Natural Gas STAR Program

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

Producers and Processors Technology Transfer Workshop
ConocoPhillips and EPA’s Natural Gas STAR Program
Kenai, AK
May 25, 2006

Agenda
- Background – U.S. Methane Emissions
- Methane Emissions in the U.S. Oil and Gas Industry
- Gas STAR Program Overview & Accomplishments
- Gas STAR Program Resources
The “So What” – Why are we here?

- 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

- CO₂ 85%
- CH₄ 8%
- N₂O 5%
- HFCs, PCs, & SF₆ 2%

**U.S. Methane Emissions**

- Landfills: 25%
- Oil & Natural Gas Systems: 26%
- Enteric Fermentation: 20%
- Coal Mining: 10%
- Other: 19%


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**U.S. Oil & Natural Gas Industry**

- Methane losses from the U.S. oil & natural gas industry total 358 Bcf
- Accounts for 2% of total U.S. greenhouse gas emissions

- Oil & Gas Production: 159 Bcf
- Distribution: 67 Bcf
- Transmission & Storage: 95 Bcf
- Oil Downstream: 2 Bcf
- Processing: 35 Bcf

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
- 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.
Gas STAR Partners & Endorsers

- 114 Program Partners across all four sectors
  - Recommended technologies and practices come directly from partner companies and industry experts
- 18 endorser associations, including
  - American Petroleum Institute (API)
  - Domestic Petroleum Council (DPC)
  - Gas Processors Association (GPA)
  - Independent Producers Association of Mountain States (IPAMS)
  - Interstate Oil & Gas Compact Commission (IOGCC)
  - Southern Gas Association
  - 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 403 Bcf
- Methane emissions from U.S. oil and gas sector below 1990 levels
Oil & Gas Methane Emissions Without Gas STAR Program (2004)

- **Production**
  - Emissions: 159 Bcf
  - Reductions: 34 Bcf

- **Transmission / Storage**
  - Emissions: 95 Bcf
  - Reductions: 28 Bcf

- **Distribution**
  - Emissions: 67 Bcf
  - Reductions: 4 Bcf

- **Processing**
  - Emissions: 35 Bcf
  - Reductions: 2 Bcf

- **Oil Downstream**
  - Emissions: 2 Bcf

Methane Emission Reduction Opportunities

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

**Best Practices - Production**
- Perform reduced emission completions
- Install vapor recovery units
- Install plunger lifts
- Install instrument air systems
- Eliminate unnecessary equipment and/or systems
- Install electric compressors

**Best Practices - Processing**
- Conduct helicopter leak surveys
- Conduct infrared leak surveys
- Replace glycol dehydration units with methanol injection
- Install electric compressors
- Use hot taps for in-service pipeline connections
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](http://www.epa.gov/gasstar)
- Technology Transfer workshops
  - Free and open to the public
- Annual record of Partner methane savings
- One-on-one technical assistance

Workshops

- Upcoming Technology Transfer Workshops (5 to 6 per year)
  - **Producers and Processors Technology Transfer Workshop**
    Sponsored by ConocoPhillips
    May 25, 2006
    Kenai, Alaska
  - **Producers Technology Transfer Workshop**
    Sponsored by Devon Energy and PTTC
    June 6, 2006
    Fort Worth, TX
  - **Producers Technology Transfer Workshop**
    Sponsored by Occidental Oil and Gas, PTTC, and NMOGA
    June 8 & 9, 2006
    Midland, TX
  - **Processors Technology Transfer Workshop**
    Sponsored by Targa Resources, GPA, and NMOGA
    July 27, 2006
    Hobbs, NM
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, China, Colombia, India, Italy, Japan, Mexico, Nigeria, Russia, Ukraine and UK.
- Gas STAR will lead natural gas system-related activities, including upcoming launch of international program
- www.methanetomarkets.org

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