	9,353
Total Project Costs	\$90,483	\$111,366	\$128,903
Participants	277	347	421
Program Life dk Saved	53,380	67,650	82,900

## **Natural Gas Program Portfolio Overview**

The proposed portfolio offers residential space and water heating rebates, including a new furnace tune-up program. In addition new 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. 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. The rebate application forms will be available 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. Below is a description of the programs with the applicable incentive levels and program qualifications.

### **Residential Space & Water Heating**

This program offers rebates to Montana-Dakota residential customers installing high efficiency natural gas heating and water heating equipment in single family dwellings. Rebates are available for water heaters and furnaces.

#### **Eligible Customers**

This program shall be available to the following Montana-Dakota residential gas customers served under Residential Rates 60 and 66:

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

#### **Included Programs**

1. Tier 1 Furnace program is available to customers with existing dwellings that convert to natural gas heating or replace an existing furnace. The new furnace requires an AFUE of 92% minimum and a maximum of 94% in order to qualify for the rebate.
2. Tier 2 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.
3. Tier 1 and Tier 2 water heating programs are available to customers for new construction or existing dwellings that convert to natural gas water heating or replace an existing water heater. The new water heaters require a minimum Energy Factor (EF) of 0.62 and 0.67, for Tier 1 and 2 respectively.
4. The furnace tune-up program is available to customers within existing dwellings. The furnace tune-up will need to be performed by a contractor and the tune-up is required to consist of a standard 10 point checklist.

**Program Incentives**

Measures and associated incentive levels for this program are:

<b>Measure</b>	<b>Incentive level</b>
Tier 1 Furnace 92%-94% AFUE	\$150 per Unit
Tier 2 Furnace 95% AFUE and above New or Replacement	\$300 per Unit
Tier 1 Water Heater 0.62 EF	\$50 per Unit
Tier 2 Water Heater 0.67 EF	\$100 per Unit
Furnace Tune-Up	\$40 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, 72 and 76.

**Included Programs**

1. Tier 1 Furnace Program is available to customers with existing commercial facilities that convert to natural gas heating or replace an existing furnace. The new furnace requires an AFUE of 92% minimum and a maximum of 94% in order to qualify for the rebate.
2. Tier 2 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:

<b>Measure</b>	<b>Incentive level</b>
Tier 1 Furnace 92%-94% AFUE	\$150 per Unit
Tier 2 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, 72 and 76.

#### Program Incentives

The incentive levels for this program are will be 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 administrative costs are allocated to each program based on anticipated participation.

**Montana-Dakota Utilities Co.  
Gas Utility - South Dakota  
Conservation Portfolio Summary  
2012 - 2014 Program Years**

<u>Programs</u>	<u>Total Participants</u>	<u>Total Energy Reduction</u>	<u>Total Cost</u>	<u>Lifetime Cost/Dk</u>
<b>Conservation Programs</b>				
<b>Residential Program</b>				
Furnaces - 92-94% AFUE	21	4,464	\$3,962	\$0.89
Furnaces - 95+% AFUE - New	57	7,290	21,211	2.91
Furnaces - 95+% AFUE - Replacement	585	137,952	218,795	1.59
Furnace Tune-Up	195	1,132	10,084	8.91
Water Heating (.62 EF)	78	1,090	4,984	4.57
Water Heating (.67 EF)	20	720	2,504	3.48
	<u>956</u>	<u>152,648</u>	<u>\$261,540</u>	<u>1.71</u>
<b>Commercial Program</b>				
Furnaces - 92-94% AFUE	18	6,732	\$3,319	\$0.49
Furnaces - 95+% AFUE - New	23	5,130	8,514	1.66
Furnaces - 95+% AFUE - Replacement	30	12,420	11,101	0.89
Custom Efficiency	18	27,000	13,278	0.49
	<u>89</u>	<u>51,282</u>	<u>\$36,212</u>	<u>0.71</u>
<b>Energy Audit Program Costs</b>			\$33,000	
<b>Total Programs</b>	<u>1,045</u>	<u>203,930</u>	<u>\$330,752</u>	<u>\$1.62</u>

The programs are available to both the Black Hills and East River areas and the breakdown of anticipated participation between the Black Hills and East River is as follows:

	<u>Black Hills</u>			<u>East River</u>		
	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
<b>Residential</b>						
Furnace Tier 1 (92-94% AFUE)	5	5	5	2	2	2
Furnace Tier 2 (95% AFUE Min) - New	10	15	20	2	4	6
Furnace Tier 2 (95% AFUE Min) - Repl.	140	160	180	30	35	40
Furnace Tune-up	40	50	60	10	15	20
Water Heating Tier 1 (.62 EF)	15	20	30	2	5	6
Water Heating Tier 2 (.67 EF)	2	5	7	1	2	3
Total Residential	<u>212</u>	<u>255</u>	<u>302</u>	<u>47</u>	<u>63</u>	<u>77</u>
<b>Commercial</b>						
Furnace Tier 1 (92-94% AFUE)	2	4	6	1	2	3
Furnace Tier 2 (95% AFUE Min) - New	4	6	8	1	2	2
Furnace Tier 2 (95% AFUE Min) - Repl.	5	5	8	2	4	6
Custom	2	4	6	1	2	3
Total Commercial	<u>13</u>	<u>19</u>	<u>28</u>	<u>5</u>	<u>10</u>	<u>14</u>
<b>Total</b>	<u>225</u>	<u>274</u>	<u>330</u>	<u>52</u>	<u>73</u>	<u>91</u>

### **Benefit Cost Test**

Montana-Dakota is proposing to continue the application of Rate 90 and expand the Company's portfolio to include six residential and four 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 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 70 – 73. 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 2011-2012 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:

$$\text{Net Benefit} = \text{Total Annual Benefits} - \text{Total Annual Costs}$$

where:

$$\text{Total Annual Benefits} = \text{Decatherm Savings (dk)}$$

$$+ \text{Incentive}$$

$$+ \text{Other Savings}$$

$$\text{Total Annual Costs} = \text{Direct Costs} + \text{Other Costs}$$

A benefit/cost ratio greater than one 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 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:

$$\text{Net Benefit} = \text{Annual Cost of Energy Saved} - \text{Annual Project Costs}$$

where:

$$\text{Annual Cost of Energy Saved} = \text{Decatherm Savings (dk)}$$

$$+ \text{O\&M Savings}$$

$$\text{Annual Project Costs} = \text{Total Project Costs}$$

A benefit/cost ratio greater than one 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:

$$\text{Net Benefit} = \text{Annual Cost of Energy Saved} - \text{Annual Project Costs}$$

where:

$$\text{Annual Cost of Energy Saved} = \text{Decatherm Savings (dk)}$$

$$+ \text{O\&M Savings}$$



A benefit/cost ratio greater than one 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 both the RIM and TRC tests are greater 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, with the exception of the Residential Furnace Tune-up program, result in benefit/cost ratios of 1.00 or greater for the TRC test as summarized in Attachment B, page 3. While the Residential Furnace Tune-up program's ratio did not exceed 1.00, the Company believes the program allows for the development of a relationship with the customer that can be built upon for possible future program participation.

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		1.60
Furnace (92-94%)	Residential	1.53
Furnace (95+%) - New	Residential	1.00
Furnace (95+%) - Replacement	Residential	1.59
Furnace Tune-Up	Residential	0.37
Water Heating (.62 EF)	Residential	1.04
Water Heating (.67 EF)	Residential	1.36
Furnace (92-94%)	Commercial	2.73
Furnace (95+%) - New	Commercial	1.54
Furnace (95+%) - Replacement	Commercial	2.61
Custom	Commercial	2.01

A brief summary of the proposed portfolio versus the current portfolio is included in the table below. Montana-Dakota is proposing to discontinue the Programmable Thermostat program due to the high saturation level of Energy Star® rated programmable thermostats already purchased and installed. The Company also proposes to discontinue the Attic Insulation program. The Attic Insulation program continues to provide cost effective energy savings, however, the program relies on the trade allies to properly install the insulation. The Company is working to develop the parameters to qualify contractors as an Attic Insulation trade ally and develop training for trade allies to provide a quality installation and ensure the program will deliver energy savings. The Company will file a plan modification with the Commission seeking to re-launch the Attic Insulation program once the trade ally network is developed. The Company also reviewed the New Construction Bundle program to include in the portfolio, however, due primarily to the low cost of gas and cost of installed equipment the program did not meet the Benefit/Cost requirements.

<b>Residential Programs</b>			
<b>Program</b>	<b>Current Program</b>	<b>New Program</b>	<b>Change</b>
Residential Space Heating – High-Efficiency Furnace (92-94%) - Replacement	\$150 cash incentive for the purchase of a replacement furnace with an AFUE rating of 92-94%	\$150 cash incentive for the purchase of a replacement furnace with an AFUE rating of 92-94%	No 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% or greater	\$300 cash incentive for the purchase of a replacement furnace with an AFUE rating of 95% or greater	No change
Residential Space Heating – High-Efficiency Furnace (95+%) - New		\$400 cash incentive for the purchase of a furnace with an AFUE rating of 95% or greater on new installations	New program  Current program does not grant cash incentives for new furnace installations
Furnace Tune-up		\$40 cash incentive for standard 10 point furnace tune-up performed by a contractor	New program
High-Efficiency Water Heater Incentive (.62 EF)	\$50 cash incentive for the purchase of a .62 EF water heater	\$50 cash incentive for the purchase of a .62 EF water heater	No Change
High-Efficiency Water Heater Incentive (.67 EF)		\$100 cash incentive for the purchase of a .67 EF water heater	New program
Programmable Thermostats	\$20 cash incentive for purchase of an Energy Star rated programmable thermostat		Discontinued program
Attic Insulation	Cash incentive for R-Value of installed insulation		Discontinued program
NC Bundle Program	Cash incentive for installation of furnace, water heater and attic insulation		Discontinued program
<b>Commercial Programs</b>			
<b>Program</b>	<b>Current Program</b>	<b>New Program</b>	<b>Change</b>
Commercial Space Heating – High-Efficiency Furnace (92-94%)		\$150 cash incentive for the purchase of a furnace with an AFUE rating of 92-94%	New program
Commercial Space Heating – High-Efficiency Furnace – New (95+%)		\$300 cash incentive for the purchase of a furnace with an AFUE rating of 95+%	New program

Commercial Space Heating – High-Efficiency Furnace – Replacement (95+%)	\$300 cash incentive for the purchase of a furnace with an AFUE rating of 95+%	New program
Commercial Custom	Cash incentive levels are project specific and do not fall within the prescribed measures	New program

### **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 \$1,000.
- **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 \$6,000 in Year 1 and \$7,000 in Years 2 and 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.

- South Dakota Energy Efficiency Awareness Day: Montana-Dakota plans to continue participation in the Energy Awareness Event held in Rapid City in order to promote conservation education and information regarding rebate programs available to customers. Montana-Dakota's focus is to be the energy expert for the customer.
- Energy Audits: Montana-Dakota plans to offer an Energy Audit program and will issue a Request for Proposal (RFP) to obtain one or more qualified energy auditors to cover its Black Hills and East River service areas to perform the energy audits. The Company plans to issue the RFP later this year and launch the program in the second quarter of 2012. 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 \$33,000 over 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 deemed database that was developed for the state of Minnesota by NEXANT, an independent third party, and is used by utilities in Minnesota as part of their Conservation Improvement Programs. Montana-Dakota adjusted the Minnesota deemed database to reflect weather data specific to Montana-Dakota's South Dakota service area. Utilizing a deemed database 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 deemed database 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.

As noted above, Montana-Dakota adjusted the Minnesota Deemed Database to reflect weather data specific to Montana-Dakota's South Dakota service area and utilized this adjusted deemed database to calculate the dk savings for each prescriptive application received from September 1, 2010 through August 31, 2011 submitted in the annual CTA filing on October 4, 2011 in a separate docket.

From each prescriptive rebate application, the Company will input equipment specific information such as equipment type and size and operating hours into the deemed database 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 deemed 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 93 percent efficiency and the calculated savings is 11.8 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