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Subpart X - Petrochemical Production

 A printer-friendly version (pdf) (29 pp, 3.8MB) of GHG reporting instructions for this subpart

Please select a help topic from the list below:

- [Using e-GGRT to Prepare Your Subpart X Report](#)
 - [Subpart X Process Unit Summary Information for this Facility](#)
 - [Subpart X MASS BALANCE Option Reporting - Process Data](#)
 - [Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)
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- [Using Subpart X Calculation Spreadsheets](#)

- [Carry forward of data from previous submissions into RY2012 forms](#)
- [Subpart X Rule Guidance](#)
- [Subpart X Rule Language \(eCFR\)](#)

Additional Resources:

- [Part 98 Terms and Definitions](#)
- [Frequently Asked Questions \(FAQs\)](#)
- [Webinar Slides](#)

Using e-GGRT to Prepare Your Subpart X Report

This page provides an overview of sub-topics that are central to Subpart X reporting:

- [Process Unit Summary Information for this Facility](#)
- [MASS BALANCE Option Reporting - Process Data](#)
- [MASS BALANCE Option Reporting - Measurement Methods Information](#)
- [ETHYLENE Option Reporting](#)
- [CEMS Option Reporting](#)
- [Validation Report](#)

If you previously reported for Reporting Year (RY) 2011, the Agency has carried some of your RY2011 data forward and entered it in your RY2012 forms to reduce the reporting burden. It is still your responsibility to review and ensure that all of the information in your submission is correct, but the Agency believes that most of the data which is carried forward is unlikely to change significantly from year to year. For more information about carry forward data, please see the [Carry forward of data from previous submissions into RY2012 forms help content](#).

The end of this page contains links you can use for more information on these topics.



If you are using a Best Available Monitoring Method (BAMM) in accordance with the rule in place of a method in Subpart X, you should select the "Other" option in the method menu and write "BAMM" or "Best Available Monitoring Method" in the corresponding text box. Details regarding BAMM methods used should be included in Subpart A.

Click image to expand

Process Unit Summary Information for this Facility

Subpart X requires you to provide the following information for each process unit at your facility:

- Name or ID for the petrochemical process (Note that you may also provide a more detailed description of the process to supplement the name or ID)
- Petrochemical produced (methanol, carbon black, acrylonitrile, ethylene dichloride, ethylene oxide, or ethylene)
- Annual amount of the petrochemical produced (in metric tons)

MASS BALANCE Option Reporting

Subpart X requires you to provide the following information for each process unit at your facility for which the mass methodology is used to calculate emissions:

- The annual CO₂ mass emissions from process operations and process off-gas combustion
- The names of each carbon-containing feedstock and product
- The physical state of each carbon-containing feedstock and product

Subpart X requires emissions information about each of the carbon-containing feedstocks and products used by or produced by each of the process units. This information is provided by calendar month for each feedstock and product:

- The method used to measure mass or volume, carbon content, and molecular weight
- Whether or not substitution data were used

This screen consists of a series of sections. In the top section you enter general information related to measurement methods that you used. Below the top section is a series of sections in which you enter details of the methods used during each month of the reporting year.

Subpart X also collects the following additional information for process units for which the mass balance methodology was used to calculate emissions:

- Wastewater (Optional Questions)
 - Total Annual Flow of Wastewater
 - Unit of Measure for Total Annual Flow of Wastewater (kg or gal)
 - Annual Average Carbon Content of the Wastewater (decimal fraction)
- Unburned Carbon Releases (Optional Questions)
 - Annual Mass of Carbon Released in Fugitive Emissions Not Controlled with a Combustion Device (in metric tons)
 - Annual Mass of Carbon Released in Process Vents Not Controlled with a Combustion Device (in metric tons)
- Off-Spec Product Information (*Note that this information is required only if you complied with the alternative sampling and analysis option in §98.243(c)(4) for a product from the process unit*)
 - Number of Days During which Off-Spec Product was Produced (in days)
 - Mass or Volume of Off-Spec Product Produced
 - Unit of Measure for the Mass or Volume of Off-Spec Product Produced (kg, gal, scf)
- Combustion Configurations
 - Identify each Combustion Configuration that Burned Both Process Off-Gas from the Petrochemical Process Unit and Supplemental Fuel by Providing the Name/Identifier of Those Units as Reported under Subpart C (*Note that for these configurations you must report the GHG emissions from the combustion of the supplemental fuel under subpart C*). If there are no such combustion configurations, please type in "none".

ETHYLENE Option Reporting

Subpart X requires you to provide the following feedstock information for each process unit at your facility for which the ETHYLENE combustion methodology is used to calculate emissions:

- The types of carbon-containing feedstock fed to each ethylene process unit
- The annual quantity of the carbon-containing feedstock fed to each ethylene process unit (in metric tons)

Subpart X requires you to provide the following stationary combustion configuration information for each process unit at your facility for which the ETHYLENE combustion methodology is used to calculate emissions:

- The unit name or identifier of the Subpart C stationary combustion configuration that burns process off-gas from the ethylene process unit
- The fraction of the total emissions from this configuration that is attributable to combustion of off-gas from the ethylene process unit

CEMS Option Reporting

For each CEMS Monitoring Location (CML), provide the following information:

- A unique unit name or identifier for the CML (see also [About Unique Unit Names](#))
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
 - Single industrial process or process unit that exhausts to a dedicated stack
 - Multiple industrial processes or process units share a common stack
 - Industrial process or process unit shares a common stack with one or more stationary fuel combustion units
- The name of each fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The cumulative total of hourly CO₂ mass emissions for each quarter of the reporting year (in metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO₂ mass emissions measured by the CEMS (in metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO₂ emissions from the combustion of all biomass fuels combined (in metric tons) (*if applicable*)
- The total annual non-biogenic CO₂ emissions (includes fossil fuel, sorbent, and process CO₂ emissions, in metric tons)
- The total annual CH₄ and N₂O emissions associated with the combustion of all [Table C-2](#) fuels combusted in all processes/process units monitored by the CEMS derived from application of [Equation C-10](#) (in metric tons) (*if there are no combustion emissions in this CML, please enter zero*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- An indication of the process units monitored by the CML
- The fraction of CO₂, N₂O, and CH₄ emissions from CML attributable to combustion of the off-gas from the petrochemical process unit (decimal fraction)

Validation Report

The Validation Report assists with the completeness and quality of your reporting data.

We strongly encourage you to use the Validation Report to check your work. The Validation Report performs two types of checks:

- Data Completeness: Data required for reporting that are missing or incomplete.
- Data Quality: Data that are outside of the expected range of values.

You may view the Validation Report at any time.



Note that the Validation Report is intended to assist users in entering data, but it is not an indication that the reporter has entered all necessary information, nor is it an indication that the reporter is in compliance with part 98. Furthermore a negative finding on the validation report is not a guarantee that a data element was entered incorrectly.

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See Also

[Screen Errors](#)

[Using e-GGRT to Prepare Your Subpart X Report](#)

[Subpart X Process Unit Summary Information for this Facility](#)

[Subpart X MASS BALANCE Option Reporting - Process Data](#)

Subpart X Process Unit Summary Information for this Facility

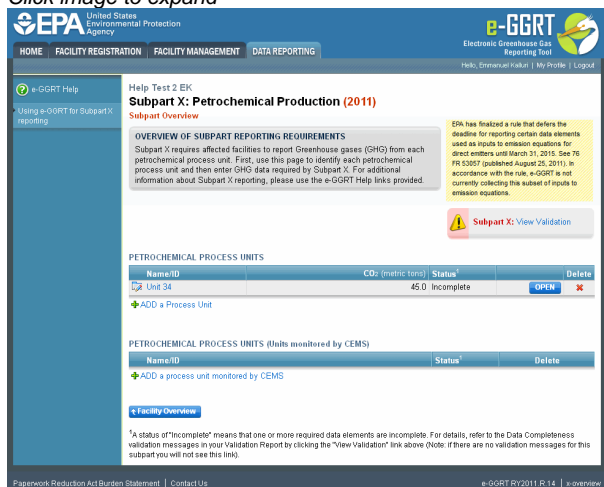
This topic provides a step-by-step description of how to enter Subpart X petrochemical production unit summary information about this facility.

Adding a Petrochemical Process Unit for this Facility

After registering your facility (see the Facility Registration section at [Registration Instructions](#)), enter information for subpart X process units by following the steps below. Note that steps 3 and 4 may be omitted if you added subpart X while previously using eGGR.

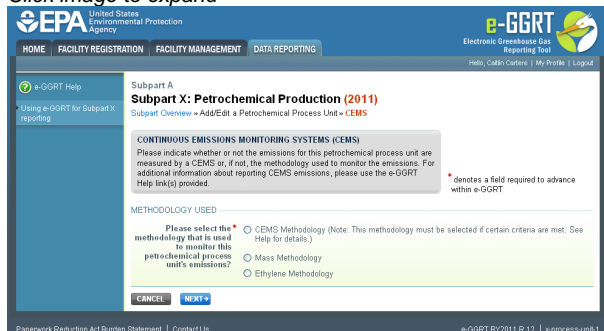
- Step 1. Click on the DATA REPORTING tab after you login. This action opens the "DR-facility-select" screen.
- Step 2. Click on the blue OPEN button in the row that contains the name of your facility. This action takes you to the "DR-facility-overview" screen.
- Step 3. Under the Report Data table, click on the "+ADD or REMOVE subparts" link. This action takes you to the "DR-facility-subparts" screen.
- Step 4. Click on the box next to "X-Petrochemical Production" (and the boxes for any other applicable subparts for your facility) and then click SAVE at the bottom of the screen. This action takes you back to the "DR-facility-overview" screen.
- Step 5. Click on the blue OPEN button on the row for "Subpart X – Petrochemical Production" in the Report Data table. This action takes you to the "x-overview" screen

Click image to expand



- Step 6. Locate the PETROCHEMICAL PROCESS UNITS table on the "X--Overview" page and click on the "+ADD a Process Unit" link. This action displays the "x-process-unit-1" screen.

Click image to expand



Subpart X requires you to identify the type of GHG measurement methodology you use for the specific petrochemical process unit. The methodology options are:

- CEMS (Note: you must use this option if all process vent emissions and emissions from all combustion configurations that burn process off-gas are exhausted through stacks that are monitored with CO₂ CEMS (§98.243(b))

- Mass Balance (§98.243(c))
- Ethylene (Note: this option may be selected only for ethylene process units) (§98.243(d))

After making your selection, click NEXT.

Uniquely Identify the Process Unit (see also About Unique Names)

Clicking NEXT on the “x-process-unit-1” screen takes you to one of three screens depending on the methodology selected. Regardless of the selected methodology, subpart X requires you to provide the following information about the process unit:

- Name or ID for the petrochemical process (Note that you may also provide a more detailed description of the process to supplement the name or ID)
- Petrochemical produced (methanol, carbon black, acrylonitrile, ethylene dichloride, ethylene oxide, or ethylene)
- Annual amount of the petrochemical produced (in metric tons)

CEMS Methodology Screen

Click image to expand

The screenshot shows the EPA e-GGRT interface for 'Subpart X: Petrochemical Production (2011)'. The form is titled 'PETROCHEMICAL PROCESS UNIT INFORMATION' and includes the following fields and options:

- Name or ID:** A text input field containing 'Petrochemical Production' with a 40-character maximum limit.
- Description:** A larger text input field for additional details.
- Type:** A dropdown menu set to 'Petrochemical Process Unit'.
- PETROCHEMICAL PRODUCED:**
 - Type of petrochemical produced:** A dropdown menu set to 'Methanol'.
 - Annual quantity of the petrochemical produced:** A text input field containing '500000' with the unit '(metric tons)'.
- METHODOLOGY USED:** A section with a note: 'Please select the methodology that is used to monitor this petrochemical process unit's emissions?'. It contains three radio button options:
 - CEMS Methodology (Note: This methodology must be selected if certain criteria are met. See Help for details.)
 - Mass Methodology
 - Ethylene Methodology

At the bottom of the form are 'CANCEL' and 'SAVE' buttons. The footer of the page includes 'Paperwork Reduction Act Burden Statement | Contact Us' and 'e-GGRT RY2011 R.12 | x-process-unit-3'.

Mass Methodology Screen

Click image to expand

United States Environmental Protection Agency | e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

Help Test 2 EK | Subpart X: Petrochemical Production (2011) | Subpart Overview | Add/Edit a Process Unit

PETROCHEMICAL PROCESS UNIT INFORMATION
Subpart X requires a facility to uniquely identify each petrochemical process unit and provide the information described below for each. For additional information about adding and editing a petrochemical process unit, please use the e-GGRT Help link(s) provided. * denotes a field required to advance within e-GGRT

Name or ID* [] (40 characters maximum)
Description []
Type Petrochemical Process Unit

PETROCHEMICAL PRODUCED
Type of petrochemical produced [Select]
Annual quantity of the petrochemical produced [] (metric tons)

WASTEWATER (OPTIONAL REPORTING REQUIREMENTS)
Total annual wastewater flow []
Unit of measure for total annual wastewater flow (gal or kg) []
Annual average carbon content of wastewater (weight fraction) [] (decimal fraction)

RELEASED CARBON (OPTIONAL REPORTING REQUIREMENTS)
Annual mass of carbon released in fugitive emissions not controlled with a combustion device [] (metric tons)
Annual mass of carbon released in process vents not controlled with a combustion device [] (metric tons)

OFF-SPEC PRODUCT PRODUCTION
Required only if facility complied with 98.243(c)(4) for a product from this process unit
Number of days during which off-spec product was produced [] (days)
Mass or volume of off-spec product produced []
Unit of measure for the mass or volume of off-spec product produced [Select]

COMBUSTION CONFIGURATIONS
Identify each combustion configuration that burned both process off-gas from the petrochemical process unit and supplemental fuel by providing the name-identifier of those configurations as reported under Subpart C (if there aren't any, please specify "None") []

METHODOLOGY USED
Please select the methodology that is used to monitor this petrochemical process unit's emissions?
 CEMS Methodology (Note: This methodology must be selected if certain criteria are met. See Help for details.)
 Mass Methodology
 Ethylene Methodology

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us | e-GGRT RY2011.R.14 | xprocess-unit2

Ethylene Methodology Screen

Click image to expand

United States Environmental Protection Agency | e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

Help Test 2 EK | Subpart X: Petrochemical Production (2011) | Subpart Overview | Add/Edit a Process Unit

PETROCHEMICAL PROCESS UNIT INFORMATION
Subpart X requires a facility to uniquely identify each petrochemical process unit and provide the information described below for each. For additional information about adding and editing a petrochemical process unit, please use the e-GGRT Help link(s) provided. * denotes a field required to advance within e-GGRT

Name or ID* [] (40 characters maximum)
Description []
Type Petrochemical Process Unit

PETROCHEMICAL PRODUCED
Type of petrochemical produced [Ethylene]
Annual quantity of ethylene produced [] (metric tons)

METHODOLOGY USED
Please select the methodology that is used to monitor this petrochemical process unit's emissions?
 CEMS Methodology (Note: This methodology must be selected if certain criteria are met. See Help for details.)
 Mass Methodology
 Ethylene Methodology

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us | e-GGRT RY2011.R.14 | xprocess-unit2

Process Unit Information for Mass Balance Option Reporting Only

Subpart X also collects the following additional information for the mass balance option (note that reporting some of this information is optional, as specified in §98.246(a)(10) of subpart X):

- Wastewater (Optional Questions)
 - Total Annual Flow of Wastewater
 - Unit of Measure for Total Annual Flow of Wastewater (kg or gal)
 - Annual Average Carbon Content of the Wastewater (decimal fraction)
- Unburned Carbon Releases (Optional Questions)
 - Annual Mass of Carbon Released in Fugitive Emissions Not Controlled with a Combustion Device (in metric tons)
 - Annual Mass of Carbon Released in Process Vents Not Controlled with a Combustion Device (in metric tons)

- Off-Spec Product Information (Note that this information is required only if you complied with the alternative sampling and analysis option in §98.243(c)(4) for a product from the process unit)
 - Number of Days During which Off-Spec Product was Produced (in days)
 - Mass or Volume of Off-Spec Product Produced
 - Unit of Measure for the Mass or Volume of Off-Spec Product Produced (kg, gal, scf)
- Combustion Configurations
 - Identify each Combustion Configuration that Burned Both Process Off-Gas from the Petrochemical Process Unit and Supplemental Fuel by Providing the Name/Identifier of Those Units as Reported under Subpart C (Note that for these configurations you must report the GHG emissions from the combustion of the supplemental fuel under subpart C). If there are no such combustion configurations, please type in "none".

When you have entered the required information, click SAVE. This action will take you back to the "x-overview" screen.

Modifying Summary Information for a Petrochemical Process Unit

To modify existing Subpart X Process Unit Summary Information for this Facility, locate the PETROCHEMICAL PROCESS UNITS table on the Subpart X Overview screen and click on the desired Name or ID in the left-most column in the table.

Click image to expand

The screenshot shows the EPA e-GGRT Subpart X Overview screen for Facility AB. The main content area is titled "Subpart X: Petrochemical Production (2011)" and includes an "Overview of Subpart Reporting Requirements" section. Below this, there are three tables:

- PETROCHEMICAL PROCESS UNITS:** A table with columns for Name/ID, CO₂ (metric tons), Status, and Delete. One entry is shown: "Unit 31" with a CO₂ value of 45.0 and a status of "Incomplete".
- PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS):** A table with columns for Name/ID, Status, and Delete. One entry is shown: "Petrochemical Production" with a status of "Incomplete".
- FLARE'S UNIT LEVEL EMISSIONS SUMMARY (REQUIRED ONLY FOR CEMS AND ETHYLENE COMBUSTION METHODOLOGIES):** A table with columns for Name/ID, CO₂ (metric tons), CH₄ (metric tons), H₂O (metric tons), Status, and Delete. The current status is "None entered".

At the bottom of the screen, there is a "CEMS MONITORING LOCATION (CML) SUMMARY" table with columns for CML Name/Identifier, CML Configuration, Monitored Unit(s), Total CO₂ emissions (metric tons), Status, and Delete. The current status is "No CEMS monitoring locations present".

Deleting a Petrochemical Process Unit

To delete an existing Subpart X Process Unit Summary Information for this Facility, locate the PETROCHEMICAL PROCESS UNITS table on the Subpart X Overview screen by Name or ID and click the red "X" icon in the Delete column. Note that this action also deletes any details about the process unit that you provided on subsequent data entry screens.

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See Also

- Screen Errors
- [Using e-GGRT to Prepare Your Subpart X Report](#)
- [Subpart X Process Unit Summary Information for this Facility](#)
- [Subpart X MASS BALANCE Option Reporting - Process Data](#)
- [Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)
- [Subpart X ETHYLENE Option Reporting](#)
- [Subpart X CEMS Option Reporting](#)
- [Subpart Validation Report](#)

Subpart X MASS BALANCE Option Reporting - Process Data

This help page provides a step-by-step description of how to enter and edit Subpart X petrochemical process unit CO₂ emissions, feedstock data, and product data for the mass balance option. This is a review of information provided in the Process Unit Summary Information Section..

Click image to expand

Subpart X: Petrochemical Production (2011)
Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS
Subpart X requires affected facilities to report Greenhouse gases (GHG) from each petrochemical process unit. First, use this page to identify each petrochemical process unit and then enter GHG data required by Subpart X. For additional information about Subpart X reporting, please use the e-GGRT Help links provided.

PETROCHEMICAL PROCESS UNITS

Name/ID	CO ₂ (metric tons)	Status	Actions
Unit 34	45.0	Incomplete	OPEN ✕

PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS)

Facility Overview

*A status of "Incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above (Note: if there are no validation messages for this subpart you will not see this link).

Start on the Subpart X Overview screen and click on the "ADD a Process Unit" link. This action takes you to the "x-process-unit-1" screen. Select "Mass Methodology" and NEXT. This action takes you to the "x-process-unit-2" screen.

Click image to expand

Subpart A: Petrochemical Production (2011)
Subpart Overview - [Add/Edit a Process Unit](#)

PETROCHEMICAL PROCESS UNIT INFORMATION
Subpart X requires a facility to uniquely identify each petrochemical process unit and provide the information described below for each. For additional information about adding and editing a petrochemical process unit, please use the e-GGRT Help link(s). * denotes a field required to advance within e-GGRT.

Name or ID * (40 characters maximum)

Description

Type

PETROCHEMICAL PRODUCED

Type of petrochemical produced

Annual quantity of the petrochemical produced (metric tons)

WASTEWATER (OPTIONAL REPORTING REQUIREMENTS)

Total annual wastewater flow

Unit of measure for total annual wastewater flow (gal or kg)

Annual average carbon content of wastewater (weight fraction)

RELEASED CARBON (OPTIONAL REPORTING REQUIREMENTS)

Annual mass of carbon released by fugitive emissions not controlled with a combustion device (metric tons)

Annual mass of carbon released in process vents not controlled with a combustion device (metric tons)

OFF-SPEC PRODUCT PRODUCTION
Required only if facility complied with 98.243(c)(4) for a product from this process unit

Number of days during which off-spec product was produced (days)

Mass or volume of off-spec product produced

Unit of measure for the mass or volume of off-spec product produced

COMBUSTION CONFIGURATIONS
Identify each combustion configuration that burned both process off-gas from the petrochemical process unit and supplemental fuel by providing the name identifier of those configurations as reported under Subpart C. (If there aren't any, please specify "None")

METHODOLOGY USED
Please select the methodology that is used to measure this petrochemical process unit's emissions?

CEMS Methodology (Note: This methodology must be selected if certain criteria are met. See Help for details.)

Mass Methodology

Ethylene Methodology

Enter information about the process unit on this screen as described in the Process Unit Summary Section of these instructions. Click SAVE at the bottom of the screen, which takes you back to the "x-overview" screen.

Report CO₂ Emissions from the Process Unit

From the "x-overview" screen, select OPEN next to the newly added process unit. This action takes you to the "x-process-unit-data" screen.

Click image to expand

Subpart A
Subpart X: Petrochemical Production (2011)
Subpart Overview » Process Unit GHG Info

GHG DATA AND ASSOCIATED INFORMATION
Use this page to enter the GHG data required by Subpart X. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Process Unit PROCESS UNIT 2

EQUATION X-4 SUMMARY AND RESULT

$$CO_2 = 0.001 \times \frac{44}{12} \times (C_p + C_i + C_s)$$

Hover over an element in the equation above to reveal a definition of that element.

Annual CO₂ mass emissions from process operations and process off-gas combustion 500 (metric tons)
Use Subpart X equation spreadsheets to calculate

CARBON-CONTAINING FEEDSTOCKS

Name	State	Delete
+ADD a Feedstock		

CARBON-CONTAINING PRODUCTS

Name	State	Delete
+ADD a Product		

Back to Overview SAVE

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RV2011 R.12 | x-process-unit-data

Subpart X requires you to calculate and report the annual CO₂ mass process emissions using Equations X-1 through X-4. Process emissions include CO₂ generated by reaction in the process and by combustion of process off-gas in stationary combustion units and flares. For the mass balance option, emissions from combustion of process off-gas in combustion units and flares are accounted for within Equations X-1 through X-4. They do not need to be reported separately under the stationary combustion unit in Subpart C or flare sections in Subpart X.

To calculate the emissions you may use the optional spreadsheets that are provided for your convenience, or you may develop your own system for calculating the emissions in accordance with Equations X-1 through X-4. To use the spreadsheets:

- Download the appropriate spreadsheets by clicking on “Use subpart X equation spreadsheets to calculate” link. Populate the spreadsheet using the instructions provided in the spreadsheets (also see the [Using Subpart X Calculation Spreadsheets](#) help for additional details about using the spreadsheets).
- Copy the CO₂ value from Equation X-4 into the red-bordered box on the “x-process-unit-data” screen.

Add Each Carbon-Containing Feedstock Used in the Process Unit

To add a feedstock, click on the “+ADD a Feedstock” link on the “x-process-unit-data” screen. This action takes you to the “x-feedstock” screen.

Click image to expand

Subpart A
Subpart X: Petrochemical Production (2011)
Subpart Overview » Add/Edit a Process Unit » Feedstock

PROCESS UNIT FEEDSTOCK INFORMATION
Use this page to identify the name and state of each carbon-containing feedstock for this process unit. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided. * denotes a field required to advance within e-GGRT

CARBON-CONTAINING FEEDSTOCK

Name of Feedstock* Natural gas
State of Feedstock* gaseous

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RV2011 R.12 | x-feedstock

Subpart X requires you to provide:

- Names of each Carbon-Containing Feedstock

Note that eGGRT provides a pick list with several common petrochemical feedstocks from which to choose. This list may not be complete. If you use a carbon-containing feedstock that is not on the list, select “other” from the pick list and then type in the name of the compound.

- State of each Carbon-Containing Feedstock

You must select one of the following three choices from the pick list: solid, liquid, or gaseous.

When you have entered the required information for one carbon-containing feedstock, click SAVE. This action takes you back to the “x-process-unit-data” screen. Repeat the steps in this section for each additional carbon-containing feedstock used in the process.

Add Each Carbon-Containing Product Produced by the Process Unit

To add a product, click on the “+ADD a Product” link on the “x-process-unit-data” screen. This action takes you to the “x-product” screen.

Click image to expand

The screenshot shows the EPA e-GGRT interface for Subpart X reporting. The main heading is 'Subpart X: Petrochemical Production (2011)'. Below this, there is a section titled 'PROCESS UNIT PRODUCT INFORMATION' which instructs users to identify the name and state of each carbon-containing product. A table for 'CARBON-CONTAINING PRODUCT' is displayed with two columns: 'Name of Product*' and 'State of Product*'. The first row shows 'Heavy Gasoline' and 'liquid'. A 'SAVE' button is located at the bottom of the table.

Subpart X requires you to provide:

- Names of each Carbon-Containing Product

Note that eGGRT automatically enters the name of the petrochemical that you entered on the “x-process-unit-2” screen when providing summary information about the process unit. For other carbon-containing products produced by the same process, you can change this entry using the provided pick list. The pick list includes several common products from petrochemical process units, but it may not be complete. If you produce a carbon-containing byproduct that is not listed, select “other” from the list and then type in the name of the product. Also use the “other” entry for carbon-containing liquid wastes.

- State of each Carbon-Containing Product

You must select one of the following three choices from the pick list: solid, liquid, or gaseous.

When you have entered the required information for one product, click SAVE. This action takes you back to the “x-process-unit-data” screen. Repeat the steps in this section for each additional carbon-containing product produced in the process.

Modify CO₂ Emissions Data or Data for a Saved Feedstock or Product

To modify saved CO₂ data or saved feedstock or product data associated with a petrochemical process unit, first navigate to the “x-process-unit-data” screen (e.g., see the [introductory paragraph on this help page](#) for the path).

To change CO₂ emissions data, follow the same steps described [above](#).

To change feedstock or product data, locate the desired feedstock or product name in the left-most column of the Feedstock or Product table on the “x-process-unit-data” screen and click on the Name. This action takes you to either the “x-feedstock” screen or the “x-product” screen where you can change the previously entered data.

Delete a Saved Feedstock or Product

To delete a previously saved feedstock or product, locate the desired feedstock or product name in the left-most column of the Feedstock or Product table on the “x-process-unit-data” screen and click on the red “X” icon in the Delete column.

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See Also

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[Subpart X MASS BALANCE Option Reporting - Process Data](#)

[Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)

[Subpart X ETHYLENE Option Reporting](#)

[Subpart X CEMS Option Reporting](#)

[Subpart Validation Report](#)

Subpart X MASS BALANCE Option Reporting - Measurement Methods Information

This help page provides a step-by-step description of how to enter information about methods that you used to measure flow and carbon content (or composition) of feedstocks and products when you use the mass balance reporting methodology.

Navigate to the Appropriate Data Entry Screen

Click image to expand

Facility AB
Subpart X: Petrochemical Production (2011)
Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS
Subpart X requires affected facilities to report Greenhouse gases (GHG) from each petrochemical process unit. First, use this page to identify each petrochemical process unit and then enter GHG data required by Subpart X. For additional information about Subpart X reporting, please use the e-GGRT Help links provided.

EPA has finalized a rule that defers the deadline for reporting certain data elements used as inputs to emission equations for direct emissions until March 31, 2015. See 76 FR 53937 (published August 25, 2011). In accordance with the rule, e-GGRT is not currently collecting this subset of inputs to emission equations.

Subpart X: View Validation

PETROCHEMICAL PROCESS UNITS

Name/ID	CO ₂ (metric tons)	Status ¹	Delete
Unit 31	45.0	Incomplete	OPEN X

ADD a Process Unit

PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS)

Name/ID	Status ¹	Delete
Petrochemical Production	Incomplete	X

ADD a process unit monitored by CEMS

FLARE'S UNIT LEVEL EMISSIONS SUMMARY (REQUIRED ONLY FOR CEMS AND ETHYLENE COMBUSTION METHODOLOGIES)

Name/ID	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	Status ¹	Delete
None entered					

ADD a Flare

CEMS MONITORING LOCATION (CML) SUMMARY

CML Name/Identifier	CML Configuration	Monitored Unit(s)	Total CO ₂ emissions (metric tons)	Status	Delete
No CEMS monitoring locations present					

ADD a CEMS Monitoring Location

Facility Overview

¹A status of "incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above (note: if there are no validation messages for this subpart you will not see this link).

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RY2011.R.15 | x-overview

Assuming you start on the "x-overview" screen, locate the name/ID of a process unit in the "Petrochemical Process Units" Table. Then click OPEN in the same row of the Table. This action takes you to the "x-process-unit-data" screen.

Note that you must select a process unit for which you are calculating emissions using the mass balance methodology, not the CEMS or ethylene methodologies.

Click image to expand

Subpart A
Subpart X: Petrochemical Production (2011)
Subpart Overview » Process Unit GHG Info

GHG DATA AND ASSOCIATED INFORMATION
Use this page to enter the GHG data required by Subpart X. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Annual CO₂ mass emissions from process operations and process off-gas combustion (metric tons): 500.0

Process Unit: PROCESS UNIT 2

EQUATION X-4 SUMMARY AND RESULT
$$CO_2 = 0.001 \times \frac{44}{12} \times (C_p + C_i + C_s)$$

Hover over an element in the equation above to reveal a definition of that element.

Annual CO₂ mass emissions from process operations and process off-gas combustion: 500 (metric tons)
Use Subpart X equation spreadsheets to calculate

CARBON-CONTAINING FEEDSTOCKS

Name	State	Delete
Natural gas	gaseous	OPEN X

ADD a Feedstock

CARBON-CONTAINING PRODUCTS

Name	State	Delete
Heavy Gasoline	liquid	OPEN X

ADD a Product

Back to Overview SAVE

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RY2011.R.12 | x-process-unit-data

Locate the name of one feedstock or product that you previously entered (see Subpart X Mass Balance Option Reporting - Process Data help) and click OPEN in that same row of the table. This action takes you to either the "x-feedstock-data" screen or the "x-product-data" screen.

Enter Method Measurement Information for Feedstocks

Click image to expand

GGRT Help
Using GGRT for Subpart Reporting

Subpart A
Subpart X: Petrochemical Production (2011)
Subpart Overview • GGRT Info • PROCESS UNIT 2

GHG EMISSIONS AND ASSOCIATED INFORMATION
Use this page to enter the greenhouse gas information required by Subpart X for this Subpart, for this process unit. Note that some information is gathered separately for each month of the reporting year. For additional information about the data collected on this page, please see the GGRT Help link provided.

Process Unit: PROCESS UNIT 2
Feedback

If applicable, dates for each process change that reduce the compliance to less than 99.5%

WEIGHING DEVICE, FLOW METER, OR TANK LEVEL MEASUREMENT DETAILS
If a weighing device, flow meter, or tank level measurement device was used at any point during the year to measure the mass or volume of feedback:

Describe the weighing device, flow meter, or tank level measurement device method of operation
Describe the weighing device, flow meter, or tank level measurement device calibration method

JANUARY
Volume for month based on mixing data procedure
Volume measurement method: Select [x] Make all months same
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x] Make all months same
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x] Make all months same
Standard temperature at which volume is reported: Select [x] Make all months same

FEBRUARY
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

MARCH
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

APRIL
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

MAY
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

JUNE
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

JULY
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

AUGUST
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

SEPTEMBER
Volume for month based on mixing data procedure
Volume measurement method: Select [x]
Carbon content or composition for month based on mixing data procedure
Carbon content or composition determination method: Select [x]
Molecular weight for month based on mixing data procedure, if applicable
Molecular weight determination method, if applicable: Select [x]
Standard temperature at which volume is reported: Select [x]

OCTOBER
Volume for month based on mixing data procedure

The “x-feedstock-data” screen is arranged with a series of sections.

In the top section, enter the following information:

- If at any time during the year you complied with the alternative sampling and analysis method in §98.243(c)(4) for the selected feedstock, enter the dates for each process change that reduced the composition to less than 99.5%. If there were none, leave this box blank.

Note that for the month(s) in which such events occurred you must measure the carbon content using a method specified in §98.244(b)(4) and fill in the relevant information in the monthly section(s) described below.

In the second section, enter the following information:

- Flow Meter, Weighing Device or Tank Level Measurement Device Operation Details (enter information only if a flow meter, weighing device or tank level measurement device was used at any point during the year to measure the mass or volume of the feedstock)
 - Description of the flow meter, weighing device or tank level measurement device manufacturer’s recommended method for operation
 - Description of the calibration method for the flow meter, weighing device or tank level measurement device.

If the flow meter, weighing device or tank level measurement device does not require calibration per the manufacturer’s instructions, then state that calibration is not required in the “Description of the calibration method” text box.

In the third section on the “x-feedstock-data” screen, enter the following information for methods used in the month of January. If you did not operate the process, or did not use this particular feedstock in January, leave the boxes in this section blank. In such cases, ignore the validation warnings that will be issued for leaving boxes empty.

- Indicate if volume for January is based on missing data procedure (click in the check box)

Do not check the box if you did not use a missing data procedure to estimate flow in January

- Volume Measurement Method

Choices in a pick list from which you may select are: flow meter, tank level measurements, weighing device, or other. Note that “other” is to be used only if the other listed methods do not apply or you used BAMM procedures.

If you used the same method in every month during the year, click on the “make all months the same” link. This action is a time-saving device that will automatically enter the selected method in the sections for February through December. However, you can edit any of those entries, if necessary.

- Indicate if carbon content or composition for January is based on missing data procedure (click in the check box)

Do not check the box if you did not use a missing data procedure to estimate carbon content or composition in January.

Do not check the box if you used the alternative sampling and analysis option in §98.243(c)(4).

- Method used to determine carbon content or composition

Choose the applicable method from the pick list. Note that the list includes all of the methods specified in §98.244(b)(4).

Leave this box blank if you complied with the alternative sampling and analysis option in §98.243(c)(4) for this feedstock during January.

If you used the same method in every month during the year, click on the "make all months the same" link. This action is a time-saving device that will automatically enter the selected method in the sections for February through December. However, you can edit any of these entries, if necessary.

If you select the alternative method allowed in §98.244(b)(4)(xv)(B), note that two additional boxes will appear in which you must enter the name of the method and provide an explanation for why the alternative method was needed. In the first year that you use the method you must also attach a copy of the method to your report using the procedures described at the bottom of the "x-feedstock-data" screen.

- For a gaseous feedstock, provide the following additional information, if applicable:
 - Indicate if molecular weight of the feedstock stream for January is based on missing data procedure (click in the check box)

Do not check the box if you did not use a missing data procedure to estimate the molecular weight in January.

Note that measurement of the molecular weight of the feedstock stream (i.e., the average molecular weight) is not needed if you measure the composition. In such cases, use the known molecular weights of the identified compounds in the stream, and do not check the box.

- Method used to determine molecular weight

Note that eGGRT provides a pick list with two options: calculation based on chemical formula and atomic weights, or an alternative method as allowed by §98.244(b)(4)(xv)(B).

If you used the same method in every month during the year, click on the "make all months the same" link. This action is a time-saving device that will automatically enter the selected method in the sections for February through December. However, you can edit any of these entries, if necessary.

- Standard temperature at which volume is reported

eGGRT provides two options in a pick list: 60°F or 68°F.

The temperature is used to determine the correct molar volume conversion (MVC) factor for use in Equation X-1. If you measure volumetric flow rate, you need the MVC and must fill in this box. However, if you measure mass flow, you do not need the MVC, and you should leave this box blank. In cases where you do need the MVC and you leave this box blank, ignore the validation warnings that will be issued for leaving boxes empty, and ignore the fact that the status for the process will be shown as incomplete in the PETROCHEMICAL PROCESS UNITS table on the "x-overview" screen.

If you corrected volumes to the same temperature in each month during the year, click on the "make all months the same" link. This action is a time-saving device that will automatically enter the selected method in the sections for February through December. However, you can edit any of these entries, if necessary.

Repeat the steps to enter applicable information in the sections for each additional month in the year during which the process operated or the specific feedstock was used (except the "make all months the same" links are not provided in the February through December sections).

When you have entered all of the applicable information for this feedstock, click SAVE. This action takes you back to the "x-process-unit-data" screen. Repeat the steps above for each additional feedstock used in the petrochemical process unit during the year.

Enter Method Measurement Information for Products

The method measurement information to report for products on the "x-product-data" screen is the same as for feedstocks on the "x-feedstock-data" screen. Thus, the help procedures described above also apply to products.

Click image to expand

e-GGRT Help
Using e-GGRT for Subpart X Reporting

Subpart A
Subpart X: Petrochemical Production (2011)

Subpart Overview » GHG Info » PROCESS UNIT 2

GHG INFORMATION AND ASSOCIATED DATA

Use this page to enter the greenhouse gas information required by Subpart X for this product, for this process unit. Note that some information is gathered separately for each month of the reporting year. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Process Unit: PROCESS UNIT 2
Product: Heavy Gasoline

If applicable, dates for each process change that reduced the composition to less than 99.5%:

WEIGHING DEVICE, FLOW METER, OR TANK LEVEL MEASUREMENT DETAILS

If a weighing device, flow meter, or tank level measurement device was used at any point during the year to measure the mass or volume of product:

Describe the weighing device, flow meter, or tank level measurement device method of operation:

Describe the weighing device, flow meter, or tank level measurement device calibration method:

JANUARY

Volume or mass for month based on missing data procedure:
Volume or mass measurement method: Make all months same
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method: Make all months same

FEBRUARY

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

MARCH

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

APRIL

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

MAY

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

JUNE

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

JULY

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

AUGUST

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

SEPTEMBER

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

OCTOBER

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

NOVEMBER

Volume or mass for month based on missing data procedure:
Volume or mass measurement method:
Carbon content or composition for month based on missing data procedure:
Carbon content or composition determination method:

DECEMBER

Volume or mass for month based on missing data procedure

Volume or mass measurement method

Carbon content or composition for month based on missing data procedure

Carbon content or composition determination method

FILE UPLOAD (required only if 99.244(b)(4)(v)(B) alternative method was used)
(Only Word and PDF files are accepted)

Uploaded File Name	Attached By	Date
Subpart A - Help Content Changes Feb-2012 (2).docx	Caitlin Cartere	February 7, 2012

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RV2011.R.12 | > product-data

Modify Method Measurement Information

To modify saved method measurement information for a feedstock or product, navigate to the "x-feedstock-data" or "x-product-data" screen as described above and then edit previous information as applicable.

[Back to Top](#)

See Also

Screen Errors

- [Using e-GGRT to Prepare Your Subpart X Report](#)
- [Subpart X Process Unit Summary Information for this Facility](#)
- [Subpart X Mass Balance Option Reporting - Process Data](#)
- [Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)
- [Subpart X ETHYLENE Option Reporting](#)
- [Subpart X CEMS Option Reporting](#)
- [Subpart Validation Report](#)

Subpart X ETHYLENE Option Reporting

This help page provides a step-by-step description of how to enter information related to the ETHYLENE reporting methodology for a petrochemical process unit.

Step1. Entering Data for an Ethylene Process Unit

[Click image to expand](#)

Subpart X: Petrochemical Production (2011)

Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS
Subpart X requires affected facilities to report Greenhouse gases (GHG) from each petrochemical process unit. First, use this page to identify each petrochemical process unit and then enter GHG data required by Subpart X. For additional information about Subpart X reporting, please use the e-GGRT Help links provided.

EPK has finalized a rule that defers the deadline for reporting certain data elements used as inputs to emission equations for direct emitters until March 31, 2015. See 76 FR 62677 published August 26, 2011, in accordance with the rule, e-GGRT is not currently collecting this subset of inputs to emission equations.

Subpart X: View Validation

PETROCHEMICAL PROCESS UNITS

Name/ID	CO ₂ (metric tons)	Status ¹	Delete
PROCESS UNIT 2	500,000.0	Complete	OPEN <input type="button" value="X"/>

[ADD a Process Unit](#)

PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS)

Name/ID	Status ¹	Delete
Petrochemical Production	Incomplete	<input type="button" value="X"/>

[ADD a process unit monitored by CEMS](#)

FLARES UNIT-LEVEL EMISSIONS SUMMARY (REQUIRED ONLY FOR CEMS AND ETHYLENE COMBUSTION METHODOLOGIES)

Name/ID	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	Status ¹	Delete
None entered					

[ADD a Flare](#)

CEMS MONITORING LOCATION (CML) SUMMARY

CML Name/Identifier	CML Configuration	Monitored Unit(s)	Total CO ₂ emissions (metric tons)	Status	Delete
No CEMS monitoring locations present					

[ADD a CEMS Monitoring Location](#)

[Facility Overview](#)

¹A status of "incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above (Note: if there are no validation messages for this subpart you will not see this link).

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RV2011.R.12 | > overview

Start on the Subpart X Overview screen and click on the "ADD a Process Unit" link. This action takes you to the "x-process-unit-1" screen. Select "Mass Methodology" and NEXT. This action takes you to the "x-process-unit-2" screen.

Click image to expand

United States Environmental Protection Agency | e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

e-GGRT Help | Using e-GGRT for Subpart X Reporting

CITY ELECTRIC SYSTEM TEST

Subpart X: Petrochemical Production (2011)

Subpart Overview | Add | Edit | Add a Process Unit

PETROCHEMICAL PROCESS UNIT INFORMATION

Subpart X requires a facility to uniquely identify each petrochemical process unit and provide the information described below for each. For additional information about adding and editing a petrochemical process unit, please use the e-GGRT Help link(s) provided. * denotes a field required to advance within e-GGRT

Name or ID * PROCESS UNIT 2 (40 characters maximum)

Description

Type Petrochemical Process Unit

PETROCHEMICAL PRODUCED

Type of petrochemical produced Ethylene

Annual quantity of ethylene produced 21 (metric tons)

METHODOLOGY USED

Please select the methodology that is used to monitor this petrochemical process unit's emissions?

CEMS Methodology (Note: This methodology must be selected if certain criteria are met. See Help for details.)

Mass Methodology

Ethylene Methodology

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us | e-GGRT RY2011 R.12 | x-process-unit-2

Enter the production rate on this screen. You may also enter an optional description of the process unit. Click SAVE at the bottom of the page, which takes you back to the "x-overview" screen.

Click image to expand

United States Environmental Protection Agency | e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

e-GGRT Help | Using e-GGRT for Subpart X Reporting

Facility AB

Subpart X: Petrochemical Production (2011)

Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS

Subpart X requires affected facilities to report Greenhouse gases (GHG) from each petrochemical process unit. First, use this page to identify each petrochemical process unit and then enter GHG data required by Subpart X. For additional information about Subpart X reporting, please use the e-GGRT Help links provided.

EPA has finalized a rule that defers the deadline for reporting certain data elements used as inputs to emission equations for direct emissions until March 31, 2015. See 76 FR 53857 (published August 25, 2011), in accordance with the rule, e-GGRT is not currently collecting the subset of inputs to emission equations.

Subpart X: View Validation

PETROCHEMICAL PROCESS UNITS

Name/ID	CO ₂ (metric tons)	Status*	Delete
PROCESS UNIT 2	N/A	Incomplete	OPEN

ADD a Process Unit

PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS)

ADD a process unit monitored by CEMS

FLARES UNIT-LEVEL EMISSIONS SUMMARY (REQUIRED ONLY FOR CEMS AND ETHYLENE COMBUSTION METHODOLOGIES)

Name/ID	CO ₂ (metric tons)	CH ₄ (metric tons)	H ₂ O (metric tons)	Status*	Delete
None entered					

ADD a Flare

Facility Overview

*a status of "incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above (note: if there are no validation messages for this subpart you will not see this link).

Paperwork Reduction Act Burden Statement | Contact Us | e-GGRT RY2011 R.17 | x-overview

When the ETHYLENE combustion methodology option is selected for a process unit (see the Facility summary information help), an additional table is added on the Subpart Overview screen.

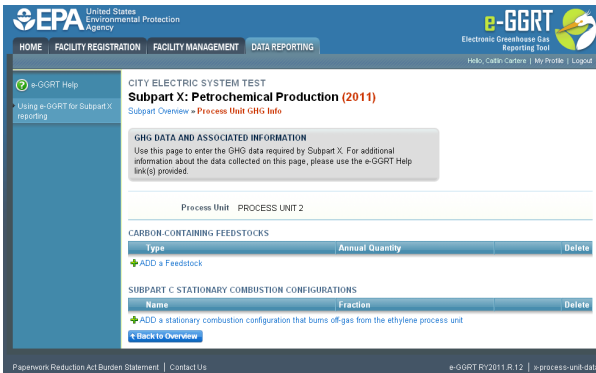
The additional table is titled "Flares Unit-Level Emissions Summary (Required Only for CEMS and Ethylene Combustion Methodologies)." Click on the "ADD a Flare" link below the table to add information about any flare that controls emissions from an ethylene process for which you are estimating emissions using the ethylene combustion methodology. See the Subpart Y Flare Reporting Help for details on the information to report for flares.

To enter other information related to the ethylene process unit, select "ADD a Process Unit" on the "x-overview" screen. This action takes you to the "x-process-unit-2" screen. From here, choose the "Ethylene Methodology". Then enter additional information on the x-process-unit-2 screen.

Step 2. Adding Feedstock Data

Locate the name/ID of the ethylene process unit in the "Petrochemical Process Units" Table. Then click OPEN in the same row of the Table. This action takes you to the Process Unit GHG Info. Report information on this screen about each carbon-containing feedstock used in the ethylene process unit and each stationary combustion configuration that burns off-gas from the ethylene process unit following the procedures described below.

Click image to expand



The steps to add feedstock data are as follows:

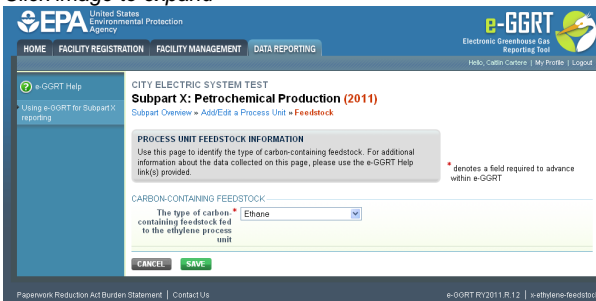
2a. Click on the “+ADD a Feedstock” link in the Process Unit GHG Info screen

This action takes you to the “x-ethylene-feedstock” screen

2b. Identify a feedstock

Note that eGGRT provides a pick list with several common ethylene process feedstocks from which to choose. If you use a feedstock that is not on the list, select “other” from the list and then type in the name of the feedstock in the box that opens when you select “other”.

Click image to expand

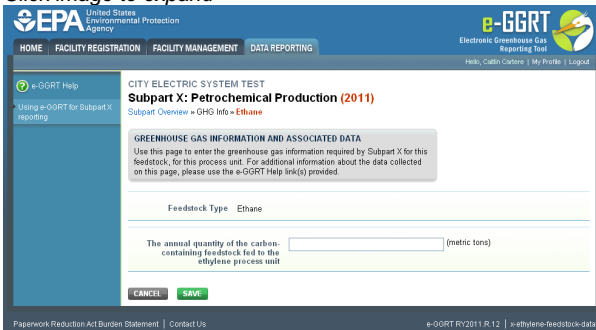


After identifying the feedstock, click SAVE. This action takes you back to the “x-process-unit-data” screen and enters the name in the feedstock table.

2c. Enter the annual quantity of the feedstock used in the ethylene process unit (in metric tons)

To enter this information, first click OPEN in the row that contains the feedstock name in the Feedstocks table on the Process Unit GHG Info screen. This action takes you to the “x-ethylene-feedstock-data” screen. Type the quantity in the box provided.

Click image to expand



After entering the quantity, click SAVE. This action takes you back to the “x-process-unit-data” screen and enters the quantity on the row for the feedstock in the Feedstocks table.

Note that the system will provide a validation warning if you provide a quantity greater than EPA expects based on production capacities at existing facilities.

Repeat the steps in this section for each additional feedstock used in the process during the year.

Step 3. Adding Stationary Combustion Configuration Data

The steps to add stationary combustion configuration data are as follows:

3a. Click on the “+ADD a Stationary Combustion Configuration...” link in the “x-process-unit-data” screen

This action takes you to the “x-ethylene-stationary-unit” screen.

Click image to expand

The screenshot shows the EPA e-GGRT interface for adding stationary combustion configuration data. The page is titled "Subpart X: Petrochemical Production (2011)". It features a "PROCESS UNIT STATIONARY UNIT INFORMATION" section with a text input field for "Configuration XYZ". A note indicates that CO2 emissions for this methodology are reported under subpart C. The page includes "CANCEL" and "SAVE" buttons at the bottom.

3b. Identify a stationary combustion configuration that burns off-gas from the ethylene process unit.

Type in the appropriate name or other identifier in the box provided.

After identifying a stationary combustion configuration, click SAVE. This action takes you back to the “x-process-unit-data” screen and enters the name in the stationary combustion configuration table.

3c. Enter the fraction of the total emissions from this configuration that is attributable to combustion of off-gas from the ethylene process unit (i.e., a value between 0 and 1).

To enter this information, first click OPEN in the row that contains the stationary combustion configuration name in the stationary combustion configurations table. This action takes you to the “x-ethylene-combustion-unit-data” screen. Type the quantity in the box provided.

Click image to expand

The screenshot shows the EPA e-GGRT interface for entering the fraction of total emissions from a stationary combustion configuration. The page is titled "Subpart X: Petrochemical Production (2011)". It features a "GREENHOUSE GAS INFORMATION AND ASSOCIATED DATA" section with a text input field for "The fraction of the total emissions from this configuration that is attributable to combustion of off-gas from the ethylene process unit". The page includes "CANCEL" and "SAVE" buttons at the bottom.

After entering the quantity, click SAVE. This action takes you back to the “x-process-unit-data” screen and enters the quantity on the row for the stationary combustion configuration in the Stationary Combustion Configurations table.

Note that you do not report the total CO₂ emissions from the stationary combustion unit in the subpart X reporting forms (and the “Petrochemical Process Units” table on the “x-overview” screen shows N/A in the CO₂ emissions column). You must report these emissions and other relevant data using the subpart C reporting forms. Make sure to use the same stationary combustion configuration name ID in the subpart C forms as you used in this table.

Repeat the steps in this section for each additional stationary combustion configuration that burned off-gas from the ethylene process unit during the year.

Step 4. Modifying Saved Feedstock or Stationary Combustion Configuration Data

To modify a feedstock or stationary combustion configuration name, locate the saved name in the applicable table on the “x-process-unit-data” screen. Click on the name to take you to either the “x-ethylene-feedstock” screen or the “x-ethylene-stationary-unit” screen. Edit the existing entries as necessary and click SAVE.

To modify a feedstock quantity or fraction of emissions attributable to combustion of ethylene process off-gas, click OPEN in the applicable feedstock or stationary combustion configuration row in the "x-process-unit-data" screen. Then click anywhere in the existing entry and edit as necessary, or highlight the entry and type in a new value.

Step 5. Deleting a Saved Feedstock or Stationary Combustion Configuration

Click image to expand

The screenshot shows the EPA e-GGRT interface for 'Subpart X: Petrochemical Production (2011)'. The main content area is titled 'GHG DATA AND ASSOCIATED INFORMATION' and includes a sub-section for 'PROCESS UNIT 2'. There are two tables:

CARBON-CONTAINING FEEDSTOCKS		
Type	Annual Quantity	Delete
Ethane	45334	OPEN X

SUBPART C STATIONARY COMBUSTION CONFIGURATIONS		
Name	Fraction	Delete
Name of Unit	0.45	OPEN X

To delete an existing feedstock or stationary combustion configuration, locate the saved name in the applicable table on the "x-process-unit-data" screen and click the red "X" icon in the Delete column for that same row of the table.

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See Also

[Screen Errors](#)

[Using e-GGRT to Prepare Your Subpart X Report](#)

[Subpart X Process Unit Summary Information for this Facility](#)

[Subpart X MASS BALANCE Option Reporting - Process Data](#)

[Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)

[Subpart X ETHYLENE Option Reporting](#)

[Subpart X CEMS Option Reporting](#)

[Subpart Validation Report](#)

Subpart X CEMS Option Reporting

This help page provides a step-by-step description of how to enter information related to the CEMS reporting methodology for a petrochemical process unit.

Step 1. Adding Process Unit that is Monitored by CEMS

Click image to expand

Start on the Subpart X Overview screen and click on either the "+ADD a Process Unit" link or the "+ADD a process unit monitored by CEMS" link. This action takes you to the "x-process-unit-1" screen. Select "CEMS Methodology" and NEXT. This action takes you to the "x-process-unit-3" screen. Enter information about the process unit as described in the Process Unit Summary Information section of these help instructions.

Step 2. Adding a CEMS Monitoring Location

Click image to expand

When the CEMS methodology option is selected for a process unit (see the Facility summary information help), two additional tables are added on the "x-overview" screen.

One table is titled "Flares Unit-Level Emissions Summary (Required Only for CEMS and Ethylene Combustion Methodologies)". Click on the "ADD a Flare" link below the table to add information about any flare that controls emissions from a petrochemical process for which all other process emissions are monitored with CO₂ CEMS. See the Subpart Y Flare Reporting Help for details.

The second table added on the "x-overview" page is titled "CEMS Monitoring Location Summary". To add a CEMS Monitoring Location (CML),

click on the "ADD a CEMS Monitoring Location" link. This action takes you to the "CEMS-Add CML" screen. Additional details on the information to add on this screen are provided below.

Step 3. Adding data for a CML

Click image to expand

The screenshot shows the EPA e-GGRT interface for adding a CEMS Monitoring Location (CML). The page is titled "Facility ABC" and "Subpart X: Petrochemical Production (2011)". It contains several sections for data entry:

- CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) MONITORING LOCATION (CML) INFORMATION:** Includes instructions on how to use the page to uniquely identify each CEMS Monitoring Location (CML) and provide annual GHG emissions.
- CONFIGURATION:** Fields for "CEMS Monitoring Location Name/ID" (40 characters maximum), "Description (optional)", "Configuration Type" (Select), and "Types of fuel combusted in the unit(s) monitored by the CEMS" (200 characters maximum).
- TIER 4 METHODOLOGY INFORMATION:** Fields for "Calculation Methodology" and "Start Date" (01/01/2011), and "Calculation Methodology" and "End Date" (12/31/2011).
- QUARTERLY CO₂ EMISSIONS:** Input fields for Quarter 1, 2, 3, and 4 (metric tons).
- ANNUAL CO₂ EMISSIONS:** Input fields for "Total annual CO₂ mass emissions (biogenic and non-biogenic) measured by the CEMS" and "Total annual biogenic CO₂ mass emissions" (metric tons). A checkbox is present to indicate if emissions are reported for a slipstream that bypassed the CEMS.
- EQUATION C-10 SUMMARY AND RESULTS:** Shows the formula $CH_4 \text{ or } N_2O = 0.001 \times (F) \times EF$. Includes input fields for "Total CH₄ emissions" and "Total N₂O emissions" (metric tons) with links to use the Equation C-10 spreadsheet to calculate.
- ADDITIONAL EMISSIONS INFORMATION:** Input fields for "Total number of source operating hours in the reporting year" and "The total operating hours in which a substitute data value was used in the emissions calculations for CO₂ concentration" (hours).
- CEMS MONITORING LOCATION PROCESS UNITS:** A section for "Process Unit Name/Identifier" with a note: "There are no process units monitored by CEMS available for selection."

At the bottom, there are "CANCEL" and "SAVE" buttons.

Subpart X requires you to provide the following information for each CML:

- A unique name or identifier for the CML (see also About Unique Names). You may also provide an optional description of the CML to supplement the name or identifier.
- One of the following CML Configuration Types
 - Single process/process unit exhausts to dedicated stack. *Select this configuration when a CO₂ CEMS is used to measure a vented stream from a petrochemical process unit, and the stream is not combined with emissions from other processes or combustion units before the CEMS. Also select this option when a CO₂ CEMS measures the outlet stream from a non-combustion control device that is used to control process vent emissions from a petrochemical process, and the outlet stream from the control device is not combined with emissions from other process units or combustion devices before the CEMS.*
 - Multiple processes/process units share common stack. *Select this configuration only if multiple petrochemical process units share a stack for process vent emissions, and no combustion unit emissions. If multiple petrochemical process units, or a petrochemical process unit and other types of process units, share a stack with one or more combustion units, then select the configuration below.*
 - Process/stationary combustion units share common stack. *Select this configuration anytime process off-gas is routed to a combustion unit. Also select this configuration when exhaust from combustion units burning any fuel other than the*

petrochemical process off-gas is routed to the same stack as process vent emissions from the petrochemical process unit.

- Types of fuel combusted in the unit(s) monitored by the CEMS
- Calculation Methodology Start Date and End Date

Subpart X also collects the following additional information about a CML:

- Quarterly CO₂ Emissions measured by the CEMS
 - Quarter 1 (metric tons)
 - Quarter 2 (metric tons)
 - Quarter 3 (metric tons)
 - Quarter 4 (metric tons)
- Total Annual CO₂ Mass Emissions Measured by the CEMS (metric tons). _Note that the value reported here should equal the sum of the 4 quarterly values reported above. It should also equal the sum of the biogenic and non-biogenic emissions reported in the next two cells.
- If there was a slipstream that bypassed the CEMS
- Total Annual Biogenic CO₂ Mass Emissions (metric tons)
- Total Annual Non-Biogenic CO₂ Mass Emissions (includes fossil fuel, sorbent, and process CO₂ emissions)(metric tons)
- Total Annual CH₄ Emissions (metric tons) – Use Equation C-10 to calculate. *For the single process/process unit and multiple process unit configurations, the reported value here should be zero because these configurations do not include emissions from combustion units. If any fuel in addition to fuel gas is burned in a combustion unit, then the value to report here is the sum of the calculated values over all of the fuels. Subpart X specifies use of equation C-8 to calculate these emissions. Thus, the value of HIA in Equation C-10 should be the product of each measured fuel flow and either the default or calculated HHV for that fuel.*
- Total Annual N₂O Emissions (metric tons) – Use Equation C-10 to calculate. *For the single process/process unit and multiple process unit configurations, the reported value here should be zero because these configurations do not include emissions from combustion units. If any fuel in addition to fuel gas is burned in a combustion unit, then the value to report here is the sum of the calculated values over all of the fuels. Subpart X specifies use of equation C-8 to calculate these emissions. Thus, the value of HIA in Equation C-10 should be the product of each measured fuel flow and either the default or calculated HHV for that fuel.*
- Total number of source operating hours in the reporting year (hours)
- The total operating hours in which a substitute data value was used in the emissions calculations for CO₂ concentration (hours)
- The total operating hours in which a substitute data value was used in the emissions calculations for stack gas flow rate (hours)
- The total operating hours in which a substitute data value was used in the emissions calculations for stack gas moisture content (if moisture correction is required and a continuous moisture monitor is used) (hours)
- CEMS monitoring location process units. *Below the CEMS Monitoring Location Process Units table on the “CEMS-Add CML” screen, click on the “ADD/REMOVE/EDIT a Process Unit” link. This action will take you to the “CEMS-Add CML Unit” screen, which lists all of the petrochemical process units you have already entered into eGGRT. Click on the check box next to each process unit that routes process emissions (defined as both CO₂ emissions generated in the petrochemical process and GHG emissions generated by combustion of off-gas from that process) to the identified CML. Then click SAVE (or click anywhere on the “CEMS-Add CML Unit” screen). This action will display three additional boxes for each checked process unit. In these boxes, report estimated fractions of the CO₂, CH₄, and N₂O emissions from the CML that are attributable to combustion of off-gas from the petrochemical process unit. Note that for the single process and multiple process configurations, the values reported for each fraction should be zero because these configurations do not include combustion units. If other petrochemical process units that have not yet been added on the “x-overview” page also route emissions to this CML, you will have to modify the information related to this CML after you add the additional process unit (follow the procedures described below for modifying a CML). Then, on the “CEMS-Add CML” screen for this CML, click on the “ADD/REMOVE/EDIT a Process Unit” link again, check the box next to the added process unit, and add the applicable fractions of emissions attributable to combustion of off-gas from that process unit. To save information entered on the “CEMS-Add CML Unit” screen you must click SAVE twice: first on the “CEMS-Add CML unit” screen, and then again on the “CEMS-Add CML” screen.*

Click image to expand

The screenshot shows the EPA eGGRT interface for 'Petrochemical Production (2010) Subpart X: Petrochemical Production'. The main content area is titled 'IDENTIFY PROCESS UNITS' and contains a checkbox for 'Is this process unit monitored by the CEMS Monitoring Location?'. Below this are three input fields for 'Fraction of CO₂ emissions from CML', 'Fraction of CH₄ emissions from CML', and 'Fraction of N₂O emissions from CML', each with a '00' value and '(decimal fraction)' label. There are 'CANCEL' and 'SAVE' buttons at the bottom of the form.

Repeat the steps in this section for each additional CML that is associated with the petrochemical process unit.

Step 3. Modifying data for a CML

Click image to expand

Subpart X: Petrochemical Production (2011)
Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS
Subpart X requires affected facilities to report Greenhouse gases (GHG) from each petrochemical process unit. First, use this page to identify each petrochemical process unit and then enter GHG data required by Subpart X. For additional information about Subpart X reporting, please use the e-GGRT Help links provided.

EPA has finalized a rule that defers the deadline for reporting certain data elements used as inputs to emission equations for direct emitters until March 31, 2015. See 76 FR 53057 (published August 25, 2011), in accordance with the rule, e-GGRT is not currently collecting the subset of inputs to emission equations.

Subpart X: No Validation Messages

PETROCHEMICAL PROCESS UNITS

Name/ID	CO ₂ (metric tons)	Status	Actions
ETHY-Process Unit 1	N/A	Complete	OPEN X
PROCESS UNIT 2	500,000.0	Complete	OPEN X

ADD a Process Unit

PETROCHEMICAL PROCESS UNITS (Units monitored by CEMS)

Name/ID	Status	Delete
Petrochemical Production	Complete	X

ADD a process unit monitored by CEMS

FLARES UNIT-LEVEL EMISSIONS SUMMARY (REQUIRED ONLY FOR CEMS AND ETHYLENE COMBUSTION METHODOLOGIES)

Name/ID	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	Status	Delete
FLARE for UNIT1	50.0	54.00	4.000	Complete	OPEN X

ADD a Flare

CEMS MONITORING LOCATION (CML) SUMMARY

CML Name/Identifier	CML Configuration	Monitored Unit(s)	Total CO ₂ emissions (metric tons)	Status	Delete
CML1	Single process/process unit exhausts to dedicated stack	Petrochemical Production	12.0	Complete	X

ADD a CEMS Monitoring Location

Facility Overview

*A status of "incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above those. If there are no validation messages for this subpart you will not see this link.

To modify information related to a particular CML, locate the CEMS Monitoring Location Summary table on the "x-overview" screen and click on the desired Name or ID in the left-most column in the table.

Step 4. Deleting a CML

To delete an existing CML, locate the applicable CML name or ID in the CEMS Monitoring Location (CML) Summary table on the "x-overview" screen and click the red "X" icon in the Delete column for that CML.

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See Also

- [Screen Errors](#)
- [Using e-GGRT to Prepare Your Subpart X Report](#)
- [Subpart X Process Unit Summary Information for this Facility](#)
- [Subpart X MASS BALANCE Option Reporting - Process Data](#)
- [Subpart X MASS BALANCE Option Reporting - Measurement Methods Information](#)
- [Subpart X ETHYLENE Option Reporting](#)
- [Subpart X CEMS Option Reporting](#)
- [Subpart Validation Report](#)

Using Subpart X Calculation Spreadsheets

i These optional spreadsheets are provided to assist reporters in calculating emissions and in keeping records of these calculations.

Reporters are required to keep records of these calculations under 40 CFR 98.3(g) and additional subpart-specific provisions, but are not required to use these spreadsheets or to submit any spreadsheets to EPA.

Spreadsheets may include inputs to emission equations, reporting some of which EPA deferred until 2015. (See 76 FR 53057, published August 25, 2011, <http://www.gpo.gov/fdsys/pkg/FR-2011-08-25/pdf/2011-21727.pdf>).

Overview

This help page provides guidance for working with the supplemental Subpart X calculation spreadsheets. The spreadsheets calculate the CO₂ process emissions in accordance with Equations X-1 through X-4 in subpart X. A facility must use these equations to calculate emissions when complying with the mass balance option in subpart X. As stated in §98.242, process emissions for the mass balance option are the total CO₂

generated in the process itself plus the CO₂ generated by combustion of off-gas from the process. The guidance provides step-by-step instructions for the following tasks:

- [Selecting the Appropriate Calculation Spreadsheet](#)
- [Downloading a Calculation Spreadsheet](#)
- [General Information on Using a Calculation Spreadsheet](#)
- [Using the Equation X-1 Calculation Spreadsheet](#)
- [Using the Equation X-2 Calculation Spreadsheet](#)
- [Using the Equation X-3 Calculation Spreadsheet](#)
- [Using the Equation X-4 Calculation Spreadsheet](#)

Specific information on each of the calculation spreadsheets is provided below:

Calculation Spreadsheet (click to download)	Calculation Result	Selection Criteria: Feedstock/Product Type	Instructions (click to view)
Equation X-1 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Gaseous	X-1 Help
Equation X-2 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Liquid	X-2 Help
Equation X-3 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Solid	X-3 Help
Equation X-4 Calculation Spreadsheet.xls	Annual CO ₂ Emissions	N/A	X-4 Help

Selecting the Appropriate Calculation Spreadsheet

Subpart X requires a facility to report annual CO₂ process emissions from each process unit used to produce petrochemicals. To calculate emissions from a process unit, users must first calculate the annual net contribution to calculated emissions from carbon in gaseous, liquid, and solid feedstocks and products using calculation spreadsheets for equations X-1, X-2, and X-3, respectively. Once completed, users should then copy the results from those spreadsheets into the Equation X-4 Calculation Spreadsheet. This sequence must be repeated for each process unit.

For each process unit with any gaseous feedstocks or products, users should calculate the annual net contribution to calculated emissions from the gaseous carbon materials using Equation X-1 and the Equation X-1 Calculation Spreadsheet. Equation X-1 is provided below:

(Equation X-1)

$$C_g = \sum_{n=1}^{12} \left[\sum_{i=1}^{j \text{ or } k} \left[(F_{gf})_{i,n} * (CC_{gf})_{i,n} * \frac{(MW_f)_i}{MVC} - (P_{gp})_{i,n} * (CC_{gp})_{i,n} * \frac{(MW_p)_i}{MVC} \right] \right]$$

For each process unit with any liquid feedstocks or products, users should calculate the annual net contribution to calculated emissions from the liquid carbon materials using Equation X-2 and the Equation X-2 Calculation Spreadsheet. Equation X-2 is provided below:

(Equation X-2)

$$C_l = \sum_{n=1}^{12} \left[\sum_{i=1}^{j \text{ or } k} \left[(F_{lf})_{i,n} * (CC_{lf})_{i,n} - (P_{lp})_{i,n} * (CC_{lp})_{i,n} \right] \right]$$

For each process unit with any solid feedstocks or products, users should calculate the annual net contribution to calculated emissions from the solid carbon materials using Equation X-3 and the Equation X-3 Calculation Spreadsheet. Equation X-3 is provided below:

(Equation X-3)

$$C_s = \sum_{n=1}^{12} \left\{ \sum_{i=1}^{j \text{ or } k} \left[(F_{sf})_{i,n} * (CC_{sf})_{i,n} - (P_{sp})_{i,n} * (CC_{sp})_{i,n} \right] \right\}$$

For each process unit, users should calculate the annual CO₂ mass emissions from process operations and process off-gas combustion using Equation X-4 and the Equation X-4 Calculation Spreadsheet. Equation X-4 is provided below:

(Equation X-4)

$$CO_2 = 0.001 * \frac{44}{12} * (C_g + C_l + C_s)$$

Downloading a Calculation Spreadsheet

Calculation spreadsheets for Subpart X may be downloaded by clicking one of the links in the first column of the table below. Users may also jump to instructions for each calculation spreadsheet by clicking one of the links in the third column.

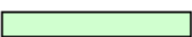


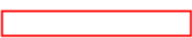
Calculation Spreadsheet (click to download)	Calculation Result	Selection Criteria: Feedstock/Product Type	Instructions (click to view)
Equation X-1 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Gaseous	X-1 Help
Equation X-2 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Liquid	X-2 Help
Equation X-3 Calculation Spreadsheet.xls	Net Contribution to Calculated Emissions from Carbon Materials	Solid	X-3 Help
Equation X-4 Calculation Spreadsheet.xls	Annual CO ₂ Emissions	N/A	X-4 Help

Using a Calculation Spreadsheet to Make Calculations

The guidance provided in this section applies to each of the calculation spreadsheets for Subpart X. Additional guidance is provided for each individual calculation spreadsheet in the sections below.

Color coding

The calculation spreadsheets contain green input cells, gray informational cells, and red-bordered results cells filled with yellow or white. Users should use green input cells to enter all data specific to their facility, unit, or process. Gray informational cells contain parameter names, column and row headings, equation constants and subtotals. Calculation results are displayed in red-bordered results cells filled with yellow or white. For red-bordered, yellow-filled results cells, the values in these cells should be entered in the appropriate and separate calculation spreadsheet (as directed below cell) where additional calculations will be made. For red-bordered, white filled results cells, the values in these cells should be entered in e-GGRT for the appropriate process units. All cells that are not green input cells are locked and cannot be modified.

	Green input cell (data entry)
	Gray informational cells (locked)
	Red-bordered, yellow-filled results cells (enter in appropriate and separate calculation spreadsheet)
	Red-bordered, white filled results cells (enter in e-GGRT)

Stop and Warning Messages

The calculation spreadsheets will display a stop message if the user enters a value that is invalid or a warning message if the user enters a value outside the EPA estimated range for a particular data element. For invalid data entries, the stop messages will not allow a user to proceed and the user must reenter valid data before moving forward. For data entries that are outside the EPA estimated range for a particular data element, the warning messages will allow a user to proceed if the user deems the entered value to be accurate.

Multiple Process Units

Users with multiple process units should use separate calculation spreadsheets for each process unit. Users should not aggregate data for multiple process units when using these calculation spreadsheets.

Using the Equation X-1 Calculation Spreadsheet

Calculate the annual net contribution to calculated emissions from carbon materials for each process unit with gaseous feedstocks and/or products using Equation X-1 and the Equation X-1 Calculation Spreadsheet. Space is provided for up to three gaseous feedstocks and three gaseous products in the spreadsheet. Use additional copies of this spreadsheet for additional materials and add the contributions prior to entering in the Equation X-4 Calculation Spreadsheet. Equation X-1 is provided below:

(Equation X-1)

$$C_{\epsilon} = \sum_{n=1}^{12} \left[\sum_{i=1}^{j \text{ or } k} \left[(F_{gf})_{i,n} * (CC_{gf})_{i,n} * \frac{(MW_f)_i}{MVC} - (P_{gp})_{i,n} * (CC_{gp})_{i,n} * \frac{(MW_p)_i}{MVC} \right] \right]$$

Begin by entering the facility name, your name, the process unit name or identifier, the unit type, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ID:	
Reporting Period:	
Comments:	
Unit Type:	

Next, enter the requested information in the green input cells in the Input Data for Feedstocks table.

Input Data for Feedstocks: Space for up to three feedstocks are provided.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_ε, and add the contributions prior to entering in e-GGRT).

Carbon containing feedstock Number i	1	2	3
Name			
[(MW _f)] = Molecular weight of gaseous feedstock i (kg/kg-mole)			
Month	[(F _{gf}) _{i,n}] = Volume of gaseous feedstock i introduced in month "n" (standard cubic feet, scf)	[(CC _{gf}) _{i,n}] = Average carbon content of the gaseous feedstock i for month "n" (kg C per kg of feedstock)	[(F _{gf}) _{i,n}] = Volume of gaseous feedstock i introduced in month "n" (standard cubic feet, scf)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Then, enter the requested information in the green input cells in the Input Data for Products table.

Input Data for Products: Space for up to three products are provided.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_ε, and add the contributions prior to entering in e-GGRT).

Product Number i	1	2	3
Name			
[(MW _p)] = Molecular weight of gaseous product i (kg/kg-mole)			
Month	[(P _{gp}) _{i,n}] = Volume of gaseous product i produced in month "n" (scf)	[(CC _{gp}) _{i,n}] = Average carbon content of gaseous product i, for month "n" (kg C per kg of product)	[(P _{gp}) _{i,n}] = Volume of gaseous product i produced in month "n" (scf)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

The calculation spreadsheet will calculate the net contribution to calculated emissions from all carbon-containing gaseous feedstocks and products in a process unit. This calculated value will be displayed in the red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered in the Equation X-4 Calculation Spreadsheet for this process unit.

Annual Net Contribution to Calculated Emissions from Carbon in Gaseous Materials from Equation X-1

$[C_g]$ = Annual net contribution to calculated emissions from carbon (C) in gaseous materials (kilograms/year, kg/yr)

Use this value in Equation X-4

Using the Equation X-2 Calculation Spreadsheet

Calculate the annual net contribution to calculated emissions from carbon materials for each process unit with liquid feedstocks and/or products using Equation X-2 and the Equation X-2 Calculation Spreadsheet. Space is provided for up to three liquid feedstocks and three liquid products in the spreadsheet. Use additional copies of this spreadsheet for additional materials and add the contributions prior to entering in the Equation X-4 Calculation Spreadsheet. Equation X-2 is provided below:

(Equation X-2)

$$C_i = \sum_{n=1}^{12} [\sum_{i=1}^{j \text{ or } k} [(F_{V_i})_{i,n} * (CC_{V_i})_{i,n} - (P_{i_p})_{i,n} * (CC_{i_p})_{i,n}]]$$

Begin by entering the facility name, your name, the process unit name or identifier, the unit type, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	

Next, enter the requested information in the green input cells in the Input Data for Feedstocks table.

Input Data for Feedstocks: Space for up to three feedstocks are provided.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_g and add the contributions prior to entering in e-GGRT).

Carbon containing feedstock Number i	1		2		3	
Name						
Month	$[(F_{V_i})_{i,n}]$ = Volume or mass of liquid feedstock i introduced in month "n" (gallons or kg)	$[(CC_{V_i})_{i,n}]$ = Average carbon content of liquid feedstock i for month "n" (kg C per gallon or kg of feedstock)	$[(F_{V_i})_{i,n}]$ = Volume or mass of liquid feedstock i introduced in month "n" (gallons or kg)	$[(CC_{V_i})_{i,n}]$ = Average carbon content of liquid feedstock i for month "n" (kg C per gallon or kg of feedstock)	$[(F_{V_i})_{i,n}]$ = Volume or mass of liquid feedstock i introduced in month "n" (gallons or kg)	$[(CC_{V_i})_{i,n}]$ = Average carbon content of liquid feedstock i for month "n" (kg C per gallon or kg of feedstock)
Unit of measure						
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Then, enter the requested information in the green input cells in the Input Data for Products table.

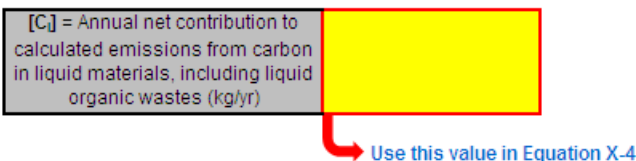
Input Data for Products: Space for up to three products are provided.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_s and add the contributions prior to entering in e-GGRT).

Product Number i	1		2		3	
Name						
Month	[(P _{ij}) _{i,n}] = Volume or mass of liquid product i produced in month 'n' (gallons or kg)	[(CC _{ij}) _{i,n}] = Average carbon content of liquid product i, for month 'n' (kg C per gallon or kg of product)	[(P _{ij}) _{i,n}] = Volume or mass of liquid product i produced in month 'n' (gallons or kg)	[(CC _{ij}) _{i,n}] = Average carbon content of liquid product i, for month 'n' (kg C per gallon or kg of product)	[(P _{ij}) _{i,n}] = Volume or mass of liquid product i produced in month 'n' (gallons or kg)	[(CC _{ij}) _{i,n}] = Average carbon content of liquid product i, for month 'n' (kg C per gallon or kg of product)
Unit of measure						
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

The calculation spreadsheet will calculate the net contribution to calculated emissions from all carbon-containing liquid feedstocks and products in a process unit. This calculated value will be displayed in the red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered in the Equation X-4 Calculation Spreadsheet for this process unit.

Annual Net Contribution to Calculated Emissions from Carbon in Liquid Materials from Equation X-2



Using the Equation X-3 Calculation Spreadsheet

Calculate the annual net contribution to calculated emissions from carbon materials for each process unit with solid feedstocks and/or products using Equation X-3 and the Equation X-3 Calculation Spreadsheet. Space is provided for up to three solid feedstocks and three solid products in the spreadsheet. Use additional copies of this spreadsheet for additional materials and add the contributions prior to entering in the Equation X-4 Calculation Spreadsheet. Equation X-3 is provided below:

(Equation X-3)

$$C_s = \sum_{n=1}^{12} \left\{ \sum_{i=1}^{j \text{ or } k} \left[(F_{sf})_{i,n} * (CC_{sf})_{i,n} - (P_{sp})_{i,n} * (CC_{sp})_{i,n} \right] \right\}$$

Begin by entering the facility name, your name, the process unit name or identifier, the unit type, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	

Next, enter the requested information in the green input cells in the Input Data for Feedstocks table.

Input Data for Feedstocks: Space for up to three feedstocks are provided. Use additional copies of this spreadsheet for additional feedstocks.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_i , and add the contributions prior to entering in e-GGRT).

Carbon containing feedstock Number i	1	2	3
Name			
Month	[(F _{ij}) _{i,j}] = Mass of solid feedstock i introduced in month "n" (kg)	[(F _{ij}) _{i,j}] = Mass of solid feedstock i introduced in month "n" (kg)	[(F _{ij}) _{i,j}] = Mass of solid feedstock i introduced in month "n" (kg)
	[(CC _{ij}) _{i,j}] = Average carbon content of solid feedstock i for month "n" (kg C per kg of feedstock)	[(CC _{ij}) _{i,j}] = Average carbon content of solid feedstock i for month "n" (kg C per kg of feedstock)	[(CC _{ij}) _{i,j}] = Average carbon content of solid feedstock i for month "n" (kg C per kg of feedstock)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Then, enter the requested information in the green input cells in the Input Data for Products table.

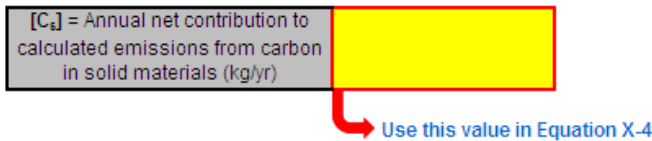
Input Data for Products: Space for up to three products are provided. Use additional copies of this spreadsheet for additional products.

Use additional copies of this spreadsheet for additional materials (i.e., use multiple spreadsheets to calculate contributions to C_i , and add the contributions prior to entering in e-GGRT).

Product Number i	1	2	3
Name			
Month	[(P _{ij}) _{i,j}] = Mass of solid product i produced in month "n" (kg)	[(P _{ij}) _{i,j}] = Mass of solid product i produced in month "n" (kg)	[(P _{ij}) _{i,j}] = Mass of solid product i produced in month "n" (kg)
	[(CC _{ij}) _{i,j}] = Average carbon content of solid product i in month "n" (kg C per kg of product)	[(CC _{ij}) _{i,j}] = Average carbon content of solid product i in month "n" (kg C per kg of product)	[(CC _{ij}) _{i,j}] = Average carbon content of solid product i in month "n" (kg C per kg of product)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

The calculation spreadsheet will calculate the net contribution to calculated emissions from all carbon-containing solid feedstocks and products in a process unit. This calculated value will be displayed in the red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered in the Equation X-4 Calculation Spreadsheet for this process unit.

Annual Net Contribution to Calculated Emissions from Carbon in Solid Materials from Equation X-3



Using the Equation X-4 Calculation Spreadsheet

Calculate the annual mass of CO₂ process emissions using the results from the X-1, X-2, and X-3 calculation spreadsheets in Equation X-4, and the Equation X-4 Calculation Spreadsheet. Equation X-4 is provided below:

(Equation X-4)

$$CO_2 = 0.001 * \frac{44}{12} * (C_g + C_l + C_s)$$

Begin by entering the facility name, your name, the process unit name or identifier, the unit type, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	

Next, enter the requested information in the green input cells in the Input Data for Feedstocks table.


Input Data

$[C_g]$ = Annual net contribution to calculated emissions from carbon (C) in gaseous materials (kilograms/year, kg/yr)		$[C_g]$ is calculated from Equation X-1
$[C_l]$ = Annual net contribution to calculated emissions from carbon in liquid materials, including liquid organic wastes (kg/yr)		$[C_g]$ is calculated from Equation X-2
$[C_s]$ = Annual net contribution to calculated emissions from carbon in solid materials (kg/yr)		$[C_g]$ is calculated from Equation X-3

The calculation spreadsheet will calculate the annual CO₂ process emissions in metric tons per year for a process unit. This calculated value will be displayed in the red-bordered cell with white fill at the bottom of the spreadsheet. This value should be entered in e-GGRT for this process unit.

Annual CO₂ emissions (metric tons), result from Equation X-4

$[CO_2]$ = Annual CO ₂ mass emissions from process operations and process off-gas combustion (metric tons/year)	
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 Enter this value in e-GGRT

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