

Discovering New Opportunities for Reducing Methane Emissions

Lessons Learned
from Natural Gas STAR



Producers Technology Transfer Workshop

ExxonMobil Production Company,
American Petroleum Institute and
EPA's Natural Gas STAR Program

September 21, 2004

New Opportunities: Agenda

- ★ Methane Losses
- ★ Methane Recovery
- ★ Creative Technology Combinations
- ★ New Technology Developments
- ★ Discussion Questions



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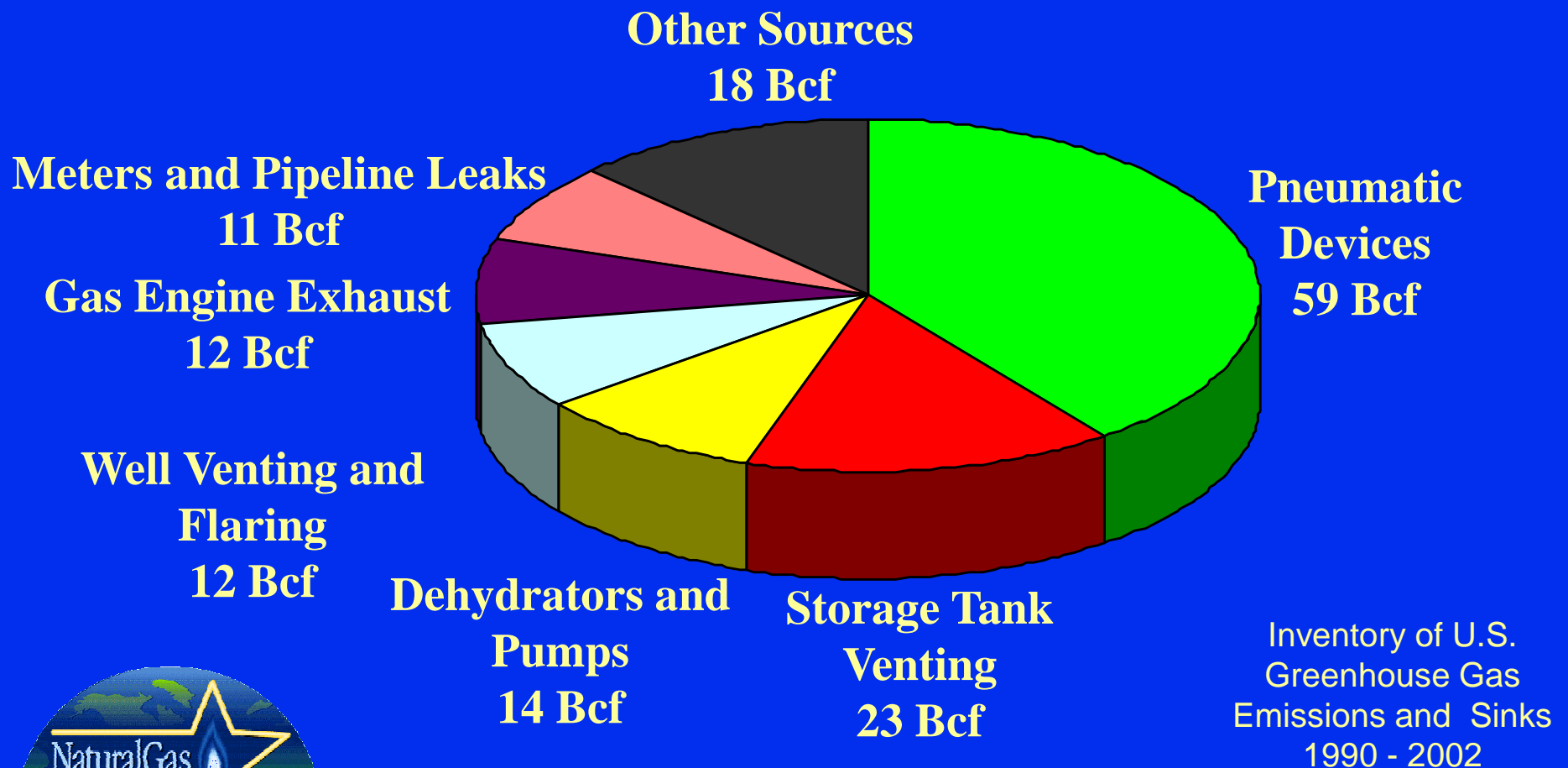
Methane Losses

- ☆ 89 Bcf methane lost to atmosphere annually from natural gas production
- ☆ 60 Bcf methane lost to atmosphere annually from oil production
- ☆ Both after 26 Bcf of Gas STAR savings
- ☆ Gas prices at all-time highs!
- ☆ Mitigating the remaining losses is becoming more and more profitable



Where are the Opportunities?

★ Production emissions sources



Methane Recovery

- ☆ Revisit Natural Gas STAR opportunities that are now more economic with rising gas prices
- ☆ Consider combinations of known opportunities that are collectively economic
- ☆ Identify new areas for profitable methane emissions reductions



Revisit Natural Gas STAR Opportunities

- ★ **Producer Partner Reported Opportunities**
 - ◆ **Evaluate or re-evaluate Natural Gas STAR practices and technologies**
 - ◆ **Newly published Partner Reported Opportunities**



Consider Technology Combinations: Capture Pneumatic Gas

- ★ Emissions: pneumatic devices
 - ◆ Also dehydrator vents and casinghead gas
- ★ Recovery: Vapor recovery unit (VRU)
 - ◆ Also compressor suction and fuel gas
- ★ Savings = Gas value - piping installed cost
- ★ Small installed costs
- ★ Negligible O&M costs



Capture Pneumatic Gas

★ Cost estimate for routing to VRU

◆ 100 ft of half inch stainless steel tubing

◆ @ \$10 installed/ft = \$1,000

★ Gas Value

◆ 525 Mcf/yr per source (1 cf/m)

◆ @ \$3/Mcf = \$1,575/yr

★ 8 month payback



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New Technology Developments: Inexpensive Sensing Technologies

- ☆ Objective: Cost-effective (profitable) automated leak detection
- ☆ Sensor alerts operators when monitored component emits enough fugitives to warrant repair
- ☆ Valve stem seals, compressor rod packing, pressure safety valve, blowdown vents



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**Leak
notifies
you**



Adsistor Ring

Environmental Systems Inc.

Cheap Alarm

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DI&M by Leak Imaging

- ★ Real-time visual image of gas leaks
 - ◆ Quicker identification & repair of leaks
 - ◆ Screen hundreds of components an hour
 - ◆ Screen inaccessible areas simply by viewing them



Infrared Gas Imaging Technology

- ★ Shoulder- and/or tripod- mounted
 - ◆ Hand-held prototype
- ★ Aerial surveillance applications
- ★ Require battery and/or power cord
- ★ Most very large leaks ($> 3\text{cf/hr}$) clearly seen



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Infrared Gas Imaging Technology

□ Visible light image of leaking component



□ Infrared image of leaking component



□ Gas plume motion clearly shows leak



Source: Texas council on Environmental Quality Study

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Infrared Gas Imaging

- ★ Video recording of fugitive leak found by infrared camera



Discussion Questions

- ★ What idea interests you most?
- ★ What are the barriers (technological, economic, lack of information, regulatory, focus, manpower, etc.) that are preventing you from launching feasibility studies and/or pilot projects?



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