

# Other Production Emissions Sources

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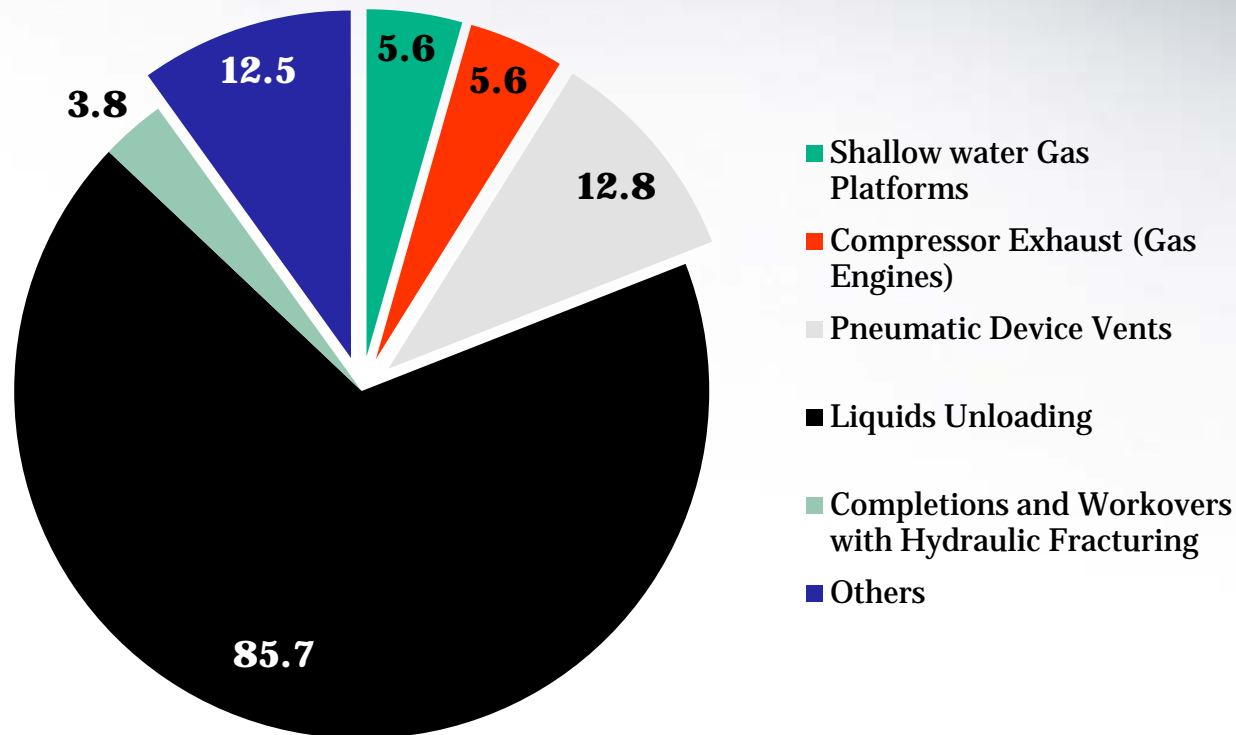


\*This presentation contains minor corrections to slides presented at the workshop.

# Methane Potential from Natural Gas Production Sector



2010 Production Sector Emissions (2012 Inventory), MMTCO<sub>2</sub>e



# Other Production Emission Sources



Shallow water Gas Platforms (Gulf of Mexico and Pacific)	Pipeline Leaks – Gathering	Gas Well Completions with Hydraulic Fracturing
Deepwater Gas Platforms (Gulf of Mexico and Pacific)	Gas Well Completions without Hydraulic Fracturing	Gas Well Workovers with Hydraulic Fracturing
Non-associated Gas Wells (less fractured wells)	Gas Well Workovers without Hydraulic Fracturing	Liquids Unloading
Gas Wells with Hydraulic Fracturing	Well Drilling	Vessel – Blowdowns
Heaters – Field Separation Equipment	Pneumatic Device Vents	Pipeline – Blowdowns
Separators – Field Separation Equipment	Chemical Injection Pumps	Compressor – Blowdowns
Dehydrators – Field Separation Equipment	Kimray Pumps	Compressor Starts – Blowdowns
Meters/Piping – Field Separation Equipment	Dehydrator Vents	Pressure Relief Valves –Upsets
Small Reciprocating Compressors – Gathering	Condensate Tanks without Control Devices	Mishaps – Upsets
Large Reciprocating Compressors – Gathering	Condensate Tanks with Control Devices	Black Warrior – CBM Produced Water
Large Reciprocating Stations – Gathering	Gas Engines	Powder River – CBM Produced Water

- Presentation will focus on 3 large sources not already covered
  - Pneumatic device vents
  - Shallow water offshore platforms
  - Compressor exhaust

# Methodology overview



## Step 1. Calculate Potential Methane

- 1a – Activity Data
- 1b – Emission Factor

## Step 2. Compile Reductions Data

- 2a – Voluntary Reductions Reported to GasStar
- 2b – Regulatory Reductions

## Step 3. Calculate Net Emissions

# Pneumatic Device Vents



*Automated devices that control onsite conditions*

- *Gas-driven pneumatics release gas with valve movements and/or continuously from valve control pilot*

## Step 1. Calculate Potential Methane

- Activity data is # of pneumatic devices in each region
  - (# of non associated gas wells in each region) × (# of pneumatic devices per gas well in each region, EPA/GRI (1996))
- Emission factor is 125,925 scf per year-device, EPA/GRI (1996)

## Step 2. Compile Reductions Data

- Reductions are those reported to GasStar
  - Replace high bleed pneumatics with low bleed pneumatics
- Future Inventories-NSPS impacts

Example for 2010 Emissions (2012 Inventory), MMTCO<sub>2e</sub>

Activity data (devices)	Emissions Factor (scf per device)	Potential Methane (MMTCO <sub>2e</sub> )	Reductions (MMTCO <sub>2e</sub> )	Emissions (MMTCO <sub>2e</sub> )
468,281	× 125,925	= 24.8	- 12.8	= 12.1

# Compressor Exhaust (Gas Engines)



*Emissions from the incomplete combustion of gas that fuels the compressors*

## Step 1. Calculate Potential Methane

- Activity data is total horsepower-hours for each region
  - Horsepower-hours per non-associated well (EPA/GRI 1996) × (# of non-associated wells in region)
- Emission factor is 0.24 scf per horsepower-hour EPA/GRI (1996)

## Step 2. Compile Reductions Data

- N/A

## Step 3. Calculate Net Emissions

Example for 2010 Emissions (2012 Inventory), MMTCO<sub>2</sub>e

Activity data (horsepower-hour)	Emissions Factor (scf/horsepower-hour)	Emissions (MMTCO <sub>2</sub> e)
55,368,000,000	× 0.24	= 5.6

# Shallow Water Offshore Platforms



*Offshore natural gas production wells in the Gulf of Mexico and the Pacific Ocean in water depths that do not exceed 500 feet*

## Step 1. Calculate Potential Methane

- Activity data: # of shallow offshore platforms in gas fields
  - (# of offshore platforms – # of deep water offshore platforms, BOEMRE) × (fraction of offshore platforms in gas fields, BOEMRE)
- Emission factor: 6,999,970 scf/year per shallow offshore gas platform (GOADS 2000)

## Step 2. Compile Reductions Data

- N/A

## Step 3. Calculate Net Emissions

Example for 2010 Emissions (2012 Inventory), MMTCO<sub>2e</sub>

Activity data (platforms)	Emissions Factor (scf/platform)	Emissions (MMTCO <sub>2e</sub> )
1973	× 6,999,970	= 5.6

# Questions for Stakeholders



- Are more recent data sources available?
  - Activity data
  - Emission factors
- Suggestions for updates to presentation of information on these activities in the GHG Inventory?