



Natural Gas STAR Program

Producers Technology Transfer Workshop

Casper, WY
August 30, 2005



epa.gov/gasstar

The Natural Gas STAR Program



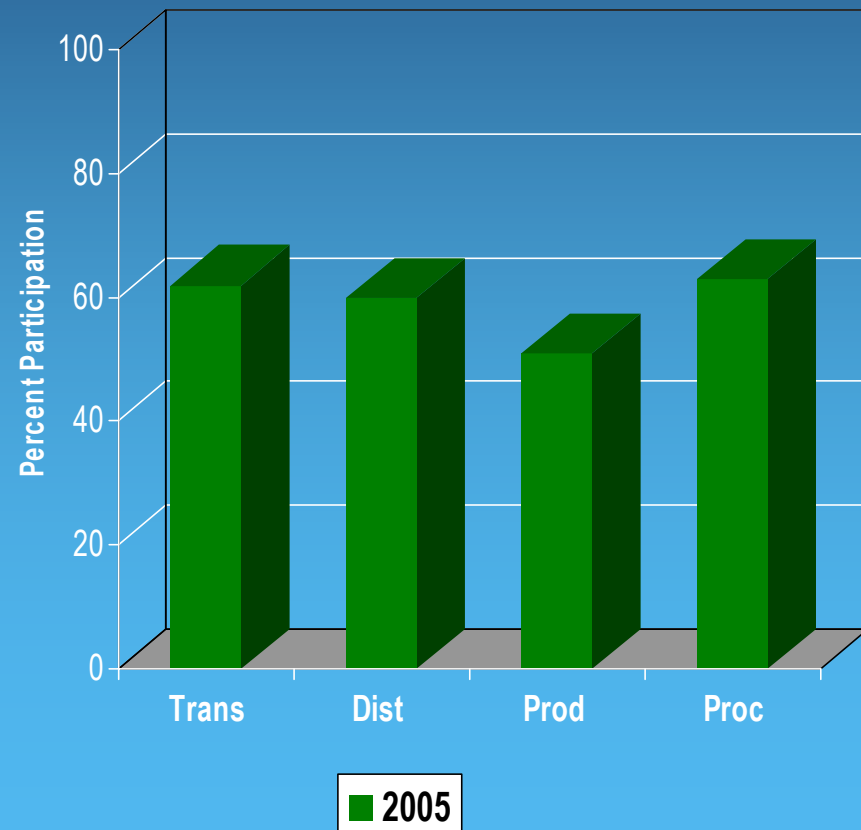
The Natural Gas STAR Program is a *flexible, voluntary partnership* between EPA and the oil and natural gas industry designed to *cost-effectively* reduce methane emissions from natural gas operations.

U.S. Industry Participation



★ 111 Program Partners

- ★ 62% of transmission assets
- ★ 22 partners
- ★ 60% of distribution assets
- ★ 45 partners
- ★ 51% of production assets
- ★ 32 partners
- ★ 63% of processing assets
- ★ 12 partners



Production Sector Gas STAR Partners



- ★ Amerada Hess Corporation
- ★ Anadarko Petroleum Corporation
- ★ Apache Corporation
- ★ BP p.l.c
- ★ Burlington Resources, Inc
- ★ ChevronTexaco Corporation
- ★ ConocoPhillips Company
- ★ Devon Energy Corporation
- ★ Dominion E & P
- ★ El Paso Production Company
- ★ EnCana Corporation
- ★ Energen Resources Corporation
- ★ ExxonMobil Production Company
- ★ Houston Exploration Company
- ★ Hunt Oil Company
- ★ Kerr-McGee Corporation
- ★ Marathon Oil Company
- ★ Murphy Oil Corporation
- ★ Newfield Exploration Company
- ★ Noble Energy
- ★ Occidental Oil & Gas Corporation
- ★ Pioneer Natural Resources
- ★ Pogo Producing Company
- ★ Quicksilver Resources, Inc.
- ★ Shell Exploration and Production
- ★ Southwestern Energy Company
- ★ Torch Energy Services
- ★ TotalFinaElf
- ★ Unocal Corporation
- ★ Williams Production RMT
- ★ Venoco, Inc.
- ★ XTO Energy, Inc

Natural Gas STAR Program Endorsers



- ★ American Gas Association (AGA)
- ★ American Institute of Chemical Engineers (AIChE) Institute for Sustainability
- ★ American Petroleum Institute (API)
- ★ Domestic Petroleum Council (DPC)
- ★ Gas Processors Association (GPA)
- ★ Gulf Coast Environmental Affairs Group (GCEAG)
- ★ Independent Producers Association of Mountain States (IPAMS)
- ★ Interstate Natural Gas Association of America (INGAA)
- ★ Interstate Oil and Gas Compact Commission (IOGCC)
- ★ National Association of Regulatory Utility Commissioners (NARUC)
- ★ Natural Gas Supply Association (NGSA)
- ★ New York State Energy Research and Development Authority (NYSERDA)
- ★ Southern Gas Association (SGA)



1000 Louisiana Boulevard
Washington, D.C. 20037-4242
202-462-6000

January 10, 2003

The Honorable Spencer Abraham
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20545

Dear Mr. Secretary:

The Honorable Spencer Abraham
January 10, 2003
Page Two

Administrators aggressively work to eliminate any potential regulatory barriers to progress in these areas.

API's Climate Action Challenge program contains broad goals such as 100% of oil and gas sector membership developing GHG management plans. It also contains more targeted goals for those key cost-effective government programs, such as 100% participation in Natural Gas Star and CHP Challenge. Expanding participation in the Natural Gas Star program would further reduce methane emissions from our natural gas production - a critical low-GHG fuel necessary for the economy's broader efforts to reduce its carbon's overall GHG intensity.

Our Climate B&B Challenge seeks long-term possibilities, such as developing low GHG emissions energy technologies, CO2 capture and sequestration technologies, and advancing the DOE FreedomCar program, which promises to significantly increase the energy efficiency of new vehicles while reducing new vehicle GHG emissions.

Finally, accurate estimates underlying all this is the API Climate Development the Estimation & Reporting Challenge. Estimating and reporting greenhouse gas emissions is extremely complex for more so than a generally realized, particularly for a highly integrated industry such as ours. Under our GHG Estimation and Reporting Challenge, we are aggressively developing a comprehensive GHG estimation protocol that can be used worldwide to produce standardized and comparable estimates of emissions from oil and gas industry operations - wherever they occur. This protocol is critical for us, since there is currently no reliable way to create our industry energy efficiency goal or other climate change actions to the President's 15 percent GHG intensity reduction goal. Over the next year, we will be developing the tools for measuring our progress toward our industry energy efficiency goal and how it relates to the President's GHG intensity goal. Additionally, as the protocol is adopted and as the data is carefully quality controlled to ensure accuracy and comparability, API will begin aggregating and reporting greenhouse gas emissions from our members' operations.

The attached document provides additional details about the API Climate Challenge Program. API and its members look forward to working with the Department of Energy and the rest of the administration on this complex and evolving issue of climate change and in addressing barriers that inhibit progress towards these goals.

Sincerely,

Eric Cavaney
President and CEO



January 10, 2003

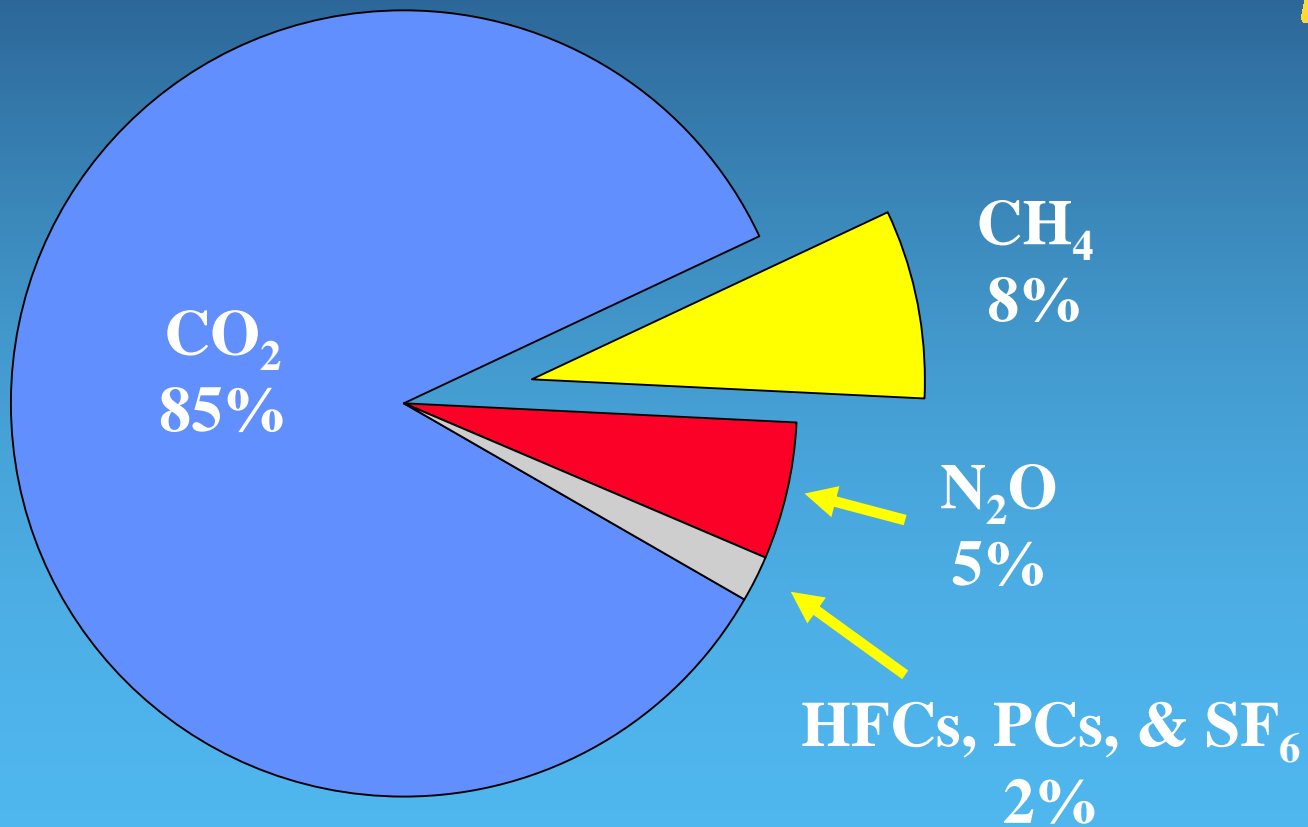
From: Mr. Red Cavaney
To: Hon. Spencer Abraham

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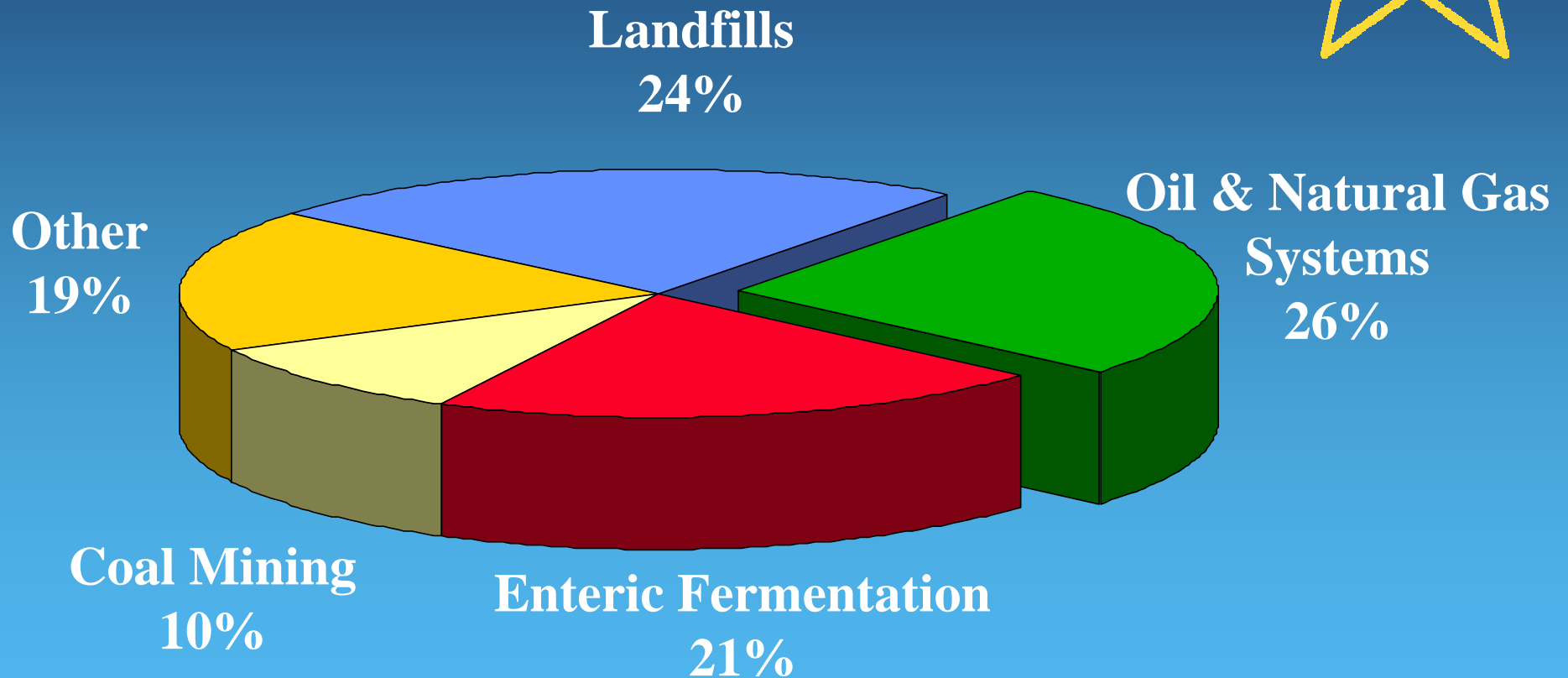
**Methane
Emissions in the
Oil and Gas
Industry**



U.S. Greenhouse Gas Emissions All Sources



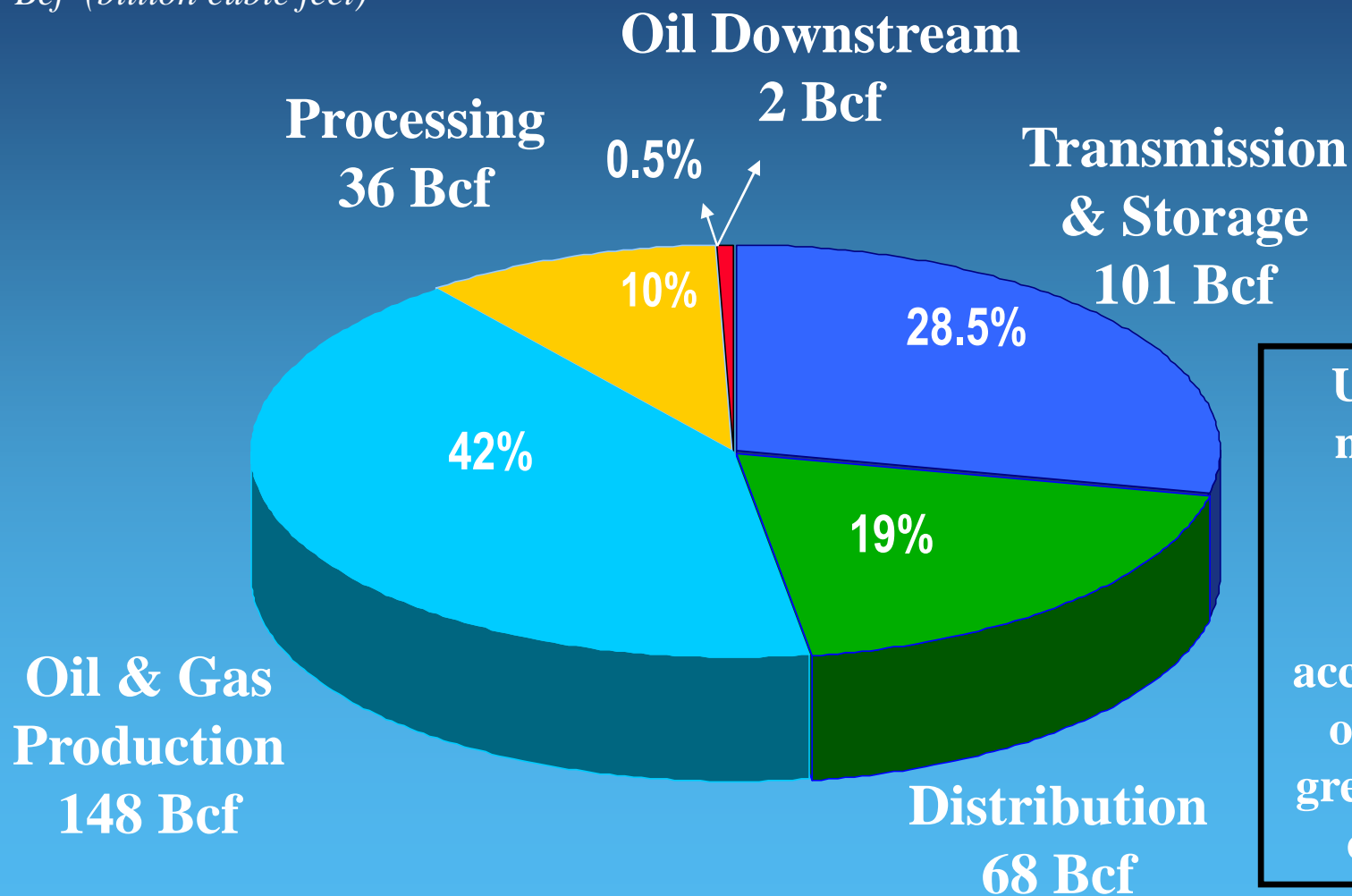
U.S. Greenhouse Gas Emissions Methane



U.S. Oil and Gas Industry Methane Emissions (Annual)



Bcf (billion cubic feet)



U.S. oil and natural gas industry methane emissions account for 2% of total U.S. greenhouse gas emissions.

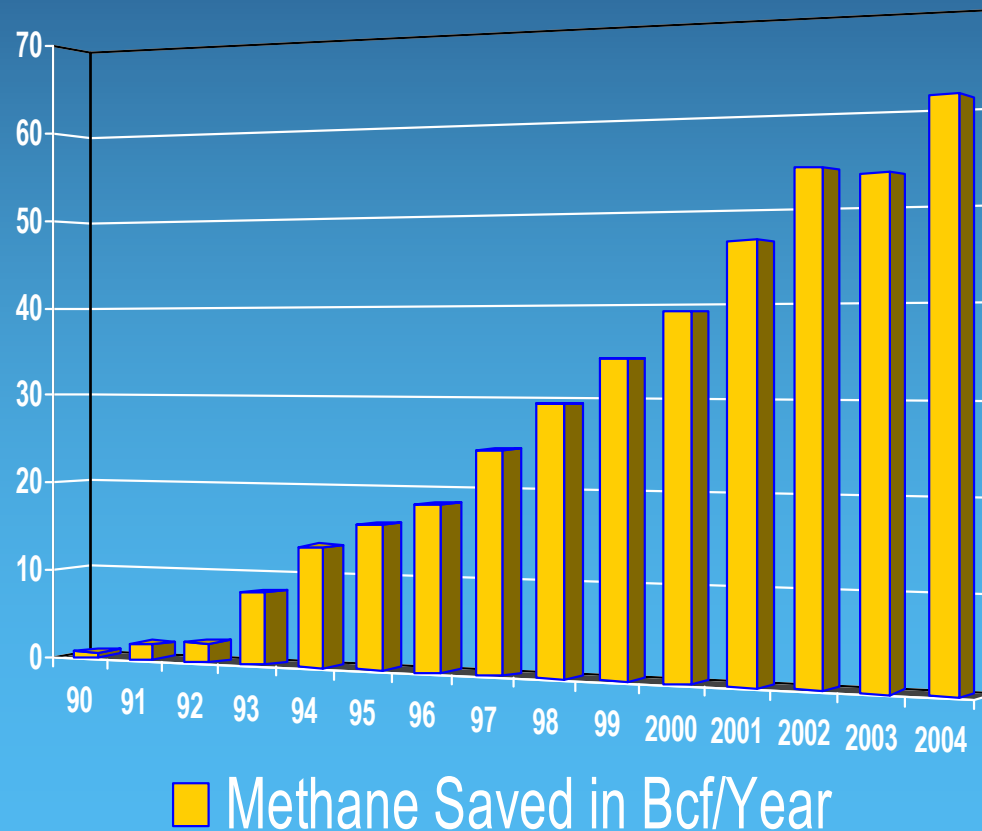
**Methane
Emissions
Reduction
Successes**



Natural Gas STAR Partner Accomplishments



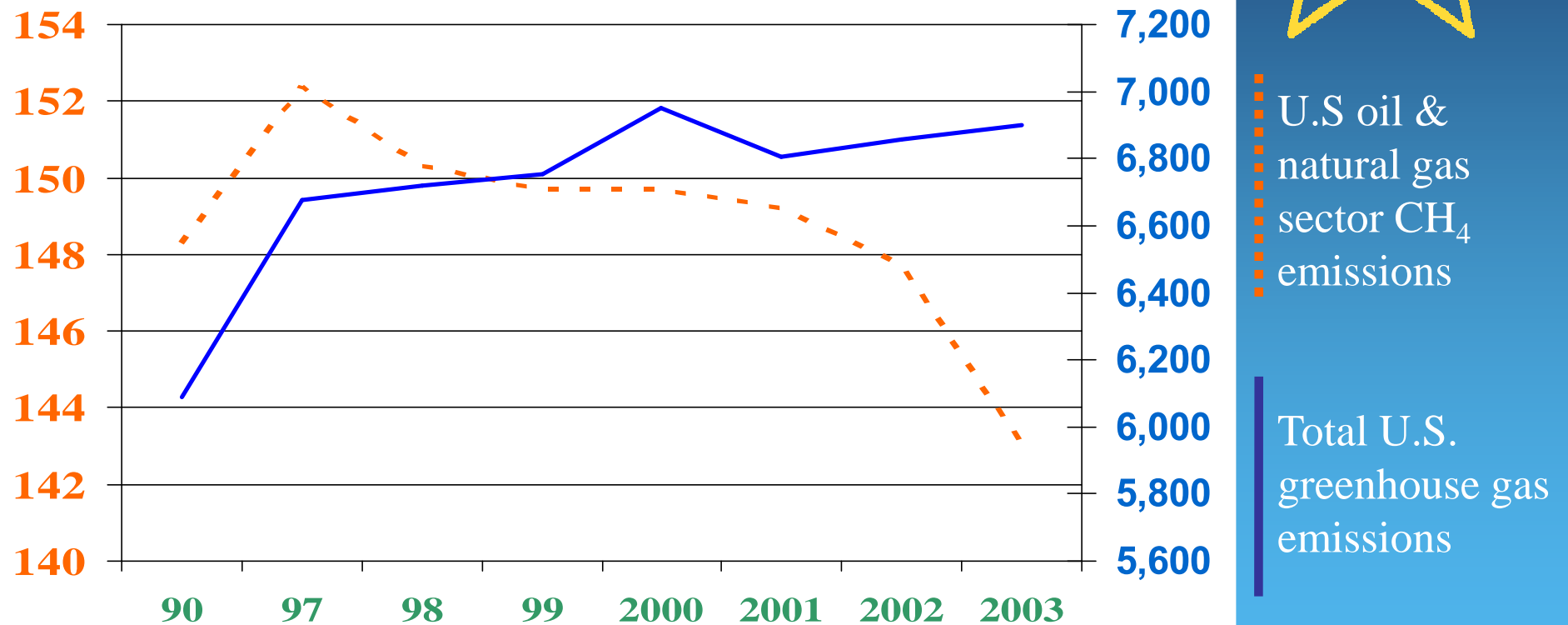
★ 403 Bcf in methane emissions reductions since 1990!



Natural Gas STAR Partner Accomplishments

Years 1990 - 2003

Natural gas sector reduced emissions while increasing throughput

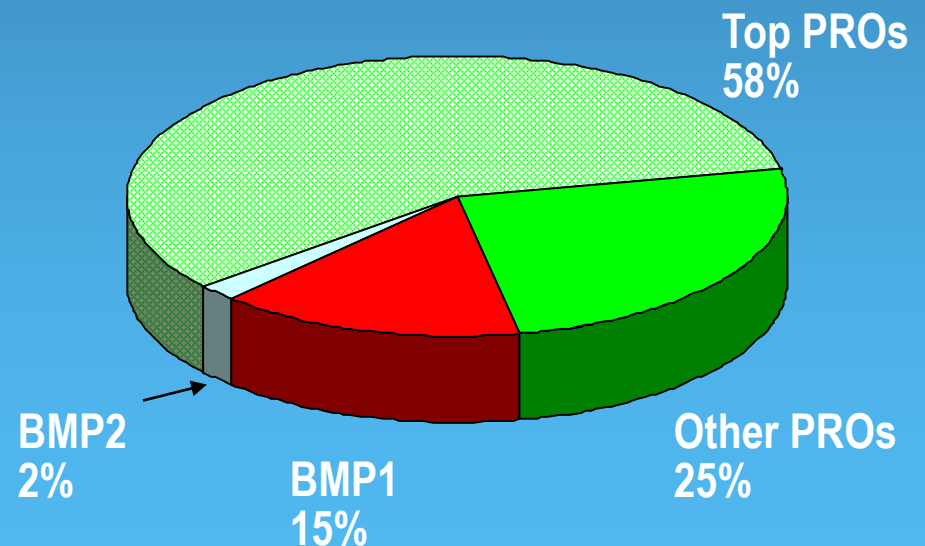


Units in teragrams of CO₂ equivalent (TgCO₂E)

Best Management Practices (BMPs)



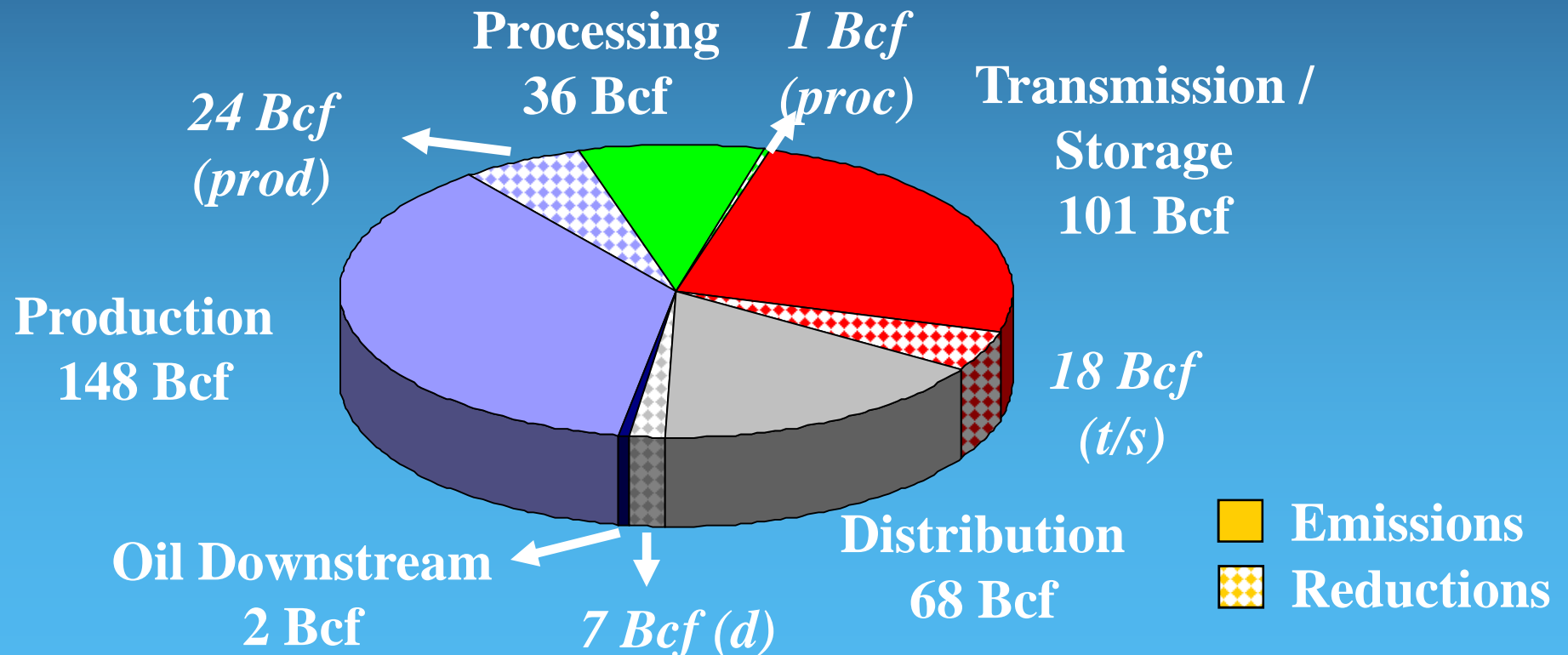
- ★ **BMP 1: Identify and replace high bleed pneumatic devices**
- ★ **BMP 2: Install flash tank separators on glycol dehydrators**
- ★ **BMP 3: Partner Reported Opportunities (PROs)**
 - 83% of production sector reductions came from PROs



Natural Gas Industry Emissions



Methane emissions (solid) and reductions (*italics*) in each sector of the U.S. natural gas industry.



Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2003, USEPA, April, 2005

Highly Implemented PROs



- ★ The Gas STAR program has identified 42 PROs that are applicable to the production sector
- ★ Ten “top” PROs:
 - PROs most reported by production Gas STAR partners
 - All target major emissions sources
 - Responsible for over 2 / 3 of PRO emissions reductions

Top PROs

- ★ Determine which top PROs are not currently implemented at your company
- ★ Revisit economics of top PROs using current gas price



Partner Reported Opportunities	Methane Savings in 2004 (Mcf)
Install vapor recovery units (VRUs)	4,187,078
Install flares	2,231,586
Install instrument air systems	410,214
Install plunger lifts	4,441,645
Eliminate unnecessary equipment and/or systems	313,731
Conduct leak surveys	14,081
Install electric compressors	116,947
Perform green completions	6,497,087
Consolidate crude oil production and water storage tanks	709,404
Alter blowdown piping	198,419

Top PROs Currently Reported



Partner Reported Opportunities	BP	ExxonMobil	ConocoTexaco	Devon Energy	Phillips
Install vapor recovery units (VRUs)	x	x	x		
Install flares	x	x	x		x
Install instrument air systems			x	x	
Install plunger lifts			x		x
Eliminate unnecessary equipment and/or systems	x	x	x	x	x
Conduct leak surveys			x	x	x
Install electric compressors				x	
Perform green completions	x				x
Consolidate crude oil production and water storage tanks			x		
Alter blowdown piping				x	
					x

Implementation of Top PROs



- ★ These PROs have been proven to reduce emissions economically
- ★ Top PROs target the largest sources of methane emissions in the production sector
- ★ Room for a great deal of further emissions reductions

Emissions Targeted by Top PROs



- ★ BMPs and top PROs target over 75% of production sector emissions but have only reduced emissions by 20%
- ★ This means:
 - Partners that report PROs recognize major sources of methane losses and are taking steps to mitigate emissions
 - Partners not practicing all BMPs and top PROs may have further opportunities to profit from methane savings

Workshops



★ Technology Transfer Workshops (5 to 6 per year)

- Production: Oklahoma City, OK – April 20, 2005
Casper, WY – August 30, 2005
Houston, TX – October 26, 2005
- Processing: Oklahoma City, OK – April 22, 2005
- Transmission: Midland, TX – June 8, 2005
- Distribution: Teleconference, May 17, 2005

★ Annual Implementation Workshop

- Houston, TX – October 24 to 26, 2005

White House “*Methane to Markets*” Initiative



- ★ Five year activity to develop verifiable methane emissions reduction projects at landfills, coal mines and natural gas systems.
- ★ Goal is to build long-term capacity within developing countries and economies in transition.
- ★ Countries include: Argentina, Australia, Brazil, Canada, China, Colombia, India, Italy, Japan, Mexico, Nigeria, Russia, South Korea, Ukraine, UK and US.
- ★ Gas STAR will lead natural gas system-related activities. The Program welcomes Gas STAR Partner participation.

Contact Information



Roger Fernandez

202-343-9386

fernandez.roger@epa.gov

epa.gov/gasstar