

Submitting Your First GHG Report

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This overview of EPA's greenhouse gas reporting rule explains the regulation's requirements and suggests strategies for compliance. It also provides insights regarding enforcement and confidential business information.

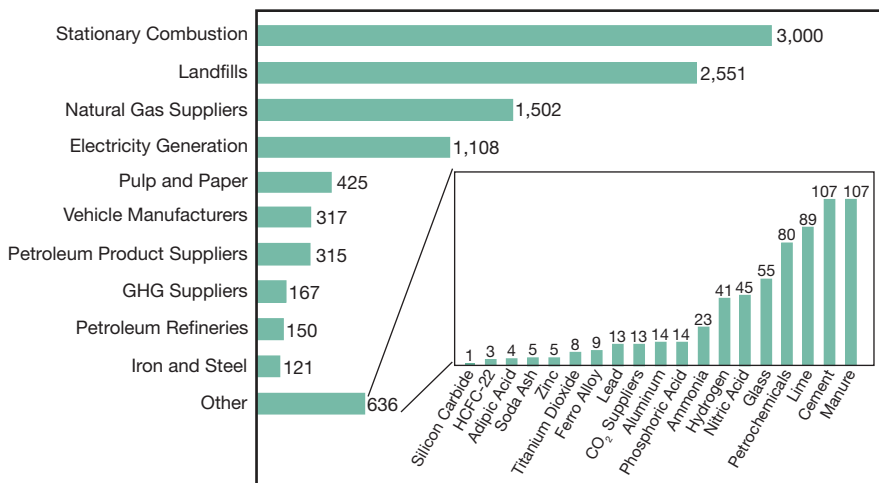
Did January 1, 2010 sneak up on you? After toasting the New Year, it was time to start monitoring greenhouse gas emissions — or at least the numerous parameters to be used in the calculations of greenhouse gas emissions — if your facility is subject to the U.S. Environmental Protection Agency's (EPA) Mandatory Greenhouse Gas Reporting Rule (1, 2).

The regulation, which became effective Dec. 29, 2009, requires approximately 10,000 facilities to report greenhouse gas (GHG) emissions annually. The first report, for calendar year 2010, is due Mar. 31, 2011, and will cover emissions of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride, and other fluorinated gases (*e.g.*, nitrogen trifluoride and hydrofluorinated ethers). Figure 1 (3) shows the distribution of facilities that EPA expects to be subject to the rule, which it believes account for nearly 85% of the nation's GHG emissions.

Facilities will report emissions of each individual greenhouse gas (in metric tons), as well as aggregate emissions in metric tons of carbon dioxide equivalent (MTCO₂e). CO₂e takes into account the different global warming potentials (GWPs) of the various greenhouse gases, which are listed in Table 1. For example, since methane traps 21 times more radiation than carbon dioxide, 1 m.t. of methane would be reported as 21 MTCO₂e.

EPA classifies emitters covered

Table 1. Greenhouse gases have different global warming potentials (GWPs).	
Greenhouse Gas	GWP*
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Oxide (N ₂ O)	310
Hydrofluorocarbons (HFCs)	12–11,700
Perfluorocarbons (PFCs)	6,500–9,200
Sulfur Hexafluoride (SF ₆)	23,900
Trifluoromethyl Sulfur Pentafluoride (SF ₅ CF ₃)	17,700
Nitrogen Trifluoride (NF ₃)	17,200
* Over a 100-yr time horizon	



▲ **Figure 1.** EPA estimates the Mandatory Reporting of Greenhouse Gases Rule will cover roughly 10,000 facilities that are responsible for about 85% of the nation's GHG emissions. Source: (3).

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Table 2a. Some emitters, known as “all-in” facilities, are subject to the GHG reporting rule regardless of the quantity of their emissions.

Source Category	Subpart
Electricity Generation*	D
Adipic Acid Production	E
Aluminum Production	F
Ammonia Manufacturing	G
Cement Production	H
HCFC-22 Production	O
HFC-23 Destruction Processes*	O
Lime Manufacturing	S
Nitric Acid Production	V
Petrochemical Production	X
Petroleum Refineries	Y
Phosphoric Acid Production	Z
Silicon Carbide Production	BB
Soda Ash Production	CC
Titanium Dioxide Production	EE
Municipal Solid Waste Landfills*	HH
Manure Management Systems*	JJ
*A facility is covered only if it meets additional applicability conditions specified in the subpart.	

by the regulation into three groups: All-In, Threshold, or Supplier facilities. Table 2 lists the source categories that fall into each classification, as well as the subpart of the rule that applies to each.

All-In facilities (Table 2a), unless otherwise specified, are subject to the rule regardless of the quantity of their GHG emissions, and they must report all emissions for which the rule specifies a calculation method.

For example, a petroleum refinery is required to report not only the GHG emissions as calculated in the petroleum refinery subpart, but also all other GHG emissions addressed in other subparts of the rule, regardless of their quantity.

While all-in facilities report GHG emissions regardless of their quantity, threshold facilities (Table 2b) report only if their total GHG emissions exceed 25,000 MTCO₂e per year. In calculating total GHG emissions, a threshold facility must take into account all operations for which any threshold subpart (C, K, N, P, Q, R, U, AA) provides a calculation method.

For example, a glass factory with emissions of 15,000 MTCO₂e would not ordinarily have to report under Subpart N. But if that factory also has stationary combustion units that emit 15,000 MTCO₂e, which on their own would not be covered by Subpart C, the facility's total emissions are 30,000 MTCO₂e — making it subject to the rule. This facil-

Table 2b. Facilities whose GHG emissions exceed 25,000 MTCO₂e/yr are subject to the “threshold” subparts.

Source Category	Subpart
Stationary Combustion Units	C
Ferroalloy Production	K
Glass Production	N
Hydrogen Production	P
Iron and Steel Production	Q
Lead Production	R
Miscellaneous Uses of Carbonate*	U
Pulp and Paper Manufacturing	AA
* A facility is covered only if it meets additional applicability conditions specified in the subpart.	

Table 2c. Facilities that supply certain materials are subject to the “supplier” subparts of the GHG reporting rule.

Source Category	Subpart
Coal-to-Liquids	LL
Petroleum Products	MM
Natural Gas and Natural Gas Liquids	NN
Industrial Greenhouse Gases	OO
Carbon Dioxide	PP

ity, therefore, would have to report all of its GHG emissions using calculation methods provided in Subparts C and N.

Supplier facilities (Table 2c) must report all emissions according to the appropriate supplier subpart, regardless of the quantity of their GHG emissions.

There is also a fourth category — “not yet subject.” As originally proposed, the rule included subparts for 12 additional facility/emission types that were not included in the final rule because additional evaluation was deemed necessary. The subparts that have not yet been finalized are:

- electronics manufacturing
- ethanol production
- fluorinated GHG production
- food processing
- magnesium production
- oil and natural gas systems
- sulfur hexafluoride (SF₆) from electrical equipment
- underground coal mines
- industrial landfills
- wastewater treatment
- suppliers of coal
- geologic sequestration.

It is anticipated that requirements for oil and natural gas systems and for geologic sequestration (which includes enhanced oil recovery) will be proposed early in 2010. It is unlikely that any of these not-yet-finalized subparts will be

promulgated in time for reporting in March 2011.

Ideally, each company has already determined whether it is subject to the reporting regulation. If your facility is subject, you should:

1. Have a monitoring plan in place.
2. Be tracking data according to the monitoring plan.
3. If using the best available monitoring method (BAMM), understand clearly when this is no longer acceptable.
4. Begin preparing for reporting.

Monitoring plan

The monitoring plan is a living document that, at a minimum, describes:

- the calculation methods that will be used for reporting GHG emissions
- the data required for those calculations
- the data-gathering equipment's calibration, maintenance, and repair procedures
- the party who will be responsible for gathering each data component.

The applicable subpart specifies some of this (*e.g.*, calculation methods and data requirements); where multiple calculation methods are allowed, the monitoring plan lays out which alternative(s) the reporter intends to use.

For example, under Subpart HH, municipal solid waste landfills that have gas collection systems in place must monitor the methane concentration in the gas being collected. They may either do so continuously (which is required if continuous monitoring is already in place) or weekly; several monitoring methods are allowed. The monitoring plan must define the frequency and the method that will be used to determine methane concentration.

Some subparts specify additional requirements. For example, under Subpart C, if "best available" information or company records are used to determine any of the required data, these methods must be documented in the monitoring plan.

The monitoring plan may refer to other existing documents where specific details are already described. In many cases, facilities will already be monitoring most or all of the required data. The responsible party may be designated either by name or by job title, and different individuals may be responsible for different parameters.

The EPA has indicated that this plan should be in place prior to Apr. 1, 2010, but it is not necessary to submit the plan to EPA. In the event of an audit, however, it will probably need to be produced, along with any data or documentation described or included in the plan.

Facilities that are not currently subject to reporting but have emissions approaching the applicable threshold should consider developing a monitoring plan. If a facility

Facilities that are not currently subject to reporting but have emissions approaching the applicable threshold should consider developing a monitoring plan.

determines that it is not subject under its current operating scenario but later begins operating such that a threshold will be exceeded by the end of the reporting year, then the facility will be responsible for reporting starting at the point in time when the operational change occurred.

BAMM and abbreviated reports

Several special provisions (4) apply to monitoring and reporting in 2010. From Jan. 1, 2010, through Mar. 31, 2010, best available monitoring methods (BAMMs) may be used in lieu of the methods prescribed in the applicable subpart. This applies to facilities that require additional equipment to monitor all of the required parameters, facilities that require different monitoring equipment to achieve the required precision/accuracy, and facilities that have not performed the required calibrations. Unless an extension request was submitted by Jan. 28, 2010, and approved, the specified methods must be utilized by Apr. 1, 2010. (If an extension request was approved, the extension will have a deadline no later than Dec. 31, 2010).

In some cases, BAMM extensions may not be required. For example, EPA has clarified that in the event initial calibrations are not complete for a continuously operating unit or meter with infrequent outages, the initial calibration may be postponed until the next scheduled maintenance event; this does not require a BAMM extension. Reference 6 provides more information on best available monitoring methods.

Facilities that are subject only to reporting due to stationary combustion emissions may submit an abbreviated emission report for calendar year 2010 emissions. Such facilities may use any of the four tier methodologies presented in Subpart C. In general, the requirements of these tiers are:

- Tier 1 uses company records to monitor annual fuel consumption, and the default higher heating value (HHV) specified in the rule
- Tier 2 uses company records to monitor annual fuel consumption, and an HHV determined by direct fuel sampling and analysis
- Tier 3 uses flowmeters to monitor annual fuel consumption, and determines carbon content and molecular weight by fuel sampling and analysis
- Tier 4 uses stack-gas volumetric flowrate, and monitoring of CO₂ concentration.

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DATA TRACKING

The following tips and suggestions will make your data-tracking efforts more effective.

1. Perform mock calculations or calculations based on previous years' data to ensure that you really are collecting the required data. The best way to ensure that directions are complete is to try to follow them.
2. Update your monitoring plan to reflect any changes as needed.
3. If your facility is required to report emissions due to stationary combustion, ensure that all combustion sources are accounted for (including space heaters) unless they are specifically exempt. There is no *de minimis* threshold.
4. If your stationary combustion units burn multiple types of fuel, keep in mind that the calculation tier is specific to the type of fuel and that different calculation methods may be required for the various fuels. Alternatively, you may elect to monitor and report using the highest applicable tier for all fuels. For example, a facility that combusts both gaseous biomass fuel (Tier 1, as long as the HHV is not routinely monitored) and natural gas (typically Tier 2) might choose to report both fuels using Tier 2 methods.
5. Consider options that will allow you to simplify monitoring. Is your plan as streamlined as possible? Are there opportunities to utilize the common-pipe or common-stack alternative methodologies for stationary combustion? Are there opportunities to utilize existing plant data rather than tracking additional parameters?
6. Take into account any changes that are on the horizon for your facility that might impact its status — e.g., whether it is subject or not subject to the rule, the specific subpart(s) that apply, etc.
7. Be prepared for additional subparts that may impact your facility. EPA has indicated that the oil and natural gas and the geological sequestration subparts may be proposed in early 2010.
8. Continue to monitor the EPA website for updates and clarifications. As EPA receives multiple questions on a similar topic, answers to these are posted to the FAQ section (6). Similar facilities may have similar questions and concerns as monitoring plans are developed.
9. As discussed previously, much of the data required are probably being tracked elsewhere already. Take advantage of existing data-tracking methods. Some additional calculations may be required, but the data tracking may not require extensive changes.
10. Ensure that all calibration records, as well as monitoring equipment maintenance and repair records, are retained for the minimum time specified (generally three years).
11. If data are missing for any periods of time, follow the appropriate missing-data procedures (specified in the rule) and document all required details (typically the method and resulting value).

This applies only for calendar year 2010 emissions. Beginning Jan. 1, 2011, the facility must monitor and report based on the appropriate tier as specified in Subpart C.

Stationary combustion sources may also take advantage of common-stack and common-pipe reporting options. The common-stack method allows for aggregating multiple combustion units if they share a common duct or stack that has a CEMS installed on it. The common-pipe option allows for aggregating multiple combustion units if they share a fuel supply pipe that is monitored by a fuel flowmeter.

Report requirements and software

In most cases, the reporting will be done at the facility level. In some cases, including many types of supplier facilities, reporting will be done at both the facility and corporate levels.

Some subparts have additional requirements that are not used to complete the GHG emission calculations, but they may require information collection throughout the year. For example, Subpart NN (which covers suppliers of natural gas and natural gas liquids) requires local distribution companies (LDCs) to report data about their customers, including the quantity of gas delivered to different types of end-users, such as residential, commercial, industrial, and electricity-generating customers.

Each annual GHG emissions report will be submitted electronically through EPA's electronic reporting system. The system is currently under development, although EPA does not expect to have it operational until January 2011. Training on the emissions reporting system is set to begin in the fall of 2010. A separate module for registering users and facilities should be available in the summer of 2010. The certificate of registration (which names and officially certifies the designated representative) must be completed and submitted no later than Jan. 31, 2011 (60 days prior to the initial emission report deadline of Mar. 31, 2011).

Designated representative

The reports must be submitted by a designated representative. This person is responsible for certifying, signing and submitting the GHG emissions reports and any other related documentation.

Do not confuse the GHG reporting rule's designated representative with individuals who certify reports submitted under other regulatory programs. Unlike the responsible corporate official who signs Title V Certifications of Compliance, who is generally an employee of the corporation, the designated representative for the GHG rule may be a consultant rather than a corporate employee. For reporters subject to the continuous emissions monitoring (CEM) requirements of 40 CFR Part 75, the same indi-

vidual who signs the Part 75 reports will likely serve as the designated representative for the GHG reporting rule, since the GHG reporting will be based in large part on the Part 75 data.

Each facility and supplier must file a certificate of representation with EPA. Before doing this, the owner and/or operator of the facility or supplier must enter into a binding agreement with the designated representative. The purpose of this agreement is to create a contractual mechanism to ensure the reliability of the reported information and to support enforcement. The agreement subjects the owner/operator to legal liability for the representations, actions/inactions, and submissions of the designated representative. Moreover, an enforcement action or judicial order against the designated representative is also binding upon the owners and operators.

The designated representative can be changed at any time by submitting a new certificate of representation. An alternate representative can act on behalf of the original designated representative if a certificate of representation identifying the alternate is submitted to EPA, in which case the alternate binds the owners and operators just like the designated representative. An updated certificate of representation must be filed within 90 days of any change in the owners or operators, although failure to submit updated information does not relieve the new owners and operators of responsibility for the designate representative's actions.

EPA does not stipulate the terms of the binding agreements between the owners/operators and their designated representative, nor does it require the agreements to be submitted. However, EPA has set specific requirements for the certificate of representation. It must: identify the facility or supplier; identify the owner(s), including (at a minimum) the controlling interest held by each; identify the operator(s); provide contact information for the designated representative and any alternate designated representative; and include a certification statement (the specific language of which is detailed in the rule), signed and dated by the designated/alternate representative.

There is some flexibility as to who may complete the reports and file them with the EPA. Other individuals may submit the reports to EPA, together with a notice of delegation, on behalf of the designated or alternate representative.

Verification of emissions data

Third-party verification of emission data is not required. Instead, the reporter self-certifies the data's accuracy, and the EPA will verify the information through data analysis and onsite auditing. If this identifies errors, EPA will notify the reporter, who has 45 days to submit a corrected report. The corrected report must correct all errors identified by both EPA and the reporter.

WHAT THIS RULE IS NOT

The intent of the regulation is to gather data from large emitters and/or generators of GHGs. These data will then guide future GHG-related policy-making.

This rule does not limit GHG emissions. Some types of facilities are subject to a reporting threshold of 25,000 m.t./yr CO₂e. However, this threshold applies only to the determination of whether the facility is subject to monitoring and reporting. The threshold is not a limit or cap.

This rule is also not related in any way to any existing state or regional GHG programs. The reporting will be completely independent from reporting for any existing state or regional reporting programs.

Finally, this rule is not a permit of any kind. The EPA has proposed a separate "tailoring rule" (see p. 70) that involves permitting related to GHGs, but it is not tied to the reporting rule.

Enforcement

EPA will enforce violations of this rule as violations of the Clean Air Act (CAA). Violations may include: failure to report GHG emissions despite applicability of the rule; failure to collect all data required to calculate GHG emissions pursuant to the applicable subparts; failure to continuously monitor and test as required by the applicable subpart; failure to retain all records required to properly verify the amount of GHG emissions; and failure to calculate GHG emissions as required by the applicable subparts. Each day of violation constitutes a separate violation.

Exiting the program

When it was proposed, the rule contained a "once-in, always-in" provision. The final rule, however, allows facilities and suppliers to stop reporting after they report less than 25,000 MTCO₂e/yr for five consecutive years, or less than 15,000 MTCO₂e/yr for three consecutive years. Entities can also stop reporting if all GHG emitting sources cease to operate. All of these scenarios require notification to EPA.

Public availability of emissions data

EPA will release and publish the GHG emissions data reported under this rule. EPA does not consider emissions data to be confidential business information (CBI). Because information other than emissions data may meet the definition of CBI, EPA intends to issue a proposal defining certain data elements that it considers to fall within the scope of emissions data that would not be protected as CBI.

These GHG emissions data will be publicly released to an uncertain landscape in the wake of the December 2009 climate-change summit in Copenhagen, the GHG cap-and-

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trade legislation that is expected to be considered again by the U.S. Senate in 2010, and EPA's endangerment finding, which concluded that GHG emissions endanger public health and the environment.

As a result of its endangerment finding, EPA is prepared to issue regulations that would control GHG emissions for the first time. Such rules would trigger application of the CAA's prevention of significant deterioration (PSD) and Title V operating permit programs to major stationary sources of GHG emissions.

The PSD rules require sources to demonstrate the application of best available control technology (BACT) if emissions exceed the threshold of 100 ton/yr; the threshold triggering Title V applicability is 250 ton/yr. These limits are quite low compared with typical emissions of GHGs. Thus, in September 2009, EPA proposed a "tailoring" rule that outlined the legal mechanism under which it would raise the major stationary source thresholds of 250 ton/yr and 100 ton/yr to 25,000 ton/yr, as well as the manner in which it would apply the CAA permitting programs to major stationary sources of GHG emissions.

EPA is expected to promulgate its final regulations to control GHG emissions from light-duty vehicles, as well as its final tailoring rule, in March 2010. These rules will become effective, and will remain so, unless they are successfully challenged in court or unless Congress

adopts legislation preempting EPA's regulatory authority to address GHGs under the Clean Air Act.

In addition to the regulation and legislation, litigation is also a possibility. In *Comer v. Murphy Oil* (5), the Fifth Circuit Court of Appeals held that a class-action suit against fossil-fuel producers could go to trial. The plaintiffs allege that the GHGs generated by the production and ultimate use of fossil fuels increased the strength of Hurricane Katrina and exacerbated damage to their property. They are seeking monetary damages as compensation.

Closing thoughts

For now, the only federal regulatory program related to greenhouse gases is the mandatory GHG reporting rule. Developing and implementing a monitoring plan is the first of several steps for facilities that are subject to its requirements.

CEP

FOR ADDITIONAL ASSISTANCE

At the Spring Meeting in San Antonio, TX, AIChE's Environmental Div. will sponsor three hands-on workshops on the Mandatory Greenhouse Gas Reporting Rule. The authors and their colleagues, Deanne Dutton Hughes, P.E., and David Winfrey, J.D., will explain the rule's requirements and provide detailed guidance on how to comply with the standard. They will cover GHG accounting, reporting, and verification methodologies. One session is focused specifically on the needs of petroleum refiners (Monday, Mar. 22, 2:30 p.m., Bonham C) and another on the concerns of olefin producers (Monday, Mar. 22, 2:40 p.m., Lone Star Salon D/E), while the third session is aimed at a general audience (Tuesday, Mar. 23, 2:00 p.m., Travis C/D).

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