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SourceGas

December 18, 2008

Mr. Doug Dean, Director
Public Utilities Commission
of the State of Colorado
1560 Broadway, Suite 250
Denver, Colorado 80202

Re: *Ex Parte* Disclosure Letter, Docket No. 08I-113EG

Dear Mr. Dean:

SourceGas Distribution LLC ("SourceGas Distribution") submits this disclosure letter in Docket No. 08I-113EG, pursuant to Commission Decision No. C08-0903, paragraph 21.

This disclosure is being filed within two business days following a permitted *ex parte* communication with a Commissioner. As required, this disclosure letter states the time, date and place of the meeting, lists the persons attending, and contains a summary description of the topics discussed.

This letter serves as disclosure of the communications between SourceGas Distribution and Chairman Ron Binz, which occurred from 10:00 a.m. to 11:00 a.m. on Tuesday, December 16, 2008, at the offices of the Public Utilities Commission of the State of Colorado ("Commission"). SourceGas Distribution was represented by Dan Watson, Ben Breland, Michael Noone and Eric Nelsen. Commission Staff members Michael Hydock and Tony Munoz also attended the meeting.

The discussion at the above-described meeting focused on the following subject matters: background information about SourceGas Distribution, direct use applications of natural gas, declining use per natural gas customer, removal of the natural gas utility throughput disincentive, promotion of energy efficiency and demand-side management and development of related incentives for natural gas utilities, natural gas supply, trackers, return on equity, price and supply options for natural gas service, and efforts to reform and streamline the traditional rate case process and to encourage flexibility in positions made in the context of that process.

SourceGas Distribution provided written materials during the meeting, which are appended hereto as follows:

Attachment 1: SourceGas Fact Sheet.
Attachment 2: SourceGas brochure – "Why Energy-Smart Consumers Heat with Natural Gas."
Attachment 3: SourceGas document discussing direct use applications of natural gas.
Attachment 4: SourceGas graph – "Recent Growth in Lower 48 Natural Gas Production Breaks with Historical Trends."
Attachment 5: "Powering Progress – The Latest Natural Gas Appliances Save Money, Energy and the Environment While Offering Consumers Greater Convenience and Contemporary Styling," *American Gas* (December 2008/January 2009 edition), pp. 28-34.
Attachment 6: Executive Summary of "Vision for 2025: A Framework for Change," National Action Plan for Energy Efficiency (dated November 2008).
Attachment 7: "Second Joint Statement of the American Gas Association and the Natural Resources Defense Council" (dated May 2008).
Attachment 8: "Direct Use of Natural Gas – Implications for Power Generation, Energy Efficiency, and Carbon Emissions," American Gas Foundation (dated April 2008).

Respectfully submitted,

Eric W. Nelsen

Attachments

SourceGas Fact Sheet

History of The Company

The company now known as SourceGas has its roots beginning in 1936 when the Kansas Pipeline and Gas Company decided to bring natural gas service to the small communities and rural areas of Kansas and Nebraska. This decision and the successful investment in the necessary facilities were contrary to conventional wisdom at the time, which held that a profitable pipeline operation must serve densely populated areas. SourceGas continues this tradition of service as operator of these assets today.

As the natural gas industry moved from a fully regulated environment to a more competitive one in the 1990s, the owners of these facilities responded enthusiastically to the change. Retaining the commitment to rural and small- to medium-size communities, they voluntarily deregulated many of the retail natural gas services associated with their natural gas system to provide new options for customers. In that same spirit, SourceGas currently administers the Choice Gas® programs in its Nebraska and Wyoming service territory, provides transportation services, and offers residential customers non-regulated in-home services.

SourceGas is specifically focused on owning and operating natural gas utility businesses. The company uses its business platforms and utility focus to deliver safe, efficient, low-cost and reliable service while investing in both acquisition and internal growth investment opportunities. With that goal in mind, SourceGas acquired Arkansas Western Gas Company in July 2008.

SourceGas

www.SourceGas.com

About SourceGas

:: SourceGas is a natural gas local distribution utility headquartered in Lakewood, Colorado

Headquarters:
SourceGas LLC
370 Van Gordon Street
Suite 4000
Lakewood, CO 80228

:: SourceGas is owned by affiliates of the GE Capital Corporation and Alinda Investments LLC.

:: SourceGas and its predecessors have been providing natural gas service to customers for over 70 years.

:: SourceGas serves nearly 420,000 customers in Arkansas, Colorado, Nebraska, Wyoming and Hermosillo, Mexico.

:: SourceGas serves 395 communities ranging from 20 to 50,000 people.

:: SourceGas operates 17,700 miles of distribution and transmission pipeline, as well as storage facilities.

:: SourceGas and its subsidiaries provide gas transportation, in-home HVAC and appliance service and sales, as well as gas commodity services to its natural gas customers.

:: SourceGas currently has 960 employees.

:: Most of our employees live in the communities we serve.

:: SourceGas is committed to providing reliable, clean, safe, cost-effective and environmentally-sensitive natural gas utility service.

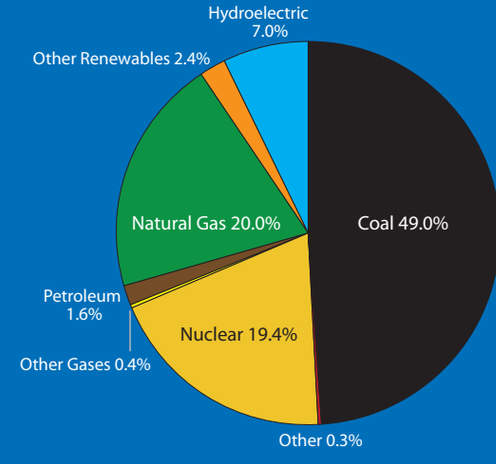
:: We are dedicated to serving our customers 24/7 with highly-trained and safety-focused employees.

:: Examples of SourceGas's commitment to utility operations include recent investments in business platforms dealing with customer information, accounting, budgeting, revenue and expense tracking, satellite mobile dispatch for customer service technicians and automated meter reading.

Natural Gas Is More Efficient:

- Most of the growth in natural gas demand comes from electricity generators, who have turned to natural gas because it is the cleanest burning fossil fuel.
- Rather than burn natural gas to create electricity used for space and water heating, natural gas can heat homes and water directly. Greater direct use of natural gas is more efficient, can reduce demand for dwindling electric supplies and can better sustain valuable North American natural gas resources.
- Natural gas is a domestic energy source. Approximately 86 percent of the natural gas consumed in the United States is produced domestically with 12 percent coming from neighboring Canada.
- The direct use of natural gas in gas appliances helps reduce reliance on foreign oil imports and can help delay the need for new electric generating plants.
- Natural gas has superior full-cycle efficiency when compared to electric power.
- Most gas water heaters are 50 to 62 percent efficient. But gas water heaters still use the thermal energy in natural gas 1.5 times better than using the same amount of natural gas to generate electric power to heat the same amount of water.
- Given the comparative energy losses, most energy experts believe the best strategy is to use natural gas for space and water heating as much as possible.

Where does your home's electricity come from?



Conventional electricity sources include coal, nuclear, oil, natural gas, and large hydropower facilities. These sources supply about 99% of the electricity used in the United States today.

Source: http://www.eia.doe.gov/cneaf/electricity/epa/figes1.html

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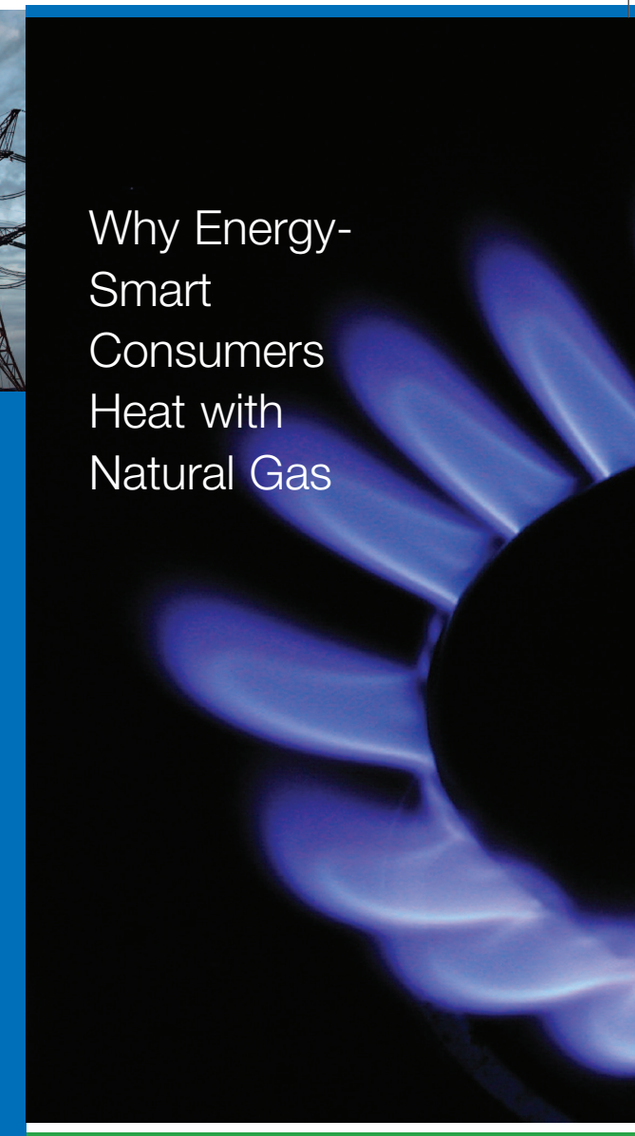
ESBRO808

Why Energy-Smart Consumers Heat with Natural Gas



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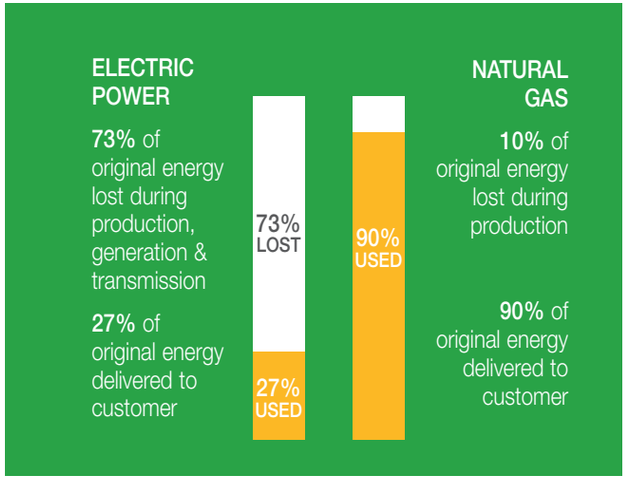
Achieving Real Energy Efficiency



:: Real energy efficiency is a comprehensive examination of the costs associated with end use, processing, generating and delivery.

:: When natural gas is delivered directly to the consumer, 90 percent of the original energy reaches the consumer.

:: When natural gas is used to generate electricity, approximately 73 percent of the energy is lost before it reaches the consumer, resulting in inefficient energy consumption and upward pressure on the price of natural gas.

:: One-hundred percent efficient electric heating appliances are really only 27 percent efficient.

The Hidden Cost of Electricity

To get an accurate picture of "energy efficiency," consumers must look beyond the efficiency of the appliance or furnace, and consider what it takes to get energy into the home.

As you can see in the graph to the left, much higher amounts of energy are used or lost during extraction, processing, transportation, conversion and distribution of electricity than for natural gas. But what about end-use efficiency?

Natural Gas — the Obvious Choice

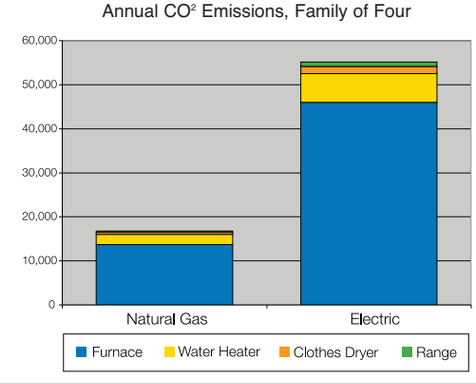
Natural gas is the most popular home-heating energy in the United States — heating 6 of every 10 homes. This popularity is especially apparent in the new-home market, where 70 percent of all new single-family homes feature natural gas. While electric appliances often appear more efficient at first glance, it's quickly apparent that in terms of cumulative efficiency, natural gas wins hands down. In fact, once the total process is evaluated, natural gas is often more than three times as efficient as electricity. Three times!

Full-Cycle Efficiency

Full-cycle efficiency measures the costs of getting energy to the home combined with the efficiency of in-home appliances that use the energy. Here again, natural gas offers superior performance.

For new residential applications, full-cycle efficiencies range from 71 to 88 percent for natural gas space heating (depending on the efficiency of the end-use equipment chosen). For electric heat pumps, the full-cycle efficiency range will be from 53 to 72 percent while less efficient electric heaters offer a mere 27 percent efficiency.

Natural gas is the cleanest fossil fuel – emitting less soot, carbon dioxide and nitrogen oxides than other fossil fuels.



Natural gas: the cleanest burning fossil fuel

When you choose natural gas, you see the following great benefits:

:: Save money on monthly energy bills

:: Sustain valuable North American resources

:: Reduce dependency on foreign oil

:: Take advantage of the cleanest burning fossil fuel

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1.800.563.0012
24 hours a day, 7 days a week
www.SourceGas.com

SourceGas advocates the direct use of natural gas in residential and commercial heating appliances (space heating, water heating, cooking, drying, etc.) instead of electricity.

There are many benefits of natural gas over electricity including cost, convenience, comfort and environmental.

For instance if you replaced a standard 52 gallon residential electric water heater with the comparable 40 gallon natural gas water heater you would:

- Reduce your annual operating cost by 50%
- Reduce the CO2 emissions 64% or 4,008 lbs., the weight of an elephant
- Increase your recovery rate 18%

Or if you installed a tankless natural gas water heater you would:

- Reduce annual operating cost by 61%
- Reduce CO2 emissions 72% or 4,499 lbs.

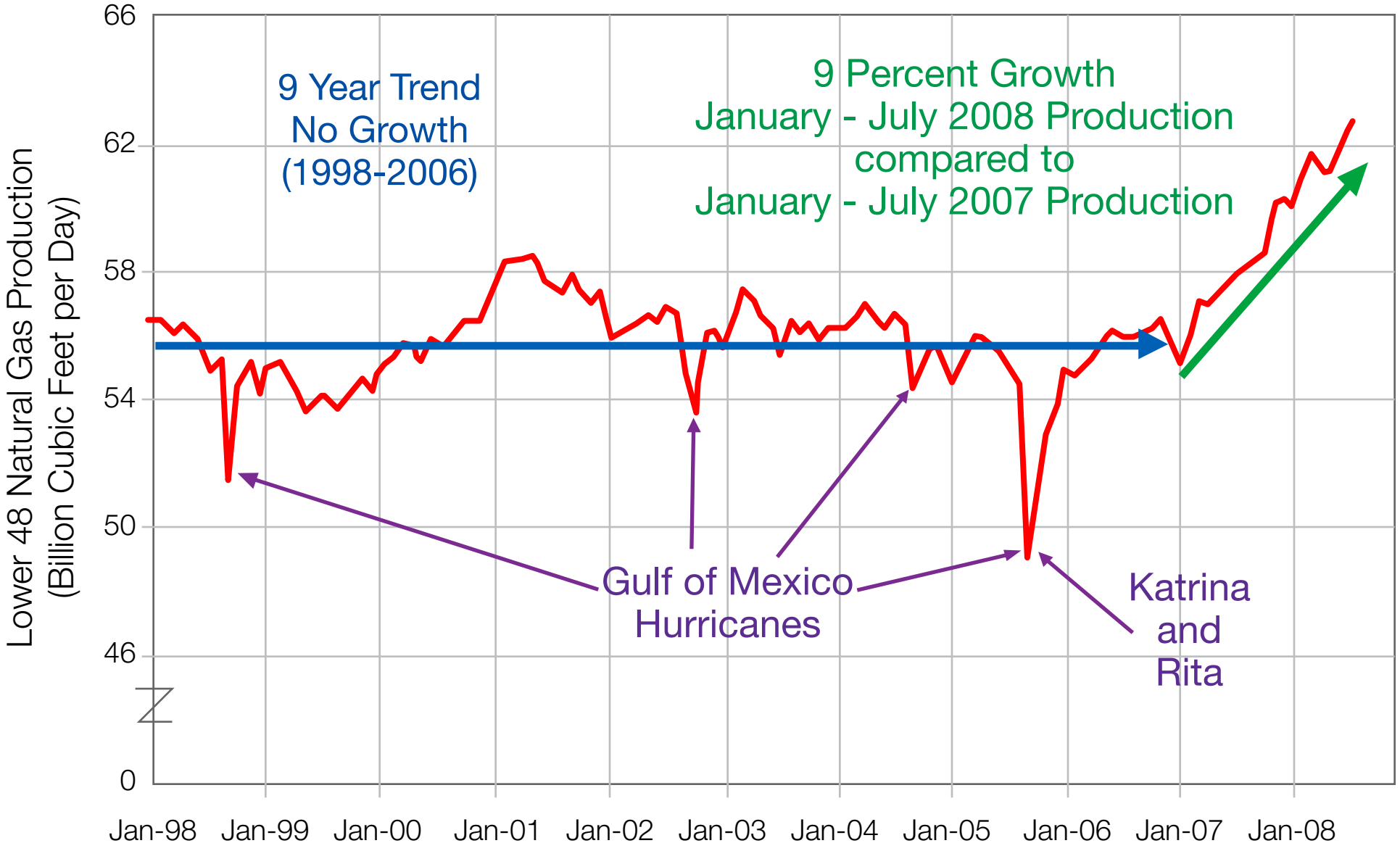
Major Assumptions for Gas versus Electric Water Heater Carbon Footprint Calculations

- Electric Generation Mix for Colorado based on 2006 EIA data
- CO2 per kwh for electric water heater based on 2006 EIA Colorado emissions data
- CO2 per Btu for gas water heater based on 0.000117 lbs per Btu
- CO2 per Btu for gas water heaters adjusted to account for losses from wellhead/exploration to burner tip (9%)
- A.O. Smith Promax Plus 40 gallon Gas Water Heater
  - First Hour recovery - 71 gallons
  - 0.62 Energy Factor
- A.O. Smith Promax Plus 52 gallon Electric Water Heater
  - First Hour recovery - 60 gallons
  - 0.92 Energy Factor
- Electric Costs base on 9.06 cents/kwh
- Gas Costs based on 0.91 $/ccf

All other assumptions, inlet and outlet water temps, amount used, days used, etc. are the same for both gas and electric scenarios.

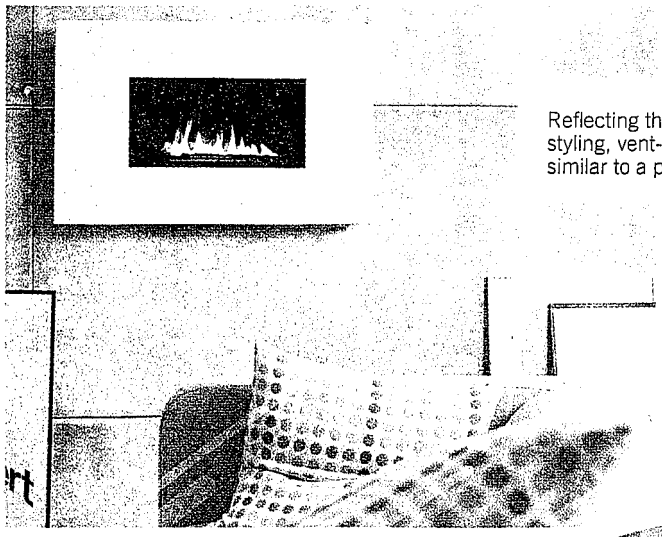
Attachment 4

Recent Growth in Lower 48 Natural Gas Production Breaks with Historical Trends

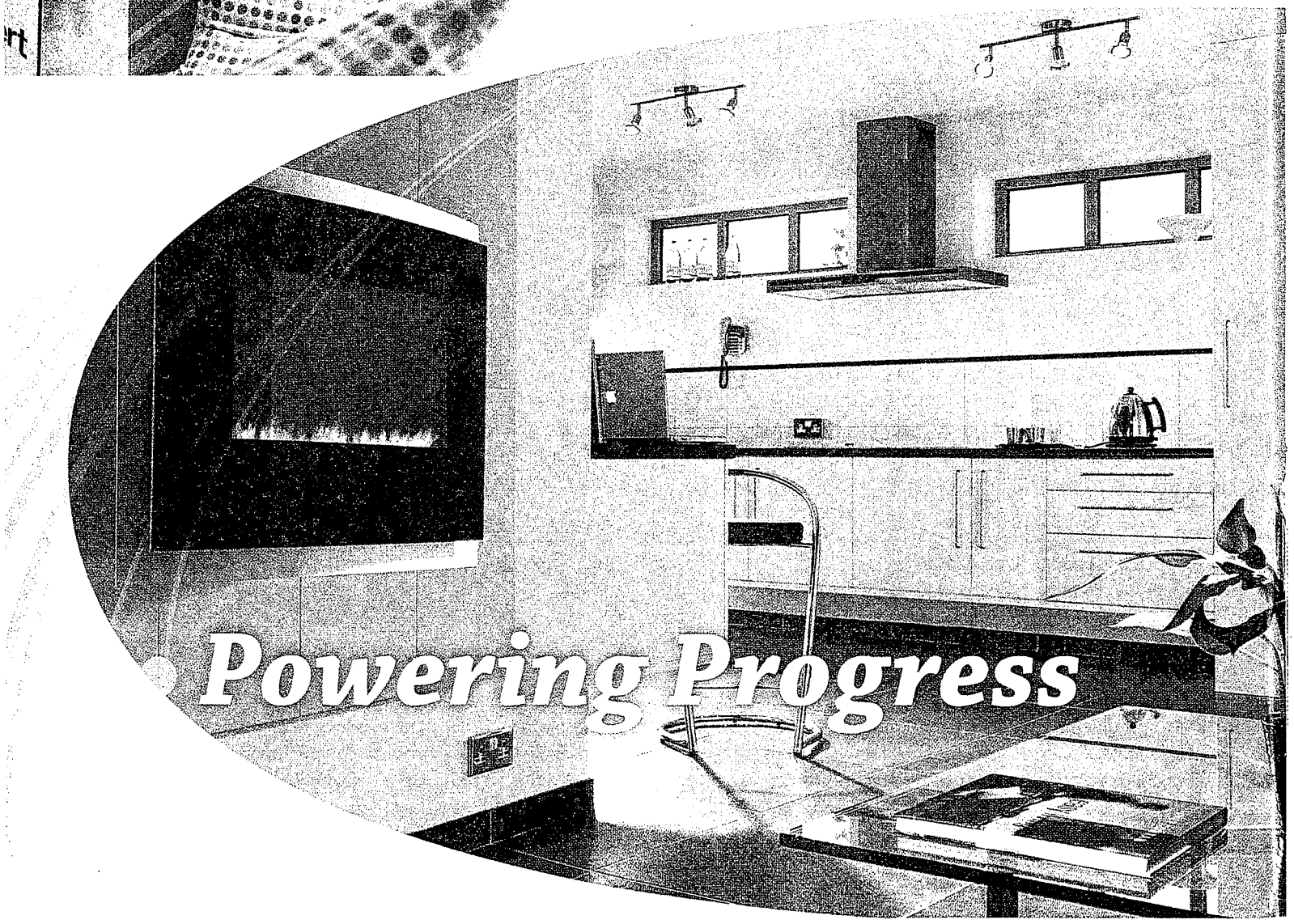


Source: Department of Energy (DOE)

Attachment 5



Reflecting the trend toward modern styling, vent-free products can look similar to a plasma TV.



Powering Progress

THE LATEST NATURAL GAS APPLIANCES SAVE MONEY, ENERGY AND THE ENVIRONMENT WHILE OFFERING CONSUMERS GREATER CONVENIENCE AND CONTEMPORARY STYLING.

By Sandra R. Sabo

PHOTOS COURTESY OF VENT-FREE GAS PRODUCTS ALLIANCE

Building a new house or undertaking a major renovation puts consumers in the position of making hundreds of decisions within a short amount of time. Some decisions are small (what color of range should we install?) while others can have significant design implications (where are we putting the fireplace?). ● Knowing which products currently appear on the most must-have lists—plus which ones are growing in popularity—can help streamline the decision-making process and guide consumers toward the best choices for their needs and lifestyle. With that goal in mind, *American Gas* talked with industry representatives to identify the major trends related to natural gas appliances. Here are the top five trends they see.

1 • COST SAVINGS

Today's soaring prices for food, transportation and just about every one of life's necessities have consumers keeping careful watch on their checkbooks. The 55 percent of Americans who heat their homes with natural gas have already made a cost-saving choice: Natural gas costs an average of $1.328 per therm compared with electricity at $3.165 per therm, as reported by the U.S. Department of Energy (DOE) in a 2008 comparison of representative average residential fuel costs.

What's more, at least four out of five consumers are taking definitive action to minimize their utility bills, according to a 2008 survey released by the National Marketing Institute. The institute's consumer trends database indicates that 83 percent of consumers regularly make extra efforts to reduce their heating and cooling costs—a 2 percent increase from one year earlier.

That extra effort may translate into employing the concept of zone heating. "To save money on home heating, you simply turn down your central furnace and heat only those rooms you use most often, such as the family room or living room," explains Deidra Darsa, public relations and media relations manager for the Hearth, Patio & Barbecue Association (HPBA), headquartered in Arlington, Va. "Gas fireplaces and stoves are great to use as zone heaters because they provide a comfortable heat as well as an attractive fire."

"For every degree you reduce your thermostat, you save 3 percent on your central heating bill," observes Sue Walker, vice president of business development of DESA Indoor/Outdoor Heating Products, Bowling Green, Ky., and chairman of the Vent-Free Gas Products Alliance. She notes that the vent-free industry in the United States traces its roots to the last large-scale energy crisis of the early 1980s. "That's another time when people were scrambling for ways to save on their heating bills, and the vent-free gas heating technology was imported from Europe as one option," says Walker.

The Vent-Free Gas Products Alliance estimates that more than 20 million of its products, which provide supplemental heat, have been installed in the United States in the last 27 years. These fixed installations, which require a natural gas line but no outside venting, initially fell into the category of space heaters but now include many types of hearth products, including gas logs, fireplaces, stoves and inserts.

Hydronic heating offers consumers another way to cut heating bills. This technology uses a gas-fired boiler to heat water, which is then circulated throughout the house and distributed via traditional radiators, thin-tube baseboard heating or radiant tubing. Hydronic heating is concentrated where it is needed most, with little heat loss. The Hydronics Industry Alliance estimates that every dollar spent on heating water in the boiler translates into 96 cents of heat.

"Although it's more expensive to install, hydronic radiant floor heat is growing in popularity because it's comfortable and efficient," says Paul Cabot, AGA's administrator of the National Fuel Gas Code.

The heat that radiates off the floor—or walls or ceilings—warms the people and objects in a room rather than the empty air. Sales of hydronic radiant tubing more than doubled between 2000 and 2007, according to the Radiant Panel Association in Loveland, Colo., outpacing sales of electric radiant tubing by two to one.

2 • ENERGY EFFICIENCY

Cost savings increase when energy use decreases, making energy efficiency the second hottest trend.

"Energy efficiency is definitely driving purchasing decisions, particularly in areas of the country with a high number of heating-degree days. There, it makes good economic sense to upgrade to newer, highly efficient equipment because consumers will see the payback of the initial cost sooner," says Colleen Hughes, director of communications for the Air-Conditioning, Heating and Refrigeration Institute (AHRI) in Arlington, Va.

because they provide a comfortable heat as well as an attractive fire."

—DEIDRA DARSA, HEARTH, PATIO & BARBECUE ASSOCIATION

Hughes reports that shipments of gas-fired furnaces that operate at more than 88 percent efficiency have increased 42 percent in the last eight years. With one in four furnaces in the United States more than 20 years old—and therefore operating at 80 percent efficiency or less—many opportunities exist to cut energy consumption.

"There have been significant advances in energy efficiency in just the last five years, with Energy Star driving many consumers toward energy-saving purchases," says Jill Notini, vice president of communications and marketing for the Washington, D.C.-based Association of Home Appliance Manufacturers (AHAM). The Energy Star program, launched

Stricter Standards Save More

Natural gas appliances purchased just 10 years ago may not seem old, but they're noticeably less efficient than today's models. In fact, "If you replaced a home's major appliances with current models, you could probably save up to $100 a year on energy costs," says Jill Notini of the Association of Home Appliance Manufacturers. "Every five years, home appliances are regularly reviewed through the Department of Energy's (DOE's) efficiency standards rulemaking process, and there have been continuous updates in the government standards."

Home appliances that exceed the government's mandatory standards for energy efficiency typically qualify for the Energy Star designation. Any change in the mandatory standards triggers a change in Energy Star criteria as well, ensuring that consumers who purchase Energy Star appliances have selected the most energy-efficient products possible.

As of January 2009, residential gas water heaters become eligible for the Energy Star designation for the first time in the program's 17-year history. According to DOE, a 50-gallon, high-performance gas storage water heater that meets the Energy Star criteria (6.9 percent more efficient than the federal standard) will yield annual energy savings of 7.3 percent. Electric resistance water heaters are not eligible for the Energy Star program.

For the full story on Energy Star criteria for gas water heaters (traditional storage, tankless and gas condensing), see the June 2008 issue of *American Gas*, p. 16.

—*S.R.S.*

"Simply installing natural gas appliances makes a consumer more"

—PAUL CABOT, AGA

by the U.S. Environmental Protection Agency and DOE in 1992, recognizes home appliances that exceed federally mandated standards for energy usage.

Natural gas utilities often encourage appliance upgrades by offering rebates and other financial incentives to homeowners who purchase highly efficient or Energy Star-labeled furnaces, water heaters and dryers. Tax incentives for energy-efficient appliances may be offered at the state or federal level as well.

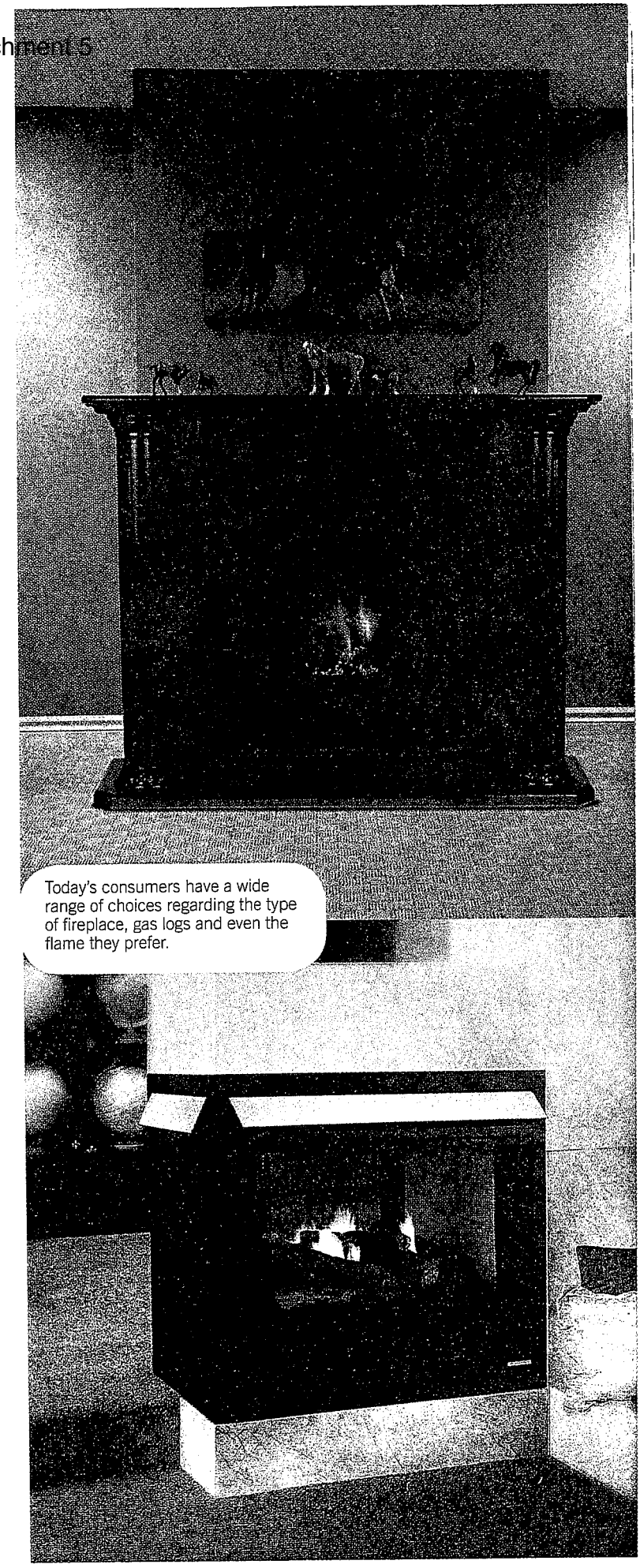
3 • REDUCED ENVIRONMENTAL IMPACT

Based on the data he has reviewed, Francis Dietz believes that cost savings have primarily motivated the consumers who have purchased highly efficient appliances in the last decade. "But being more conscious of the environment, doing the right thing by being more 'green,' is an added benefit," says Dietz, AHRI's vice president of public affairs.

Further driving this trend, one-third of consumers (34 percent) say they are much more concerned about environmental issues today compared with a year ago. That's one of the findings from "Going Green," a Yankelovich consumer survey released in September 2008. The survey also found that slightly more than one in 10 consumers (13 percent) are considered "greenthusiasts" because they express a passionate concern for the environment.

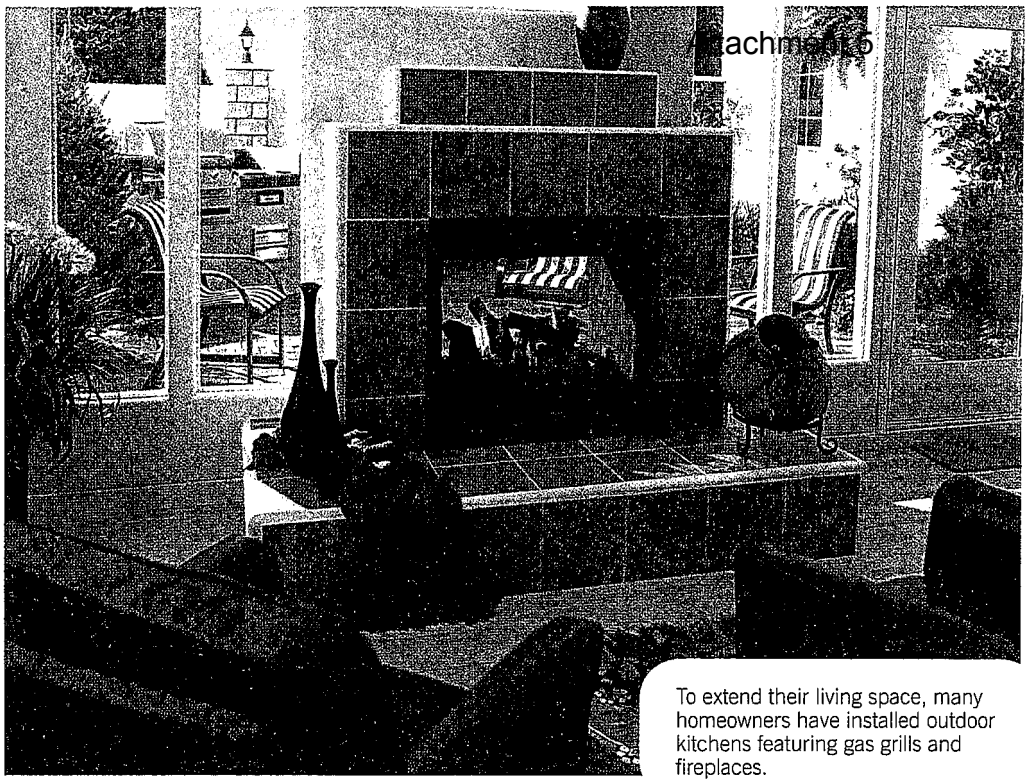
Simply installing natural gas appliances makes a consumer more eco-friendly, emphasizes Paul Cabot. "According to source-based calculations—in other words, how much energy it takes to extract the energy source—natural gas is really the most green energy source to begin with," he says. "And, on average, 90 percent of the energy produced as natural gas is ultimately delivered to customers."

To emphasize the greenness of natural gas, AGA recently developed the Naturally Green Natural Gas Home Program (see www.aga.org/NaturallyGreenHomes). Administered by local natural gas utilities, the program recognizes home builders and remodelers who self-certify their work as taking full advantage of the comfort, dependability and eco-friendliness offered by natural gas appliances.



Today's consumers have a wide range of choices regarding the type of fireplace, gas logs and even the flame they prefer.

PHOTOS COURTESY OF VENT-FREE GAS PRODUCTS ALLIANCE



To extend their living space, many homeowners have installed outdoor kitchens featuring gas grills and fireplaces.

Developed with the assistance of NAHB's research center, the program awards points based on the number and type of natural gas appliances installed in new home construction or remodels. Builders and remodelers can use the resulting certification when marketing their work to eco-conscious consumers.

Jill Notini points out that upgrading to more energy-efficient appliances can help save the environment in more ways than one. She says, "Today, more than 95 percent of major appliance products—which are heavy users of steel—are recycled at the end of their life. Consumers are not only saving energy by upgrading but also keeping the old products out of a landfill."

4 • CONVENIENCE

Saving money, saving energy and saving the environment pack a powerful punch for consumers. Yet they don't want to sacrifice convenience to achieve those goals. Here are some examples of how the convenience trend plays out with natural gas appliances.

DUAL-FUEL RANGES. Consumers who favor natural gas for cooking and electricity for baking no longer have to compromise. "Introduced within the last three or four years, dual-fuel ranges are gaining in popularity," says Notini. "Typically, they have gas burners for the cooktop portion and an electric range with a fan for convection heating."

FIREPLACES. NAHB research indicates that an indoor fireplace ranks second on the list of most-requested features in a new home. Yet many consumers may not want to bother hauling in logs and hiring the chimney cleaners required by a wood-burning fireplace.

"With natural gas fireplaces and stoves, you just turn them on and off. Consumers can have the look and the feel of a wood fire without the work of one," says Deidra Darsa. "Many models operate by remote control—you just press a button and have a fire going."

In new construction, Sue Walker often sees fireplaces that can do double duty. "To make consumers happy—and to promote resale—you can create a wood-burning fireplace and then install a vent-free gas log. That provides ultimate flexibility for consumers," says Walker. Or, for homeowners who want the ambience of a gas fireplace in a particular location, a vent-free gas product can be installed on any interior wall. In contrast, a vented fireplace requires an outside wall and construction of a chimney.

OUTDOOR LIVING AREAS. According to HPBA, baby boomers in particular prefer to enjoy the great outdoors in style. Darsa explains, "Many people have turned to their backyards to build their own resort. They add a natural gas firepit or fireplace, an outdoor grill and perhaps a full outdoor kitchen to extend the outdoor season."

Adding to the ambience of both indoor and outdoor gas fireplaces, manufacturers have greatly expanded the look of the logs available. Logs come in numerous varieties of "wood," often with natural-looking details such as knotholes and ax marks.

5 • CONTEMPORARY STYLING

"A lot of people, particularly younger ones, like a sleek and modern look," says Walker. "Some vent-free gas fireplaces, for example, have no logs in them—they look like a plasma TV hanging on the wall, with only flames showing."

In the kitchen, this fifth trend manifests itself in the skyrocketing popularity of different-colored appliances. Although white remains

PHOTO COURTESY OF HEARTH, PATIO & BARBECUE ASSOCIATION

the color of choice for most home appliances, it has lost some ground—primarily to stainless steel. AHAM reports that fewer than one in five gas ranges (18 percent) was stainless steel in 2004. By 2007, that number had grown to nearly one in three ranges (31 percent)—a 72 percent increase in just three years.

"Some manufacturers offer a full color palette, such as clothes dryers in metallics, bright blues and deep reds," says Notini. Even water heaters, traditionally available only in white, have begun appearing with blue or red storage tanks.

"To make consumers happy—and to promote resale—you can create a wood-burning fireplace and then install a vent-free gas log.

—SUE WALKER, DESA INDOOR/OUTDOOR HEATING PRODUCTS & VENT-FREE GAS PRODUCTS ALLIANCE

ADDITIONAL APPLICATIONS

You might be surprised at other ways that natural gas makes homes more comfortable and enjoyable. For instance:

- A vent-free space heater, installed at least 18 inches off the ground, can easily keep a garage warm enough to work in, even in the coldest climates.
- In areas with significant snowfall, a hot water system embedded in the driveway can melt away any accumulation.
- Hydronic heating can be directed through tubing to warm towels in bathrooms and dry wet gloves by the door.
- A home-fueling system for compressed natural gas (CNG) vehicles can be installed in a garage and used much like the pump at a traditional gas station.

"The market for privately owned CNG vehicles hasn't been large, but it will become more widespread," predicts Paul Cabot. "The refueling system uses the same house piping and low pressure then compresses the natural gas to fill the car's tank overnight."

With gasoline prices expected to continue climbing over the long run, CNG could be the start of a new trend.

SANDRA R. SABO is a freelance writer based in Mendota Heights, Minn.

Making Their Mark in the Community

When you're blind or visually impaired, how do you know whether the gas burner is on high or low? How do you determine whether you're drying your clothes for one minute or one hour? Xcel Energy, headquartered in Minneapolis, solves those problems with its Kitchen Appliance Marking Program (KAMP).

Now in its 20th year, KAMP is a free service offered to blind and visually impaired customers living within Xcel Energy's Twin Cities service area. Approximately 1,800 customers have taken advantage of the service, which marks key temperature points on appliances using peel-and-stick bubbles or colored dots.

"This service is provided by a small group of retirees, who volunteer their time to apply the raised and colored markings however the customer would like," explains Ceace Haagensen, senior representative of community affairs for Xcel Energy. For example, a customer may request markings on stove burners at high, medium and low temperature settings or to indicate when an oven has been set to 350 degrees.

Xcel Energy promotes KAMP in partnership with area nonprofits and businesses that serve the blind and visually impaired. Consumers call a dedicated phone line to request the service, which matches them with a retiree in their area.

"Our retirees love helping people, and they do much more than appliance marking," reports Haagensen. In 2009, Xcel Energy plans for KAMP volunteers to also distribute information on energy conservation and help blind and visually impaired customers locate additional services for which they may be eligible, based on their income.

—*S.R.S.*

National Action Plan for Energy Efficiency

Vision for 2025:

A Framework for Change

EXECUTIVE SUMMARY

NOVEMBER 2008

Letter from the Co-Chairs of the National Action Plan for Energy Efficiency

November 2008

To all,

As you know, the National Action Plan for Energy Efficiency is playing a vital role in advancing the dialogue and the pursuit of energy efficiency in our homes, buildings, and industries —an important energy resource for the country.

With the commitment and leadership from more than 60 diverse organizations nationwide we have made great progress in a short time. We have:

- Developed five broad and meaningful recommendations for pursuing cost-effective energy efficiency.
- Brought together more than 100 organizations from 50 states around this common goal to take energy efficiency to the next level.

However, there is much more to do. We remain substantially underinvested in effi ciency at a time when using energy wisely can help address rising energy costs, rising emissions of greenhouse gases, and our dependence on foreign fuel supplies.

We need a concerted, sustained effort to overcome what are truly surmountable hurdles to making energy efficiency a larger part of our supply picture. To continue our progress we need to move from our initial Action Plan to implementation. We need a vision for where we want to be and a path for getting there.

Commensurate with that goal, we are pleased to offer this updated 2025 Vision for the National Action Plan. As we released it last year, the Vision outlines what our long-term goals should be if we are to truly achieve all cost-effective energy efficiency. With recent refinements to our approach for measuring progress under the ten key implementation goals, we believe the Vision now provides a complete framework for changing our course on energy efficiency.

This Vision represents the thinking of many leading organizations nationwide. Importantly, we believe that this Vision is a living document that looks out to long-term needs and will be modified to reflect new information and changing conditions.

We thank the Leadership Group for its contribution to this document. It is a pleasure to work with this committed group to advance energy efficiency to address the critical energy and environmental issues facing the country.

Sincerely,

Marsha H. Smith
President, National Association
Regulatory Utility Commissioners
Commissioner, Idaho Public Utilities Commission

James E. Rogers
President, Chairman, and CEO
Duke Energy

National Action Plan for Energy Efficiency

Vision for 2025:

A Framework for Change

EXECUTIVE SUMMARY

NOVEMBER 2008

The Leadership Group of the National Action Plan for Energy Efficiency is committed to taking action to increase investment in cost-effective energy efficiency. The Vision for 2025 was developed under the guidance of and with input from the Leadership Group. The document does not necessarily represent a consensus view and does not represent an endorsement by the organizations of Leadership Group members.

The Vision is a product of the National Action Plan for Energy Efficiency Leadership Group and does not reflect the views, policies, or otherwise of the federal government. The role of U.S. DOE and U.S. EPA is limited to facilitation of the Action Plan.

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Executive Summary

This Vision for the National Action Plan for Energy Efficiency establishes a goal of achieving all cost-effective energy efficiency by 2025; presents ten implementation goals for states, utilities, and other stakeholders to consider to achieve this goal; describes what 2025 might look like if the goal is achieved; and provides a means for measuring progress. It is a framework for implementing the five policy recommendations of the Action Plan, announced in July 2006, which can be modified and improved over time.

Background

Through the Leadership Group of the National Action Plan for Energy Efficiency (Action Plan), more than 60 diverse leading organizations recognized the importance of bringing greater emphasis to the role that cost-effective energy efficiency[1] can and should play in supplying our future energy needs. Improving the energy efficiency of homes, businesses, schools, governments, and industries—which consume more than 70 percent of the natural gas and electricity used in the United States—is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and independence, air pollution, and global climate change in the near future. Energy efficiency can play a significant role in meeting our energy requirements, and it is a critical component of the overall modernization of utility energy systems worthy of the 21st century.

Despite the value that cost-effective energy efficiency offers, it is not achieving its full potential for a number of reasons. In July 2006, the Action Plan presented five key policy recommendations (see Figure ES-1) for fully developing the cost-effective energy efficiency resources in this country, building upon experiences in particular states and regions. It was a call to action to take investment in energy efficiency to the next level. As of November 2008, more than 120 organizations have endorsed these recommendations and/or made commitments to take energy efficiency to the next level within their spheres of influence.

As a next step, the Action Plan co-chairs challenged the Leadership Group to define a vision that would detail the steps necessary to fully implement the Action Plan. The Vision presented in this document is the response to that challenge. It includes establishment of a long-term aspirational goal and ten key implementation goals. It also describes what 2025 could look like if the

Figure ES-1. National Action Plan for Energy Efficiency Recommendations

- **Recognize energy efficiency as a high-priority energy resource.**
- **Make a strong, long-term commitment to implement cost-effective energy efficiency as a resource.**
- **Broadly communicate the benefits of and opportunities for energy efficiency.**
- **Promote sufficient, timely, and stable program funding to deliver energy efficiency where cost-effective.**
- **Modify policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments.**

long-term goal were achieved and provides a means for measuring progress over time. The Vision is provided as a framework to guide the changing policies toward energy efficiency for natural gas and electricity; it can be modified and improved over time.

Achieve All Cost-Effective Energy Efficiency

The long-term aspirational goal for the Action Plan is to achieve all cost-effective energy efficiency by the year 2025. Based on studies, the efficiency resource available may be able to meet 50 percent or more of the expected load growth over this time frame, similar to meeting 20 percent of electricity consumption and 10 percent of natural gas consumption.[2] The benefits from achieving this magnitude of energy efficiency nationally can be estimated to be more than $100 billion in lower energy bills in 2025 than would otherwise occur, over $500 billion in net savings, and substantial reductions in greenhouse gas emissions.

Importantly, the energy efficiency resource's role in meeting load and load growth may vary across the country due to regional differences in growth patterns, costs of energy, and other factors. Furthermore, the long-term goal is not a statement about the need for new power supply additions in the future, as new plants may be a critical component of the desired modernization of the energy supply and delivery system. However, the greater the energy efficiency savings, the greater the likelihood that efficiency gains can help replace older, less efficient power supply options, resulting in substantial environmental benefits.

Ten Implementation Goals

Over two decades of program experience support the implementation of a number of policies to enhance the likelihood that the long-term goal will be achieved. Energy efficiency needs to be valued similarly to supply options. Utilities and investors need to be financially interested in saving energy. State activity is key in this transformation of natural gas and electricity supply and delivery, including updating and enforcing codes and standards to ensure that savings are captured as new buildings and products enter the system. Customers must also have the proper incentives to make investments in cost-effective energy efficiency. With such policies in place, cost-effective energy efficiency can be a key component of the modernization of the energy supply and delivery system and help to transform how customers receive and value energy services.

These policies are included in the following ten implementation goals. These goals provide a framework for implementing the recommendations of the Action Plan (see Figure ES-1) by outlining the key steps state decision-makers should consider to help achieve the 2025 Vision. The time line for achieving these implementation goals is by 2015 to 2020, so that the necessary policy foundation is in place to help ensure success of the 2025 Vision.

Goal One: Establishing Cost-Effective Energy Efficiency as a High-Priority Resource

Utilities[3] and applicable agencies are encouraged to:

- Create a process, such as a state or regional collaborative, to explore the energy efficiency potential in the state and commit to its full development.
- Regularly identify cost-effective achievable energy efficiency potential in conjunction with ratemaking bodies.
- Set energy savings goals or targets consistent with the cost-effective potential.
- Integrate energy efficiency into energy resource plans at the utility, state, and regional levels, and include provisions for regular updates.

Goal Two: Developing Processes to Align Utility and Other Program Administrator Incentives Such That Efficiency and Supply Resources Are on a Level Playing Field

Applicable agencies are encouraged to:

- Explore establishing revenue mechanisms to promote utility and other program administrator indifference

to supplying energy savings, as compared to energy generation options.

- Consider how to remove utility and other program administrator disincentives to energy efficiency, such as by removing the utility throughput disincentive and exploring other ratemaking ideas.
- Ensure timely cost recovery in place for parties that administer energy efficiency programs.

Goal Three: Establishing Cost-Effectiveness Tests

Applicable agencies along with key stakeholders are encouraged to:

- Establish a process to examine how to define cost-effective energy efficiency practices that capture the long-term resource value of energy efficiency.
- Incorporate cost-effectiveness tests into ratemaking procedures going forward.

Goal Four: Establishing Evaluation, Measurement, and Verification Mechanisms

Ratemaking bodies are encouraged to:

- Work with stakeholders to adopt effective, transparent practices for the evaluation, measurement, and verification (EM&V) of energy efficiency savings.

Program administrators are encouraged to:

- Conduct EM&V consistent with these practices.

Goal Five: Establishing Effective Energy Efficiency Delivery Mechanisms

Applicable agencies are encouraged to:

- Clearly establish who will administer energy efficiency programs.
- Review programs, funding, customer coverage, and goals for efficiency programs; ensure proper administration and cost recovery of programs, as well as ensuring that goals are met.
- Establish goals and funding on a multi-year basis to be measured by evaluation of programs established.
- Create strong public education programs for energy efficiency.
- Ensure that the program administrator shares best practice information regionally and nationally.

Goal Six: Developing State Policies to Ensure Robust Energy Efficiency Practices

Applicable agencies are encouraged to:

- Have a mechanism to review and update building codes.
- Establish enforcement and monitoring mechanisms of energy codes.
- Adopt and implement state-level appliance standards for those appliances not addressed by the federal government.
- Develop and implement lead-by-example energy efficiency programs at the state and local levels.

Goal Seven: Aligning Customer Pricing and Incentives to Encourage Investment in Energy Efficiency

Utilities and ratemaking bodies are encouraged to:

- Examine, propose, and modify rates considering impact on customer incentives to pursue energy efficiency.
- Create mechanisms to reduce customer disincentives for energy efficiency (e.g., financing mechanisms).

Goal Eight: Establishing State of the Art Billing Systems

Utilities are encouraged to:

- Work with customers to develop methods of supplying consistent energy use and cost information across states, service territories, and the nation.

Goal Nine: Implementing State of the Art Efficiency Information Sharing and Delivery Systems

Utilities and other program administrators are encouraged to:

- In conjunction with their regulatory bodies, explore the development and implementation of state of the art energy delivery information, including smart grid infrastructures, data analysis, two-way communication programs, etc.
- Explore methods of integrating advanced technologies to help curb demand peaks and monitor efficiency upgrades to prevent equipment degradation, etc.
- Coordinate demand response and energy efficiency programs to maximize value to customers.
- Support development of an energy efficiency services and program delivery channel (e.g., quality trained technicians), with specific attention to residential programs.

Goal Ten: Implementing Advanced Technologies

Applicable agencies and utilities are encouraged to:

- Review policies to ensure that barriers to advanced technologies, such as combined heat and power (CHP), are removed; ensure inclusion into the broader resource plans.
- Work collectively to review advanced technologies and determine rapid integration timelines.

Measuring Progress

Measurement of the progress toward full implementation of these ten goals by 2015 to 2020 is an important part of the Vision. Progress will be measured and reported on every few years. As of December 31, 2007, based on information collected from across the country (see Table ES-1), there is a strong basis of experience with these energy efficiency policies upon which to draw and to expand. For example, more than a dozen states have:

- Established a policy to recognize energy efficiency as a high-priority resource.
- Identified the cost-effective, achievable potential for energy efficiency over the long term, and established energy savings goals or targets consistent with this potential.
- Established cost-effectiveness tests for energy efficiency consistent with the long-term benefits of energy efficiency.
- Established energy efficiency programs for their various types of customers.

There is also more progress to make. For example, several states have partially implemented the following policy steps to advance energy efficiency:

- Integrated energy efficiency savings goals or expected energy savings targets into state energy resource plans, with provisions for regular updates.
- Provided for stable (multi-year) funding for energy efficiency programs, consistent with energy efficiency goals.

These policies go hand in hand with significant investment in energy efficiency, as well as capturing the energy savings and environmental benefits from these programs. As of 2008, the most recent national benefits data show that:

- Cumulative electricity savings total 63 billion kilowatt-hours (kWh) (about 2 percent of retail sales) as of 2006, including incremental electricity savings of over 8 billion kWh in 2006 alone. These cumulative savings have avoided the need for 16 gigawatts of new capacity, equivalent to 32 new 500-megawatt power plants.[4]
- Cumulative natural gas savings total 135 million therms (0.1 percent of retail sales) as of 2006.[5]

Table ES-1. Progress in Meeting Implementation Goals

	Implementation Goal and Key Steps	States Having Adopted Policy Step as of December 31, 2007			
		Electricity Services		Natural Gas Services	
		Completely	Partially	Completely	Partially
Goal One: Establishing Cost-Effective Energy Efficiency as a High-Priority Resource					
1	Process in place, such as a state and/or regional collaborative, to pursue energy efficiency as a high-priority resource.	14	0	14	0
2	Policy established to recognize energy efficiency as high-priority resource.	21	22	8	8
3	Potential identified for cost-effective, achievable energy efficiency over the long term.	25	1	13	0
4	Energy efficiency savings goals or expected energy savings targets established consistent with cost-effective potential.	15	3	5	2
5	Energy efficiency savings goals and targets integrated into state energy resource plan, with provisions for regular updates.	0	16	0	1
6	Energy efficiency savings goals and targets integrated into a regional energy resource plan.**	TBD	TBD	TBD	TBD
Goal Two: Developing Processes to Align Utility and Other Program Administrator Incentives Such That Efficiency and Supply Resources Are on a Level Playing Field					
7	Utility and other program administrator disincentives are removed.	17	8	18	5
8	Utility and other program administrator incentives for energy efficiency savings reviewed and established as necessary.	10	5	5	2
9	Timely cost recovery in place.**	TBD	TBD	TBD	TBD
Goal Three: Establishing Cost-Effectiveness Tests					
10	Cost-effectiveness tests adopted which reflect the long-term resource value of energy efficiency.	29	2	9	0
Goal Four: Establishing Evaluation, Measurement, and Verification Mechanisms					
11	Robust, transparent EM&V procedures established.	14	6	5	2
Goal Five: Establishing Effective Energy Efficiency Delivery Mechanisms					
12	Administrator(s) for energy efficiency programs clearly established.	24	2	13	1
13	Stable (multi-year) and sufficient funding in place consistent with energy efficiency goals.	4	9	2	4
14	Programs established to deliver energy efficiency to key customer classes and meet energy efficiency goals and targets.	24	2	7	0
15	Strong public education programs on energy efficiency in place.	18	5	13	6
16	Energy efficiency program administrator engaged in developing and sharing program best practices at the regional and/or national level.	30	0	18	0

Table ES-1. Progress in Meeting Implementation Goals (continued)

	Implementation Goal and Key Steps	States Having Adopted Policy Step as of December 31, 2007			
		Electricity Services		Natural Gas Services	
		Completely	Partially	Completely	Partially
Goal Six: Developing State Policies to Ensure Robust Energy Efficiency Practices					
17	State policies require routine review and updating of building codes.	28	13	28	13
18	Building codes effectively enforced.**	TBD	TBD	TBD	TBD
19	State appliance standards in place.	11	0	11	0
20	Strong state and local government lead-by example programs in place.	13	24	13	24
Goal Seven: Aligning Customer Pricing and Incentives to Encourage Investment in Energy Efficiency					
21	Rates examined and modified considering impact on customer incentives to pursue energy efficiency.	7	5	2	0
22	Mechanisms in place to reduce consumer disincentives for energy efficiency (e.g., including financing mechanisms).	4	1	0	0
Goal Eight: Establishing State of the Art Billing Systems					
23	Consistent information to customers on energy use, costs of energy use, and options for reducing costs.**	TBD	TBD	TBD	TBD
Goal Nine: Implementing State of the Art Efficiency Information Sharing and Delivery Systems					
24	Investments in advanced metering, smart grid infrastructure, data analysis, and two-way communication to enhance energy efficiency.	5	29	***	***
25	Coordinated energy efficiency and demand response programs established by customer class to target energy efficiency for enhanced value to customers.**	TBD	TBD	***	***
26	Residential programs established to use trained and certified professionals as part of energy efficiency program delivery.	9	0	9	0
Goal Ten: Implementing Advanced Technologies					
27	Policies in place to remove barriers to combined heat and power.	11	24	***	***
28	Timelines developed for the integration of advanced technologies.**	TBD	TBD	TBD	TBD

* See Appendix D of the full *Vision for 2025* report for additional information on how these numbers have been determined.

** See Appendix D of the full *Vision for 2025* report for discussion of why progress on this policy step is not currently measured.

*** Steps 24, 25, and 27 do not apply to natural gas.

TBD = To be determined

Table ES-2. Current Benefits from and Funding for State- and Utility-Administered Energy Efficiency Programs*

Annual Benefits and Funding	Energy Savings		Avoided CO_2 Emissions (million tons)	Efficiency Funding	
	Energy Use (kWh or therms)	Peak Capacity (GW)		2006 Spending ($ billion)	2007 Budgets ($ billion)
Electricity					
Incremental	8 billion	1.3	5.8	$1.60 (0.5% of utility revenues)	$1.88
Cumulative	63 billion (2% of retail sales)	16.0	46.1		
Natural Gas					
Incremental	N/A	—	N/A	$0.29 (0.3% of utility revenues)	$0.28
Cumulative	135 million (0.1% of retail sales)	—	0.8		

Sources: ACEEE (Eldridge et al., 2008), CEE (Nevius et al., 2008), eGRID2007 Version 1.0 (EPA, 2008), EIA energy sales and savings data (EIA, 2007, 2008a, 2008b, 2008c), and American Gas Association statistics (AGA, 2008).

*For information on how these numbers were derived, see Chapter 2 of the full Vision for 2025 report.

N/A = Not available

- Greenhouse gas emissions are being reduced by nearly 50 million metric tons annually, equivalent to emissions from 9 million vehicles per year.[6]
- Approximately $2 billion (approximately 0.5 percent of utility revenues) is being invested annually in state- and utility-administered energy efficiency programs.[7]
- State energy savings goals and utility energy savings targets are in place to encourage cumulative savings exceeding 200 billion kWh in the year 2025, in addition to current energy savings.[8]

Additional details on the estimates for current investments and benefits are provided in Table ES-2. Improving the available data will be an ongoing effort as the Action Plan continues to measure progress toward all cost-effective energy efficiency.

The Energy System in 2025

An energy system in 2025 that would evolve with the suite of energy efficiency policies in place as outlined above and that captures all cost-effective energy efficiency will be different from the one we have today. Some of the key differences based on the effects that some of these policy changes are having in parts of the country, as well as expectations of some of the advantages that new technology and system modernization can bring, are highlighted below from the perspectives of the energy customer and society.

- **Customers** across the residential, commercial, and industrial sectors would have ready, uniform access to comprehensive energy efficiency services across the country. These services would bring a range of efficiency improvements to homes, buildings, and

Table ES-3. Changes to Watch in Evolving Technology, Policy, and Program Practices for Energy Efficiency

Policy Area	Changes to Watch
Evaluation, measurement, and verification	• Development of national standards • Requirements for independent verification • Growing role for smart grid technologies in EM&V • Requirements for state and regional carbon programs
Demand response, advanced metering, and smart grids	• New technologies, such as advanced meters and smart appliances/ controls • Data collection networks and data analysis to enhance energy efficiency • New customer interfaces • Increased interoperability
Regional resource planning	• Regional value of energy efficiency identified
Building energy efficiency expertise/workforce	• Development and use of energy efficiency curriculum for various segments of the workforce • Development and broad use of training and certification programs
Integration of R&D, building codes, appliance standards, and market transformation efforts	• Regional and national coordination across these efforts

Sources: PJM, 2007; CEC and CPUC, 2005; Business Roundtable, 2007; Elliott et al., 2007; Roseman and Hochstetter, 2007; Schiller Consulting, 2007; Western Governors' Association, 2006.

facilities and reduce customers' bills below what they would have been without these programs. Customers would also have clear information on the cost of energy and increased awareness of their total energy use. In addition, new efficient appliances and other equipment will help to control the peak demand of utility systems and give large customers greater flexibility in how they manage and control their own operations to reduce energy use, reduce costs, and increase their own competitive positions. New homes and buildings would meet up-to-date energy codes.

- **Society** would benefit from significantly modernized energy supply, transmission, and distribution systems and, with increased investment in cost-effective energy efficiency, would benefit from lower overall cost of energy supply, increased fuel diversity, and lower emissions of air pollutants and greenhouse gases. The low-income populations would benefit, in particular, from the lower energy bills resulting from a commitment to deliver energy efficiency to these customer classes. Society may also see economic benefits from the greater employment necessary to build an industry capable of delivering energy efficiency services at this broad scale, from a robust business in energy efficiency products and services, and from using more capital locally.

There are a number of challenges to achieving this Vision, including the necessary evolution of technology, policy, and program practices. Table ES-3 highlights some of these evolving areas, including evaluation approaches for efficiency resources, customer involvement through demand response programs and smart grid technology, regional resource planning, workforce building, and integration across energy efficiency efforts.

Related State, Regional, and National Policies

Other energy and environmental policy decisions at the state, regional, and national levels can affect energy efficiency. Ideally, these policies will be designed and implemented in a manner that helps remove barriers to energy efficiency and helps capture energy efficiency resources for a lower-cost energy system than otherwise would be necessary. Integrating energy efficiency considerations into related policy areas, as appropriate, will be critical to achieving this Vision. Such related policy areas are those designed to:

- Limit emissions of greenhouse gases.
- Encourage the use of clean, efficient distributed generation.
- Promote clean energy supply, such as renewable energy.
- Promote load reductions at critical peak times through demand response.
- Modernize and maintain the nation's electric transmission and distribution system, including "smart grid" and advanced meter infrastructure.
- Maintain a sufficient reserve margin for reliable electricity supply.

Next Steps

This Vision is offered as a framework to assist change in energy efficiency and related policies and programs at the state level across the country, toward the goal of achieving all cost-effective energy efficiency in 2025. It presents a snapshot of where the country is as of December 31, 2007 based on the collection and organization of available information on the existing policy and program options. The decision of whether to adopt a policy or program and particular design details at the state level are, of course, to be determined through state processes that address state goals, objectives, and circumstances. The Action Plan Leadership Group and other public and private sources provide a wealth of tools and assistance to parties taking action to advance the Vision, as summarized in Table ES-4.

The Vision will be updated as new information becomes available and improved as information changes. Information on measuring progress at the state level will be updated on a regular basis at the Action Plan Web site, www.epa.gov/eeactionplan. People are encouraged to provide additional information and their comments for how to refine this Vision to the Action Plan Leadership Group. Please send feedback to the Action Plan sponsors via Larry Mansueti, U.S. Department of Energy (lawrence.mansueti@hq.doe.gov, 202-586-2588) and Stacy Angel, U.S. Environmental Protection Agency (angel.stacy@epa.gov, 202-343-9606).

Table ES-4. National Action Plan for Energy Efficiency Tools by Implementation Goals

Goal	Type of Tool or Resource		Detailed Action Plan Tools and Resources
	Introduced in Action Plan Report	Detailed Guide/ Material	
Goal One: Establishing Cost-Effective Energy Efficiency as a High-Priority Resource	X	X	• Guide to Resource Planning with Energy Efficiency • Guide for Conducting Energy Efficiency Potential Studies • Communications Kit
Goal Two: Developing Processes to Align Utility and Other Program Administrator Incentives Such That Efficiency and Supply Resources Are on a Level Playing Field	X	X	• Aligning Utility Incentives with Investment in Energy Efficiency Paper
Goal Three: Establishing Cost-Effectiveness Tests	X	X	• Understanding Cost-Effectiveness of Energy Efficiency Programs Paper • Guide to Resource Planning with Energy Efficiency • Guide for Conducting Energy Efficiency Potential Studies
Goal Four: Establishing Evaluation, Measurement, and Verification Mechanisms	X	X	• Model Energy Efficiency Program Impact Evaluation Guide
Goal Five: Establishing Effective Energy Efficiency Delivery Mechanisms	X		• Program Design and Implementation Best Practices Guidance (under development)
Goal Six: Developing State Policies to Ensure Robust Energy Efficiency Practices		X	• Building Codes for Energy Efficiency Fact Sheet • Efficiency Program Interactions with Codes Paper (under development) • State and Local Lead-by-Example Guide (under development)
Goal Seven: Aligning Customer Pricing and Incentives to Encourage Investment in Energy Efficiency	X		• Executive Briefings on Customer Incentives Through Rate Design (under development)
Goal Eight: Establishing State of the Art Billing Systems		X	• Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data
Goal Nine: Implementing State of the Art Efficiency Information Sharing and Delivery Systems			• Paper on Coordination of Demand Response and Energy Efficiency (under development)
Goal Ten: Implementing Advanced Technologies			• Most Energy-Efficient Economy Scoping Paper (under development)

Notes

1. "Energy efficiency" refers to using less energy to provide the same or an improved level of service to the energy consumer in an economically efficient way. As used here, the term includes using less energy at any time, including at times of peak demand through demand response and peak shaving efforts.

2. The energy efficiency savings as a percent of load growth and savings depend on forecast assumptions used and vary by region. This magnitude of savings is consistent with the potential savings documented in a number of recent studies. See Appendix B of the full *Vision for 2025* report for references for these studies.

3. "Utility" refers to any organization that delivers electric and gas utility services to end-users, including investor-owned, cooperatively owned, and publicly owned utilities.

4. Annual incremental electricity savings are from the American Council for an Energy-Efficient Economy (ACEEE) (Eldridge et al., 2008) and cumulative electricity savings are from Energy Information Administration (EIA) Form-861 data (EIA, 2008b), both for year 2006. Values reflect reported data for administered energy efficiency programs only and do not include low-income programs nor other load management efforts such as demand response. Cumulative savings do not capture those programs administered by state entities. Peak electricity savings are from EIA Form-861 data for year 2006 and reflect reported data for utility-administered energy efficiency programs only and do not include load management programs.

5. Natural gas savings are from the Consortium for Energy Efficiency (CEE) for their members only (Nevius et al., 2008) and include estimated savings from measures installed in 2006, as well as those installed as early as 1992 that were still generating savings as of 2006.

6. The 2005 non-baseload output carbon dioxide (CO_2) emission rates from eGRID2007 Version 1.0 were applied to 2006 electricity savings. Emissions savings from natural gas savings assume 0.00585 tons CO_2 per therm. Vehicle conversion assumes that 5.46 tons CO_2 are emitted per vehicle annually.

7. Annual spending value considers both ACEEE's 2006 actual electricity efficiency program spending (Eldridge et al., 2008) and CEE's 2007 budget estimates for residential, commercial, and industrial electricity and gas efficiency programs (Nevius et al., 2008). CEE budget estimates capture both CEE members and nonmember administrators of energy efficiency program respondents. Program funding for low-income, load management, and other programs is not included in these estimates. Actual 2006 spending for electricity efficiency programs comes from ACEEE, leveraging EIA and ACEEE's independent information collection efforts.

8. Expected energy to be saved through energy savings goals assumes energy savings post-2007 from 14 states. More details on this methodology are included in Appendix E. No states were found to have comparable, enforceable savings goals for natural gas.

References

American Gas Association [AGA] (2008). Gas Utility Industry Revenues from Sales, by Class of Service. Accessed 2008. <http://www.aga.org/Research/statistics/annualstats/revenues/GasUtilityRevenuesSales.htm>

Business Roundtable (2007). *More Diverse, More Domestic, More Efficient—A Vision for America's Energy Future.* <http://www.businessroundtable.org/pdf/Energy/Business_Roundtable_Energy_Report_06062007.pdf>

California Energy Commission [CEC] and California Public Utilities Commission [CPUC] (2005). *Energy Action Plan II: Implementation Roadmap for Energy Policies.* <http://www.energy.ca.gov/energy_ action_plan/2005-09-21_EAP2_FINAL.PDF>

U.S. Energy Information Administration [EIA] (2007). Revenue from Retail Sales of Electricity to Ultimate Customers by Sector, by Provider. *Electric Power Annual.* Released October 22, 2007. <http://www.eia.doe.gov/cneaf/electricity/epa/epat7p3.html>

U.S. Energy Information Administration [EIA] (2008a). Electric Sales, Revenue, and Average Price, 2006. Accessed 2008. <http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html>. See Table 2: Sales to Bundled and Unbundled Consumers by Sector, Census Division, and State, 2006. <http://www.eia.doe.gov/cneaf/electricity/esr/table2.xls>

U.S. Energy Information Administration [EIA] (2008b). Form EIA-861 Final Data File for 2006. Accessed 2008. <http://www.eia.doe.gov/cneaf/electricity/page/eia861.html>

U.S. Energy Information Administration [EIA] (2008c). Natural Gas Consumption by End Use. Accessed 2008. <http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm>

Eldridge, M., M. Neubauer, D. York, S. Vaidyanathan, A. Chittum, and S. Nadel (2008). *The 2008 State Energy Scorecard.* American Council for an Energy-Efficient Economy. <http://www.aceee.org/pubs/E086.pdf>

Elliott, R.N., M. Eldridge, A.M. Shipley, J. Laitner, S. Nadel, A. Silverstein, B. Hedman, and M. Sloan (2007). *Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Needs.* American Council for an Energy-Efficient Economy. <http://www.environmentaldefense.org/documents/6029_ACEEE_Texas_ Report.pdf>

U.S. Environmental Protection Agency [EPA] (2008). eGRID2007 Version 1.0. <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>. Year 2005 Summary Tables at <http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2007V1_0_year05_SummaryTables.pdf>

Nevius, M., J. Krouk, S. Griffith, and C. Lasky (2008). *Energy Efficiency Programs: A $3.7 Billion U.S. and Canadian Industry.* Boston: Consortium for Energy Efficiency. <http://www.cee1.org/ee-pe/2007/>

PJM (2007). *Bringing the Smart Grid Home.* <http://www2.pjm.com/documents/downloads/strategicresponses/letters/smartgrid.pdf>

Roseman, E., and S. Hochstetter (2007). *Regional Resource Planning Makes Sense.* <http://www.energypulse.net/centers/article/article_display.cfm?a_id=1416>

Schiller Consulting, Inc. (2007). *Survey of Energy Efficiency Evaluation Measurement and Verification (EM&V) Guidelines and Protocols.* <http://www.naesb.org/pdf2/dsmee061807w19.pdf>

Western Governors' Association (2006). *Energy Efficiency Taskforce Report.*

Appendix A: National Action Plan for Energy Efficiency Leadership Group

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Second Joint Statement of the American Gas Association and the Natural Resources Defense Council

May 2008

As the United States confronts the dual challenges of ensuring that Americans have access to affordable, environmentally clean and reliable energy services, while addressing global climate change, the American Gas Association (AGA) and the Natural Resources Defense Council (NRDC) have been working together to accelerate progress toward a clean, energy efficient future. In 2004, AGA and the NRDC issued a joint statement that identified significant regulatory barriers to achieving energy efficiency. AGA and the NRDC encouraged state public utility commissions to consider innovative proposals to promote energy efficiency and conservation in a manner that would benefit both customers and shareholders. The National Association of Regulatory Utility Commissioners encouraged state officials to consider the joint AGA-NRDC recommendations,[1] and the states' initial response has been encouraging.

Today, AGA and the NRDC issue a second joint statement recommending the next steps toward win-win solutions for American consumers and the natural gas utilities that serve them. As we did in 2004, AGA and the NRDC urge state public utility commissions and officials responsible for publicly-owned natural gas distribution systems to consider proposals for implementing cost-effective programs that will increase energy efficiency and reduce the nation's carbon footprint while also balancing shareholder interests.

1. **Removing Disincentives for Utilities to Promote Energy Efficiency and Reduce Greenhouse Gas Emissions, and Uniting to Achieve Increased Savings Through Programs and Standards.**

It is now almost universally recognized that energy efficiency is a large, underutilized, resource that needs to be expanded significantly to reduce consumer costs, improve energy security and reduce greenhouse gas emissions.[2] Numerous studies and extensive experience in many states and countries have shown that improving energy efficiency can be critical to meeting these goals cost-effectively.[3] Consumer surveys

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[1] *Resolution on Gas and Electric Energy Efficiency*, sponsored by the NARUC Natural Gas Task Force, Committee on Gas, Committee on Consumer Affairs, Committee on Electricity, and Committee on Energy Resources and the Environment. Adopted by the NARUC Board of Directors, July 14, 2004.

[2] *See, e.g., National Action Plan for Energy Efficiency Vision for 2025: Developing a Framework for Change* (November 2007). http://www.epa.gov/cleanenergy/documents/vision.pdf.

[3] *See, e.g., Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets in the Pacific West*, William Prindle, R. Neal Elliott, Ph.D., P.E., Anna Monis Shipley, American Council for an Energy-Efficient Economy, Report Number E062 (January 2006).

show strong support for coordinated government and utility efforts to increase conservation and energy efficiency.[4]

Yet there are a number of barriers blocking the path forward to increased energy efficiency. One significant barrier has been regulatory policies that unintentionally but effectively discourage gas distribution companies from promoting energy efficiency improvements. AGA and the NRDC pointed this out in our July 2004 joint statement:

> When customers use less natural gas, utility profitability almost always suffers, because recovery of fixed costs is reduced in proportion to the reduction of sales. Thus, conservation may prevent the utility from recovering its authorized fixed costs and earning its state-allowed rate of return. In this important aspect, traditional rate practices fail to align the interests of utility shareholders with those of utility customers and society as a whole. This need not be the case.[5]

Since the joint statement was issued in 2004, a significant number of gas distribution utilities have been given permission to adopt ratemaking mechanisms that better align the interests of utility shareholders, their customers and society as a whole. Today 26 natural gas distribution utilities in 13 states have implemented revenue decoupling programs that serve 20 million residential customers. The National Action Plan for Energy Efficiency, which was developed by more than 50 diverse stakeholder groups, included as one of its five recommendations the need to "[m]odify policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments."[6] Additionally, Congress passed the Energy Independence and Security Act of 2007, directing each state regulatory authority to consider "separating fixed-cost revenue recovery from the volume of transportation or sales service provided to the customer."[7] Today, AGA and the NRDC again urge state public utility commissions and officials responsible for publicly-owned natural gas distribution systems to actively support natural gas utilities' energy efficiency proposals that use automatic rate true-ups to ensure a utility's opportunity to recover its authorized fixed costs. We also urge state public utility commissions that have adopted such programs on a trial basis to make longer term commitments. Finally, we will assign high priority to mutual advocacy for improved energy efficiency standards at both state and federal levels, and we will seek urgently needed extensions for federal tax incentives for energy efficiency in buildings and equipment. We will work to ensure that these standards and incentives are designed in ways that avoid inappropriately influencing customers' fuel choices, from both economic and environmental perspectives.

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[4] *See, e.g.,* M. Kubik, *Consumer Views on Transportation and Energy* (Third Edition), National Renewable Energy Laboratory Technical Report, NREL/TP-620-39047 (Jan. 2006), http://www.osti.gov/bridge.

[5] Joint Statement of the American Gas Association and the Natural Resources Defense Council (July 2004) at 2.

[6] *National Action Plan for Energy Efficiency – A Plan Developed by More Than 50 Leading Organizations in Pursuit of Energy Savings and Environmental Benefits Through Electric and Natural Gas Energy Efficiency* (July 2006) at 2, 7, 8, and 1-10. See also *Aligning Utility Incentives with Investment in Energy Efficiency – A Resource of the National Action Plan for Energy Efficiency* (Nov. 2007) http://www.epa.gov/cleanenergy/documents/incentives.pdf.

[7] *See* Sec. 532(b)(6), *Energy Independence and Security Act of 2007*, P.L. 110-140, Dec. 19, 2007 (In general, "[t]he rates allowed to be charged by a natural gas utility shall align utility incentives with the deployment of cost-effective energy efficiency." "[E]ach State regulatory authority and each non-regulated utility shall consider- (i) separating fixed cost revenue recovery from the volume of transportation or sales service provided to the customer; (ii) providing to utilities incentives for the successful management of energy efficiency programs, such as allowing utilities to retain a portion of the cost-reducing benefits accruing from the programs;").

2. Developing Performance-Based Incentives for Utilities to Promote Energy Efficiency and Reduced Greenhouse Gas Emissions

Simply removing utility disincentives to promote energy efficiency may be adequate if the goal is to achieve relatively modest increases in efficiency. But neutrality is no substitute for committed action. If energy efficiency achievements are to reach the level required by the various climate change bills currently being considered by Congress and under review or adoption in states across the country, then utility commissions need to consider linking such achievements to earnings opportunities for the utilities involved.[8] We agree that such opportunities would yield significant increases in energy efficiency and reductions in customer energy consumption. Despite decades of programs designed to promote energy efficiency, it is widely recognized that these programs remain critically underutilized in the nation's energy portfolio.[9] Without carefully considered incentive programs, it seems unlikely that dramatically improved results will occur in the future.

The National Action Plan for Energy Efficiency discusses three different types of utility performance incentive mechanisms: 1) performance target savings, 2) shared savings incentives, and 3) rate of return incentives.[10] Performance target and shared savings mechanisms have been adopted in a number of states, and while differing in structure and operation, typically seek to allow utilities operating at or above a prescribed minimum performance level to capture some portion of net benefits delivered (usually based on energy savings performance).[11] Rate of return incentives might offer a utility an increased return for energy efficiency investments and/or an even higher return on total equity investment for superior performance.[12] While each option has its advantages and disadvantages, we unite in supporting approaches that link energy-efficiency incentives to independently verified net benefits that utilities deliver to customers through either successful administration of cost-effective efficiency programs and other authorized efficiency programs that serve low-income constituencies, or contributions to enactment of cost-effective efficiency standards and tax incentives.[13] AGA and the NRDC encourage state commissions and officials responsible for publicly-owned natural gas distribution systems to adopt energy efficiency incentive

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[8] Congress recently encouraged state commissions and unregulated utilities to consider such utility energy efficiency earnings opportunities. *See* Sec. 532(b)(6)(B)(ii), *Energy Independence and Security Act of 2007*, P.L. 110-140, Dec. 19, 2007 ("[E]ach State regulatory authority and each nonregulated utility shall consider- (ii) providing to utilities incentives for the successful management of energy efficiency programs, such as allowing utilities to retain a portion of the cost-reducing benefits accruing from the programs;").

[9] *See, e.g., Aligning Utility Incentives with Investment in Energy Efficiency* at ES-1. For years, groups such as the American Council for an Energy Efficient Economy (ACEEE) have produced numerous studies detailing the dramatic results possible if various energy efficiency measures were adopted. *See, e.g., Examining the Potential for Energy Efficiency to Help Address the Natural Gas Crisis in the Midwest,* Martin Kushler, Dan York, and Patti Witte (Jan. 2005, ACEEE Report No. U051) (projecting annual Midwest customer cost savings of $2 billion on their natural gas bills by 2010); *Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demands*, R. Neal Elliott, Maggie Eldridge, Anna M. Shipley, John "Skip" Laitner, Steven Nadel, Philip Fairey, Robin Vieira, Jeff Sonne, Alison Silverstein, Bruce Hedman and Ken Darrow (June 2007, ACEEE Report No. E072); *Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets in the Pacific West*, William Prindle, R. Neal Elliott, Anna Monis Shipley (Jan. 2006, ACEEE Report No. E062) (projecting reduced natural gas bills and reduced natural gas consumption if energy efficiency measures were adopted).

[10] *Aligning Utility Incentives with Investment in Energy Efficiency: A Resource of the National Action Plan for Energy Efficiency* (Nov. 2007) at 6-1 (chapter on performance incentives).

[11] *Id.* at 6-3 and 6-4.

[12] *Id.* at 6-11.

[13] Energy efficient incentives do not include rate design mechanisms, such as margin decoupling, which merely reduce utility disincentives. We also agree that consumer education and marketing expenditures are important to the success of many of the energy efficiency programs that this statement references and supports.

mechanisms for natural gas utilities that will reduce consumer costs, reduce greenhouse emissions and align with shareholders' interests.

3. Recognizing the Potential Contributions of Efficient Natural Gas Use in Promoting Reduced Greenhouse Gas Emissions

Among fossil fuels, natural gas applications lead the way in reducing greenhouse gas emissions.[14] Average residential and commercial natural gas consumption is much lower today than in the 1970s, due to improved energy efficiency and conservation. The 64 million households served by natural gas today heat their homes and their water, feed their families and dry their clothing using 1/3 less energy than they did in 1980.

Our paramount joint objective is developing ways to help America extract more economic benefits from the most efficient use of natural gas.[15] There should be continued focus on the environmental benefits of more efficient direct use of natural gas in homes and businesses, which can and should be an important strategy to lower U.S. greenhouse gas emissions.

AGA and the NRDC pledge to continue their efforts to find more ways to use natural gas efficiently, thereby assisting consumers and speeding the transition to a lower carbon future.

This Joint Statement also has been reviewed and endorsed by:

Alliance to Save Energy

ALLIANCE TO SAVE ENERGY
Creating an Energy-Efficient World

American Council for an Energy Efficient Economy

ACEEE

[14] When burned in power plants of equivalent thermal efficiency, natural gas emits 45 percent less CO_2 than coal and 30 percent less CO_2 than oil on an energy equivalent basis. This advantage can be further increased by integrating combined heat and power applications with end use efficiency improvements.

[15] Along with natural gas, some natural gas utilities have supplemented their supply needs with renewable sources of supply such as biogas, which can help reduce greenhouse gas emissions.

American Gas Foundation

Direct Use of Natural Gas

Implications for Power Generation, Energy Efficiency, and Carbon Emissions

April 2008

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Direct Use of Natural Gas

Implications for Power Generation, Energy Efficiency, and Carbon Emissions

April 2008

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1.0 EXECUTIVE SUMMARY

The North American energy market will experience continued uncertainty for the foreseeable future. In spite of notable increases in natural gas prices in recent years, the use of natural gas for power generation in the U.S. is expected to increase significantly in response to efforts to regulate greenhouse gas emissions. Concerns are also heightened regarding availability of energy supplies to meet growing demand. Both trends suggest that any comprehensive approach to addressing our nation's energy needs will include significant new commitments to both increasing energy efficiency and reducing the environmental impacts of energy use.

In addressing the challenge of meeting increasing demand for energy while also reducing greenhouse gas emissions restrictions through 2030, it is clear that a "silver bullet" does not exist. Rather it is prudent for policy makers to consider pursuing a number of alternatives which together yield a practical energy policy that advances energy efficiency and reduces CO_2 emissions while sustaining economic growth. The analysis presented in this report examines the potential for the increased use of natural gas in residential and commercial applications to increase the productivity of available energy supplies, reduce overall energy cost, and reduce related CO_2 emissions.

Purpose and Scope

The analysis summarized in this report examined the impact of the increased direct use of natural gas for Residential & Commercial ("R&C") end uses. End uses considered include space heating, water heating, cooking, and clothes drying. The study analyzes the effect of the increased direct use of natural gas on expected use of gas for electric generation and the net effect in total energy use, energy costs and CO_2 emissions.

Although there are several factors that drive the use of natural gas for power generation, there is a growing concern that the overall natural gas supply/demand balance could be adversely impacted as demand of natural gas for power generation continues to grow. The underlying framework of the study considers the impact of the increased use of natural gas for direct applications in a series of scenarios. This study examines the impact of future scenarios that may influence ongoing policy debate and establishes a quantitative approach that can be replicated or expanded for future analysis.

The scenarios identified key drivers of uncertainty within the natural gas market. The key uncertainties are the natural gas supply, new technology for R&C applications and the environmental regulations related to CO_2 emissions. The combinations of these three variables create five distinct scenarios.

- Reference Case – Baseline Technology/No CO_2 Restrictions
- Natural Gas Supply Lower & High Technology/High CO_2 Restrictions
- Natural Gas Supply Lower & 2006 Technology/High CO_2 Restrictions
- Natural Gas Supply Higher & High Technology/Low CO_2 Restrictions
- Natural Gas Supply Higher & 2006 Technology/Low CO_2 Restrictions

The scenarios employ assumptions regarding supply sensitivities as referenced in the Energy Information Administration's Annual Energy Outlook ("AEO") 2007[1] integrated price cases. The Natural Gas Supply Higher scenario drives lower prices and higher consumption of natural gas relative to the reference case. The Natural Gas Supply Lower scenario drives higher prices and lower consumption. The High Technology and 2006 Technology cases from the Energy Information Administration ("EIA") were incorporated into these two supply environments. Higher Technology refers to high efficiencies of appliances and building shells which lower energy consumption. Conversely, lower technology is linked to increased energy consumption. The effect of technology on energy consumption makes it a key variable for both supply worlds. The Low and High CO_2 restriction scenarios reflect implementation of moderate and stringent controls on CO_2 emissions from the U.S. electric sector. This will increase the use of natural gas fueled generation.

This study examined the impact of increased direct use of natural gas in the context of each scenario by forecasting primary energy consumption, energy costs, and CO_2 emissions with and without an assumed increase in the direct use of natural gas to half the R&C electric loads capable of operating on natural gas but currently powered by electricity. This scenario assumption of increased direct gas use amounts to about 7% of the total R&C electric load in 2030. The study also utilizes three underlying energy metrics that provide a clear measure of each scenario.

- Energy consumption (as measured in Quadrillion Btu)
- Total energy cost (as measured in 2005 dollars)
- CO_2 Emissions (as measured in millions of tons)

Some of the forecasting that was analyzed in this study was based on the AEO 2007. Although the AEO 2008 was released too late to incorporate in this study, B&V has reviewed the early release of the AEO 2008 and has come to the conclusion that, while the forecasts indicate lower natural gas and electric demand, there would still be significant savings in primary energy use, CO_2 emissions and the cost of energy from the increased direct use of natural gas with the use of the updated AEO forecast. The AEO 2008 forecasts a slight reduction in electric load growth from the 2007 forecast amounting to 5% less electric consumption in 2030. The natural gas consumption forecast for 2008 is 10% less in 2030 than the AEO forecast for 2007.

[1] *B&V utilized the high and low integrated price cases from AEO 2007.*

Major Findings

- Increased direct use of natural gas in R&C applications can increase the productivity of available energy supplies, reduce overall energy cost, and reduce related CO_2 emissions in all scenarios considered.

- Natural gas demand for power generation is expected to increase significantly in a CO_2 constrained world. Nuclear power and renewables could offset part of the increase but natural gas demand is still projected to increase over the forecast horizon with an accompanying upward pressure on gas prices.

- The increased direct use of natural gas for R&C applications rather than for power generation is expected to decrease energy consumption in the United States. Within the scenarios considered, a shift of 7% of the total electric load for R&C applications to natural gas, indicates that the energy savings can range from 1.25-2.00 quadrillion Btu in 2030 – or 6% of total energy consumption growth projected by AEO through 2030. In the absence of restrictions on CO_2 emissions, there is a greater proportion of coal fired plants in the electric generation mix. Coal generation gets displaced when the increased direct use of gas for R&C applications decreases electricity demand.

- Depending on the scenario, the avoided generation capacity is forecast to range from 63 to 80 GW. The avoided investment costs are forecast to range from $49 billion to $122 billion.[2]

- With restrictions on the total level of CO_2 emissions, natural gas generation is displaced when the increased direct use of gas for R&C applications decreases electricity demand. A larger market percentage of the direct use of natural gas for R&C applications drives a net decrease in overall gas consumption as well as energy costs (since the decrease in gas demand for power generation is higher than the increase in direct use of natural gas in the R&C sectors).

- In the scenario where CO_2 restrictions match the levels proposed by the Lieberman-Warner Senate bill currently being debated in Congress, the value of the reduction in energy costs is significant and ranges from $18 to almost $29 billion dollars by the year 2030.

- Emissions are decreased in all scenarios considered. The highest impacts are in the Reference Case where coal fired generation is displaced. The CO_2 constrained scenarios also show a decrease in CO_2 emissions when there is a greater direct use of gas in R&C applications.

[2] The estimate of avoided electric generating capacity in GW was based on simplified assumptions of the demand for uses that can be served by natural gas or electricity at the time of peak demand for supplying electric utilities. A detailed analysis of residential and commercial electric load patterns by end use coincident with electric system peaks would be required to better estimate the avoided generation capacity. Such a detailed analysis should be included in subsequent investigations.

- ❖ There are regional implications to CO_2 emissions regulations and the direct use of natural gas for R&C applications rather than for power generation. Some of the states with larger potential for greater direct use of natural gas for R&C uses are also the states applying CO_2 restrictions in advance of any restrictions by the federal government, notably, these include California, Florida and the Northeast states participating in the Regional Greenhouse Gas Initiative ("RGGI"). For these states, the increased use of natural gas by R&C customers stands to reduce overall costs of energy supplies and reduce emissions consistent with state goals. Several measures are being considered to decrease emissions, and the front runners among these are increased end use efficiency, increased nuclear generation and increased use of renewable fuels. However these measures alone are unlikely to reduce CO_2 emissions to the projected targets and a combination of multiple smaller measures are required to approach the CO_2 target.

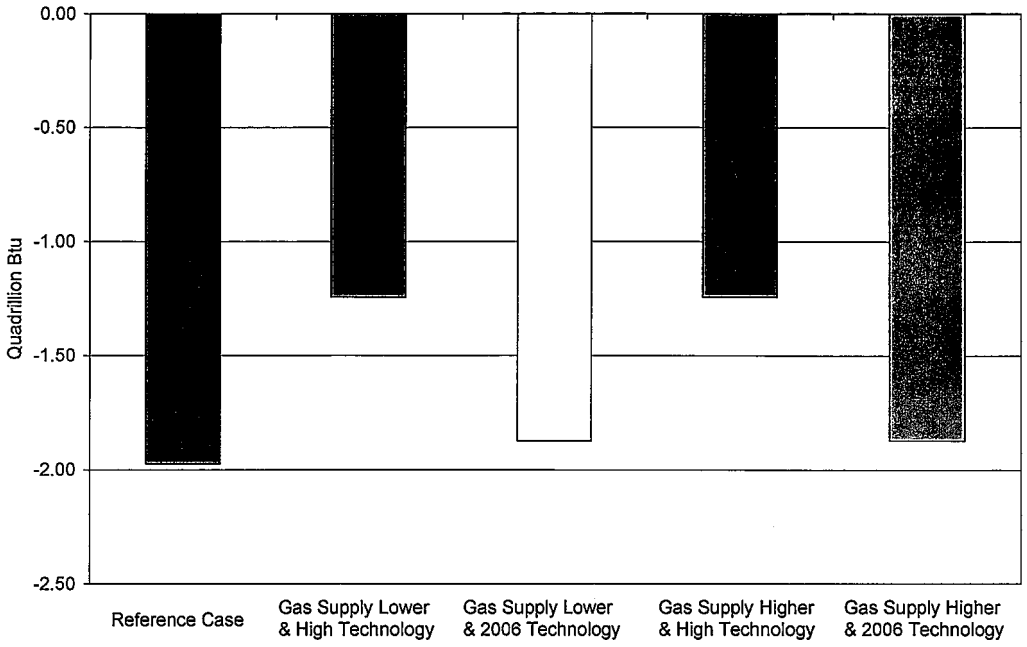
Summary Results

The analysis assessed the net impact through 2030 of an increase in direct use of natural gas for R&C applications and entailed the following steps in order to examine the impact on the U.S. energy market:

- Forecast the impact of the increased natural gas demand from shifting a percentage of current electric demand for switchable R&C applications to natural gas;
- Forecast the impact of corresponding decreased electricity demand for R&C applications; and
- Estimate the net impact on the energy requirements in the U.S. from a shift in R&C demand from electricity to natural gas.

The net impact on energy consumption from the increased direct use of natural gas for R&C applications instead of for power generation is shown in Figure 1.1. The analysis indicates a net decrease in the total energy consumption in the United States that ranges from 1.25 quadrillion Btu to almost 2 quadrillion Btu in 2030. The greater efficiency of natural gas in the R&C applications when compared to electricity is the contributing factor that drives the expected savings in energy. The "real energy" analysis takes into account the efficiency of the appliance and the overall energy acquisition and delivery process.

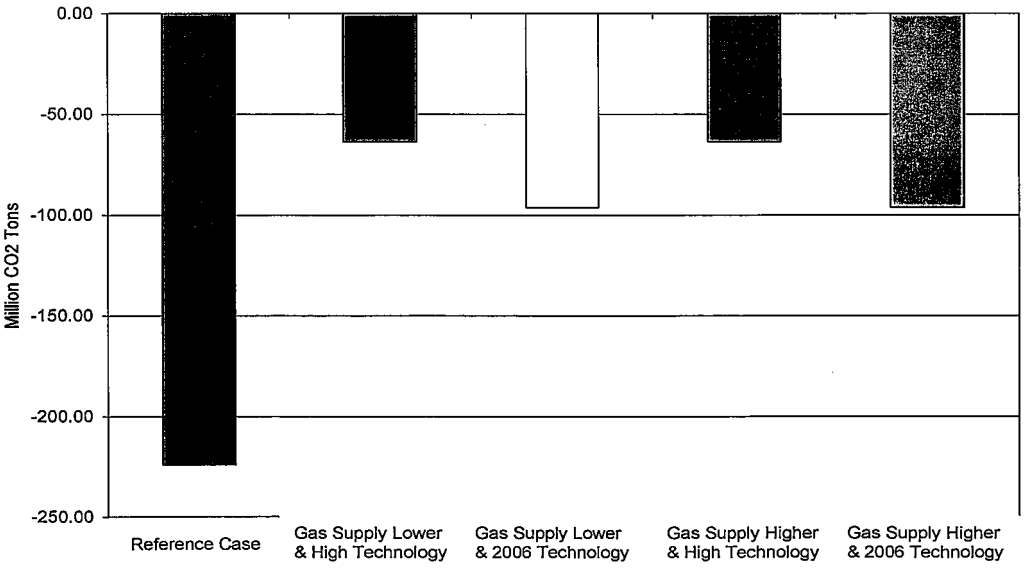
Figure 1.1: Decrease in Energy Consumption in 2030 – Real Energy



Source: EIA, B&V Analysis

The net impact on CO_2 emissions from the increased direct use of natural gas for R&C applications is shown in Figure 1.2. In all the scenarios considered, there is a net decrease in the total CO_2 emissions from the increased use of natural gas for R&C applications. The Reference Case shows the largest decrease in emissions of over 200 million tons of CO_2 driven by a decrease in coal fired generation. The decrease in CO_2 emissions in the other scenarios range from about 60 to almost 100 million tons of CO_2.

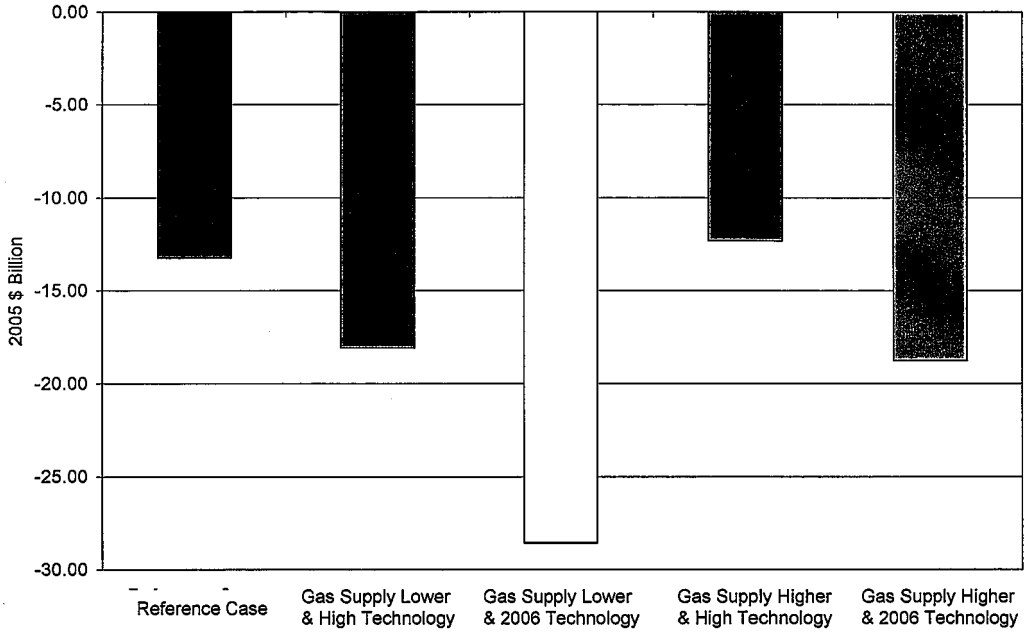
Figure 1.2: Decrease in Emissions in 2030 – Real Energy



Source: EIA, B&V Analysis

The net impact on the total energy costs for the U. S. is shown in Figure 1.3. In all the scenarios considered, there is a net decrease in the total energy costs in 2030. The savings in energy costs range from $12 billion to almost $29 billion in 2030.

Figure 1.3: Decrease in Energy Costs in 2030 – Real Energy



Source: EIA, B&V Analysis

Additional Observations

Expectation of Current Market Conditions for Natural Gas to Continue

Natural gas production in the lower 48, including both onshore and offshore production, is expected to peak in 2017 at 53.4 Bcf/day. With the exception of the Rockies and other unconventional plays, the supply of natural gas in the U.S. is projected to decline. There is an expectation of a flat trend in the domestic supply of natural gas in the U.S. Increased reliance on LNG is projected as imports increase to keep up with growth in the demand for natural gas. Appendix B provides a more detailed overview of natural gas supply in North America. Since the U.S. will be competing with countries that have very aggressive demand projections for natural gas, it is likely that the price of natural gas will continue to be sustained at the current high levels.

Drivers of Natural Gas Demand Remain Strong

Natural gas is a versatile fuel with a number of important characteristics that make it a premium fuel. It is a clean burning fuel with relatively low emissions when compared to coal, petroleum and other fossil fuels. As a fuel with a delivery efficiency amounting to about 90% from production to consumption, it offers an

extremely efficient alternative to serve end uses wherever applicable.[3] In contrast, the delivery efficiency for oil is 86% and the delivery efficiency for electricity is 27% as a result of the efficiencies of the source fuels used to generate the electricity as well as the losses during the conversion of the source fuel to electricity and the losses during the transmission of electricity to serve end use markets.[4] The real energy method for measuring efficiency used in this report takes into account these losses as well as the appliance efficiency. Natural gas also offers reliability of supply due to the large proportion that is domestically produced, the underground pipeline network that is not easily affected by weather and other disruptions, and the ability to store the gas and use it when required.

Gas Use for Power Generation is Expected to Increase Significantly

The power generation industry in the U.S. is facing serious uncertainty - maybe more serious than any uncertainty it has faced in the last 25 years. This uncertainty stems from a number of factors, including a national imperative calling for reductions in greenhouse gas emissions that are believed to be a major contributor to global warming. Natural gas demand for power generation is expected to increase significantly in the coming years. Increased end use efficiency, nuclear power and renewables may offset some of the increase, but gas demand for electricity production will increase multiple times before the U.S. gets even close to the CO_2 caps targeted in recently proposed legislation.

CO_2 Emissions Regulations Will Significantly Impact the Natural Gas Market

Emerging trends towards greater energy efficiency as well as a more highlighted focus on the environmental implications of our energy use further support the adoption of measures that would decrease energy consumption and reduce our environmental footprint. CO_2 emissions controls are expected to become a reality in the United States with several legislative climate change targets having been proposed in the 110th Congress. Several measures are being considered as means to help decrease CO_2 emissions to the levels that are being widely considered as likely targets in impending regulations.

[3] "Public Policy and Real Energy Efficiency, Assessing the effects of Federal policies on energy consumption and the environment", October 2005, American Gas Foundation.

[4] "Source Energy and Emission Factors for Residential Energy Consumption", August 2000, American Gas Association ("AGA").