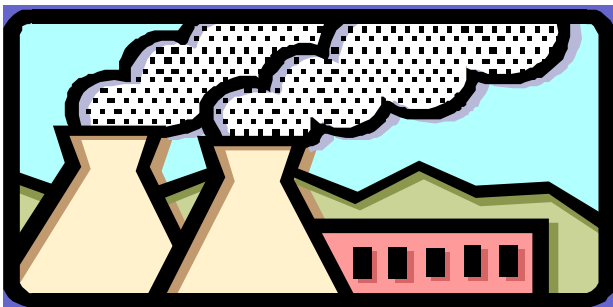


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EMISSION ENGINEERING SYSTEMS AND SERVICES, INC.®

Natural Gas STAR Program

15th Annual Implementation Workshop



**Jerome Blackman, Program Manager
Natural Gas STAR Program
November 12, 2008**





Agenda

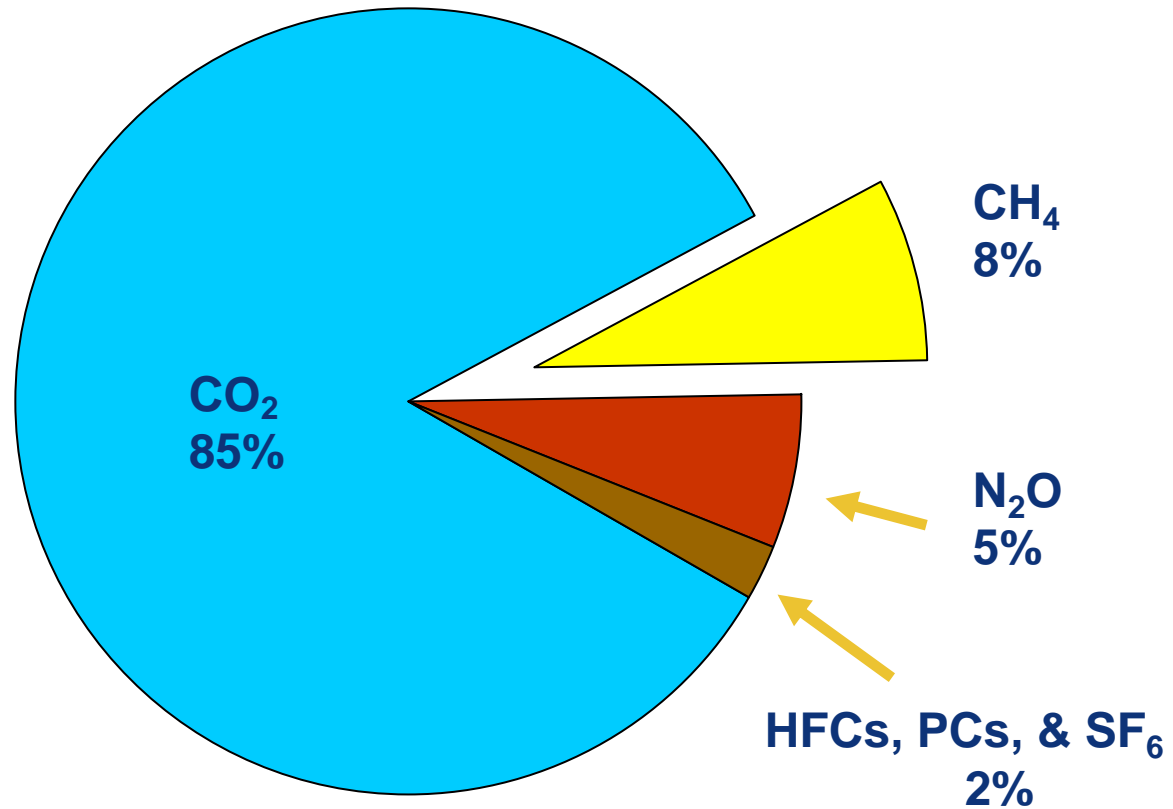
- 🔥 2007/2008 Overview & Program Highlights
- 🔥 New Program Resources and Services
- 🔥 Overview of Annual Workshop

Overview & Program Highlights





U.S. Greenhouse Gas Emissions All Sources

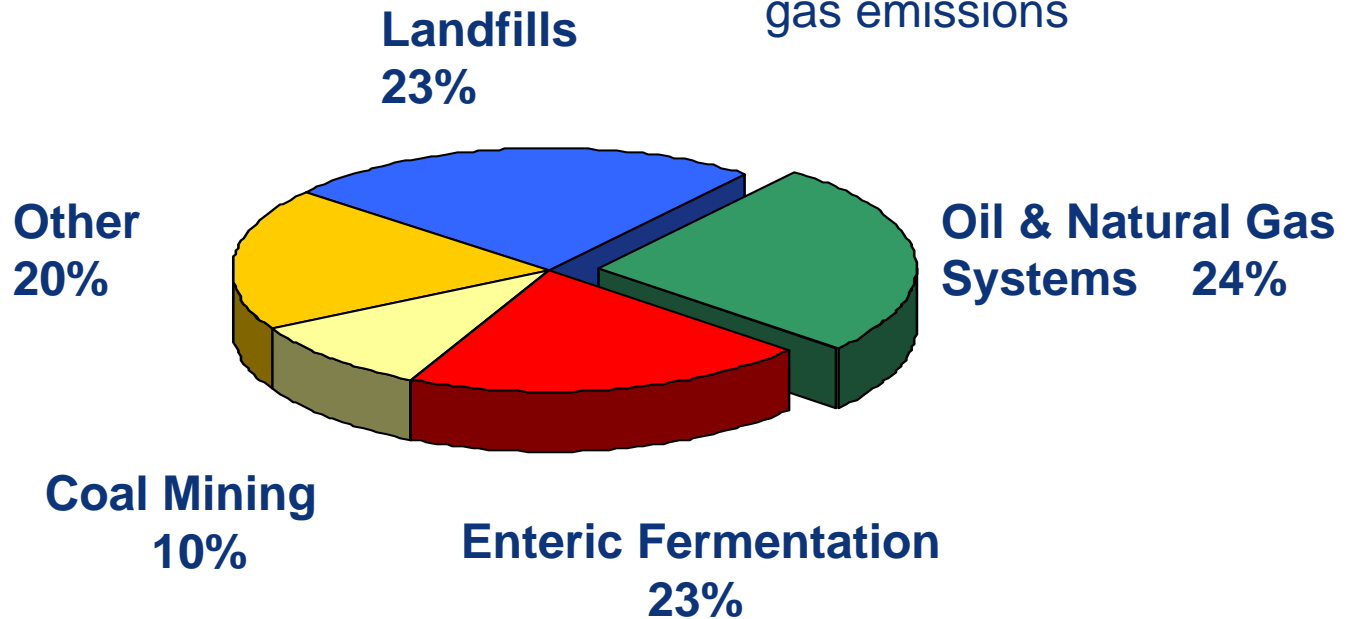


Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2006, USEPA, April, 2008



U.S. Methane Emissions All Sources

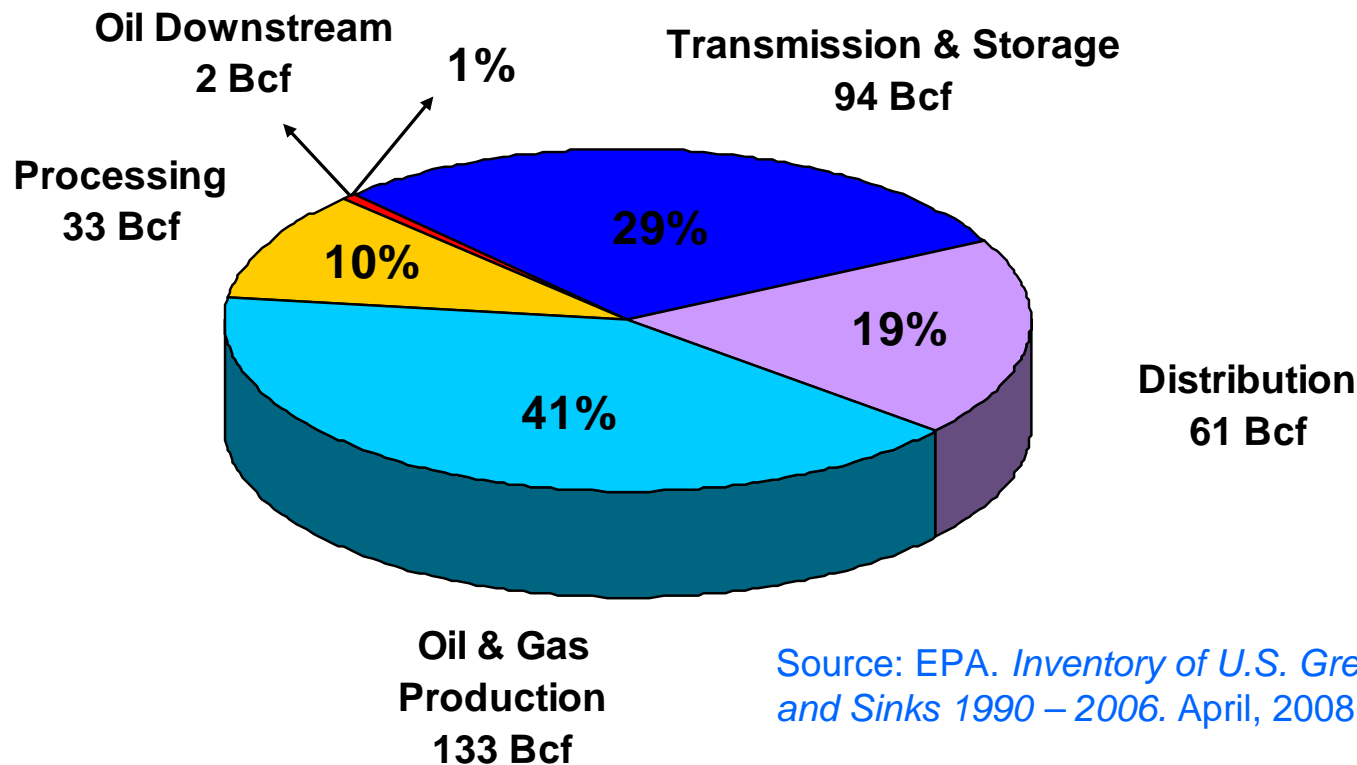
Methane emissions from Oil and Gas systems make up 2% of total U.S. greenhouse gas emissions



U.S. contributes 11% of worldwide methane emissions from oil and gas systems



U.S. Oil and Gas Methane Emissions



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2006*. April, 2008.

- 💧 Total **323 Bcf** equates to: \$2.26B in lost revenue (at \$7/Mcf);
- 💧 CO₂ emissions from the electricity use of 17.3 million homes for one year;
- 💧 Annual greenhouse gas emissions from 24 million cars

Opportunity exists to *cost-effectively* reduce these impacts



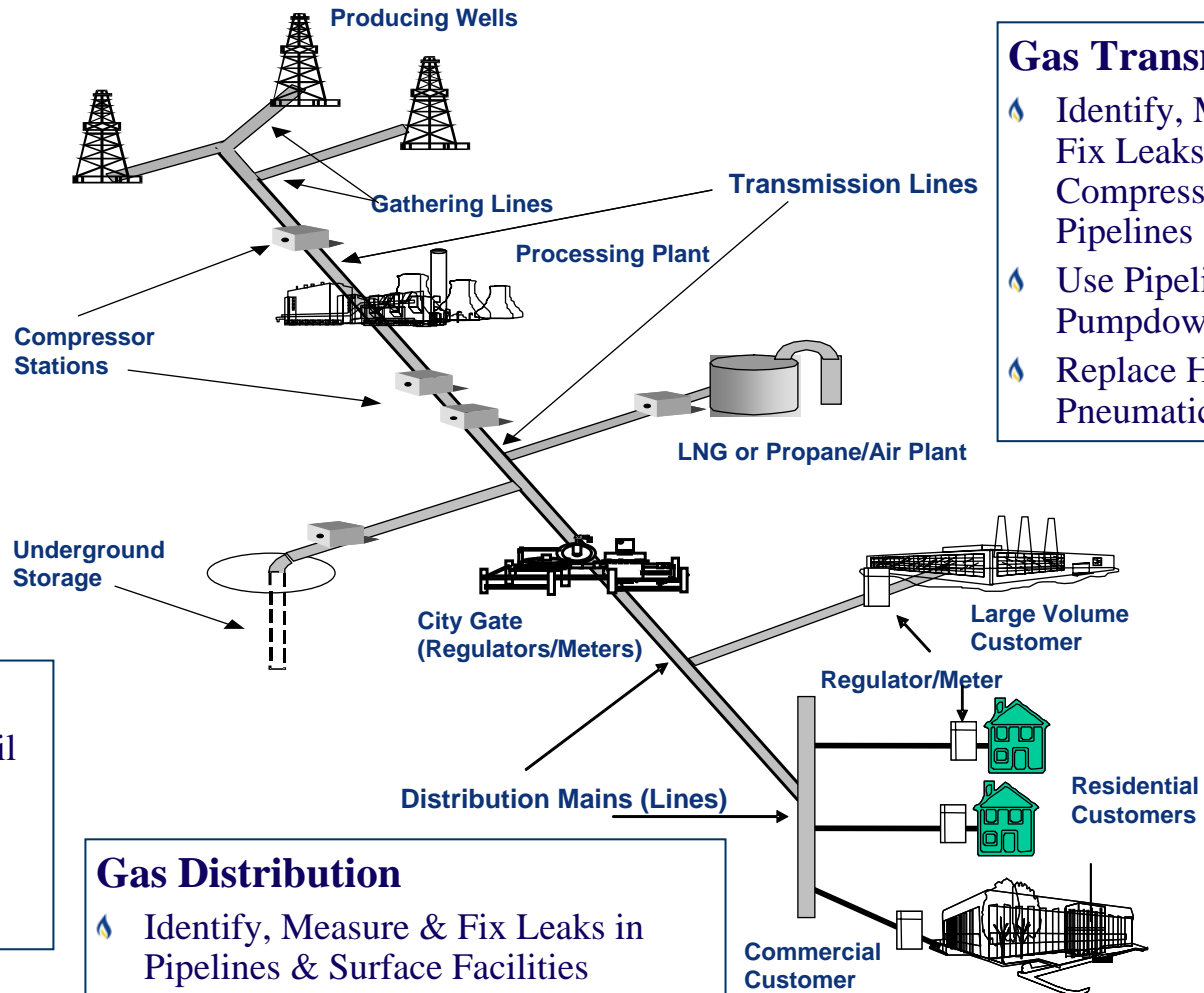
Opportunities to Reduce Methane Emissions Along the Value Chain

Gas Production & Processing

- 🔥 Reduced Emission Well Completions
- 🔥 Install Plunger Lifts on Gas Wells
- 🔥 Identify, Measure & Fix Leaks in Processing Plants
- 🔥 Install Flash Tank Separators on Dehydrators

Oil Production

- 🔥 Install VRUs on Crude Oil Storage Tanks
- 🔥 Route Casinghead Gas to VRU or Compressor for Recovery & Use or Sale



Gas Distribution

- 🔥 Identify, Measure & Fix Leaks in Pipelines & Surface Facilities
- 🔥 Inject Blowdown Gas into Low Pressure Mains

Gas Transmission

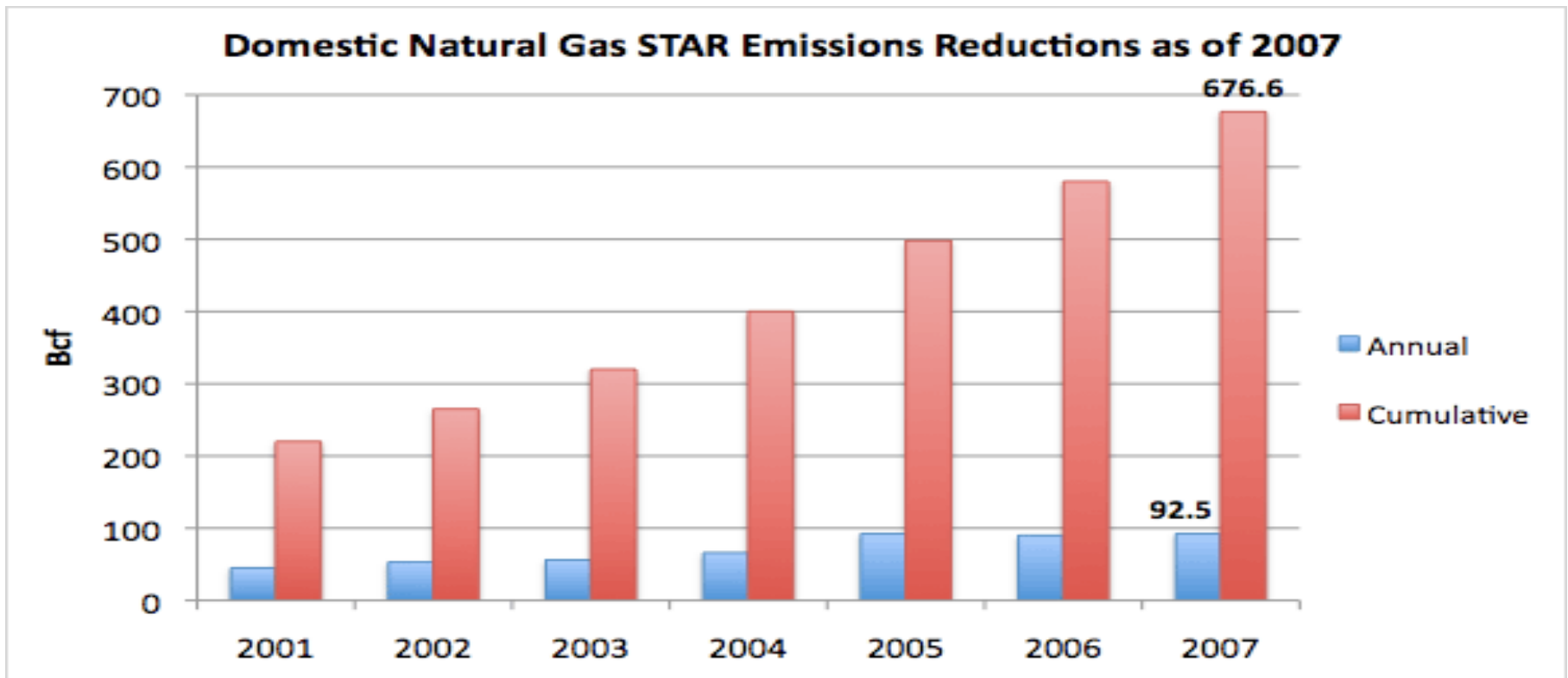
- 🔥 Identify, Measure & Fix Leaks in Compressor Stations, Pipelines
- 🔥 Use Pipeline Pumpdown
- 🔥 Replace High-Bleed Pneumatics

Picture courtesy of American Gas Association



2007 Another Successful Year Domestic Methane Emission Reductions

- Gas STAR Partners reduced methane emissions by 92.5 Bcf in 2007
- 677 Bcf in cumulative reductions since 1990





Natural Gas STAR Continues to Grow – New Partners

🔥 **Currently, over 130 Partners**

🔥 **2008 New Partners**

- 🔥 Comgas (Gas STAR International)
- 🔥 Kansas Gas Services
- 🔥 Linn Energy, LLC
- 🔥 Oklahoma Natural Gas
- 🔥 ROC Gas Company
- 🔥 SandRidge Energy
- 🔥 Source Gas LLC
- 🔥 Texas Gas Services
- 🔥 Xcel Energy



Technology Transfer

🔥 2008 Technology Transfer Workshops

- **Charlotte, NC (June 25)**
 - SGA's Environmental Round Table
- **Denver, CO (April 29, 2008)**
 - Marathon; IPAMS
- **Rock Springs, WY (May 1, 2008)**
 - EnCana; Petroleum Association of WY; IPAMS
- **New Orleans, LA (May 6)**
 - Shell; Chevron
- **Midland, TX (July 23)**
 - Chevron; TX Oil & Gas Association; NM Oil & Gas Association
- **Webcasts**
 - Transmission (Oct 16, 2008)
 - Distribution (July 16, 2008)



Natural Gas STAR International and Methane to Markets (M2M)

After 15 years of working with the U.S. oil and gas industry, EPA expanded Program to include international operations in 2006 under Methane to Markets.

🔥 Participation involves:

- 🔥 Developing an implementation plan
- 🔥 Identifying and implementing cost-effective projects
- 🔥 Reporting your success

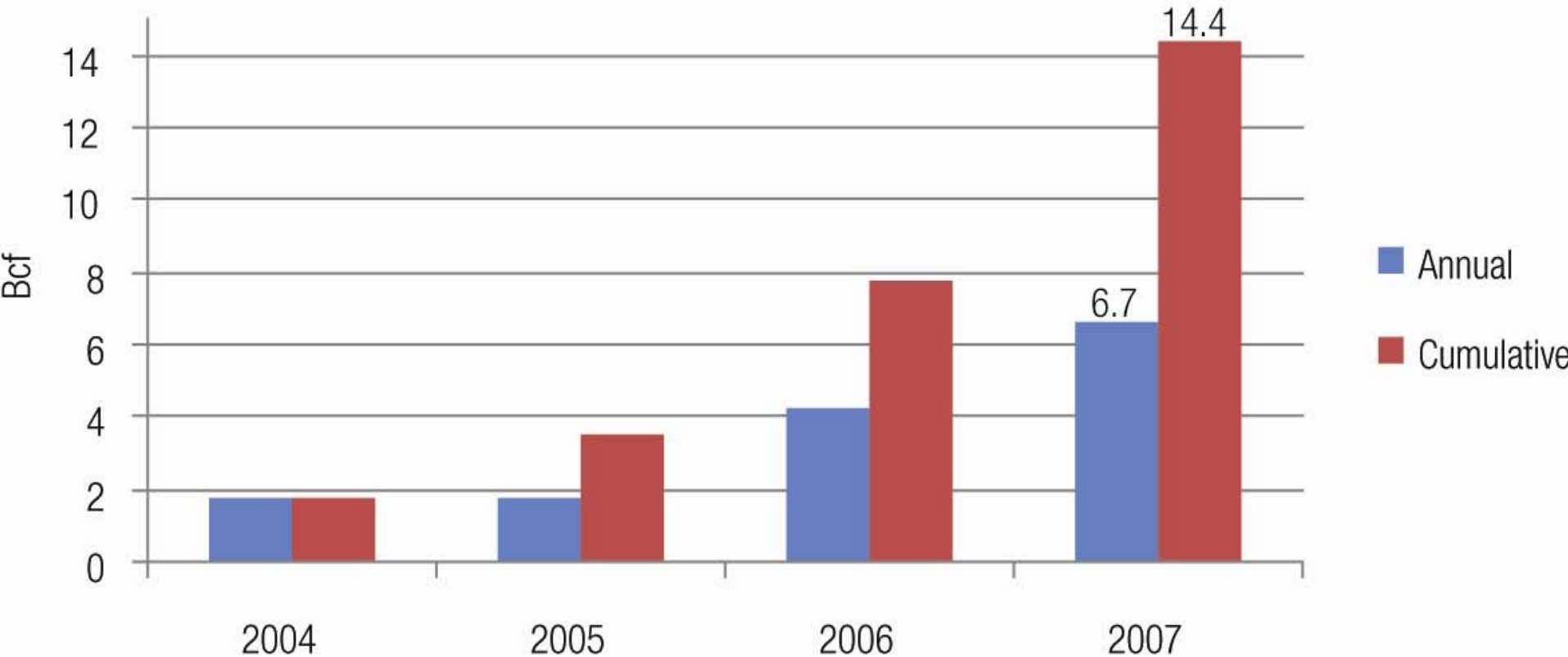
🔥 Support from Gas STAR International is available:

- 🔥 Identify top cost-effective methane reduction project opportunities
- 🔥 Conduct project pre-feasibility analysis
- 🔥 On-site training and workshop development



Natural Gas STAR International Methane Emission Reductions

International Natural Gas STAR Emissions Reductions as of 2007



New Program Resources and Services





New Tools

- **ONTIME Reductions: On-line Tool for Identifying Methane Emission Reductions**
 - Today's Presentation on "Methane Emission Reduction Project Identification Tool"
- **Service Provider Directory:** Online directory of vendors who offer methane emission reduction technologies and services for the oil and gas sector

www.epa.gov/gasstar/index.html



Service Provider Directory

- ❖ Product and Service Providers – relevant service providers can submit information to be considered for the directory
- ❖ Searchable list of service providers who offer methane emission reduction technologies and services for the oil and gas sector

**Available on the Gas STAR Web site under
Documents, Tools and Resources**

www.epa.gov/gasstar/tools/service-provider-directory.html

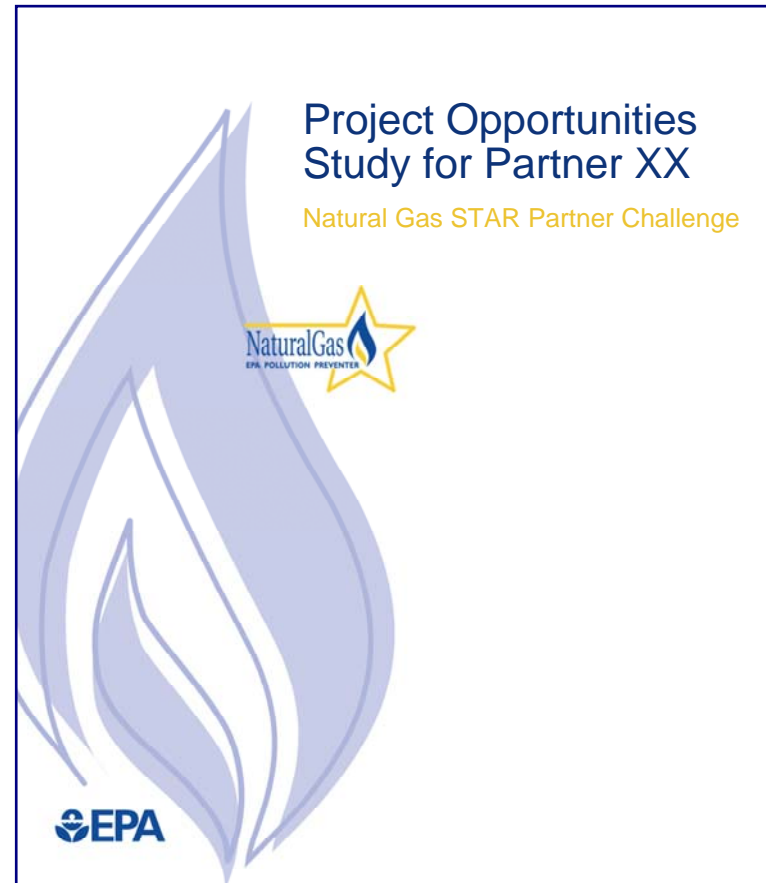


Natural Gas STAR Technical Assistance

Technical Assistance for Targeted Opportunities - “Partner Challenge”

💧 EPA offers assistance to partners in developing estimates of methane emissions and major sources for purpose of identifying and prioritizing new emission reduction opportunities:

- 💧 **Uses customized data**
- 💧 **Details project opportunities and emission reduction potential**
- 💧 **Details economic, operational, and environmental benefits of recommended technologies & practices**





New Web site: www.epa.gov/gasstar

U.S. ENVIRONMENTAL PROTECTION AGENCY



Natural Gas STAR Program

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The Natural Gas STAR Program is a flexible, voluntary partnership that encourages oil and natural gas companies—both domestically and abroad—to adopt cost-effective technologies and practices that improve operational efficiency and reduce emissions of methane, a potent greenhouse gas and clean energy source.

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Highlights

FLARING AND VENTING REDUCTION
&
NATURAL GAS UTILISATION FORUM
AMSTERDAM 3-5 DECEMBER 2008
NIK GRAND HOTEL KRASNAPOLSKY

- » **Nov 11-13** - 15th Annual Natural Gas STAR Implementation Workshop
- » The Natural Gas STAR Partner Update – Fall 2008
- » Other Current News





Upcoming Events

🔥 Flaring and Venting Reduction and Natural Gas Utilization Forum – The Netherlands

**🔥 Methane to Markets
Steering Committee and Technical Workshop - Mexico**

For more information and workshop announcements:
www.epa.gov/gasstar/workshops/index.html



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www.epa.gov/gasstar
www.methanetomarkets.org

2008 Annual Implementation Workshop





Overview

Today

- 🔥 **Keynote Speaker**
- 🔥 **Greenhouse Gas Management Programs and Strategies**
- 🔥 **Awards Luncheon Ceremony – International Center**
- 🔥 **3 Concurrent Track Sessions on Proven Methods to Capture or Reduction Methane Emissions**
 - 🔥 Production
 - 🔥 Gathering & Processing
 - 🔥 Transmission/Distribution

Tomorrow

- 🔥 **Leak Detection and Measurement Panel**
- 🔥 **Carbon Credits and Finance Panel**



Keynote Speaker

Dina Kruger

**Director - Climate Change Division
Office of Atmospheric Programs
US Environmental Protection Agency**