

Greenhouse Gas Reporting Program: Three-Year Update

Prepared For:

U.S. Coal Mine Methane Conference

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Presentation Outline

- Greenhouse Gas Reporting Program
- Subpart FF– Underground Coal Mines
- Reporting Requirements
- Reporting Facilities, and Reported Emissions and Emissions Avoided
- Comparing the GHGRP and the US CMM Inventory
- Lessons Learned



Greenhouse Gas Reporting Program (GHGRP)

- Authorization - FY2008 Consolidated Appropriations Act.
 - Authorized EPA to “develop and publish rules to require mandatory reporting of Greenhouse Gas (GHG) emissions above appropriate thresholds in all sectors of the economy of the United States.”
- July 12, 2010 - the U.S. EPA published the final rulemaking for the mandatory reporting of greenhouse gases (GHG)
 - 40 Code of Federal Regulations Part 98
 - Sources that in general emit 25,000 metric tons or more of carbon dioxide equivalent per year in the United States.
- Purpose
 - Better understand relative emissions of specific industries, and of individual facilities within those industries
 - Better understand factors that influence GHG emission rates and actions facilities could take to reduce emissions
- The GHGRP is a reporting rule only – it does not require control of GHGs
- A single facility may have multiple emission source categories, and thus, will be required to report under multiple rule subparts



Subpart FF- Underground Coal Mines

- Reporting rules for Underground Coal Mines – 40 CFR Part 98, Subpart FF
- 2011 – 1st year of reporting for Subpart FF
- Only applicable to active underground coal mines
- Who is required to report?
 - UG mines liberating at least 36.5 mil. actual cubic feet or more of CH₄ per year
 - Combined CH₄ liberated and CO₂ emissions from on-site combustion > 25,000 metric tonnes
- Facilities that share boundaries and ownership can report as one facility
- If previously subject to the rule, a facility must submit annual reports until CH₄ liberation and on-site CO₂ emissions are:
 - <25K tCO₂pa for 5 consecutive years or
 - <15K tCO₂pa for 3 consecutive years
- GHGRP Global Warming Potential (GWP)
 - GWP of 21 in 2011, 2012
 - GWP of 25 from 2013



Reporting Requirements for FF

- CH₄ liberated from mine ventilation and degasification systems
- CH₄ destruction from systems where gas is sold, used onsite, or otherwise destroyed (including by flaring and Ventilation Air Methane (VAM) oxidation)
- Net CH₄ emissions from ventilation and degasification systems (CH₄ liberated less CH₄ destroyed)
- CO₂ emissions from coal mine CH₄ destruction occurring at the facility, where the gas is not a fuel input for energy generation or use. (This applies primarily to CH₄ that is flared or VAM oxidation.)
- All reporting under the GHG Reporting Program is electronic using EPA's Electronic Greenhouse Gas Reporting Tool (e-GGRT).

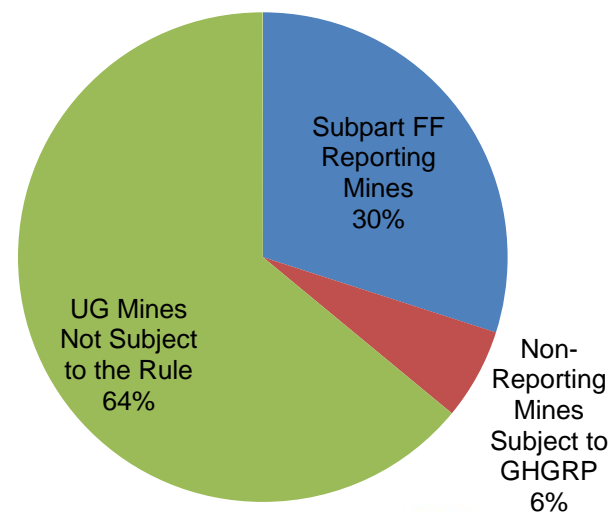


GHGRP Subpart FF Reporting Facilities

Underground Coal Mines Sector	Number of Reporters		
	2011	2012	2013
Underground Coal Mine Sector reporters	110	111	120
Additional non-reporting Underground Coal Mines that may be above the reporting threshold	28	20	23
Total Underground Coal Mines expected to report	138	131	143

Subpart FF Coverage

- 395 active underground coal mines in the US in 2013¹
- 36% of UG mines meet reporting threshold



¹US Energy Information Administration



GHGRP Reported Emissions

Greenhouse Gas Emissions 2011-2013

(all emissions values presented in million metric tons CO₂e)

	2011	2012	2013
Total Emissions (CO₂e)	40.6	38.6	39.8
Methane	40.0	37.8	39.4
Carbon Dioxide	0.6	0.8	0.4



Underground Coal Mines — Greenhouse Gas Emissions

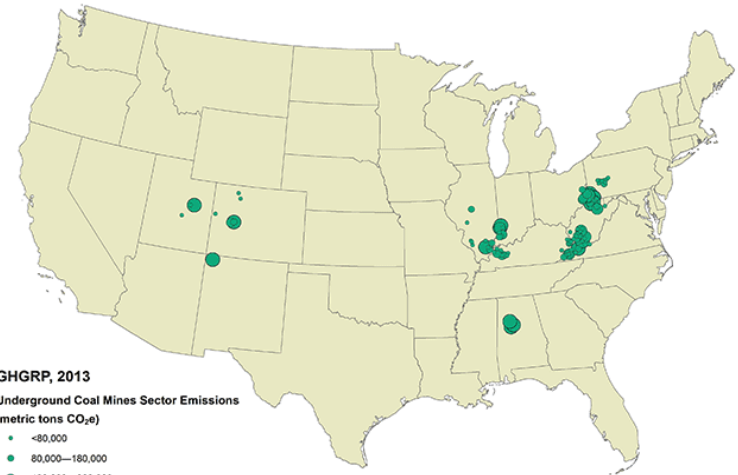
(all emissions values presented in million metric tons CO₂e)

Underground Coal Mines Sector	Emissions (MMTCO ₂ e)
	2013
Total Underground Coal Mines Sector	39.8
Subpart FF reported emissions	
CH ₄ liberated from ventilation systems	35.6
CH ₄ liberated from degasification systems	12.7
CH ₄ destroyed on site or transported off site	-8.9
CO ₂ emissions from CH ₄ destroyed on site, where gas is not a fuel input for energy generation or use	0.2



Where are the reporting facilities?

- Northern and Central Appalachia account for largest share of gas liberation
- Most gas drainage recovered and used in Central Appalachia and Black Warrior basins
- Still significant venting of drained gas in Northern Appalachia and the Western Basins

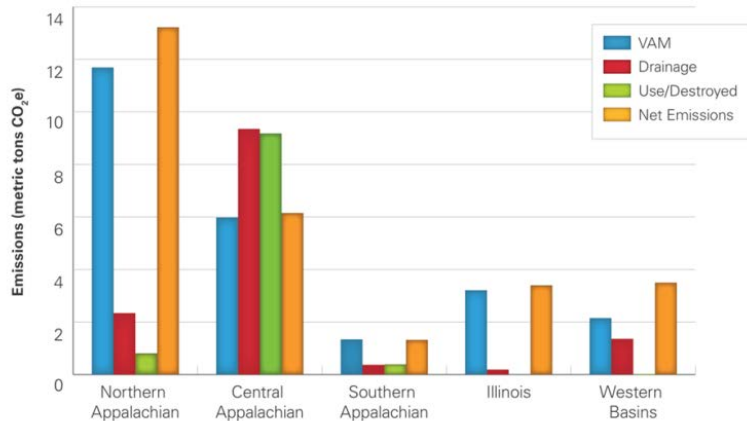


GHGRP, 2013
Underground Coal Mines Sector Emissions
 (metric tons CO₂e)

- <80,000
- 80,000—180,000
- 180,000—380,000
- 380,000—580,000
- >580,000

Data Source: 2013 Greenhouse Gas Reporting Program
 As of: 08/18/2014

UNDERGROUND COAL MINES SECTOR: EMISSIONS BY COAL BASIN (2012)



Number of Coal Mine Within Certain Emission Ranges 2013

	Emissions Range (Thousand MTCO ₂ e)					
	0-25	25-50	50-100	100-250	250-1,000	> 1,000
Total Underground Coal Mines Sector (2013)	34	15	27	11	22	11



Emissions Avoided from Use or Destruction of CMM

	Methane emissions avoided (MMTCO ₂ e)		
	2011	2012	2013
Total	14.9	12.8	8.9
Methane destroyed on site	0.1	0.1	0.3
Methane transported off site	14.8	12.7	8.6

- Methane transported off site is sold to natural gas pipelines.
- Coal mine methane was used or destroyed on site in the following applications:
 - Ventilation Air Methane (VAM) oxidation
 - Thermal coal drying
 - Power generation
 - Flaring
 - As fuel to run gob well pumps and compressors at multiple mines.



Monitoring Methods Used

Type of Emissions	Methodology	Portion of Emissions Monitored by Method (by Type)		
		2011	2012	2013
Ventilation systems	Quarterly manual samples	43%	50%	42%
	CEMS	0%	2%	0%
	Quarterly MSHA test results	57%	48%	58%
Degasification systems	CEMS	14%	14%	49%
	Weekly manual samples	86%	86%	51%



GHGRP and the U.S. CMM Inventory

There are differences in the total emissions reported under the GHGRP and U.S. CMM Inventory

	GHGRP	CMM Inventory
Type of Mining	Active UG mines	Active UG mines, Surface mines, Post-mining emissions, Abandoned underground mines
Threshold for UG mines	Only mines with emissions >36.5 mmcf/yr	Includes UG mines <36.5 mmcf/yr
Gas drainage (pre-mine drainage)	No cumulative production for pre-drainage wells. Only report gas production in year well mined through.	Cumulative production from pre-drainage wells in year well mined through.
Mine ventilation	Accounts for downtime in ventilation operations	Assumes ventilation is running 24/7
Temperature and pressure	Used to calculate emissions – can vary measurement by 5%	Not used in inventory. Based on volumetric flow and CH4% only
Sampling method	Allows for use of grab samples and CEMs which may differ from MSHA measurements for variety of reasons	Quarterly measurements from MSHA.



What have we learned over 3 years of reporting?

- There has been learning curve for everyone – EPA, facilities, reporters.
- Most facilities want to report correctly.
- Some facilities below the reporting threshold still report. Not necessary if the facility has never been subject to the GHGRP.
- Common reporting errors:
 - Certain required data elements are sometimes omitted from the initial report submission – e.g., temperature, pressure
 - Data is reported using incorrect units - e.g., Pressure in inches Hg instead of atm, Temp in C or F instead of Rankine, volumetric flow in cfd instead of cfm
 - Inconsistent interpretation of MSHA quarterly reports for ventilation emissions
- Most reporters are very responsive and problems are resolved quickly allowing EPA to verify reports.



GHGRP Guidance for Interpretation of MSHA Data

- In advance of Year 2014 Reporting, EPA will release guidance to help Subpart FF reporters correctly interpret the MSHA quarterly reports.
- Focus of the guidance document - correctly calculating and reporting quarterly ventilation volumetric flow and CH₄ concentration measurements in the GHGRP reports that are based on raw data contained in the MSHA quarterly reports.
 - GHGRP facilities are required to report at the shaft level
 - MSHA reports may list multiple approaches to a shaft
 - Reporters have use varied methodologies to calculate volumetric flow and methane concentrations
- The guidance should help reporters develop a consistent and accurate approach for reporting their CH₄ emissions from ventilation systems.



GHGRP Resources

- Greenhouse Gas Reporting Program:
<http://www.epa.gov/ghgreporting/index.html>
- Subpart FF (includes training materials):
<http://www.epa.gov/ghgreporting/reporters/subpart/ff.html>
- Facility Level Information on Greenhouse Gases Tool (Flight):
<http://ghgdata.epa.gov/ghgp/main.do>
- 40 CFR Part 98:
<http://www.ecfr.gov/cgi-bin/text-idx?SID=904316a9b7cc6cd074b8a6e0b986c7c7&node=pt40.21.98&rgn=div5>



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Thank You

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