

EEP-2013-0001

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Executive Secretary

March 29, 2013

IOWA UTILITIES BOARD



Black Hills Energy

Natural Gas

Energy-Efficiency Plan

2014-2018:

Appendices C-D

Prepared for:
Iowa Utilities Board
Docket EEP-2013-0001

April 1, 2013

EEP-2013-0001

Appendix C. Collaborative Presentations

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March 29, 2013

IOWA UTILITIES BOARD

2012 Collaborative Meeting

April 3, 2012

Black Hills Energy
www.BHEhowto.com

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Agenda

- Welcome and Introductions
- Current Programs and Historical Accomplishments
- 2014-2018 Energy Efficiency Plan Development Process
- Program Design Discussion:
 - Residential
 - Non-Residential
 - Public Purpose and Low Income
- Summary and Next Steps

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Timeline for Plan Development

Milestone	Date
1 st Collaborative	April 3, 2012
Trade Ally Collaborative	May 8, 2012
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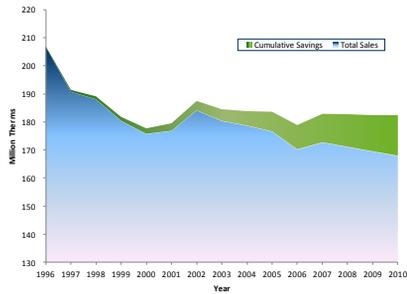


Current Programs and Historical Accomplishments

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Historical Data



2010 cumulative savings: 14.5 million therms = 8.6% of sales

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Current Programs

- Residential
 - Space and Water Heating
 - Envelope
 - New Construction
 - Energy Evaluation
- Commercial and Industrial
 - Prescriptive and Custom Rebate
 - New Construction
 - Building Operator Certification
 - Industrial Sector Outreach
 - Small Commercial Energy Evaluation
- Public Purpose & Low Income
 - Low-Income Assistance
 - School-Based Energy Education
 - Tree Planting
 - Iowa Energy Center (IEC) and Center for Global and Regional Environmental Research (CGRER)

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Residential Programs

- Residential Space and Water Heating Program
 - Includes five components:
 1. Furnace/Boiler Replacement
 2. Appliance Rebates
 3. Water Heater Replacement
 4. Setback Thermostats & Furnace/Boiler Maintenance
 5. Innovative Space & Water Heating Technologies
- Residential Energy Evaluation Program
 - Comprehensive Assessment
 - Home Performance with ENERGY STAR pilot
 - Low-Cost Measures

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Residential Programs - continued

- Envelope Measures Retrofit Program
 - Installation of insulation and other thermal envelope measures
 - Roof, wall, and foundation insulation, infiltration measures (e.g., caulking, window film, etc), and doors
 - Incentives set at a percent of installed cost up to a cap
- Residential New Construction Program
 - Prescriptive path
 - Standard Builders Option Package (BOP)
 - Advanced- BOP (new in 2012)
 - Performance path
 - Tier 1 (ENERGY STAR)
 - Tier 2 (5% lower HERS than ENERGY STAR)

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Commercial and Industrial Programs

- **Prescriptive and Custom rebates**
 - Prescriptive component: Predetermined rebates
 - Custom Component: Calculated rebates
- **Small-commercial energy evaluation program**
 - Comprehensive Assessment
- **Non-residential new construction program**
 - New construction as well as major renovations
 - Design assistance and rebates for the design team as well as builder incentives.
- **Building Operator Certification**
 - Trains individuals responsible for building operation and maintenance
- **Industrial sector outreach program**
 - Design assistance for construction of new industrial facilities
 - Partner with the Department of Energy Industrial Technologies Program

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Public Purpose & Low Income Programs

BHE supports numerous Low Income Assistance Programs, including:

- **Weatherization:** Offers assistance to community action agencies by funding the weatherization of low income households.
- **Energy Education:** Provides energy education materials and low-cost efficiency measures to customers qualifying for Energy Assistance.
- **Affordable Housing:** Offers increased incentives for energy-efficient technologies and building envelope measures, high efficiency clothes washers, as well as funding for Home Energy Ratings or inspections to meet ENERGY STAR requirements.
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- **Weatherization Team:** BHE's brings together volunteers from BHE staff, the IUB staff, and the community to weatherize homes of low income households in 14 Iowa communities.

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Public Purpose & Low Income Programs - continued

- **School-Based Energy Education:** Offers school-based energy education to 6th graders
- **Trees Forever and Trees for Kids:** Promotes tree planting for energy efficiency and overall environmental improvement.
- **Iowa Energy Center and Center for Global & Regional Environmental Research**

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2014-2018 Energy Efficiency Plan Development Process

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Context and Objectives of Collaborative Process

- Principal objective of Joint Utility Study:
 - Develop estimates of technical and economic DSM potential in areas served by Alliant, BHE, and MidAmerican
- Results guide the utilities' five-year (2014-2018) energy efficiency and DSM plans
- BHE is seeking input on both program concepts and program design elements

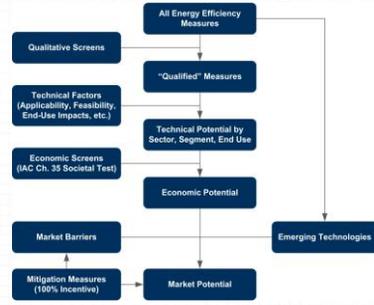


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Energy Efficiency Potential Methodology



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Baseline Forecast

- Baseline forecast is determined using an end-use modeling approach
- For residential and commercial sectors, "bottom-up" approach combines estimates of consumption at the segment and end-use level with market data to build up to total usage at the sector level
- Industrial sector follows a "top-down" approach, where total sector consumption is broken down the individual segment/NAICS and process levels
- All baselines are fully calibrated in the base year to actual sales for each sector

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Measure Characterization

- Basic characteristics of the energy-efficiency measures that were assessed in the joint study
 - Savings – percent of baseline consumption saved due to measure installation
 - Cost – full and incremental cost associated with measure installation
 - Applicability – combination of technical feasibility and existing penetration
 - Measure life – years that the measure will provide savings
- Total number of gas measures analyzed:

Sector	Unique Measures	Measure Permutations
Residential	61	281
Commercial	71	657
Industrial	23	92

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Determining Economic Potential

- Methodology consistent with standard protocols and Iowa rules
 - Screening criterion: Societal Test: $NPV(b) / NPV(c) > 1$
- Benefit components:
 - Net present value of avoided monthly energy costs and peak day capacity costs
 - Includes externalities (7.5% for gas)
 - Volatile gas price forecasts
 - Discount rate (3.56%): 12-month average of the 10-year and 30-year Treasury Bond rate
 - Other fuel and non-energy benefits (water, economic)
- Cost components:
 - Total installed measure costs (labor and material)
 - On-going O&M (where applicable)
 - Admin costs *not* included yet

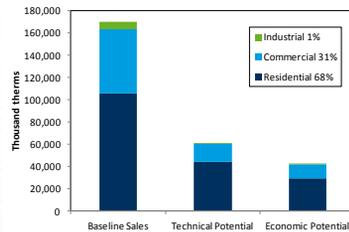
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Overview of Energy Efficiency Potentials

- Technical potential represents 36% of baseline sales
- Economic potential represents 25% of baseline sales

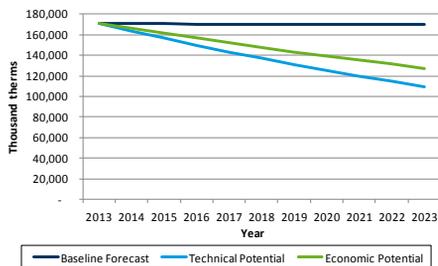


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Gas Load Forecasts



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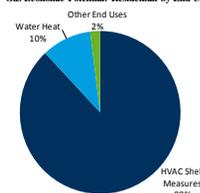


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Residential Energy Efficiency Economic Potentials

- Dominated by shell measures
- Mostly in single family (73% of residential potential)

Gas Economic Potential: Residential by End Use



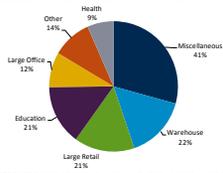
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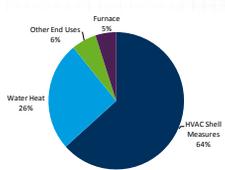
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Commercial Energy Efficiency Economic Potentials

Commercial Sector Natural Gas Economic Potential by Segment



Gas Economic Potential: Commercial by End Use



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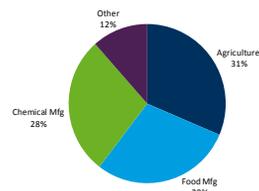


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Industrial Energy Efficiency Economic Potentials

- Potential primarily in agriculture and food manufacturing.
 - Substantial savings opportunities also exist in chemical manufacturing
- Mostly in indirect boilers and process heat (96%)

Industrial Sector Gas Economic Potential by Segment

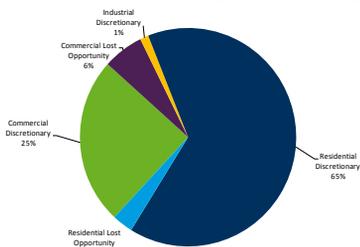


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Economic Potentials Summary (Cumulative 2023)



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Achievable Potential

- All that is economic is not achievable
 - Maximum long-term market penetration is estimated to be ~65% of economic potential for gas
- Energy efficiency plans will determine likely level of accomplishments
 - Programs include administrative costs, not included in economic measure-level screen
 - Actual amount obtained depends on incentive levels, marketing/outreach, and equity considerations

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Next Steps

- How can we improve program achievements?
- Conceptual design
 - Focus today on some program concepts
 - Future collaborative meetings will focus on additional program design details and results
- Detailed program planning
 - Incentive structure and level
 - Administration and delivery
- Filing of plans
- Launching of programs (2014)

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Discussion Topics

- Cross cutting
 - Bundling measures for bonus rebate
 - Early replacement
- Residential
 - Energy Evaluation
 - Res New Construction
- Nonresidential
 - Focused sectors (restaurant, small business, multifamily)
 - Direct install
- Public Purpose
 - Low Income Multifamily

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Commercial & Industrial

Current C&I Options:

Energy Evaluation
Prescriptive
New Construction
Custom program
Building Operator Certification
Industrial Assessments
Technology Training

Program Overviews:

- **Commercial Energy Evaluation**- offers small commercial customers the opportunity to have a low cost (\$50) evaluation of their facility. This evaluation will identify the current energy costs to operate the facility and give recommendations to the building shell to help lower those costs.
- **Prescriptive**- available for water heaters, furnaces, boilers and cooking equipment.
- **New Construction**- covers new construction and major renovations. A minimum energy savings of 15% or better than State of Iowa energy code is required. Also, a financial incentive is available to help offset the initial costs associated with the design and installation of EE options.
- **Custom**- buys down EE upgrades to a two-year payback, or up to one half of the incremental cost of the equipment, whichever is less, for eligible measures not listed in Prescriptive program.
- **BOC**- training and certification for C&I building operators and maintenance staff.
- **Industrial assessment**- A center, located at Iowa State University, provides free site assessments for small to medium-sized manufacturing facilities (with sales less than \$100 million and energy costs from \$100,000 to \$2.5 million).
- **Training**- This program offers Best Practices training sessions on Steam Systems and Process Heating.

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Public Purpose

Current Options:

Affordable New Home Construction
Low Income Multi-family
Low Income weatherization
School Based Energy Education
Trees Programs

Program Overviews:

- **Affordable New Home Construction**- helps to ensure that qualifying low-income families receive energy efficient homes that will not break the budget. Designed for agencies such as Habitat for Humanity, Community Housing Initiatives and Community Action Corporations.
- **Low Income Multi-Family**- designed to help and incent qualified low income, multi-family facilities implement natural gas efficiency measures.
- **Low Income weatherization**- for customers that qualify for federal low-income assistance, they may also qualify for the Weatherization Program partnering with the [Iowa Department of Human Rights](#). This program provides free funding for home improvements such as space and water heating equipment upgrades, insulation, low flow showerheads and faucet aerators.
- **School Based Energy Education**- provides educational material for the teachers and EE kits that students take home to work with parents to install. Measures include low flow showerheads, aerators, caulking, outlet gaskets, and more.
- **Trees Program**- sponsor programs to promote tree planting throughout the state that helps save energy.

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Residential

Current Options:

Home Energy Evaluations
Furnace/Boiler Replacement
Water Heater Replacement
Envelope Measures
Innovative Space & Water Heating
Setback Thermostats
Furnace Maintenance
Financing
Appliances
New Construction
HPWES- Pilot Program
SAVE Tuition Rebates

Program Overviews:

- **Home Energy Evaluations**- Free for homes over 10 years old and heated by natural gas. Free low cost energy efficiency measures installed at the time of the evaluation, including both gas and electric measures in shared locations.
- **Home Performance with ENERGY STAR**- Home energy evaluation pilot program in Council Bluffs. Includes blower door test-in and test-out plus bonus rebate if 3 out of 5 recommendations installed.
- **Furnace/Boiler Replacements**- Tiered rebates for more efficient units. Minimum efficiency of 92% AFUE for Furnaces and 85% AFUE for boilers. Also duct repair and insulation.
- **Water Heater Replacements**- Incentives for higher efficiency for storage (.67 EF), condensing (.80 EF) and tankless (.82 EF).
- **Envelope measures**- Covers rebates for insulation for ceiling, wall, foundation and infiltration measures and doors.
- **Setback Thermostats/Furnace Maintenance**- Rebates for self-installed and professionally installed programmable thermostats and annual furnace maintenance.
- **Innovative Space & Water Heating**- Drain Water Heating Recovery, Multi-zone thermostats, Integrated Space & **Water Heaters** (84%CAE).
- **Financing**- Low interest on bill financing for high efficient furnaces/boilers or integrated systems.
- **Appliances**- rebates for ENERGY STAR or high efficiency washers and dishwashers.
- **New Home Construction**- Tiered rebates for both prescriptive and performance paths requiring HERS ratings depending on path and equipment installed.
- **SAVE**- Quality installation tuition rebates for HVAC trade allies.

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Trade Ally Collaborative Meeting

May 8, 2012

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Current Programs

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Current Programs

- Residential
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 - New Construction
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- Commercial and Industrial
 - Prescriptive and Custom Rebate
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Commercial and Industrial Programs

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- How can we improve program achievements?
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Discussion Topics

- Cross cutting
 - Bonus rebates for bundled measures
 - Early replacement
- Expanding the Residential Energy Evaluation Program
- Residential New Construction
- Training
- Trade Ally Program

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Discussion Topics

- Potential residential rebate changes

Program Component	Equipment Type	Measure	Customer Rebate	Dealer Spiff	Possible Exclusions	Possible Inclusions
Furnace and Boilers	Natural Gas Furnace	92-93.9% AFUE	\$ 250	\$ 100	92-93.9% AFUE	
		94-95.9% AFUE	\$ 325	\$ 125		
		96% or greater	\$ 400	\$ 155		
	Boiler	85-89.9% AFUE	\$ 150	\$ 90	85 - 89.9% AFUE	95% + AFUE tier
		90% or greater	\$ 400	\$ 155		
Water Heating	Storage Water Heater	≥ 0.67 to 0.79 EF	\$ 75	\$ 10		
	Storage/Condensing	≥ 0.80 EF	\$ 300	\$ 60		Contractor Training
	Tankless Water Heater	≥ 0.82 EF	\$ 300	\$ 60		
Innovative Space and Water Heating Technologies	Drain Heat Recovery		\$ 300	\$ 60		
	Integrated Space & W/H	≥ 84% CAE	\$ 500	\$ 175	CAE requirement	Contractor Training
	Multi-Zone Thermostat		\$ 300	\$ 60		
	Gas Fireplace		TBD	TBD		

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Discussion Topics

- Expanding the Nonresidential Energy Evaluation Program
- New Multifamily Program
- Targeting the restaurant sector

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Discussion Topics

- Potential nonresidential rebate changes

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		96% or greater	\$ 400	\$ 155		
	Boiler ≤ 300 kBTLUH	85-89.9% AFUE	\$ 150	\$ 90	85 - 89.9% AFUE	95% + AFUE tier
		90% or greater	\$ 400	\$ 155		
	Boiler Controls		TBD	TBD		
Water Heating	Storage Water Heater ≤ 60 gal	≥ 0.67 to 0.79 EF	\$ 75	\$ 10		
	Storage/Condensing ≤ 60 gal	≥ 0.80 EF	\$ 300	\$ 60		
	Tankless Water Heater	≥ 0.82 EF	\$ 300	\$ 60		
Restaurant and Food Service	Broiler	≥ 34% EF	\$ 100	\$ 10		
	Convection Oven	ENERGY STAR	\$ 200	\$ 20		
	Conveyor Oven	40% EF	\$ 500	\$ 50		
	Fryer	ENERGY STAR	\$ 500	\$ 50		
	Steam Cooker	ENERGY STAR	\$ 500	\$ 50		
	Rotisserie Oven		TBD	TBD		
	Rotating Rack Oven		TBD	TBD		
	Demand controlled ventilation		TBD	TBD		

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2012 Collaborative Meeting

October 4th, 2012

Black Hills Energy
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Agenda

- Welcome & Introductions
- Milestone Timeline
- The Changing Future
- Summary of Input from Collaborative & Trade Ally Meeting
- Proposed Program Descriptions, Budgets, Savings, & Participation
 - Residential
 - Non-Residential
 - Public Purpose & Low Income
- Discussion & Comments

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The Changing Future

- Significant changes are making EE Gas plans difficult to plan
 - Codes and standards continue to improve
 - Forecasted gas prices have declined
 - Savings are harder to reach as programs mature
- Implications
 - To maintain a well rounded portfolio, Black Hills Energy is considering measuring its new portfolio using the Utility Cost Test

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Overall Energy Efficiency Program Design Approach

- Reviewed current programs and looked for new opportunities to expand
- Projected participation based on historic trends
- Aimed to maintain well rounded programs
- Continued to coordinate with IOUs to ensure similar programs
- Continue to provide comprehensive and coordinated energy educations through program marketing & outreach

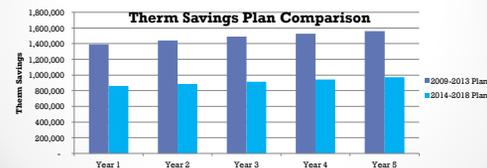
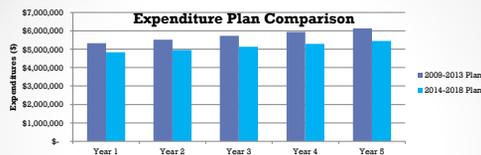
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Overall Energy Efficiency Program Design Outcome

- Offering several new programs including:
 - Multifamily Evaluations
 - Large Commercial Evaluations
- Expanding residential evaluation options
- Providing a residential bonus incentive to encourage more comprehensive measure installation
- Striking a balance between offering a well rounded portfolio of measures and striving to be cost effective
- Revised and simplified Residential New Construction program
- Expanding commercial kitchen equipment incentives

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The Big Picture

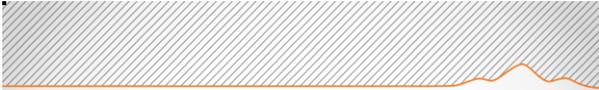


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Preliminary Cost Effectiveness

	Benefits (NPV)	Costs (NPV)	Net Benefits	B/C Ratio
Utility (UCT)	\$26,458,033	\$21,577,572	\$4,880,461	1.23
Participant (PCT)	\$41,191,763	\$34,585,374	\$6,606,390	1.19
Ratepayer Impact (RIM)	\$26,458,033	\$48,613,275	-\$22,155,243	0.54
Societal Cost (SCT)	\$46,532,800	\$44,858,484	\$1,674,317	1.04

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Proposed Program Descriptions, Budgets, Savings, & Participation

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Residential: Evaluation

Continues to serve customers with an array of evaluations and energy saving opportunities

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Residential: Evaluation

What's Changing?

- Expanding single family evaluation options:
 - Online (NEW)
 - Walk Through
 - Tier I (NEW)
 - Tier II (similar to HPWES; now offered across service territory)
 - A new Multifamily energy evaluation for common areas and energy efficiency kit for individual units
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Residential: Prescriptive

Continues to provide incentives for high-efficiency measures such as furnace replacement, water heating, setback thermostats & furnace maintenance, innovative space & water heating technologies, and envelope measures including: roof, wall, & foundation insulation and infiltration

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Residential: Prescriptive

What's Changing?

- Dropping: Lower-efficiency Furnaces (92-93.9% & 94-95.9% AFUE) and Boilers (85-89.9% & 90-94.9% AFUE), Thermal door (R-10), R-38 Ceiling insulation, and Dishwasher
- Reconfigured Residential Programs
- A new 10% bonus incentive when customers install three or more measures
- New individual incentives including:
 - Early replacement of eligible furnaces and water heaters
 - Boilers 95%+ AFUE
 - Gas Fireplace 70%+ AFUE
 - WIFI Programmable thermostat
 - Floor Insulation (R-30)
 - Duct sealing

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Residential: New Construction

Continues to provide trade allies with incentives to minimize lost energy savings opportunities in new homes

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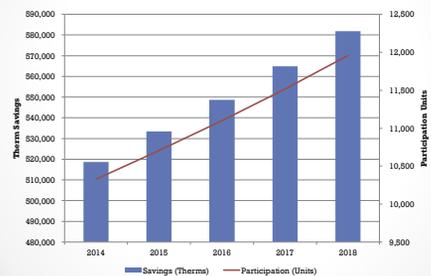
Residential: New Construction

What's Changing?

- Dropping:
 - ABOP and Performance paths
- Reworked the BOP to include:
 - Furnace (96% AFUE) with QI
 - Wall Insulation (R-20+5)
 - Drain Water Heat Recovery
 - Water Heater (EF = .67)

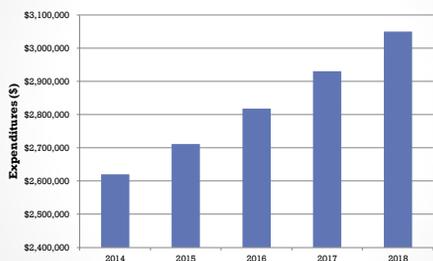
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Residential Programs: Projected Therm Savings & Participation



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Residential Programs: Projected Budgets



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Nonresidential: Evaluation

- Continues to provide business customers with evaluations and energy saving opportunities within their facilities
- Continues to offer:
 - Small business (<=25,000 sq. ft.) evaluation
 - Industrial sector outreach with evaluations of industrial facilities

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Nonresidential: Evaluation

What's Changing?

- A new large commercial evaluation (>25,000 sq ft)

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Nonresidential: Prescriptive

Continues to provide incentives for high-efficiency measures such as commercial cooking equipment, furnaces and boilers, water heaters, setback thermostats, spa covers, and envelope measures including: doors, wall & ceiling insulation and infiltration

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Nonresidential: Prescriptive

What's Changing?

- Dropping
 - Dishwashers, Furnaces (92-93.9%), Boilers (85-89.9%), Boiler controls, Doors (R-11)
- Considering dropping
 - Furnaces (94-95.9%) and Boilers (90-94.9%)
- Offering an enhanced set of commercial cooking measures including:
 - High efficiency Griddle
 - Rotisserie Oven
 - Rotating Rack Oven
 - Char-broiler
 - Salamander Broiler
- Increasing HVAC measures including:
 - Duct repair, Sealing, and Insulation package
 - Duct Insulation
 - Furnace Tune-ups
 - High-efficiency Boilers (95%+)

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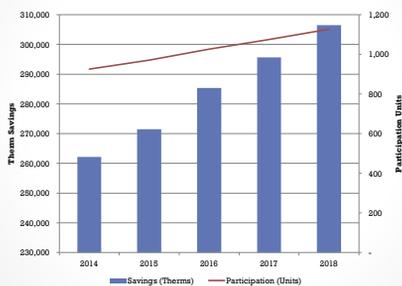
Nonresidential: Custom & New Construction

No Changes

- Continues to offer rebates, determined on a case-by-case basis, for energy-efficient equipment and projects that are not covered by prescriptive rebates.
- Nonresidential new construction continues to support the construction of high-efficiency facilities with at least a 15% savings compared to code

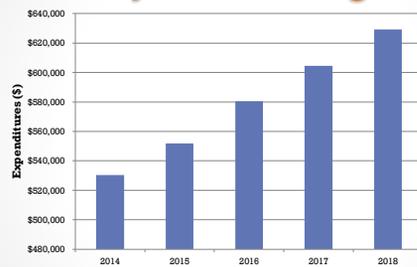
22

Nonresidential Programs: Projected Therm Savings & Participation



23

Nonresidential Programs: Projected Budgets



24

Public Purpose & Low Income Programs

Black Hills Energy supports numerous PP and LI Programs, including:

- Weatherization
- Energy Education
- Affordable Housing
- Multifamily Efficiency Improvement Initiative
- Weatherization Team
- School-Based Energy Education
- Trees Forever and Trees for Kids
- Iowa Energy Center and Center for Global & Regional Environmental Research

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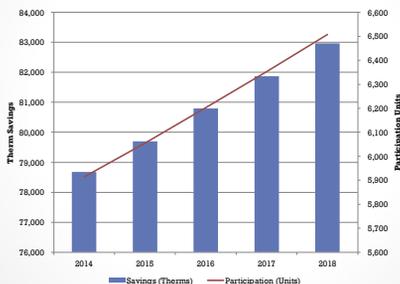
Public Purpose & Low Income Programs

What's Changing?

- Low Income Multifamily
 - IOUs working directly with The Energy Group
 - Offering 40% of installed costs when cost effective
 - If not cost effective, providing a rebate up to five times the annual savings
 - Providing energy efficient direct installation kits

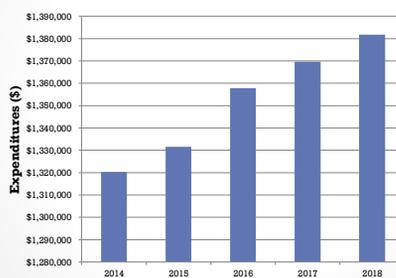
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Public Purpose & Low Income Programs: Projected Therm Savings & Participation



27

Public Purpose & Low Income Programs: Projected Budgets



28

Next Steps

- Finalize inputs and detailed program planning
 - Incentive structure and level
 - Administration and delivery
 - Marketing and outreach
- Filing of plans (April 1, 2013)
- Launching of programs (2014)

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Discussion & Comments

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Appendix D. Avoided Cost Methodology

Calculations of the avoided capacity costs shall be based on the following formula:

$$\text{Avoided Capacity Costs} = [(D + OC) \times (1 + RM)] \times (1 + EF) \quad (1)$$

Where:

- *D* (demand) is the greater of *CD* or *FD*.
 - *CD* (current demand cost) is the utility's average demand cost expressed in dollars per DTh or Mcf during peak and off-peak periods.
 - *FD* (future demand costs) is the utility's average future demand cost over the 20-year period expressed in dollars per DTh or Mcf when supplying gas during peak and off-peak periods.
- *RM* (reserve margin) is the reserve margin adopted by the utility.
- *OC* (other cost) is the value of any other costs per DTh or Mcf related to the acquisition of gas supply or transportation by the utility over the 20-year period in the peak and off-peak periods.
- *EF* (externality factor) is a 7.5% factor applied to avoided capacity costs in the peak and off-peak periods to account for societal costs of supplying energy. In addition, the utility may propose a different externality factor but must submit documentation of its accuracy.

Table 1. Pipeline Entitlement Costs

Contract	Volume	Annual Costs	Season
TF-12- Summer	31,544	\$1,254,852	S
TF-12 Winter	28,734	\$1,469,744	W
TF-12 (Sid et al)	2,579	\$98,002	W
TF-12 Discount	231	\$10,358	W
TF12-V Summer	14,966	\$595,362	S
TF12-V Winter	14,966	\$1,037,593	W
TFX-5	87,852	\$6,656,107	W
TFX-5	4,226	\$320,183	W
TFX-5	19,907	\$892,630	W
TFX-5-D	6	\$228	W
TF-5	14,735	\$1,116,397	W
TF-5-D	2	\$76	W
TF-5-D	3,055	\$136,986	W
Peak Capacity	12,182	\$277,750	W
NGPL	2,900	\$142,973	W
NGPL	2,900	177166	S

Type	Winter Peak Therms over Costs from All Contracts
Applicable Costs	\$14,186,407
Peak DTh	191,375
\$/Peak DTh	\$74.13

2011 Demand (\$/DTh)	\$74.13
Other Costs	0
Reserve Margin	3.15%
Externality	7.50%
Escalation	2.5%

Table 2. Annual Avoided Capacity

Year	\$/DTh Capacity
2014	\$82.34
2015	\$84.40
2016	\$86.51
2017	\$88.67
2018	\$90.89
2019	\$93.16
2020	\$95.49
2021	\$97.88
2022	\$100.33
2023	\$102.84
2024	\$105.41
2025	\$108.04
2026	\$110.74
2027	\$113.51
2028	\$116.35
2029	\$119.26
2030	\$122.24
2031	\$125.30
2032	\$128.43
2033	\$131.64
2034	\$134.93
2035	\$138.30
2036	\$141.76
2037	\$145.30
2038	\$148.94
2039	\$152.66
2040	\$156.48
2041	\$160.39
2042	\$164.40
2043	\$168.51

Table 3. BHE Commodity Costs

Nov 2010 to Oct 2011	
Total Sales	\$73,919,697
Total Volume (dt)	17,412,580.70
\$/therm	0.42

Table 4. BHE Tariffs (for Monthly Variation)

Effective Date	GS, SVI/LVI \$/Therm
Nov-11	\$0.56
Oct-11	\$0.51
Sep-11	\$0.52
Aug-11	\$0.52
Jul-11	\$0.52
Jun-11	\$0.51
May-11	\$0.50
Apr-11	\$0.52
Mar-11	\$0.58
Feb-11	\$0.61
Jan-11	\$0.57
Dec-10	\$0.58
Nov-10	\$0.50
Oct-10	\$0.50
Sep-10	\$0.48
Aug-10	\$0.56

Table 5. Raw NYMEX - Trade Date 11/08/11 (for Escalation)

Month	Open	High	Low	Change	Settle
Dec-11	3.704	3.767	3.656	0.049	3.745
Jan-12	3.809	3.864	3.76	0.04	3.843
Feb-12	3.819	3.878	3.78	0.043	3.859
Mar-12	3.792	3.852	3.748	0.04	3.832
Apr-12	3.791	3.851	3.753	0.04	3.832
May-12	3.828	3.886B	3.794	0.039	3.869
Jun-12	3.86	3.926B	3.831	0.039	3.909
Jul-12	3.907	3.970B	3.881	0.039	3.955
Aug-12	3.925	3.997B	3.908	0.039	3.983
Sep-12	3.938	3.998B	3.911A	0.038	3.984
Oct-12	3.976	4.034	3.941	0.038	4.02
Nov-12	4.111	4.174B	4.092A	0.035	4.162
Dec-12	4.376	4.438	4.362A	0.032	4.427
Jan-13	4.499	4.563	4.489	0.028	4.55
Feb-13	4.51	4.55	4.48	0.028	4.538
Mar-13	4.462	4.504	4.431A	0.027	4.489
Apr-13	4.35	4.41	4.344A	0.026	4.398
May-13	4.383	4.44	4.382A	0.026	4.413
Jun-13	-	4.441B	4.388A	0.026	4.441
Jul-13	4.447	4.479B	4.431A	0.026	4.479
Aug-13	4.451	4.501B	4.448	0.025	4.498
Sep-13	4.451	4.502B	4.45	0.024	4.501
Oct-13	4.506	4.541B	4.485A	0.024	4.537
Nov-13	4.608	4.645B	4.595	0.022	4.651
Dec-13	4.83	4.881B	4.83	0.02	4.89
Jan-14	5	5	4.952A	0.018	5.006
Feb-14	-	4.967B	4.930A	0.017	4.979
Mar-14	-	4.898B	4.857A	0.016	4.901
Apr-14	-	-	-	0.006	4.731
May-14	4.7	4.715B	4.7	0.006	4.741
Jun-14	-	-	-	0.006	4.769
Jul-14	4.79	4.79	4.79	0.006	4.805
Aug-14	-	-	-	0.006	4.825
Sep-14	-	-	-	0.005	4.831
Oct-14	-	-	-	0.005	4.861
Nov-14	-	-	-	0.002	4.978

Month	Open	High	Low	Change	Settle
Dec-14	-	-	-	0.002	5.208
Jan-15	5.32	5.32	5.310A	UNCH	5.323
Feb-15	-	-	-	-0.001	5.29
Mar-15	-	-	-	-0.004	5.207
Apr-15	-	-	-	-0.012	4.999
May-15	-	-	-	-0.012	5.009
Jun-15	-	-	-	-0.012	5.037
Jul-15	-	-	-	-0.012	5.072
Aug-15	-	-	-	-0.012	5.092
Sep-15	-	-	-	-0.012	5.099
Oct-15	5.108	5.108	5.108	-0.012	5.129
Nov-15	5.23	5.23	5.23	-0.014	5.247
Dec-15	-	-	-	-0.014	5.475
Jan-16	5.58	5.58	5.58	-0.016	5.59
Feb-16	-	-	-	-0.018	5.558
Mar-16	-	-	-	-0.021	5.475
Apr-16	-	-	-	-0.031	5.26
May-16	-	-	-	-0.031	5.27
Jun-16	-	-	-	-0.031	5.298
Jul-16	-	-	-	-0.031	5.333
Aug-16	-	-	-	-0.031	5.358
Sep-16	-	-	-	-0.031	5.366
Oct-16	-	-	-	-0.031	5.396
Nov-16	-	-	-	-0.031	5.521
Dec-16	-	-	-	-0.033	5.754
Jan-17	5.88	5.88	5.88	-0.033	5.876
Feb-17	-	-	-	-0.033	5.844
Mar-17	-	-	-	-0.034	5.761
Apr-17	5.53	5.53	5.53	-0.037	5.531
May-17	-	-	-	-0.037	5.541
Jun-17	-	-	-	-0.037	5.569
Jul-17	5.6	5.62	5.6	-0.037	5.604
Aug-17	-	-	-	-0.037	5.637
Sep-17	-	-	-	-0.037	5.647
Oct-17	-	-	-	-0.037	5.681
Nov-17	-	-	-	-0.037	5.809
Dec-17	-	-	-	-0.037	6.036
Jan-18	-	-	-	-0.037	6.156

Month	Open	High	Low	Change	Settle
Feb-18	-	-	-	-0.037	6.124
Mar-18	-	-	-	-0.037	6.041
Apr-18	-	-	-	-0.037	5.781
May-18	-	-	-	-0.037	5.789
Jun-18	-	-	-	-0.037	5.817
Jul-18	-	-	-	-0.037	5.852
Aug-18	-	-	-	-0.037	5.885
Sep-18	-	-	-	-0.037	5.895
Oct-18	-	-	-	-0.037	5.941
Nov-18	-	-	-	-0.04	6.073
Dec-18	-	-	-	-0.042	6.301
Jan-19	-	-	-	-0.042	6.426
Feb-19	-	-	-	-0.042	6.396
Mar-19	-	-	-	-0.042	6.316
Apr-19	-	-	-	-0.042	6.006
May-19	-	-	-	-0.042	6.011
Jun-19	-	-	-	-0.042	6.036
Jul-19	-	-	-	-0.042	6.071
Aug-19	-	-	-	-0.042	6.108
Sep-19	-	-	-	-0.042	6.118
Oct-19	-	-	-	-0.042	6.166
Nov-19	-	-	-	-0.042	6.301
Dec-19	-	-	-	-0.042	6.531
Jan-20	-	-	-	-0.042	6.656
Feb-20	-	-	-	-0.042	6.626
Mar-20	-	-	-	-0.042	6.546
Apr-20	-	-	-	-0.042	6.236
May-20	-	-	-	-0.042	6.231
Jun-20	-	-	-	-0.042	6.253
Jul-20	-	-	-	-0.042	6.291
Aug-20	-	-	-	-0.042	6.331
Sep-20	-	-	-	-0.042	6.346
Oct-20	-	-	-	-0.042	6.406
Nov-20	-	-	-	-0.042	6.541
Dec-20	-	-	-	-0.042	6.771
Jan-21	-	-	-	-0.042	6.896
Feb-21	-	-	-	-0.042	6.866
Mar-21	-	-	-	-0.042	6.786

Month	Open	High	Low	Change	Settle
Apr-21	-	-	-	-0.042	6.476
May-21	-	-	-	-0.042	6.471
Jun-21	-	-	-	-0.042	6.491
Jul-21	-	-	-	-0.042	6.533
Aug-21	-	-	-	-0.042	6.573
Sep-21	-	-	-	-0.042	6.59
Oct-21	-	-	-	-0.042	6.65
Nov-21	-	-	-	-0.042	6.786
Dec-21	-	-	-	-0.042	7.018
Jan-22	-	-	-	-0.042	7.15
Feb-22	-	-	-	-0.042	7.12
Mar-22	-	-	-	-0.042	7.04
Apr-22	-	-	-	-0.042	6.73
May-22	-	-	-	-0.042	6.715
Jun-22	-	-	-	-0.042	6.753
Jul-22	-	-	-	-0.042	6.801
Aug-22	-	-	-	-0.042	6.846
Sep-22	-	-	-	-0.042	6.861
Oct-22	-	-	-	-0.042	6.926
Nov-22	-	-	-	-0.042	7.062
Dec-22	-	-	-	-0.042	7.294
Jan-23	-	-	-	-0.042	7.426
Feb-23	-	-	-	-0.042	7.396
Mar-23	-	-	-	-0.042	7.316
Apr-23	-	-	-	-0.042	7.006
May-23	-	-	-	-0.042	6.991
Jun-23	-	-	-	-0.042	7.031
Jul-23	-	-	-	-0.042	7.081
Aug-23	-	-	-	-0.042	7.126
Sep-23	-	-	-	-0.042	7.141
Oct-23	-	-	-	-0.042	7.206
Nov-23	-	-	-	-0.042	7.342
Dec-23	-	-	-	-0.042	7.574

Calculations of avoided energy costs in the peak and off-peak periods on a seasonal basis shall be based on the following formula:

$$\text{Avoided Energy Costs} = (E + VOM) \times (1 + EF) \quad (4)$$

Where:

- *E* (energy costs) is the greater of *ME* or *FE*.
 - *ME* (current marginal energy costs) is the utility's current marginal energy costs expressed in dollars per DTh or Mcf during peak and off-peak periods.
 - *FE* (future energy costs) is the utility's average future energy costs over the 20-year period expressed in dollars per DTh or Mcf during peak and off-peak periods.
- *VOM* (variable operations and maintenance costs) is the utility's average variable operations and maintenance costs over the 20-year period expressed in dollars per DTh or Mcf during peak and off-peak periods.
- *EF* (externality factor) is a 7.5% factor applied to avoided energy costs in the peak and off-peak periods to account for societal costs of supplying energy. In addition, the utility may propose a different externality factor but must submit documentation of its accuracy.

Table 6. Avoided Energy Costs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	\$0.58	\$0.60	\$0.64	\$0.49	\$0.46	\$0.48	\$0.48	\$0.49	\$0.56	\$0.56	\$0.61	\$0.61
2015	\$0.61	\$0.63	\$0.68	\$0.52	\$0.48	\$0.50	\$0.51	\$0.52	\$0.59	\$0.59	\$0.65	\$0.64
2016	\$0.65	\$0.66	\$0.72	\$0.55	\$0.51	\$0.53	\$0.54	\$0.54	\$0.62	\$0.62	\$0.68	\$0.67
2017	\$0.68	\$0.70	\$0.75	\$0.57	\$0.53	\$0.55	\$0.56	\$0.57	\$0.65	\$0.66	\$0.72	\$0.70
2018	\$0.71	\$0.73	\$0.79	\$0.60	\$0.56	\$0.58	\$0.59	\$0.60	\$0.68	\$0.69	\$0.75	\$0.73
2019	\$0.74	\$0.76	\$0.83	\$0.62	\$0.58	\$0.60	\$0.61	\$0.62	\$0.70	\$0.71	\$0.78	\$0.76
2020	\$0.77	\$0.79	\$0.86	\$0.65	\$0.60	\$0.62	\$0.63	\$0.64	\$0.73	\$0.74	\$0.81	\$0.79
2021	\$0.80	\$0.82	\$0.89	\$0.67	\$0.62	\$0.65	\$0.66	\$0.67	\$0.76	\$0.77	\$0.84	\$0.82
2022	\$0.83	\$0.85	\$0.92	\$0.70	\$0.65	\$0.67	\$0.69	\$0.70	\$0.79	\$0.80	\$0.87	\$0.85
2023	\$0.86	\$0.88	\$0.96	\$0.73	\$0.67	\$0.70	\$0.71	\$0.72	\$0.82	\$0.83	\$0.91	\$0.88
2024	\$0.88	\$0.91	\$0.98	\$0.75	\$0.69	\$0.72	\$0.73	\$0.74	\$0.84	\$0.85	\$0.93	\$0.90
2025	\$0.90	\$0.93	\$1.01	\$0.76	\$0.71	\$0.74	\$0.75	\$0.76	\$0.86	\$0.87	\$0.95	\$0.92
2026	\$0.92	\$0.95	\$1.03	\$0.78	\$0.72	\$0.75	\$0.77	\$0.78	\$0.88	\$0.90	\$0.98	\$0.95
2027	\$0.95	\$0.98	\$1.06	\$0.80	\$0.74	\$0.77	\$0.79	\$0.80	\$0.91	\$0.92	\$1.00	\$0.97
2028	\$0.97	\$1.00	\$1.08	\$0.82	\$0.76	\$0.79	\$0.81	\$0.82	\$0.93	\$0.94	\$1.02	\$1.00

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2029	\$0.99	\$1.03	\$1.11	\$0.84	\$0.78	\$0.81	\$0.83	\$0.84	\$0.95	\$0.97	\$1.05	\$1.02
2030	\$1.02	\$1.05	\$1.14	\$0.87	\$0.80	\$0.83	\$0.85	\$0.86	\$0.98	\$0.99	\$1.08	\$1.05
2031	\$1.04	\$1.08	\$1.17	\$0.89	\$0.82	\$0.85	\$0.87	\$0.88	\$1.00	\$1.01	\$1.10	\$1.07
2032	\$1.07	\$1.10	\$1.20	\$0.91	\$0.84	\$0.87	\$0.89	\$0.90	\$1.03	\$1.04	\$1.13	\$1.10
2033	\$1.10	\$1.13	\$1.23	\$0.93	\$0.86	\$0.90	\$0.91	\$0.93	\$1.05	\$1.07	\$1.16	\$1.13
2034	\$1.13	\$1.16	\$1.26	\$0.95	\$0.88	\$0.92	\$0.94	\$0.95	\$1.08	\$1.09	\$1.19	\$1.15
2035	\$1.15	\$1.19	\$1.29	\$0.98	\$0.90	\$0.94	\$0.96	\$0.97	\$1.10	\$1.12	\$1.22	\$1.18
2036	\$1.18	\$1.22	\$1.32	\$1.00	\$0.93	\$0.97	\$0.98	\$1.00	\$1.13	\$1.15	\$1.25	\$1.21
2037	\$1.21	\$1.25	\$1.35	\$1.03	\$0.95	\$0.99	\$1.01	\$1.02	\$1.16	\$1.18	\$1.28	\$1.24
2038	\$1.24	\$1.28	\$1.39	\$1.05	\$0.97	\$1.01	\$1.03	\$1.05	\$1.19	\$1.21	\$1.31	\$1.27
2039	\$1.27	\$1.31	\$1.42	\$1.08	\$1.00	\$1.04	\$1.06	\$1.07	\$1.22	\$1.24	\$1.34	\$1.31
2040	\$1.30	\$1.35	\$1.46	\$1.11	\$1.02	\$1.07	\$1.09	\$1.10	\$1.25	\$1.27	\$1.38	\$1.34
2041	\$1.34	\$1.38	\$1.49	\$1.14	\$1.05	\$1.09	\$1.11	\$1.13	\$1.28	\$1.30	\$1.41	\$1.37
2042	\$1.37	\$1.41	\$1.53	\$1.16	\$1.08	\$1.12	\$1.14	\$1.16	\$1.31	\$1.33	\$1.45	\$1.41
2043	\$1.41	\$1.45	\$1.57	\$1.19	\$1.10	\$1.15	\$1.17	\$1.19	\$1.35	\$1.36	\$1.48	\$1.44
2044	\$1.44	\$1.49	\$1.61	\$1.22	\$1.13	\$1.18	\$1.20	\$1.22	\$1.38	\$1.40	\$1.52	\$1.48

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2045	\$1.48	\$1.52	\$1.65	\$1.25	\$1.16	\$1.21	\$1.23	\$1.25	\$1.41	\$1.43	\$1.56	\$1.52
2046	\$1.51	\$1.56	\$1.69	\$1.28	\$1.19	\$1.24	\$1.26	\$1.28	\$1.45	\$1.47	\$1.60	\$1.55
2047	\$1.55	\$1.60	\$1.73	\$1.32	\$1.22	\$1.27	\$1.29	\$1.31	\$1.49	\$1.51	\$1.64	\$1.59
2048	\$1.59	\$1.64	\$1.78	\$1.35	\$1.25	\$1.30	\$1.32	\$1.34	\$1.52	\$1.54	\$1.68	\$1.63
2049	\$1.63	\$1.68	\$1.82	\$1.38	\$1.28	\$1.33	\$1.36	\$1.38	\$1.56	\$1.58	\$1.72	\$1.67
2050	\$1.67	\$1.72	\$1.87	\$1.42	\$1.31	\$1.36	\$1.39	\$1.41	\$1.60	\$1.62	\$1.76	\$1.71
2051	\$1.71	\$1.77	\$1.91	\$1.45	\$1.34	\$1.40	\$1.42	\$1.44	\$1.64	\$1.66	\$1.81	\$1.76