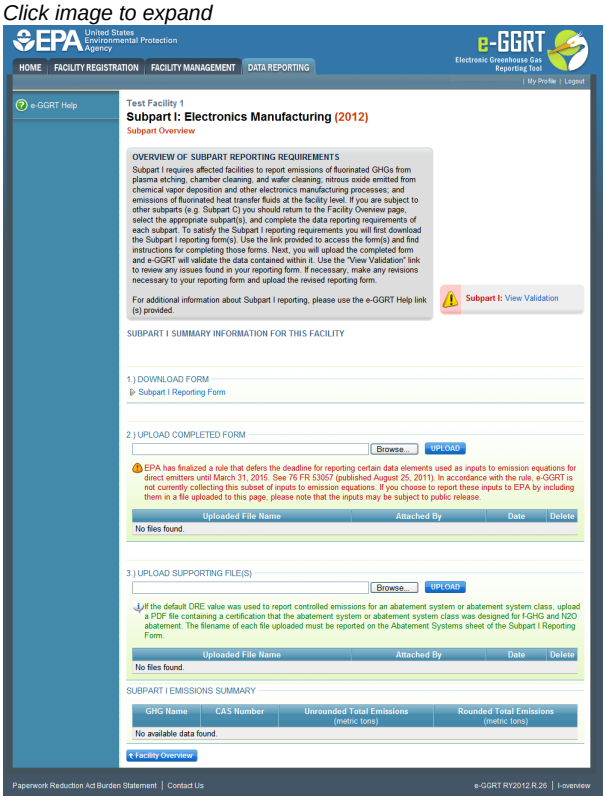
Subpart I - Electronics Manufacturing

A printer-friendly version (pdf) (7 pp, 665KB) of GHG reporting instructions for this subpart

This page provides an overview of Subpart I reporting through e-GGRT. More detailed information regarding Subpart I reporting can be found in the Subpart I Webinar

Once you have added Subpart I to the list of subparts you will report and have clicked on the "Open" link next to Subpart I, you will see the following screen:

Click image to expand



Subpart I Reporting Form

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

> **Use of Best Available Monitoring Methods (BAMM)**
> Please note: Only report the use of BAMM on the Subpart I reporting form if you have reported BAMM on Subpart A - General Information. Only facilities or suppliers that have been approved by EPA to use BAMM or have automatically been granted BAMM under the rule should report use of BAMM.

- Subpart I - Facility Details
- Subpart I - F-GHG Emissions Information for PV, MEMS, and LCD Manufacturing (By Process)
- Subpart I - F-GHG Emissions Information for Semiconductor Manufacturing (By Process)
- Subpart I - Recipe Information for Facilities Employing Recipe-specific Factors (By Recipe)
- Subpart I - N2O Emissions from Chemical Vapor Deposition and Other Electronics Manufacturing Processes
- Subpart I - Fluorinated Heat Transfer Fluid Information
- Subpart I - Emissions Abatement Systems

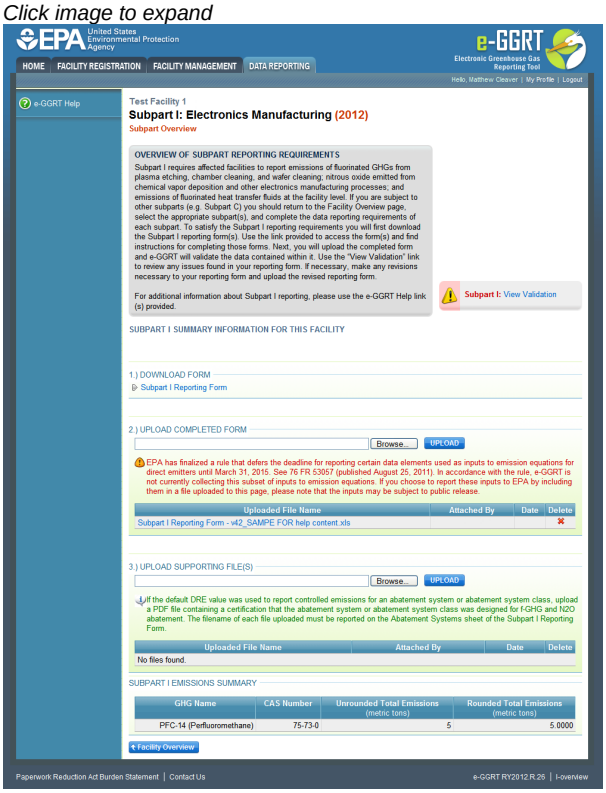
Subpart I also allows users to upload a upload a file which certifies that the abatement system or abatement system class in place at the facility was designed for f-GHG and N2O abatement. If the default DRE value was used to report controlled emissions for an abatement system or

abatement system class, you must upload a PDF file containing a certification that the abatement system or abatement system class was designed for f-GHG and N2O abatement. The filename of each file uploaded must be reported on the Abatement Systems sheet of the Subpart I Reporting Form and must be uploaded in the "Upload Supporting Forms" area on the Subpart I Upload Page.

Completed Subpart I Reporting Form

After you have successfully uploaded your completed Subpart I reporting form, the page will be updated to reflect the file you have uploaded. The Subpart I upload screen will display a summary of your reporting by chemical at the bottom of the page, as seen below.

Click image to expand



If you attempt to upload a file but your file is not accepted by e-GGRT, it is generally because your file has a fatal flaw or is missing essential data. The reason why the file was not acceptable is displayed as a screen error on the upload page. For an example of a screen error message, see below.

Click image to expand

During the upload, e-GGRT will generate a validation report which will list potential deficiencies or issues with your reporting form. Click on the "Subpart I: View Validation" link to review your validation report. An explanation of the validation report and the process for correcting validation issues prior to submission is presented in Reporting Form Validation

Once you have addressed the validation issues to the extent you believe necessary, and once you have completed any other applicable subparts, you must generate, review, certify, and submit your annual report as described in How to Submit an Annual Report

Subpart I - Emissions Abatement Systems

Subpart I - Emissions Abatement Systems

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
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Indicate if the facility has any abatement systems

- Select the appropriate radio button
- If you don't have any abatement systems through which F-GHGs or N_2O flow, then no further information is required

1.) **Does your facility have any abatement systems through which fluorinated GHGs or N_2O flow and which are designed for abatement of fluorinated GHGs or N_2O?** ○ Yes ○ No

Fill out the abatement system information table.

- The name of the abatement system or class of abatement systems used at the facility
- The manufacturer
- The model number(s) (for a class, list each model number separated by a comma)
- The file name for the certification statement if you used the default DRE value to report controlled emissions
- The number of systems in each class for which the DRE was properly measured
- The method used to determine the “class” DRE value
- The method used to select individual abatement systems for testing
- The type of product associated with the abatement system or class of abatement systems
- The tool types associated with the abatement system or class of abatement systems

- The model numbers of the tools associated with the abatement system or class of abatement systems
- The process sub-types or process types associated with each abatement system or class of abatement systems
- Certify the abatement system has been installed, maintained and operated in accordance with the manufacturer's specifications
- The name of each F-GHG or N_2O in the effluent stream
- The manufacturer DRE value for the abatement system

Subpart I - Facility Details

Subpart I - Facility Details

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
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Fill out the general information table.

- GHGRP ID is required. *(the GHGRP ID on the reporting form must match the facility ID in e-GGRT)*
- Reporting Year is required. *(for RY2012 this must be reported as "2012")*

1.) Fill out the following table with general information about this facility:

Facility Name:	
GHGRP ID:	
Reporting Period:	
Comments: (optional)	

Fill out the facility type and manufacturing information table.

- The types of products manufactured at your facility
  - If you are a semiconductor manufacturer, indicate the size (or sizes) of wafers you manufacture.
- The manufacturing capacity you calculated using the method in Equation I-5,
- The annual production.

2.) Enter the facility type and manufacturing information required in the table below:

				Only for semiconductor manufacturing facilities				
Does facility manufacuture semiconductors? [§98.96]	Does facility manufacture MEMS, PVs, and/or LCDs? [§98.96]	Annual Manufacturing Capacity of the Facility as Determined by Eq. I-5 (square meters) [§98.96(a)]	Annual Production in Terms of Substrate Area (square meters) [§98.96(e)]	Does facility manufacture 150 millimeter wafers? [§98.96(b)]	Does facility manufacture 200 millimeter wafers? [§98.96(b)]	Does facility manufacture 300 millimeter wafers? [§98.96(b)]	Does facility manufacture wafers larger than 300 millimeters? [§98.96(b)]	If facility manufactures wafers smaller than 150 mm in diameter, please list the specific size(s) manufactured [§98.96(b)]
Yes	No	18600	14500	Yes	Yes	No	No	100, 200

Fill out the apportioning model information table.

- The metric used in the engineering model for apportioning gas consumption between recipes, process sub-types, or process types.
- The start and end dates for when you monitored gas consumption to validate the apportioning model.
- Indicate whether the gases selected for monitoring correspond to the largest quantities consumed on a mass basis by your facility during the reporting year for the plasma etching and chamber cleaning process types.
- The relative percent difference between the modeled and actual gas consumption under the plasma etching process type when you performed the apportioning model verification.

3.) Enter the apportioning model data required in the table below:

Quantifiable Metric used in Engineering Model to Apportion Gas Consumption [§98.96(m)(i)]	Start Date Selected under §98.94(c)(2)(i) [MM/DD/YYYY] [§98.96(m)(ii)]	End Date Selected under §98.94(c)(2)(i) [MM/DD/YYYY] [§98.96(m)(ii)]	Certification that the gases you selected under §98.94(c)(2)(ii) correspond to the largest quantities consumed on a mass basis, at your facility in the reporting year for the plasma etching process type and the chamber cleaning process type. [§98.96(m)(iii)]	Result of calculation comparing actual to modeled etch gas consumption under §98.94(c)(2)(iii) (%) [§98.96(m)(iv)]
Wafer Starts	01/01/2011	01/29/2011	Certified	4.50%

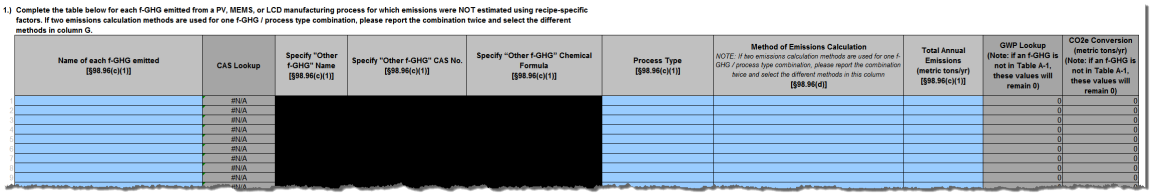
Subpart I - F-GHG Emissions Information for PV, MEMS, and LCD Manufacturing (By Process)

Subpart I - F-GHG Emissions Information for PV, MEMS, and LCD Manufacturing (By Process)

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

Fill out the PV, MEMS, and/or LCD manufacturing processes that DO NOT use recipe-specific emission factors information table.

- The names of the F-GHGs emitted from the manufacturing process (for "other F-GHG," provide the name, CAS number, and chemical formula)
- The process type (if an F-GHG is used in more than one process type, report the F-GHG multiple times and select the different process types)
- The method used to calculate emissions
- The emissions of each F-GHG for each process type



1.) Complete the table below for each f-GHG emitted from a PV, MEMS, or LCD manufacturing process for which emissions were NOT estimated using recipe-specific factors. If two emissions calculation methods are used for one f-GHG / process type combination, please report the combination twice and select the different methods in column G.

	Name of each f-GHG emitted [§98.96(c)(1)]	CAS Lookup	Specify "Other f-GHG" Name [§98.96(c)(1)]	Specify "Other f-GHG" CAS No. [§98.96(c)(1)]	Specify "Other f-GHG" Chemical Formula [§98.96(c)(1)]	Process Type [§98.96(c)(1)]	Method of Emissions Calculation *NOTE: If two emissions calculation methods are used for one f-GHG / process type combination, please report the combination twice and select the different methods in this column* [§98.96(d)]	Total Annual Emissions (metric tons/yr) [§98.96(c)(1)]	GWP Lookup (Note: if an f-GHG is not in Table A-1, these values will remain 0)	CO2e Conversion (metric tons/yr) (Note: if an f-GHG is not in Table A-1, these values will remain 0)
1		#N/A							0	0
2		#N/A							0	0
3		#N/A							0	0
4		#N/A							0	0
5		#N/A							0	0
6		#N/A							0	0
7		#N/A							0	0
8		#N/A							0	0
9		#N/A							0	0

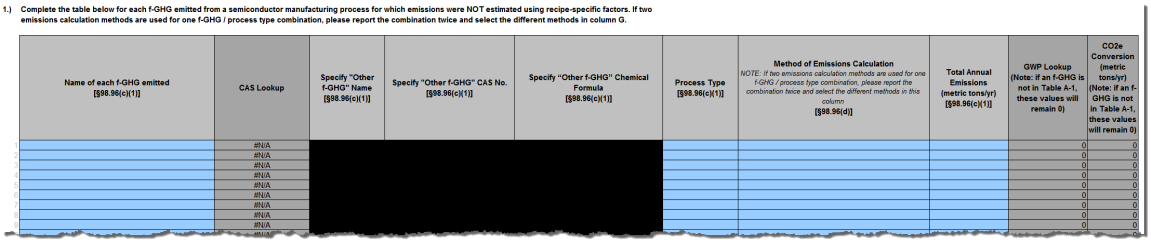
Subpart I - F-GHG Emissions Information for Semiconductor Manufacturing (By Process)

Subpart I - F-GHG Emissions Information for Semiconductor Manufacturing (By Process)

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

Fill out the semiconductor manufacturing processes that DO NOT use recipe-specific factors information table.

- The names of the F-GHGs emitted from the semiconductor process (if you select "other F-GHG," provide the name, CAS number, and chemical formula)
- The process type (if an F-GHG is used in more than one process type, report the F-GHG multiple times and select the different process types)
- The method used to calculate emissions
- The emissions of each F-GHG



1.) Complete the table below for each f-GHG emitted from a semiconductor manufacturing process for which emissions were NOT estimated using recipe-specific factors. If two emissions calculation methods are used for one f-GHG / process type combination, please report the combination twice and select the different methods in column G.

	Name of each f-GHG emitted [§98.96(c)(1)]	CAS Lookup	Specify "Other f-GHG" Name [§98.96(c)(1)]	Specify "Other f-GHG" CAS No. [§98.96(c)(1)]	Specify "Other f-GHG" Chemical Formula [§98.96(c)(1)]	Process Type [§98.96(c)(1)]	Method of Emissions Calculation *NOTE: If two emissions calculation methods are used for one f-GHG / process type combination, please report the combination twice and select the different methods in this column* [§98.96(d)]	Total Annual Emissions (metric tons/yr) [§98.96(c)(1)]	GWP Lookup (Note: if an f-GHG is not in Table A-1, these values will remain 0)	CO2e Conversion (metric tons/yr) (Note: if an f-GHG is not in Table A-1, these values will remain 0)
1		#N/A							0	0
2		#N/A							0	0
3		#N/A							0	0
4		#N/A							0	0
5		#N/A							0	0
6		#N/A							0	0
7		#N/A							0	0
8		#N/A							0	0
9		#N/A							0	0

Subpart I - Fluorinated Heat Transfer Fluid Information

Subpart I - Fluorinated Heat Transfer Fluid Information

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

Fill out the fluorinated heat transfer fluid information table.

- The names of the heat transfer fluids used at the facility

- The emissions calculation method
- The total annual emissions for each fluorinated heat transfer fluid used

1.) Complete the table below for each fluorinated heat transfer fluid used at your facility.

	Fluorinated Heat Transfer Fluid (f-HTF) Name [§98.96(c)(4)]	CAS Lookup	Specify "Other f-HTF" Name [§98.96(c)(4)]	Specify "Other f-HTF" CAS No. [§98.96(c)(4)]	Specify "Other f-GHG" Chemical Formula [§98.96(c)(4)]	Method of Emissions Calculation [§98.96(d)]	Total Annual Emissions (metric tons/yr) [§98.96(c)(4)]
1	FC-70 (Perfluorotripentylamine)	338-84-1				Equation I-16 (mass ba	18.9000
2		#N/A					

Subpart I - N2O Emissions from Chemical Vapor Deposition and Other Electronics Manufacturing Processes

Subpart I - N_2O Emissions from Chemical Vapor Deposition and Other Electronics Manufacturing Processes

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

Fill out the chemical vapor deposition processes information table.

- The method used to calculate the emissions
- If facility-specific utilization factors were used, specify the method used to determine the factors
- N_2O emissions from chemical vapor deposition processes
- Certify that the measurements were made are representative of the facility.
- If the measurements were made before January 1, 2007, certify that the facility-specific utilization factors were determined using the correct International SEMATECH version specified in the rule

1.) Complete the table below for chemical vapor deposition processes at your facility that use and emit N2O.

Method of Reporting Emissions [§98.96(d)]	Source of the facility-specific N2O utilization factor, if used [§98.96(f)(5)	Specify "other" Source of the facility-specific N2O utilization factor [§98.96(f)(5)	Total Annual N2O Emissions from Chemical Vapor Deposition (metric tons/yr) [§98.96(c)(3)]	Certification that the measurements for all reported facility-specific N2O utilization factors were made using the International SEMATECH #06124825A-ENG (incorporated by reference, see §98.7), or the International SEMATECH #01104197A-XFR (incorporated by reference, see §98.7) if measurements were made prior to January 1, 2007. [§98.96(f)(4)]	Certification that the conditions under which the measurements were made for facility-specific N2O utilization factors are representative of your facility's N2O emitting production processes. [§98.96(f)(6)]
Developed facility-specific utilization factor	Facility measured: International SEMATECH #06124825A-ENG		0.370	Certified	Certified

Fill out the other electronics manufacturing processes information table.

- The method used to calculate the emissions
- If facility-specific utilization factors were used, specify the method used to determine the factors
- N_2O emissions from other electronics manufacturing processes
- Certify that the measurements were made are representative of the facility.
- If the measurements were made before January 1, 2007, certify that the facility-specific utilization factors were determined using the correct International SEMATECH version specified in the rule

2.) Complete the table below for other electronics manufacturing processes at your facility that use and emit N2O.

Method of Reporting Emissions [§98.96(d)]	Source of the facility-specific N2O utilization factor, if used [§98.96(f)(5)	Specify "other" Source of the facility-specific N2O utilization factor [§98.96(f)(5)	Total Annual N2O Emissions from all other N2O-using manufacturing processes (metric tons/yr) [§98.96(c)(3)]	Certification that the measurements for all reported facility-specific N2O utilization factors were made using the International SEMATECH #06124825A-ENG (incorporated by reference, see §98.7), or the International SEMATECH #01104197A-XFR (incorporated by reference, see §98.7) if measurements were made prior to January 1, 2007. [§98.96(f)(4)]	Certification that the conditions under which the measurements were made for facility-specific N2O utilization factors are representative of your facility's N2O emitting production processes. [§98.96(f)(6)]
Used default utilization factor from Table I-8			0.100	N/A – did not use facility-specific factors	N/A – did not use facility-specific factors

Subpart I - Recipe Information for Facilities Employing Recipe-specific Factors (By Recipe)

Subpart I - Recipe Information for Facilities Employing Recipe-specific Factors (By Recipe)

Please see Reporting Form Instructions on downloading the blank reporting form and uploading the completed reporting form.
You may also refer to Optional Calculation Spreadsheet Instructions to download the Subpart I calculation spreadsheet.

Fill out the certification information table.

- Certify recipes included in a set are in fact similar as defined in §98.98
  - If yes, then select "Certified"
  - If no, then select "Used BAMM"
  - If only one recipe was used for each factor, then enter "Not applicable - only individual recipes used"

- Certify that you used the methods specified in the rule

1.) Certify the recipes used at your facility in the table below.

Certification that the recipes included in a set of similar recipes are similar, as defined in §98.98. [§98.96(f)(3)]	Certification that the measurements for all reported recipe-specific utilization and by-product formation rates were made using the International SEMATECH #06124825A-ENG (incorporated by reference, see §98.7), or the International SEMATECH #01104197A-XFR (incorporated by reference, see §98.7) if measurements were made prior to January 1, 2007. [§98.96(f)(4)]
Certified	Certified

Fill out the recipe information table.

- Enter an ID or name for each individual recipe (or set of similar recipes if you are using the same recipe-specific factor for two or more similar recipes)
- Recipe Type
- Process type for each recipe
  - If the process involves etching then you must enter both the name of the film or substrate and types of features etched
  - Feature type that is etched
- Source of the recipe-specific utilization and by-product formation rates
- Name for each F-GHG used in the recipe or sets of similar recipes
- Emissions for each F-GHG used in the recipe or sets of similar recipes (re-enter the recipe information for each F-GHG used in the recipe)