

Natural Gas STAR Program



Innovative Technologies for the Oil & Gas
Industry: Product Capture, Process
Optimization, and Pollution Prevention

Targa Resources and the Gas Processors
Association

July 27, 2006

epa.gov/gasstar



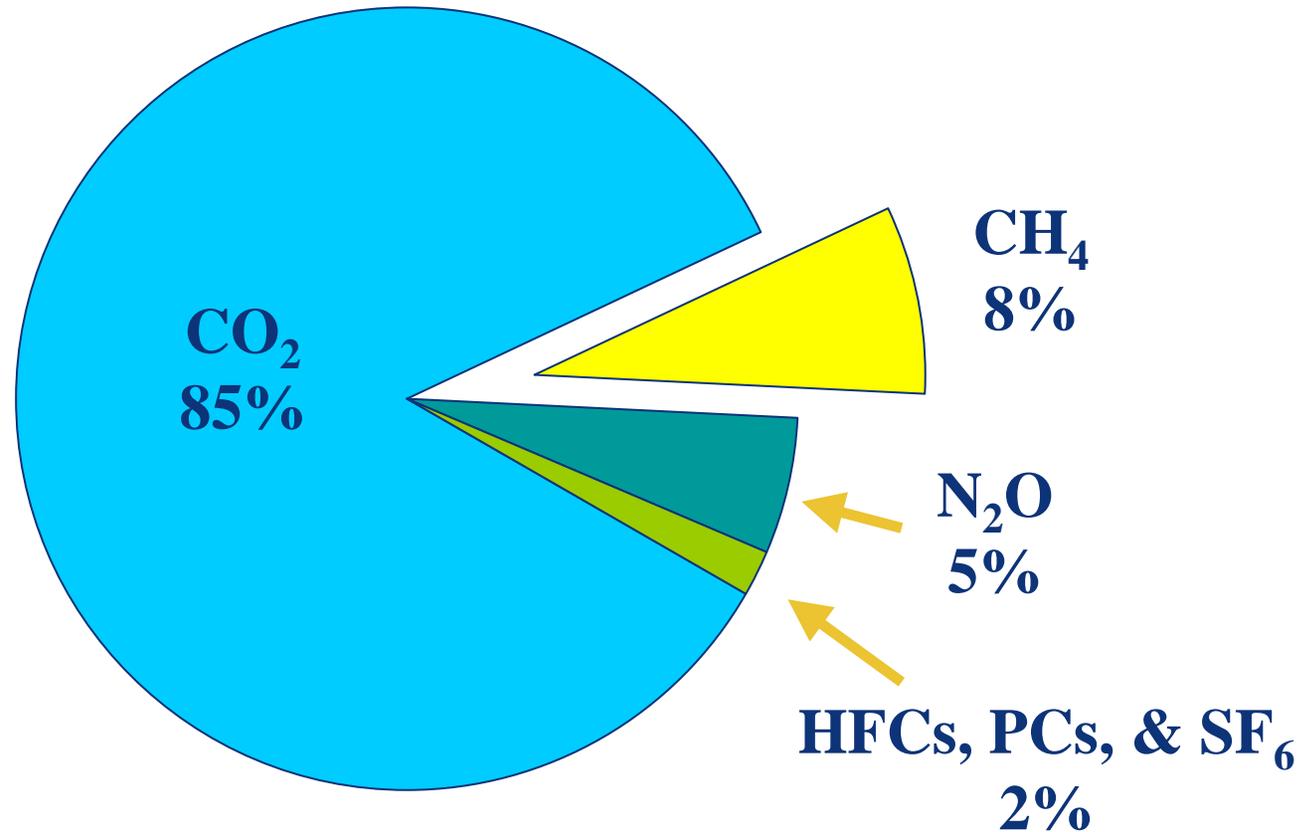
Agenda

- 🔥 Background – U.S. Methane Emissions
- 🔥 Methane Emissions in the U.S. Oil and Gas Industry
- 🔥 Natural Gas STAR Program Overview & Accomplishments
- 🔥 Natural Gas STAR Program Resources

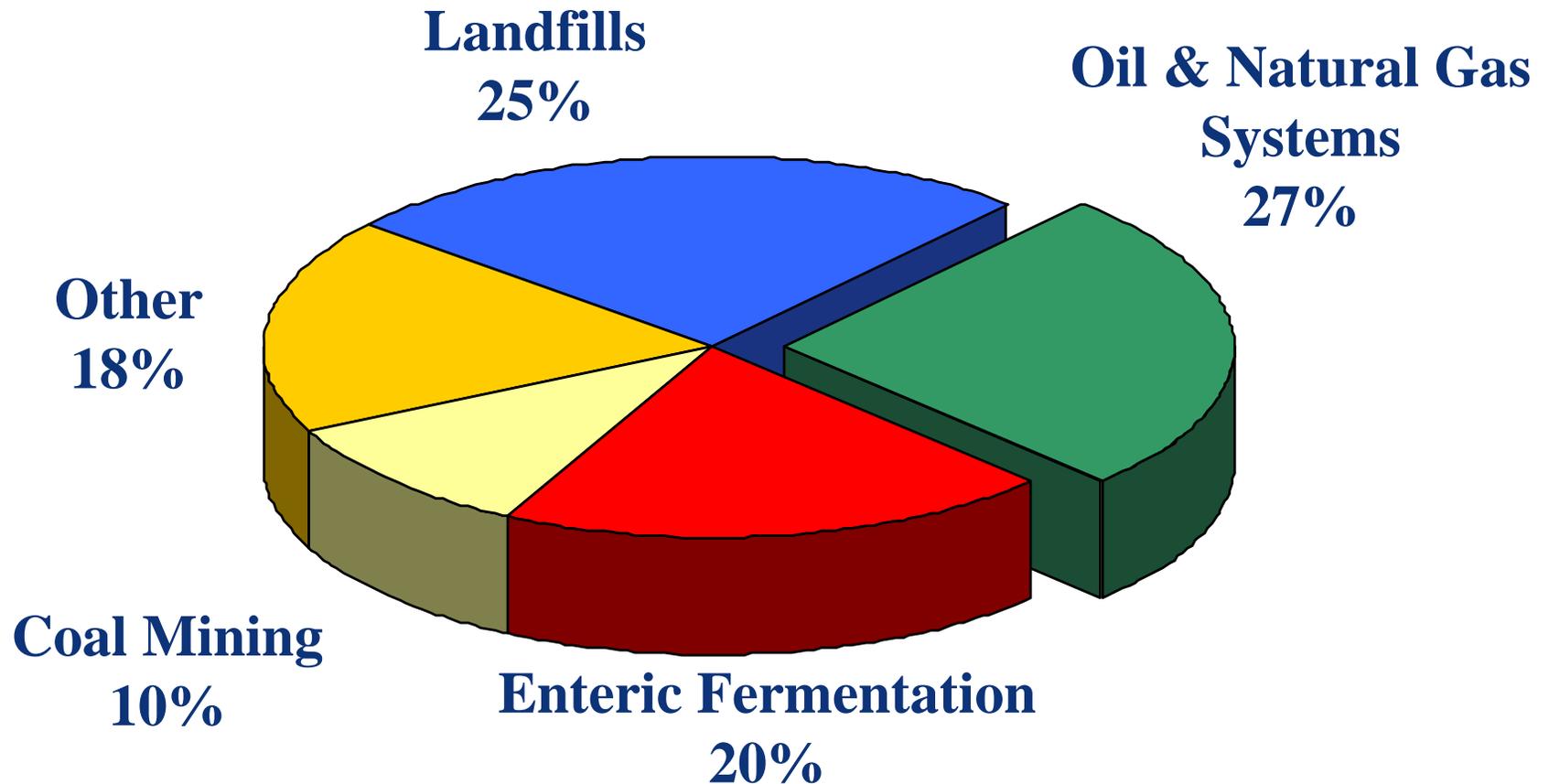
Why are methane emissions reductions important to you?

- 🔥 Reducing methane emissions from the U.S. oil and gas industry has cross-cutting impacts
 - 🔥 Addressing environmental and global warming concerns
 - 🔥 Potential for increased profits and operational efficiency in the oil & gas sector
 - 🔥 Increasing domestic natural gas supply

U.S. Greenhouse Gas Emissions All Sources

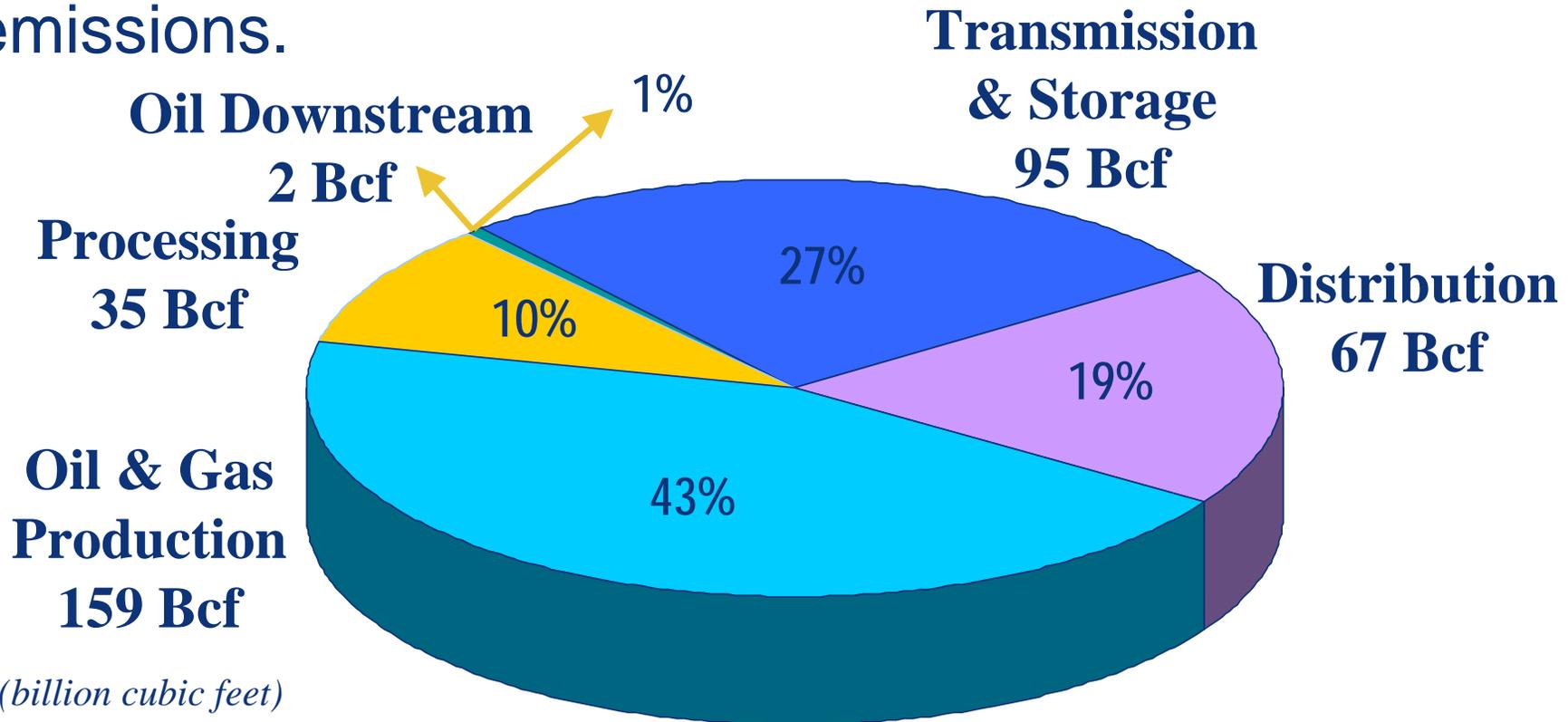


U.S. Methane Emissions



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

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



U.S. Oil & Natural Gas Opportunities

- 🔥 358 Bcf of methane emissions per year amounts to
 - 🔥 \$2.51B in lost revenue at \$7/Mcf natural gas
 - 🔥 Global warming equivalent of putting over 31 million additional cars on the road in the U.S.
 - 🔥 Gas supply capable of heating over 5 million U.S. households for a year
 - 🔥 Approximately 10,000 new gas wells worth of methane in the U.S.
- 🔥 U.S. oil and gas industry has an opportunity to cost-effectively reduce these impacts

Natural Gas STAR Program

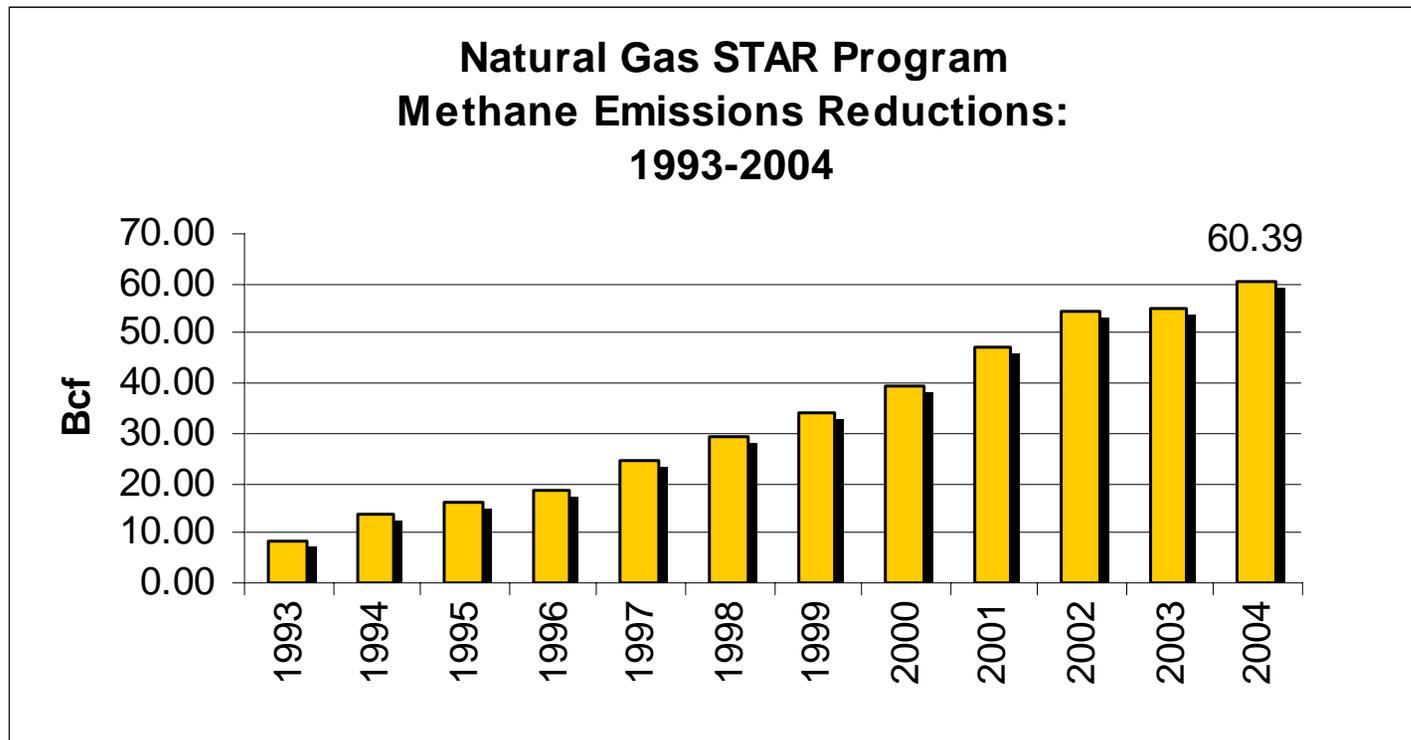
The Natural Gas STAR Program is a ***flexible, voluntary partnership*** between EPA and the oil and natural gas industry designed to ***cost-effectively*** reduce methane emissions from natural gas operations.

Natural Gas STAR Partners & Endorsers

- 🔥 Over 110 Program Partners across all four sectors
 - 💧 Recommended technologies and practices come directly from partner companies and industry experts
- 🔥 18 endorser associations, including
 - 💧 Gas Processors Association (GPA)
 - 💧 American Petroleum Institute (API)
 - 💧 Domestic Petroleum Council (DPC)
 - 💧 Independent Producers Association of Mountain States (IPAMS)
 - 💧 Interstate Oil & Gas Compact Commission (IOGCC)
 - 💧 Southern Gas Association (SGA)
 - 💧 Colorado Oil & Gas Association (COGA)
 - 💧 Petroleum Association of Wyoming (PAW)
 - 💧 Petroleum Technology Transfer Council (PTTC)
 - 💧 Independent Producer's Association of America (IPAA)

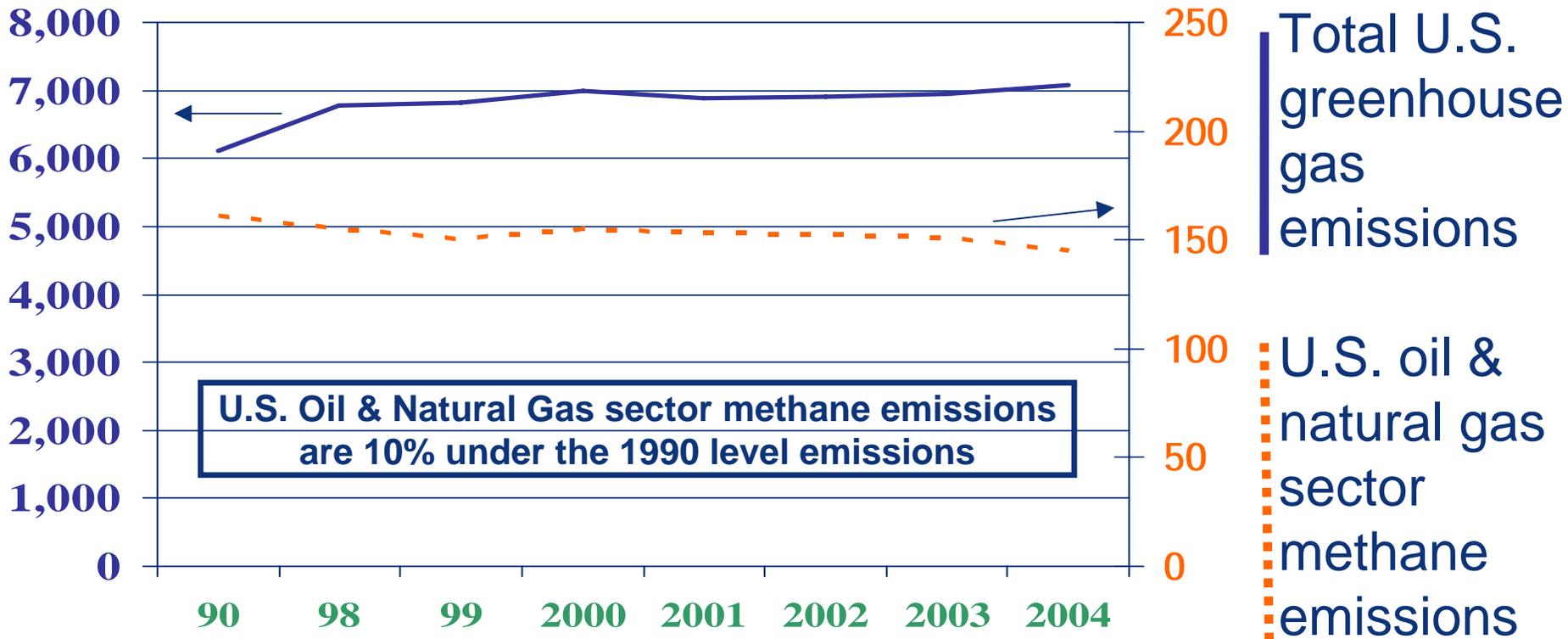
Natural Gas STAR Partner Accomplishments

- 🔥 Natural Gas STAR Partners have reduced methane emissions by cumulative 403 Bcf since 1990



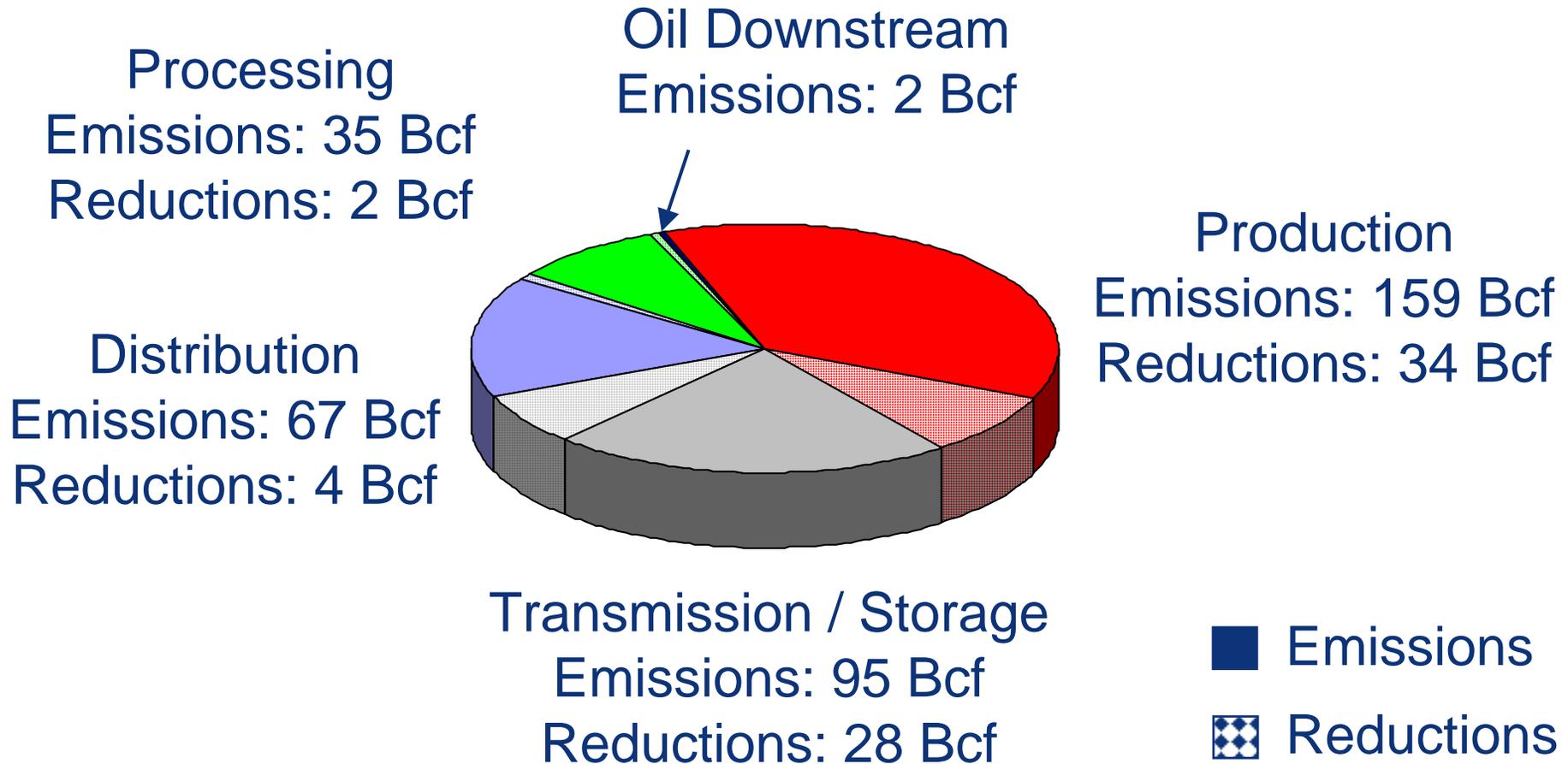
Natural Gas STAR Partner Accomplishments (1990 – 2004)

Natural gas sector reduced emissions while increasing intensity



Units in teragrams of CO₂ equivalent (TgCO₂E)

Oil & Gas Methane Emissions and Natural Gas STAR Reductions (2004)



Methane Emission Reduction Opportunities

- Partners have reported over 80 technologies and practices for achieving cost-effective methane emission reductions

Best Practices - Processing

- Eliminate Unnecessary Equipment and/or Systems
- Use of Composite Wrap Repair
- Conduct aerial leak surveys
- Acid gas removal options
- Directed Inspection & Maintenance and IR Leak Detection

Program Resources

🔥 Guidance on recommended practices & technologies

🔥 Detailed implementation guides, including partner case studies

🔥 Economic analysis tools

🔥 Communication tools

🔥 Available on www.epa.gov/gasstar

🔥 Technology Transfer workshops

🔥 Free and open to the public

🔥 Annual record of Partner methane savings

🔥 One-on-one technical assistance



The image shows three overlapping 'PRO Fact Sheet' covers from the Natural Gas EPA Pollution Preventer program. The top cover is 'Nitrogen Rejection Unit Optimization', the middle is 'Zero Emissions Dehydrators', and the bottom is 'Convert Engine Starting to Nitrogen'. Each cover includes a title, a brief description, and a list of partner reporting companies. The 'Convert Engine Starting to Nitrogen' cover also includes a 'Methane Savings' table and a 'Benefits' section.

Methane Savings: 1,200 Mcf per year	
Costs	
Capital Costs (including installation)	☐ \$0-100 ☐ \$101-1000 ☐ \$1000+
Operating and Maintenance Costs (annual)	☐ \$0-10 ☐ \$100-\$1,000 ☐ \$1,000+
Payback (Years)	☐ <1 ☐ 1-2 ☐ 3-10 ☐ >10

Benefits
 Reducing methane emissions is a primary justification for the project.

Workshops

🔥 International

- 🔥 Technology Transfer Workshop & Plant Tour
 - 🔥 Co-hosted by Pemex, Villahermosa, Mexico; April 25-26, 2006
- 🔥 IPIECA Annual Meeting / Technology Transfer Workshop
 - 🔥 September 26, 2006, Washington, DC

🔥 Domestic

- 🔥 Technology Transfer Workshops
 - 🔥 Kenai, AK – May 25, 2006 (ConocoPhillips Alaska)
 - 🔥 Fort Worth, TX – June 6, 2006 (Devon and PTTC)
 - 🔥 Midland, TX – June 8, 2006 (Occidental, PTTC, and NMOGA)
- 🔥 Annual Implementation Workshop
 - 🔥 Houston, TX – October 23-25, 2006

White House “Methane to Markets” Initiative

- 🔥 Initiative 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, Ecuador, Germany, India, Italy, Japan, Mexico, Nigeria, Republic of Korea, Russia, Ukraine, U.K. and U.S.
- 🔥 Natural Gas STAR will lead natural gas system-related activities, including upcoming launch of international program.
- 🔥 www.methanetomarkets.org

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