

Greenhouse Gas Reporting Rule

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Agenda



- e-GGRT Registration
- Background
- Rule Applicability
- Reporting, Monitoring, and Recordkeeping
- Data Publication
- Subpart C, Stationary Fuel Combustion Sources
- For more information
- Q&A

Disclaimer



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Overview: U.S. EPA GHG Reporting Program (GHGRP)



Goal of GHGRP is to collect accurate and timely data on GHG information to inform future policy decisions.

- Monitoring began in 2010 for most emission sources with first reports due by March 31, 2011.
- An additional 12 source categories began collecting data in 2011 and report by March 31, 2012.
- Rule covers 41 source categories for reporting, accounting for 85-90% of U.S. GHG emissions.
- Reporting only, no control or use requirements.



Source Categories for 2010



- **Adipic Acid Production (Subpart E)**
- **Aluminum Production (Subpart F)**
- **Ammonia Manufacturing (Subpart G)**
- **Cement Production (Subpart H)**
- **Electricity Generation (Subpart D)**
- **Ferroalloy Production (Subpart K)**
- **General Stationary Fuel Combustion Sources (Subpart C)**
- **Glass Production (Subpart N)**
- **HCFC-22 Production HFC-23 Destruction (Subpart O)**
- **Hydrogen Production (Subpart P)**
- **Iron and Steel Production (Subpart Q)**
- **Lead Production (Subpart R)**
- **Lime Manufacturing (Subpart S)**
- **Manure Management Systems (Subpart JJ)** [*EPA will not be implementing subpart JJ due to a Congressional restriction prohibiting the expenditure of funds for this purpose.*]
- **Municipal Solid Waste Landfills (Subpart HH)**
- **Miscellaneous Uses of Carbonates (Subpart U)**
- **Nitric Acid Production (Subpart V)**
- **Petrochemical Production (Subpart X)**
- **Petroleum Refineries (Subpart Y)**
- **Phosphoric Acid Production (Subpart Z)**
- **Pulp and Paper Manufacturing (Subpart AA)**
- **Silicon Carbide Production (Subpart BB)**
- **Soda Ash Production (Subpart CC)**
- **Suppliers of Coal-based Liquid Fuels (Subpart LL)**
- **Suppliers of Petroleum Products (Subpart MM)**
- **Suppliers of Natural Gas and Natural Gas Liquids (Subpart NN)**
- **Suppliers of Industrial Greenhouse Gases (Subpart OO)**
- **Suppliers of Carbon Dioxide (Subpart PP)**
- **Titanium Dioxide Production (Subpart EE)**
- **Zinc Production (Subpart GG)**

New Source Categories for 2011



The twelve new source categories for reporting year 2011 and beyond include:

- Electronics Manufacturing (Subpart I)
- Fluorinated Gas Production (Subpart L)
- Magnesium Production (Subpart T)
- Petroleum and Natural Gas Systems (Subpart W)
- Use of Electric Transmission and Distribution Equipment (Subpart DD)
- Underground Coal Mines (Subpart FF)
- Industrial Wastewater Treatment (Subpart II)
- Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (Subpart QQ)
- Carbon dioxide injection and geologic sequestration (Subpart RR)
- Manufacture of electric transmission and distribution (Subpart SS)
- Industrial waste landfills (Subpart TT)
- Injection of carbon dioxide (Subpart UU)

Full Version of 40 CFR Part 98

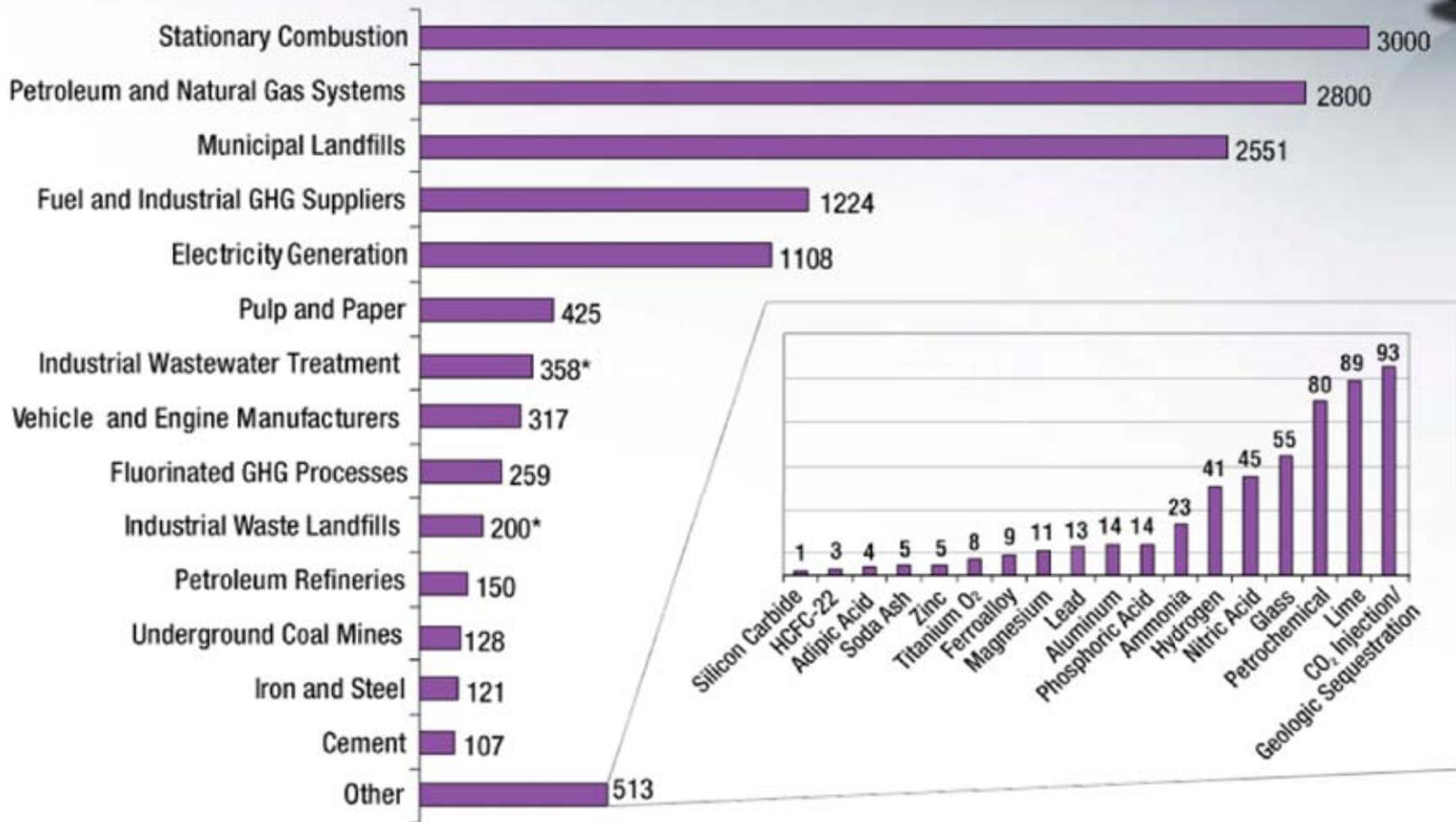


Available in the electronic Code of Federal Regulations(eCFR) at:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;rgn=div5;view=text;node=40%3A20.0.1.1.12;idno=40;sid=eee188f1d621707e0e74d868c03560d4;cc=ecfr>

This version of the regulation contains all published rule updates.

More Than 13,000 U.S. Facilities Covered



*The majority of these facilities already have to report under other subparts (e.g., pulp and paper, petroleum refining)

Key Elements of the Rule



- Annual reporting of GHG by:
 - 41 source categories, which includes:
 - 33 types of direct emitters
 - 6 types of suppliers of fuel and industrial GHG
 - Facilities that inject CO₂ underground for geologic sequestration, enhanced oil recovery, or any other purpose.
- 25,000 metric tons CO₂e or more per year reporting threshold for most sources; capacity-based thresholds where feasible
- Direct reporting to EPA electronically
- EPA verification of emissions data

What GHGs Are Reported?



- CO₂
- CH₄ (methane)
- N₂O (nitrous oxide)
- Fluorinated GHGs
 - HFCs (hydrofluorocarbons)
 - PFCs (perfluorocarbons)
 - SF₆ (sulfur hexafluoride)
 - Other fluorinated gases (except CFC and HCFC and gases <1 mm Hg @25° C)

What Is CO₂e?



- GHGs have varying heat-trapping ability and atmospheric lifetimes.
- Global warming potential (GWP) is a metric used to compare emissions among GHGs.
- The GWP of CO₂ is 1.0, and the GWP of other GHGs are expressed relative to CO₂
 - For example, CH₄ has a GWP of 21. Each metric ton of CH₄ emissions would have 21 times as much impact on global warming (over a 100-year time horizon) as a metric ton of CO₂ emissions.
- Mass emissions x GWP = CO₂e (metric tons)

*Table A-1 of Subpart A lists GWPs**

**Fluorinated Greenhouse Gases source categories can use a default GWP of 2,000 for GWPs not listed in Table A-1.*



Part 2. Applicability

Applicability for Direct Emitters Is Facility-Based



In most cases, a facility* is defined as...

- Physical property, plant, building, structure, source, or stationary equipment;
- on contiguous or adjacent properties;
- in actual physical contact or separated solely by public roadway or other public right of way; and
- under common ownership or common control

*Military installations may be classified as more than one facility.

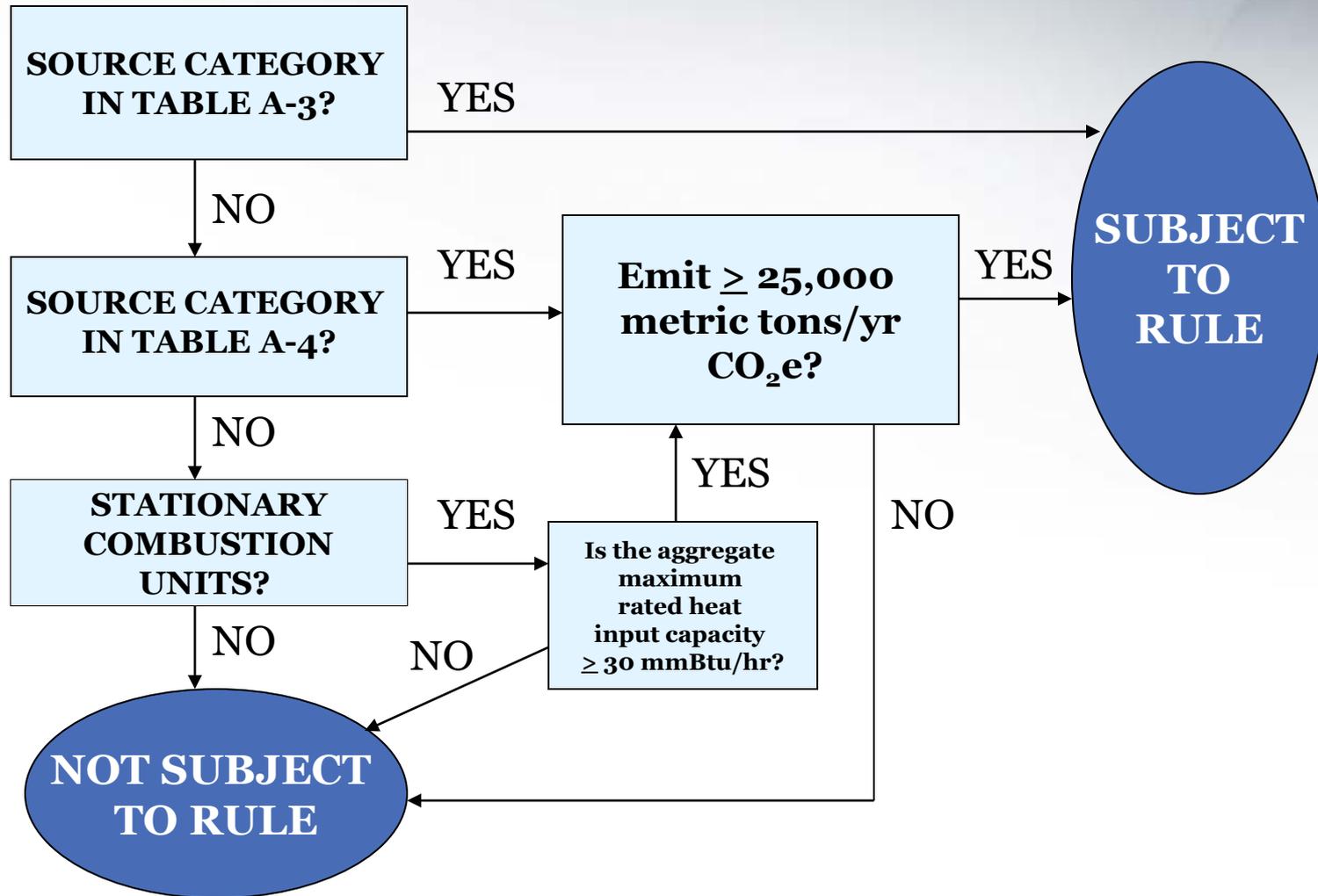
A different definition of “facility” applies to the Electric Transmission and Distribution Equipment source category (subpart DD) and some Petroleum and Natural Gas Systems (subpart W).

Assessing Applicability to the Rule



- A facility can have multiple source categories.
- You must evaluate each source category separately to assess applicability to the rule.
- If rule applies, report emissions for all source categories at your facility for which methods are provided in the rule.

Does the Rule Apply to My Facility?



Does the Rule Apply to My Facility?

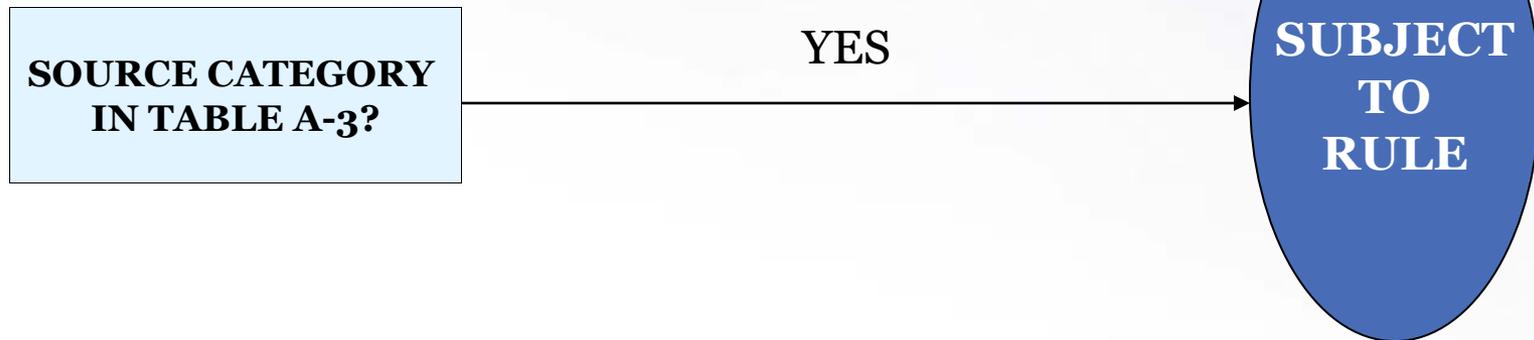




Table A-3: All-in Source Categories

Applies in 2010

Electricity Generation if report CO₂ year-round through Part 75

Adipic Acid Production

Aluminum Production

Ammonia Manufacturing

Cement Production

HCFC-22 Production/
HFC-23 Destruction Processes

Lime Manufacturing

Nitric Acid Production

Petrochemical Production

Petroleum Refineries

Phosphoric Acid Production

Manure Management Systems*

Silicon Carbide Production

Soda Ash Production

Titanium Dioxide Production

Municipal Solid Waste Landfills that generate CH₄ ≥ 25,000 metric tons CO₂e per year

Applies in 2011

Carbon Dioxide Injection

Electrical Equipment Use

Electrical Equipment Manufacturing

Fluorinated GHG processes

Geologic Sequestration

Underground Coal Mines that are subject to quarterly sampling by MSHA

**The rule for manure management systems will not be implemented due to a Congressional restriction prohibiting the expenditure of funds for this purpose.*

Does the Rule Apply to My Facility?

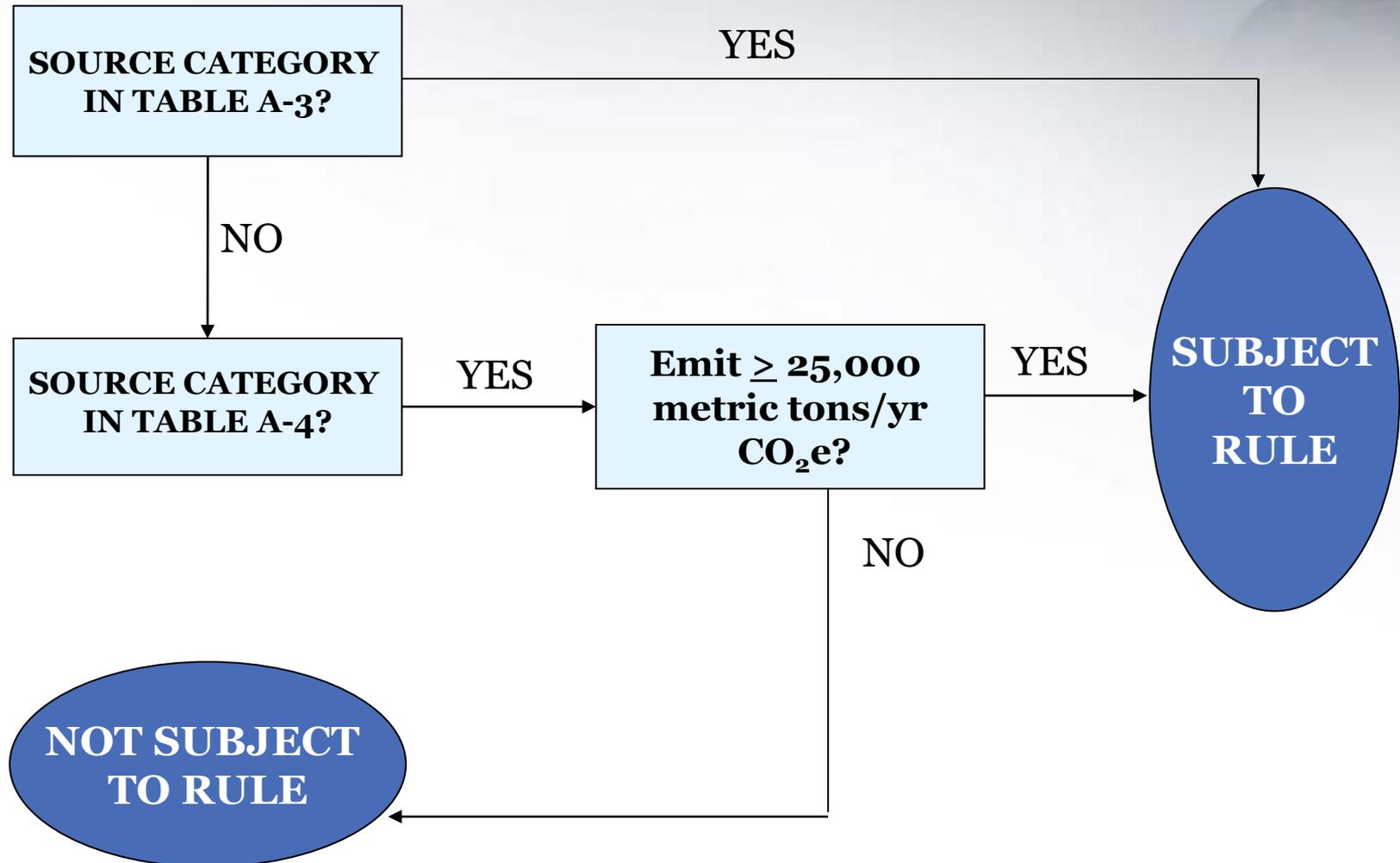




Table A-4: Threshold Source Categories*

Applies in 2010

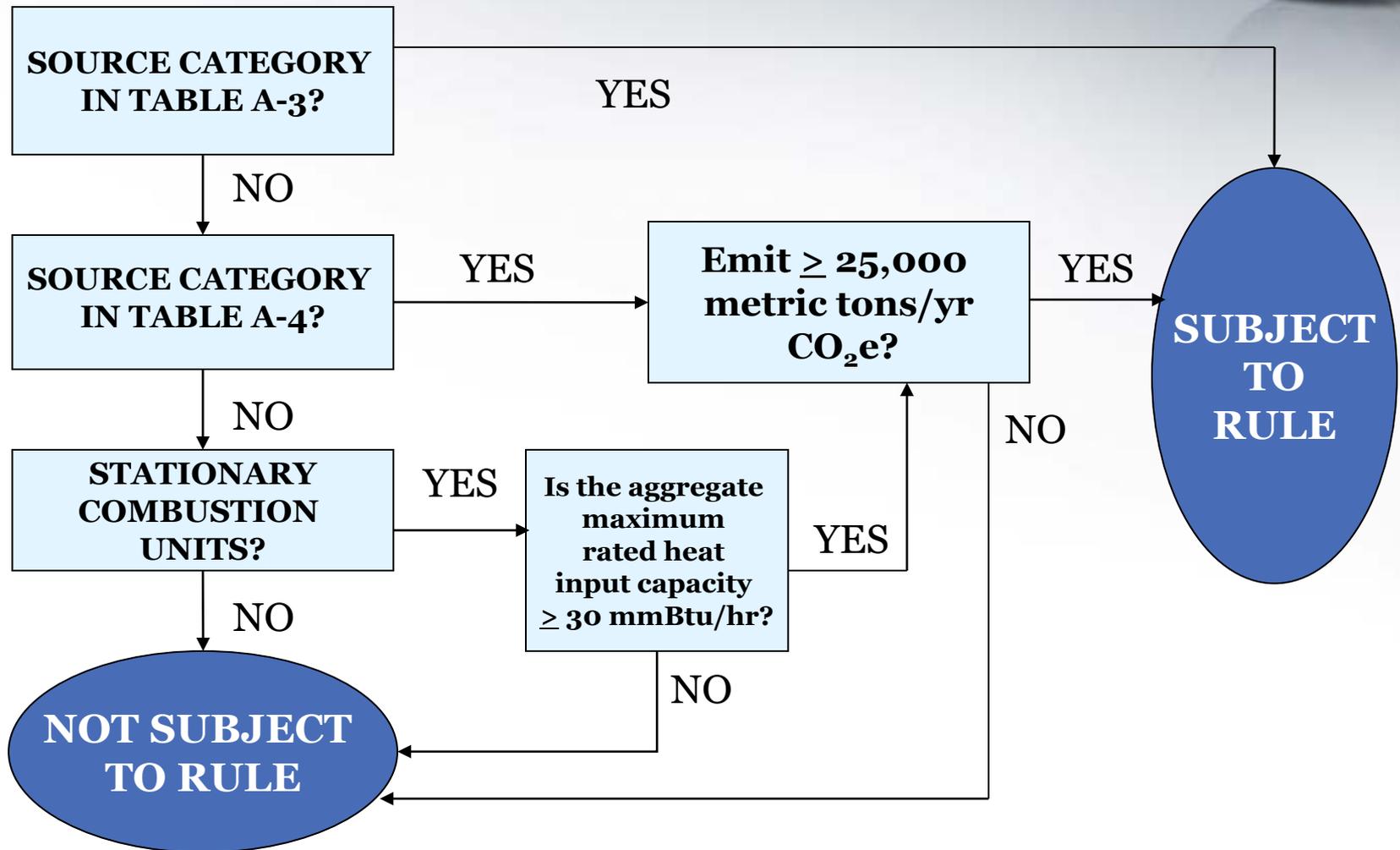
Ferroalloy Production
Glass Production
Hydrogen Production
Iron and Steel Production
Lead Production
Pulp and Paper
Manufacturing
Zinc Production

Applies in 2011

Electronics Production
Fluorinated GHG Production
Industrial Wastewater
Treatment
Industrial Waste Landfills
Magnesium Production
Petroleum and Natural Gas
systems

** $\geq 25,000$ metric tons CO₂e per year from all source categories, combustion units, and miscellaneous use of carbonates.*

Does the Rule Apply to My Facility?



What Combustion Units Will Emit 25,000 MT CO₂e per Year?



Fuel	Design Capacity* (mmBtu/hr)	Annual Fuel Use
Coal	30	10,800 tons
Fuel Oil	35	2.3 million gallons
Natural Gas	50	460 million ft ³

**Assuming full utilization and 8,760 hours/yr.*

25,000 MT CO₂e per year is equivalent to using 131 rail cars of coal

Applicability Tool



To help determine if facilities must report...

- Indicate reporting year
- Check-off list of source categories
- Combustion calculator
- Municipal landfill calculator
- Electronics Manufacturing calculator
- Petroleum and Natural Gas Production calculators

<http://www.epa.gov/climatechange/emissions/GHG-calculator/index.html>

** Calculators provide conservatively high emission estimates*

How Do I Estimate Emissions for Applicability Purposes?



- Estimate actual emissions
- Use applicable equations in the rule
- Monitoring data not required—use available company records
- Simplified methods allowed for combustion sources
- Include CO₂ transferred off-site
- Exclude CO₂ emissions from biomass combustion, but include CH₄ and N₂O emissions
- Exclude research and development activities, unless otherwise specified in an applicable subpart (e.g. subpart RR)
- Include an F-GHG only if listed in Table A-1 of rule

If you are close to 25,000 MT CO₂e/yr based on available records, it may be prudent to monitor.

What Suppliers Are Covered?



- All producers of:
 - Petroleum products
 - Coal-based liquids
 - Industrial GHGs (F-GHG and N₂O)
 - CO₂
- Exporters of 25,000 metric tons CO₂e per year or more
- Importers of 25,000 metric tons CO₂e per year or more
- Natural gas and natural gas liquids
 - All fractionators
 - Local gas distribution companies that deliver 460 million ft³
- Importers and exporters of fluorinated GHGs in pre-charged equipment or closed-cell foams equivalent to 25,000 metric tons CO₂e per year (starting in 2011 reporting year)

Applicability Example #1



Facility Description	Required to Report?	Explanation
A petrochemical plant emits 22,000 metric tons/yr CO ₂ e.	Yes	Because petrochemical manufacturing is a source category that is listed in Table A-3, the facility must submit a report regardless of the amount of GHGs emitted.

Applicability Example #2



Facility Description	Required to Report?	Explanation
A university emits 24,000 metric tons/yr CO ₂ e from a cogeneration unit and 2,000 metric tons/yr CO ₂ e from coal storage.	No	Because the rule does not prescribe a method for calculating GHG emissions from coal storage, coal storage emissions are not counted in determining applicability.

Applicability Example #3



Facility Description	Required to Report?	Explanation
<p>A cheese manufacturing plant contains:</p> <ul style="list-style-type: none">• A gas-fired boiler that emits 15,000 metric tons/yr CO₂e,• A biogas-fired boiler that emits 10,000 metric tons/yr CO₂, and 200 metric tons/yr of CH₄ and N₂O• A wastewater treatment operation that emits 9,000 metric tons/yr CO₂e.	No	Because wastewater treatment at food processing plants is a source category listed in Table A-4, the facility must report only if emissions from wastewater treatment and stationary fuel combustion are 25,000 metric tpy CO ₂ e or more. Because CO ₂ emissions from combustion of biogenic fuels is excluded from the applicability computation, nonbiogenic GHG emissions for the facility are 24,200 metric tpy CO ₂ e, and the facility is not required to report.

For more examples:
<http://www.epa.gov/climatechange/emissions/downloads09/generalprovisions.pdf>

Applicability Example #4



Facility Description	Required to Report?	Explanation
An offshore petroleum and natural gas production platform has stationary combustion emissions exceeding 25,000 metric tons of CO ₂ e/year	<p>2010</p> <ul style="list-style-type: none">•No for subpart W•Yes for subpart C <p>2011</p> <ul style="list-style-type: none">•Yes for subpart W•Yes for subpart C	The facility must report combustion emissions in 2011 because emissions from stationary combustion are 25,000 metric tons/yr CO ₂ e or more. Emissions from both combustion and production would be reported in 2012 because the facility emits 25,000 metric tons/yr CO ₂ e

For more examples:
<http://www.epa.gov/climatechange/emissions/downloads09/generalprovisions.pdf>



Part 3. Reporting, Monitoring, and Recordkeeping Requirements

What Are the Reporting Requirements?



- Subpart A: General Provisions
 - Applicability provisions
 - Schedule
 - Reporting and recordkeeping requirements common to all reporters
 - Definitions
 - Report submission procedures
 - Other (e.g., calibration procedures, monitoring plan)
- Subparts C-UU: Source-Specific Requirements
 - Definition of source category
 - GHG to report
 - Calculation methods
 - Monitoring and QA/QC
 - Missing data procedures
 - Reporting and recordkeeping elements unique to each subpart

General Monitoring Approaches



- Continuous emission monitoring systems (CEMS)
 - Required if already used (e.g., NSPS, Acid Rain Program) and meet specified criteria
 - Optional for other sources
- Source category-specific GHG calculation methods
 - Monitor process parameters, fuel use
 - Calculate GHG using equations in applicable subparts
 - Example approaches (varies by source category)
 - Mass balance calculation
 - Site-specific emission factors
 - Default emission factors



Best Available Monitoring Methods

- Best available monitoring methods may be used during part of the first year for some source categories:
 - Use emission estimation equations provided in the rule
 - Obtain equation inputs using best available monitoring method (e.g., current monitoring methods, engineering calculations, company data)
- Must begin following all applicable monitoring and QA/QC requirements when the BMM period expires, unless an extension is approved by EPA

Best Available Monitoring Methods: 2010 Source Categories



- The use of best available monitoring methods has ended for all except three 2010 source categories.
- Hydrogen Production (Subpart P), Petrochemical Production (Subpart X), Petroleum Refineries (Subpart Y) source categories can extend use if installing monitors would require a process or unit shutdown or hot tap and:
 - An initial notice of intent was submitted by January 1, 2011
 - A full extension request is submitted by February 15, 2011, and approved by EPA.

Best Available Monitoring Methods: 2011 Source Categories



- Best available monitoring methods can be used through March 31, 2011 for:
 - CO₂ Injection and Geologic Sequestration (Subpart RR)
 - Injection of CO₂ (Subpart UU)
- And though June 30, 2011 for:
 - Electronics Manufacturing (Subpart I)
 - Fluorinated Gas Production (Subpart L)
 - Electrical Transmission & Distribution Equipment Use (subpart DD)
 - Imports and Exports of Equipment Pre-charged with F-GHGs or containing F-GHGs in Closed Cell Foams (Subpart QQ)
 - Manufacture of Electric Transmission & Distribution (Subpart SS)
- Further extensions possible for some subparts. See subparts for dates requests are due and duration of extension

Schedule for Monitoring and Reporting – Reporting Year 2010



1/1/10	Start collecting data using required methods in each subpart or best available monitoring methods
12/31/10	Complete 2010 data collection
1/30/11	Submit certificate of representation
3/31/11	Submit GHG report for reporting year* 2010
Ongoing	Submit corrected report 45 days after each discovery (unless extension is requested)
Ongoing	Submit annual reports on 3/31 each year

** Reporting year is the year in which the data are collected (e.g., reporting year 2010 data are contained in the report submitted on March 31, 2011).*

Schedule for Monitoring and Reporting – Reporting Year 2011



1/1/11	Start collecting data using required methods in each subpart or best available monitoring methods
12/31/11	Complete 2011 data collection
1/31/12	Submit certificate of representation
3/31/12	Submit GHG report for 2011
Ongoing	Submit corrected report 45 days after each discovery (unless extension is requested)
Ongoing	Submit annual reports on 3/31 each year

What Do Facilities Report?



- Identifying information, parent companies, NAICS code(s)
- Annual GHG emissions excluding biomass CO₂, metric tons CO₂e
- Annual CO₂ emissions from biomass combustion, metric tons
- Annual emissions of each GHG for each source category, metric tons each gas
- Other emissions data required by an applicable subpart (e.g., by unit or process line)
- Verification data required by each subpart
- Data elements for which a missing data procedure was used
- Certification by the “designated representative”

Facilities for which the rule does not apply are not subject to any reporting or recordkeeping requirements. Further, facilities are not required to submit verification or notify EPA that they are not subject to the rule. However, it may be prudent to retain a record of your emission computations in the event that you may be audited.

What Do Suppliers Report?



- Identifying information, parent companies, NAICS code(s)
- Annual quantity from all supply categories, metric tons CO₂e
- Annual quantity from each supply category, metric tons of each gas
- Other data required by an applicable subpart
- Verification data required by each subpart
- Data elements for which a missing data procedure was used
- Certification by the “designated representative”

What Is Not Reported?



- Indirect emissions (e.g., electricity use)
- Mobile source emissions (e.g., fleet emissions, off-road equipment)
- Emission offsets

Retain These Records for 3 Years:



- List of all units, operations, processes, and activities for which GHG emission were calculated
- All data used to calculate the GHG emissions for each unit, operation, process, and activity, categorized by fuel or material type
- The annual GHG reports
- Missing data computations
- Written GHG Monitoring Plan
- Certification and QA tests
- Maintenance records for measurement equipment
- Other data required by applicable subparts

Monitoring Plan



- Identifies responsibilities (i.e., job titles) for data collection
- Explains processes and methods used for data collection
- Describes QA/QC procedures for monitors
- May rely on references to existing corporate documents (e.g., existing QA plans, standard operating procedures)
- **Monitoring Plans must be prepared by the following dates:**

For 2010 Reporters:

4/1/2010

For 2011 Source Categories:

1/1/2011 for magnesium production, underground coal mines, industrial wastewater treatment, and industrial waste landfills

4/1/2011 for all other 2011 reporters

General Monitor Calibration Requirements [40 CFR 98.3(i)]



- Calibrate flow meters and other required measurement devices (e.g. weighing devices) by April 1, 2010 (unless previous calibration still active) or by date specified in each subpart.
 - May postpone until next maintenance outage if calibration requires a process or unit shutdown
 - For 2011 source categories, calibrate by date the measurement device must be installed, unless the subpart provides a different date
- Calibrate using manufacturer's specifications, industry consensus standard, or method in rule subpart. Describe in monitoring plan.
- Recalibrate at frequency specified in subpart. If not specified, use manufacturer's recommendations or industry consensus practice.

General Monitor Calibration Requirements [40 CFR 98.3(i)] (cont.)



- Flow meters measuring liquid or gaseous fuel feed rates, process stream flow rates, or feedstock flow rates must meet accuracy specifications in 98.3(i) if specified by the subpart
 - No more than 5% calibration error for most flow meters
 - Other values specified for orifice, nozzle, and venturi flow meters
- Calibration and accuracy requirement do not apply to:
 - Company records
 - Best available information
 - Part 75 methodologies
 - Fuel billing meters (unless company combusting fuel owns meters)
 - Flow meters used exclusively for unit startup

When Can I Stop Annual Reporting?



- Notify EPA by March 31 of the year after you meet one of the following conditions:
 - If annual reports demonstrate CO₂e <25,000 metric tons/yr for 5 consecutive years.
 - If annual reports demonstrate CO₂e <15,000 metric tons/yr for 3 consecutive years.
 - If you shut down all processes/units/supply operations covered by the rule. (Does not apply to landfills)
- You must resume reporting in future year if conditions are no longer met

How Will Emissions Be Verified?



- Self certification
 - Designated representative certifies report
 - Rule requires one designated representative (DR) and allows one alternate designated representative (ADR) for each facility and supplier
- EPA verification
 - Reports submitted through an electronic system
 - Built-in calculation and completeness checks for reporters
 - Electronic QA and consistency checks
 - EPA data review and follow-up with reporters
 - On-site audits

Electronic Reporting System



- All reporting under the GHG Reporting Program will be electronic.
- Web-based system for facility/supplier to EPA reporting
 - Web-forms will guide reporters through data entry and submission.
 - Include a mechanism to submit file directly using Extensible Markup Language (XML) format.
 - XML schema is available on the EPA website.
- For updates on the data system, training schedule, and to view the XML schema:

<http://www.epa.gov/climatechange/emissions/data-reporting-system.html>

Note: Subparts LL and MM must report using the Office of Transportation and Air Quality Fuels Registration (OTAQREG) system.

e-GGRT User and Facility Registration



e-GGRT Help

- About e-GGRT
- Climate Change Home Page
- Applicability Tool for the Mandatory Greenhouse Gas Reporting Rule

About the e-GGRT One-time User Registration Process

SHOULD YOU REGISTER TO USE e-GGRT?

You will need to create an e-GGRT user account, if you plan to register or represent a Facility or Supplier affected by EPA's Mandatory Greenhouse Gas Reporting Rule.

If you are uncertain, the [Applicability Tool](#) may help you assess whether your facility is required to report greenhouse gas (GHG) emissions. Note that information tailored to Suppliers and other affected entities can also be found there.

You are already registered if:

- You have a CDX Account.** CDX and e-GGRT are integrated so that both will work with your existing CDX account.

Login to e-GGRT with your username and password.

- On screen directions explain each step of user registration.

Additional context sensitive help links

- 1 Create User Profile** (Detailed description of the registration process)
- 2 Pick Challenge Questions** Pick, and supply answers to, five challenge questions. You will be asked one of those questions anytime you certify and sign a submission in e-GGRT.
- 3 Electronic Signature Agreement** Print the Electronic Signature Agreement (ESA). Sign the form, then mail or courier to EPA.
You will not be able to use e-GGRT until EPA has received and processed this paper agreement with your signature.
- 4 Print Summary** Print the summary of your registration for your records. If you have questions regarding your registration, including the status of your ESA, you can refer to this document.

Start Using e-GGRT EPA will not activate your account until your ESA has been received and processed. An account activation notice will be sent to the email address you used for registration. You will then be able to use e-GGRT.

BEGIN REGISTRATION

If your facility is not subject to the GHG reporting rule in 2010, your facility is not required to register with the e-GGRT system by January 30, 2011. If your facility triggers the rule during 2011, you would be required to register your facility 60 days before submission of your initial report (i.e., January 31, 2012).

GHG Data Publication



- EPA plans to publish collected through the GHG RP on the web
- EPA will only publish non-CBI data
 - CBI data will be aggregated to shield sensitive information
- EPA is developing a publication tool for the GHG RP data
 - Display facilities on a map
 - Create charts, graphs, and lists
 - Download data
 - Leverage social media

Goals for Data Publication



- Increase understanding of the sources of GHG emissions in the U.S. among the public
- Encourage voluntary reductions of emissions
- Improve quality of reported data
- Support regional, state, and local programs
- Information to be displayed in a simple, transparent manner

Confidential Business Information (CBI)



- EPA will protect any information claimed as CBI in accordance with regulations in 40 CFR Part 2, subpart B
- In general, emissions data collected under CAA sections 114 and 208 cannot be considered CBI
- EPA is deferring the reporting of certain data elements that are inputs to emission equations to better assess implications of its collection and public release. See 12/27/10 FR notice for list of data elements not required to be reported in March 2011.



Reporters must submit their 2010 GHG Reports by March 31, 2011. The Interim Final deferral action published on December 27, 2010 in the Federal Register applies only to specific data elements listed in that action and does not defer reporting of any other GHG data.



Part 4. Subpart C: Stationary Fuel Combustion Sources

What Units Are Covered?



- Devices that combust solid, liquid, or gaseous fuel for:
 - producing electricity, generating steam, or providing useful heat or energy for industrial, commercial, or institutional use, or
 - reducing the volume of waste by removing combustible matter
- Examples:
 - Boilers
 - Stationary Internal Combustion Engines
 - Process Heaters
 - Combustion Turbines
 - Incinerators
 - Other Stationary Fuel Combustion Equipment (e.g. control devices)
- Covers any fuel combustion device, unless specifically exempted

Subpart C Does Not Apply to These:



- Portable equipment
- Emergency generators and emergency equipment
- Agricultural irrigation devices
- Flares, unless otherwise required by another subpart (e.g., subpart W)
- Electricity Generating Units subject to subpart D
- Hazardous waste combustion (co-fired fossil fuels only)
- Pilot lights

Applicability



Three ways for subpart C to apply:

- Facility is subject to the rule because of another source category
- Facility emits 25,000 metric tons CO₂e/year from all stationary fuel combustion units
- Another subpart refers to subpart C for combustion emissions (e.g., kiln emissions)

What GHGs Are Reported?



- CO₂ from fossil fuel and biomass
 - Four different methods (Tiers) for calculating CO₂ emissions
 - Different tiers used based on unit size, fuel type, other factors
 - Separately estimate CO₂ from sorbent used for acid gas control (unless CO₂ is measured with CEMS)
- CH₄ and N₂O
 - Emission factors



CO₂ Emission Calculation Tiers

Tier	For this fuel...	Measure these parameters...	And use a default factor for...
1	60 fuels ¹	Annual fuel use	HHV CO ₂ emission factor
2	60 fuels ¹ MSW	Annual fuel use HHV Steam generation	CO ₂ emission factor CO ₂ emission factor
3	Solid/liquid Gas	Annual fuel use Carbon content Annual fuel use Carbon content Molecular weight	--
4	All	CO ₂	--

¹Any of the 60 fuels listed in Table C-1 of subpart C, except MSW units that generate steam.

Tier 1 Monitoring: Fuel Use



Use “company records”

- Direct measurements of fuel consumption by gravimetric or volumetric means
- Tank drop measurements
- Engineering calculations (e.g., using generation or unit operating hours)
- Fuel billing records
- Other

Must maintain records of methods used

Tier 2 Monitoring: HHV



- Fuel use
 - Company records
- High heating value of fuel. Minimum sampling frequency:
 - Natural gas: Semiannual
 - Coal and fuel oil: Each fuel lot (shipment or delivery)
 - Other liquid fuels, fossil fuel-derived gas fuels, and biogas: Quarterly
 - Other solid fuels: Weekly sample and monthly analysis

Tier 3 Monitoring: Fuel Carbon Content



- Fuel use
 - Solid fuel: Company records
 - Liquid fuel: Flow meter, billing meter, or tank drop measurements
 - Gaseous fuel: Flow meter or billing meter
- Minimum fuel sampling frequency (carbon):
 - Same as for Tier 2, except
 - Other gaseous fuels: Daily (if equipment in place) or weekly

Tier 4 Monitoring (CEMS)



- Install CO₂ and volumetric flow rate monitor
 - O₂ monitor may be used in some situations
 - Calculate hourly mass emission rates
 - Sum to quarterly and annual emissions
- Three alternatives: Use continuous heat input measurements and part 75 equations [98.33(a)(5)]

Use of Tier 1 (measure fuel use only)



Tier 1 may be used in these situations:

- Unit ≤ 250 mmBtu/hour & fuel listed in Table C-1*
- Units of any size:
 - Municipal solid waste (MSW) unit that does not produce steam
 - MSW unit burning $\leq 1,000$ tons MSW per year
 - MSW and/or tires provides $\leq 10\%$ annual heat input
 - Natural gas if consumption is provided in therms or mmBtu
 - Biomass listed in Table C-1 *

*If HHV data are available at the minimum required frequency, Tier 2 must be used.

Use of Tier 2 (measure HHV)



Tier 2 may be used in 3 situations:

- Unit ≤ 250 mmBtu/hour and fuel listed in Table C-1 (60 fuels)
- Natural gas and/or distillate fuel oil in unit of any size
- MSW unit that produces steam

Use of Tier 3 (measure carbon content)



Tier 3 must be used in 2 situations:

- Unit > 250 mmBtu/hour for any fuel listed in Table C-1, except:
 - Natural gas, distillate fuel oil, and biomass fuels
 - MSW
 - If Tier 4 is required
- Unit > 250 mmBtu/hour and a fuel not listed in Table C-1, only if:
 - The fuel provides 10% or more of annual heat input to the unit, and
 - Tier 4 is not required

Use of Tier 4 (CEMS) (large units)



For large units, required if ALL six requirements are met:

1. Unit has CEMS that is required by regulation or permit.
2. Unit >250 mmBtu/hr, or >600 tons per day of MSW.
3. Solid fossil fuel or MSW is primary fuel.
4. Unit operated $>1,000$ hours in any calendar year since 2005.
5. CEMS has a gas monitor of any kind or a stack gas volumetric flow rate monitor
6. Monitors undergo periodic QA testing under part 75, NSPS, or State program.

Use of Tier 4 (CEMS) (small units)



For small units, required if ALL six requirements are met:

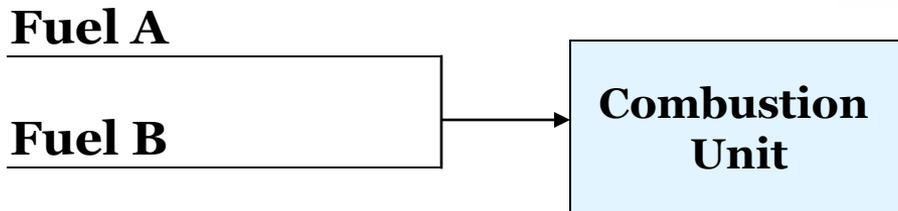
1. Unit has CEMS that is required by regulation or permit.
2. Unit ≤ 250 mmBtu/hr, or ≤ 600 tons per day of MSW.
3. Solid fossil fuel or MSW is primary fuel.
4. Unit operated $>1,000$ hours in any calendar year since 2005.
5. CEMS has a CO₂ monitor and a stack gas volumetric flow rate monitor
6. Monitors undergo periodic QA testing under part 75, NSPS, or State program.

Thermal Oxidizers/Control Devices



- Hazardous Wastes
 - Use CEMS if required by another rule
 - Otherwise, report only fuels listed in Table C-1
- Units ≤ 250 MMBtu/hour
 - Report only fuels listed in Table C-1
- Units > 250 MMBtu/hour
 - Report only fuels listed in Table C-1, and
 - Any other fuel that provides $> 10\%$ annual heat input to the unit

Mixed Fuel



Tier 1 or Tier 2

1. Estimate relative portion of fuel using best available information
2. Determine a heat-weighted average CO₂ emission factor
3. Apply Tier 1 or 2 equation

Tier 3

Measure carbon content (and molecular weight for gases) of mixed fuel

- Use appropriate tier for each fuel.

What Must Be Reported?



- CO₂, N₂O, and CH₄ from fossil fuel and biomass
- Reporting is at unit level (each fuel) with some exceptions:
 - Aggregate units ≤ 250 mmBtu/hr
 - Aggregate units served by common pipe
 - Aggregate units sharing common stacks using CEMS
- Verification data specified at i 98.36(e)

Requirements for Biomass



- Biomass CO₂ emissions not considered in applicability, but are reported separately if subject to rule
- Estimate biogenic CO₂ emissions for fuels listed in Table C-1, and non-Table C-1 fuels, if >10% of annual heat input in a unit >250 mmBtu/hr
 - Wood and Wood Residuals
 - Agricultural Byproducts
 - Peat
 - Solid byproducts
 - Biogas
 - Ethanol
 - Biodiesel
 - Rendered Animal Fat
 - Vegetable Oil
- CH₄ and N₂O emissions are considered in applicability and reported

Calculating Biogenic CO₂ from Mixed Biomass and Fossil Fuels



- If no CEMS
 - Tier 1 (or Tier 2 if required) and company records for amount of biomass combusted
- If use CEMS
 - Tier 1 (or Tier 2 if required), or
 - Equations using F-factors, or
 - ASTM D7459-08 and D6866-06a (quarterly)
- If burning tires, reporting biomass is optional
 - Tier 1 or 2 or 3 (as applicable) for total CO₂, and
 - ASTM D7459-08 and D6866-06a (quarterly), or
 - Tier 1 and default value of 20% for biogenic fraction if MSW and tires(combined) $\leq 10\%$ annual heat input

Calculating Biogenic CO₂ from Mixed Biomass and Fossil Fuels (continued)



- If burning MSW
 - Tier 1 or 2 (as applicable) for total CO₂, and
 - ASTM D7459-08 and D6866-06a (quarterly)
 - or
 - Tier 1 and default value of 60% for biogenic fraction if $\leq 1,000$ tpy MSW, or MSW and tires(combined) $\leq 10\%$ annual heat input

CH₄ and N₂O Calculation Methods



If you use this Tier for	Measure these parameters ¹	And use a default factor for
Tier 1 or Tier 3	Annual fuel use	HHV CH ₄ emission factor N ₂ O emission factor
Tier 2 Fuel Option (Eq. C-9a)	Annual fuel use HHV	CH ₄ emission factor N ₂ O emission factor
Tier 2 Steam Option (Eq.C-9b)	Annual steam generation MMBtu/lb steam output (maximum rated)	CH ₄ emission factor N ₂ O emission factor
Tier 4	Annual heat input	CH ₄ emission factor N ₂ O emission factor

¹Use same values as used for CO₂ calculations

What Is Reported for Each Unit?



- Unit identification number
- Type of unit (code)
- Rated capacity
- Each fuel type burned
- Tier methodology used for CO₂
- For Tier 1-3 (for each fuel)
 - CO₂ emissions in tons
 - CH₄ and N₂O emissions in tons and CO₂e
- For Tier 4
 - CO₂ emissions for all fossil fuels combined
 - CO₂ emissions for all biomass fuels combined
 - CH₄ and N₂O emissions for each fuel (tons and CO₂e)
- CO₂ sorbent emissions (if not using CEMS)
- Customer meter number for natural gas
- Verification data

Additional Information



- www.epa.gov/climatechange/emissions/ghgrulemaking.html
 - Preamble and rule
 - Technical background documents on source categories
 - Response to comment documents
 - Link to rulemaking docket
 - Technical assistance materials (e.g., Information Sheets, Monitoring Checklists, FAQs, optional forms)
 - Data reporting system information (e-GGRT)
 - On-line applicability tool
- Rule questions: GHGMRR@epa.gov
- e-GGRT questions: GHGReporting@epa.gov



Questions?