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Winter 2001

NATURAL GAS STAR

Winter 2001

PARTNER UPDATE

Higher Gas Prices Mean Greater Cost Savings from Reducing Methane Emissions

Natural gas has never been a more valuable commodity! With elevated gas prices and demand at an all-time high, some gas companies may see a welcome boost to profits. Today's high prices also mean that operators are likely to have additional cost-effective opportunities to reduce methane emissions and increase gas sales.

With annual industry-wide emissions estimated at 312 Bcf and well-head prices averaging $4.00/Mcf and higher, approximately $1.2 billion of natural gas are lost to the atmosphere each year. Now is a good time to take a second look at gas leaks and losses that were not economic to address at lower prices. **(continued on page 2)**

Potential Cost Savings at $4/Mcf and $6/Mcf

Action	Annual Volume of Gas Lost	Value of Gas Saved at $4/Mcf	Value of Gas Saved at $6/Mcf	Implementation Cost	Payback in Months	
					$4/Mcf	$6/Mcf
Replace wet seals with dry seals in centrifugal compressors	45,120 Mcf	$180,480	$270,720	$240,000	8.8	5.9
Directed inspection and maintenance at compressor stations	2,585 Mcf per station on average	$10,340 per station on average	$15,510 per station on average	$2,065 per station on average	N/A	N/A
Install static seal/maintain pressure in off-line compressors	5,600 Mcf	$22,400	$33,600	$3,000	1.6	1.0
Directed inspection and maintenance at gate stations and surface facilities	385 Mcf	$1,540	$2,310	$295 per station	N/A	N/A
Reduce TEG circulation rates in dehydration units	130 to 13,140 Mcf	$320 to $52,560	$480 to $78,840	Negligible	Immediate	
Replace high-bleed pneumatic devices with low-bleed devices	50 to 200 Mcf	$200 to $800	$300 to $1200	$150 to $250	2.3-1.5	1.5-10
Economic replacement of rings and rods in compressor rod packing systems	80 Mcf	$320	$480	$100	3.7	2.5
Install flash tank separators (energy exchange pump, 300 gal/hr TEG circulation rate)	7,095 Mcf	$31,080	$46,620	$7,160	2.8	1.9

Higher Gas Prices Mean Greater Cost Savings

continued from page 1

Historically, Natural Gas STAR has used $2.00/Mcf to calculate savings and evaluate economic opportunities from methane emission reduction technologies and practices. Given today's higher gas prices, potential savings are even more impressive, and payback periods are significantly shorter. The table on page 1 demonstrates possible savings and payback periods for selected STAR Best Management Practices and Partner Reported Opportunities, using gas prices of $4.00/Mcf and $6.00/Mcf.

We hope this information will encourage you to consider which practices and technologies will boost *your* company's bottom line.

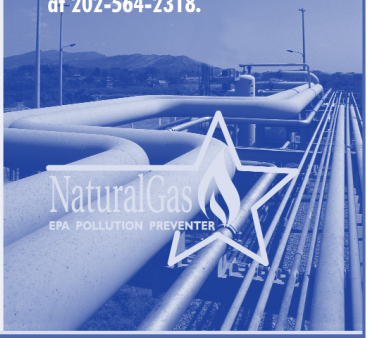
To showcase the methane reduction efforts of Gas STAR Partners and promote the Natural Gas STAR Program, this public service announcement appeared pro bono in the December 1999 issue of *Pipeline & Gas Industry* and in the March 2000 issue of *American Gas.*

When change is in the air...*leaders emerge.*

ANR Pipeline
Atlanta Gas Light
Baltimore Gas & Electric
Bay State Gas
Brooklyn Union/Keyspan Energy
Central Hudson Gas & Electric
Citizens Gas & Coke Utility
Colorado Interstate Gas
Columbia Gas of KY, MD, OH, PA, VA
Columbia Gas Transmission
Columbia Gulf Transmission
Conectiv Power Delivery
Consolidated Edison
Consumers Energy
El Paso Natural Gas
Enron Gas Pipeline Group
Equitable Resources
Granite State Gas Transmission
Great Lakes Gas Transmission
Iroquois Gas Transmission
Kansas Operating Pipeline
Koch Gateway Pipeline
LG&E Gas Division
Michigan Consolidated Gas
MidCon Texas Pipeline
Natural Gas Pipeline Company of America
New York State Electric & Gas
Niagara Mohawk Power
Northern Indiana Public Service
Northern Utilities
Northwest Natural Gas
Orange & Rockland Utilities
Pacific Gas & Electric
PECO Energy
Public Service Company of North Carolina
Public Service Electric & Gas
Reliant Energy Minnegasco
Rochester Gas & Electric
South Carolina Electric & Gas
Southern California Gas
Southern Natural Gas
Southwest Gas
Superior Water, Light & Power
Tennessee Gas Pipeline
UGI Utilities
UtiliCorp United
Washington Gas
Williams Gas Pipeline–Central
Williams–Texas Gas Transmission
Williams–Transco
Wisconsin Public Service

These transmission and distribution companies are leaders in the natural gas industry. Why? Because they are implementing voluntary, cost-effective measures to reduce emissions of methane, a greenhouse gas. They're maximizing profits by reducing gas losses, and they're demonstrating that environmental performance and business innovation go hand in hand.

To learn how your company can master this winning combination, call EPA's Natural Gas STAR Program at 202-564-2318.



EPA Natural Gas STAR Program — www.epa.gov/gasstar

IN THIS ISSUE

This public service announcement and editorial promoting Gas STAR was printed pro bono on the cover wrap of the November/ December 2000 edition of the *Harvard Business Review.*

GAS STAR IN THE NEWS

Industry journals are increasingly interested in the achievements of Natural Gas STAR and its partners. These three excerpted articles highlight Gas STAR's recent accomplishments.

From *OGJ Newsletter*

EPA is expanding its STAR program to promote cost-effective management practices that could save up to 2.5 bcf, or more than 70% of the natural gas lost annually by the gathering and processing segment of the industry. The new program proposes to reduce gas losses through market-based activities that are profitable for industry partners and beneficial to the environment. Industry partners would choose among a number of best management practices recommended by EPA to minimize equipment leaks, reduce gas releases from unit

—*Oil and Gas Journal,* December 11, 2000

Methane Cuts Save STAR Partners $54 Million

Washington, Dec. 22, 2000 - EPA's Natural Gas STAR program industrial partners reduced methane emissions from unit operations and equipment leaks by 27 billion cubic feet in 1999, according to an Agency report just released. At a gas value of $2 per thousand cubic feet, these gas savings are worth approximately $54 million. The STAR program, a voluntary partnership between EPA and the natural gas industry, focused on identifying and implementing cost-effective technologies and

—GreenBiz.com, week of December 22, 2000

STAR Honors Companies For Reducing Emissions

Washington - The U.S. Environmental Protection Agency announces that the industry partners in its Natural Gas STAR program reduced methane emissions from unit operations and equipment leaks by 27 billion cubic feet in 1999. At a gas value of $2 an Mcf, these reductions equate to $54 million, EPA notes.

EPA reports that it has awarded Kerr-McGee Oil and Gas Corp., Columbia Transmission, and Bay State Gas Co. with STAR Partner of the Year awards for outstanding performance in identifying and implementing innovative emission-reducing practices, achieving significant reductions, and supporting

—*The American Oil & Gas Reporter*, December 2000

PROGRAM UPDATE

Natural Gas STAR Welcomes Five New Partners!

Murphy Exploration and Production Company, a business unit of Murphy Oil Corporation, is an independent oil and gas company based in New Orleans, Louisiana. Murphy's U.S. exploration and production operations are concentrated in the Gulf of Mexico Region and onshore South Louisiana. Average daily production from these areas in 2000 was approximately 150 million cubic feet of natural gas and 6,800 barrels of crude oil and natural gas liquids. This is roughly one-third of Murphy's total production. Visit Murphy's Web site at www.murphyoilcorp.com.

Barrett Resources Corporation, based in Denver, Colorado, is an independent natural gas and oil exploration and production company with major emphasis in the Rocky Mountain Region. The company also has producing properties in the Mid-Continent Region and exploration activities in Peru. Barrett Resources operates a gas marketing and trading group, allowing the company to market its own gas and buy and resell other companies' natural gas at a profit. Visit Barrett's Web site at www.brr.com.

Reliant Energy Arkla, based in Little Rock, Arkansas, and **Reliant Energy Entex**, based in Houston, Texas, are subsidiaries of Houston-based Reliant Energy. Together, they serve over 2.1 million natural gas customers in Louisiana and Texas. Reliant Energy is an international energy services and energy delivery company with approximately $29 billion in annual revenue and assets totaling more than $32 billion. The company has nearly 24,000 megawatts of power generation in operation in the United States and nearly 4 million American customers. Visit Reliant's Web site at www.reliantenergy.com.

Louis Dreyfus Natural Gas Corporation is an independent oil and gas producer based in Oklahoma City, Oklahoma. Louis Dreyfus is one of the largest natural gas companies in the United States, with reserves of 1.464 Tcfe and average daily production of 345 Mmcfe. Natural gas represents 88 percent of proven reserves. The company's major operating regions are the Mid-Continent, Permian Basin, and Gulf Coast/Offshore. Visit Louis Dreyfus's Web site at www.ldng.com.

How do you like receiving the Partner Update via e-mail? Natural Gas STAR would like your opinion. E-mail your response to Carolyn Henderson at henderson.carolyn@epa.gov.

If you prefer to receive a paper copy, please let us know.

We are pleased to welcome Kathleen Meier as the newest Natural Gas STAR team member. Kathleen recently worked in the EPA Office of Pesticide Programs and will now work with Paul Gunning and Carrie Henderson to manage Natural Gas STAR. Jon Passe has moved on to another position within EPA's Climate Protection Partnerships Division.

PROGRAM TOOLS

We hope that you have received your copy of the Natural Gas STAR Communications Toolkit User's Guide, designed to help partners communicate about their participation in the program. The kit contains (1) templates for press releases, newsletters and web sites; (2) sample communication pieces developed and used by STAR partners; (3) presentations, videos, and articles about the STAR Program; and (4) technical and programmatic information. You can request a User's Guide from Kathleen Meier at (202) 564-9748 or go to the Toolkit on the Internet at www.epa.gov/gasstar/toolkit.

TECHNICAL NEWS

Mitigating Greenhouse Gases: State of New Jersey First To Implement Action Plan

With the unveiling of its Sustainable State Project on April 17, 2000, New Jersey became the first state to establish a goal for greenhouse gas (GHG) reductions with specific milestones. Last year, the New Jersey Department of Environmental Protection (NJDEP) committed to cutting state GHG emissions by 3.5 percent below 1990 levels by 2005. The plan calls for reducing emissions by about 20 million tons through five initiatives: energy conservation, pollution prevention, innovative technologies, recycling and solid waste management, and natural resource protection. New Jersey produces about 2 percent of the nation's greenhouse gases (about 130 million tons a year). If no action is taken, emissions are projected to rise 6 percent annually.

On February 12, all 56 New Jersey colleges and universities agreed to implement programs to help reach the state's 3.5-percent GHG reduction target. State Environmental Protection Commissioner Bob Shinn is now working to develop environmental partnership agreements with cities and counties that contain a similar commitment to GHG reductions. The City of Bayonne and Hudson County have already signed on; three more agreements are in draft stages. Joe Genovay, Office of the Commissioner, notes that Shinn plans to create a statewide program through these agreements.

Strategies to address greenhouse gases include the following:

- Establishing incentives that encourage voluntary reductions, such as a banking and trading system for carbon dioxide emissions
- Promoting energy efficiency through the Open Market Emission Trading Program and requiring power suppliers in the forthcoming deregulated electricity market to disclose energy efficiency information
- Addressing mobile sources of carbon dioxide emissions
- Reducing landfill methane emissions
- Promoting and establishing incentives for the use of renewable energy technologies, including geothermal, fuel cells, wave, solar, methane from landfills, biofuels and biomass used in the transportation, heating/cooling and energy production sectors

The state's action plan follows on the heels of an incentive program for permit applicants established by NJDEP. The program seeks to reduce GHG emissions and achieve higher levels of pollution prevention. The Silver and Gold Track Programs for Environmental Excellence offer regulatory flexibility to companies with superior track records in exchange for a covenant committing to specified environmental gains. Five applicants have signed up for these programs since they were announced in late 1999.

Natural Gas STAR strives to keep Partners informed about greenhouse gas and climate change-related developments at the state and federal levels.

For more information on New Jersey's greenhouse gas action plan, contact Mike Winka, NJDEP, at (609) 292-9962. For more information on the partnership agreements, contact Joe Genovay, Office of the Commissioner, at (609) 633-1238.

SERVICE REPRESENTATIVES

Looking for assistance using the new Gas STAR Communications Toolkit or help in preparing your annual report? If so, your STAR Service Representative is waiting to hear from you. These representatives can help complete program forms, facilitate information exchange among partners, and provide up-to-date information on program developments.

David Frank 703/841-0588 or dfrank@erg.com

Rebecca Ferro 703/841-1705 or rferro@erg.com

Thomas Graham 703/841-4378 or tgraham@erg.com

Trevor Quinn 703/841-4816 or tquinn@erg.com

Jocelyn Spielman 703/841-0557 or jspielma@erg.com

Heather Wright 703/841-0547 or hwright@erg.com

Company Name	*STAR Service Representative*
Amerada Hess Corporation, U.S. Exploration & Production	TREVOR QUINN
ANR Pipeline Company	TREVOR QUINN
Atlanta Gas Light Company	DAVID FRANK
Atmos Energy Corporation	THOMAS GRAHAM
Baltimore Gas and Electric Co.	THOMAS GRAHAM
Barrett Resources Corp.	THOMAS GRAHAM
Bay State Gas Company	THOMAS GRAHAM
Belco Energy Corp.	JOCELYN SPIELMAN
BP Amoco Corp.	HEATHER WRIGHT
Burlington Resources, Inc.	THOMAS GRAHAM
Central Hudson Gas & Electric Corporation	TREVOR QUINN
Chevron U.S.A. Production Company	HEATHER WRIGHT
Citizens Gas and Coke Utility	HEATHER WRIGHT
Colorado Interstate Gas Company	JOCELYN SPIELMAN
Columbia Energy Group Distribution Companies	DAVID FRANK
Columbia Transmission Segment	DAVID FRANK
Conectiv Power Delivery	JOCELYN SPIELMAN
Conoco, Inc.	THOMAS GRAHAM
Consolidated Edison Company of New York, Inc.	HEATHER WRIGHT
Consumers Energy	HEATHER WRIGHT
Devon Energy Corporation	JOCELYN SPIELMAN
Duke Energy Gas Transmission	REBECCA FERRO
Dynegy Midstream Services, L.P.	REBECCA FERRO
El Paso Field Services	TREVOR QUINN
El Paso Natural Gas Company	TREVOR QUINN
Enron Gas Pipeline Group	DAVID FRANK
Equitable Resources, Inc.	HEATHER WRIGHT
ExxonMobil Corporation	JOCELYN SPIELMAN
FINA Oil and Chemical Company	DAVID FRANK
Great Lakes Gas Transmission Company	TREVOR QUINN
Iroquois Gas Transmission System	DAVID FRANK
Kansas Pipeline Company	HEATHER WRIGHT
Kerr-McGee Oil and Gas Corporation	JOCELYN SPIELMAN
Keyspan Energy Delivery	JOCELYN SPIELMAN
Koch Gateway Pipeline Company	HEATHER WRIGHT
Louis Dreyfus Natural Gas	JOCELYN SPIELMAN
Louisville Gas & Electric Company	TREVOR QUINN
Marathon Oil Company	THOMAS GRAHAM
Michigan Consolidated Gas Company	DAVID FRANK
Mitchell Energy and Development Corporation	REBECCA FERRO

SERVICE REPRESENTATIVES

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Murphy Exploration and Production Company	THOMAS GRAHAM
Natural Gas Pipeline Company of America/KN Energy	THOMAS GRAHAM
New York State Electric & Gas Corporation	DAVID FRANK
Niagara Mohawk	HEATHER WRIGHT
Northern Indiana Public Service Company	JOCELYN SPIELMAN
Northwest Natural Gas Company	DAVID FRANK
Ocean Energy, Inc.	REBECCA FERRO
ONEOK Field Services	REBECCA FERRO
Orange and Rockland Utilities, Inc.	HEATHER WRIGHT
Pacific Gas and Electric Company	JOCELYN SPIELMAN
PECO Energy Company	REBECCA FERRO
PG&E Natural Energy Group	JOCELYN SPIELMAN
Phillips Petroleum Company's America Division	REBECCA FERRO
Pioneer Natural Resources USA, Inc. (Domestic Operations)	THOMAS GRAHAM
Pioneer Natural Resources USA, Inc. (Gas Processing)	THOMAS GRAHAM
PSNC Energy	DAVID FRANK
Public Service Electric and Gas Company	HEATHER WRIGHT
Questar Pipeline Company	JOCELYN SPIELMAN
Reliant Energy - Arkla	JOCELYN SPIELMAN
Reliant Energy - Entex	JOCELYN SPIELMAN
Reliant Energy - Minnegasco	JOCELYN SPIELMAN
Rochester Gas & Electric Corporation	THOMAS GRAHAM
Shell Exploration and Production Company	JOCELYN SPIELMAN
South Carolina Electric & Gas	TREVOR QUINN
Southern California Gas Company	DAVID FRANK
Southern Natural Gas	HEATHER WRIGHT
Southwest Gas Corporation	HEATHER WRIGHT
Superior Water, Light and Power Company	HEATHER WRIGHT
Tennessee Gas Pipeline	TREVOR QUINN
Texaco Exploration and Production	THOMAS GRAHAM
TXU Electric and Gas	DAVID FRANK
TXU Lone Star Pipeline	DAVID FRANK
UGI Utilities, Inc.	DAVID FRANK
Union Pacific Resources Group, Inc.	HEATHER WRIGHT
Unocal Corp.	TREVOR QUINN
UtiliCorp United, Inc.	REBECCA FERRO
Washington Gas	JOCELYN SPIELMAN
WBI Holdings, Inc.	REBECCA FERRO
Williams Gas Pipeline - Texas Gas	REBECCA FERRO
Williams Gas Pipeline Central	REBECCA FERRO
Williams-Transco	REBECCA FERRO

The Natural Gas STAR Service Representatives are employees of Eastern Research Group, a consulting firm providing support to EPA's Natural Gas STAR Program.

DOCUMENT REQUEST FORM

Natural Gas
EPA POLLUTION PREVENTER

Name & Title: _____

Organization: _____

Street Address: _____

City, State, Zip: _____

E-Mail Address: _____

Telephone #: _____ **FAX #:** _____

Date Requested: _____

Date Info Needed: _____

FedEx/UPS # (if info needed asap): _____

Please fax to your STAR Service Representative at 703-841-1440 or directly to the Natural Gas STAR Program at 202-565-6674.

PLEASE INDICATE WHICH MATERIALS YOU WOULD LIKE TO RECEIVE:

LESSONS LEARNED

_____ 1. Directed Inspection and Maintenance at Compressor Stations
_____ 2. Directed Inspection and Maintenance at Gate Stations and Surface Facilities
_____ 3. Options for Reducing Methane Emissions from Pneumatic Devices in the Natural Gas Industry
_____ 4. Installation of Flash Tank Separators
_____ 5. Reducing Methane Emissions from Compressor Rod Packing Systems
_____ 6. Reducing Emissions When Taking Compressors Off-Line
_____ 7. Installing Vapor Recovery Units on Crude Oil Storage Tanks
_____ 8. Replacing Wet Seals with Dry Seals in Centrifugal Compressors
_____ 9. Reducing the Glycol Circulation Rates in Dehydrators
_____ 10. Replacing Gas-Assisted Glycol Pumps with Electric Pumps
_____ 11. Installing Plunger Lift Systems in Gas Wells
_____ 12. Using Pipeline Pump-Down Techniques To Lower Pipeline Pressure Before Maintenance

STAR IMPLEMENTATION TOOLS

_____ Video-Production
_____ Video-Transmission/Distribution
_____ Case Study-El Paso Natural Gas
_____ Case Study-Brooklyn Union/Keyspan Energy
_____ Case Study-Texaco Exploration and Production, Inc.

OUTREACH MATERIALS

_____ Natural Gas STAR Program Brochure
_____ Natural Gas STAR Marketing Package
_____ Natural Gas STAR Communications Toolkit
_____ STAR Partner Update, Summer 1998
_____ STAR Partner Update, Spring 1999
_____ STAR Partner Update, Winter 1999
_____ STAR Partner Update, Fall 2000

Most of these materials are available on the Internet at www.epa.gov/gasstar