

Greenhouse Gas Reporting Program

XML Reporting Instructions for Subpart N - Glass Production

United States Environmental Protection Agency
Climate Change Division
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These instructions explain how to report the required data for the applicable regulations. Owners and operators of units should refer to the applicable regulations for information about what data are required to be reported.

EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. (See <http://www.epa.gov/climatechange/emissions/notices.html> for a pre-publication version of the rule). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations.

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I. Introduction

The U.S. Environmental Protection Agency's (EPA's) electronic greenhouse gas reporting tool (e-GGRT) extensible markup language (XML) Reporting Schema contains all of the data elements needed to comply with the Greenhouse Gas Reporting Program (GHGRP) beginning with the 2010 data collection year. The XML schema defines expected data elements and attributes, allowable data formats for each data element, and the hierarchical structure and sequence in which data elements must appear in the XML file. Similar to an architectural blueprint that describes the structural design of a house, an XML schema describes the structural design of an XML file. In some cases, it also defines which elements are optional and which are required and the maximum number of occurrences allowed for each element.

The e-GGRT XML schema is made up of a root data element (GHG) and complex and simple data elements. A simple element is a single piece of data. A complex element is a group of simple elements which are logically grouped together. The root data element is the base of the XML schema.

The schema's structure can be thought of as a family tree. The elements are related to each other in parent-child relationships. The root element is the parent element of the entire schema. Complex elements are children of the root element, and complex elements can also be children of other complex elements.

The XML upload method may be used for reporting a facility or supplier's annual greenhouse gas (GHG) data; however, the following actions can only be performed using the e-GGRT web forms:

- User, facility and supplier registration
- Certificate of Representation and Notice of Delegation signing
- Facility representative and agent changes
- Facility and supplier address changes
- Notice of intent to not submit an annual GHG report

All XML files submitted to e-GGRT must be well formed and will be accepted only if they conform to the current version of the e-GGRT XML schema.

An XML submission must only contain GHG data for a single facility or supplier. All data for a facility or supplier must be submitted in a single file as a complete report and must include all of the relevant Subparts. It is not possible to submit a subset of any portion of a facility's data to add, delete, correct or update. The entire report must be resubmitted to make any modification at all. Each subsequent submission for the same facility replaces all of the previously submitted data.

The e-GGRT XML schema contains enumerated lists of the units of measures for some data elements and allowable values for some data elements. For rules regarding the unit of measure or allowable values for a specific data element, please refer to the appropriate Data Element Definitions table.

The e-GGRT XML Reporting Schema is available for download at the e-GGRT help website: <http://www.ccdsupport.com/confluence/display/help/XML+Reporting+Instructions>. The zip file contains:

- **GHG_Final.xsd and Included Files**
- **SchemaChanges.xlsx**

Table 1
Reporting Numbers

Number Format	Description
Rounding	<ul style="list-style-type: none"> • CO₂e and CO₂ emissions data expressed in metric tons should be rounded to one decimal place. This should be done regardless of the level of data collection (e.g., unit-level, facility-level). Quantities less than 0.05 metric tons would round to 0.0 and be reported as such. Quantities greater than or equal to 0.05 metric tons would round up to 0.1 and be reported as such. • CH₄ emissions data expressed in metric tons should be rounded to two decimal places. • N₂O emissions data expressed in metric tons should be rounded to three decimal places. • Emissions data for all GHGs other than CO₂, N₂O and CH₄ expressed in metric tons should be rounded to the fourth digit to the right of the decimal (one tenth of a kilogram, or 1 ten thousandth of a metric ton). This rounding should be applied regardless of the level of data collection (unit, facility, etc.). • Other (non-emissions) quantitative data reported by the user (e.g., a monthly HHV sample result, an annual production quantity) will not need to be rounded. • In the case of aggregation/roll-ups, those calculations should be performed on the rounded values.
Percentages	If a value must be reported as a percentage, then the number should be within the range of 0 to 100 (percent), e.g. 85.5% should be reported as 85.5.
Fractions	If a value must be reported as a decimal fraction, then the number should be within the range of 0 and 1, e.g., 1/4 should be reported as 0.25. Leading zeroes are optional.

Key XML Terms

- **XML:** A markup language for documents containing structured information. The XML specification defines a standard way to add markup to documents. Its primary purpose is to facilitate the sharing of structured data across different information systems, particularly via the internet.
- **XML Schema:** An XML schema describes the structure of an XML document. The schema also defines the set of rules to which the XML document must conform in order to be considered "valid".
- **XML file:** A file containing data organized into a structured document using XML markup.
- **Data Element:** An XML data element is used for storing and classifying data in an XML file. Opening and closing tags represent the start and end of a data element. An opening tag looks like <elementName>, while a closing tag has a slash that is placed before the element's name </elementName>. The following example shows how to report the facility's identification

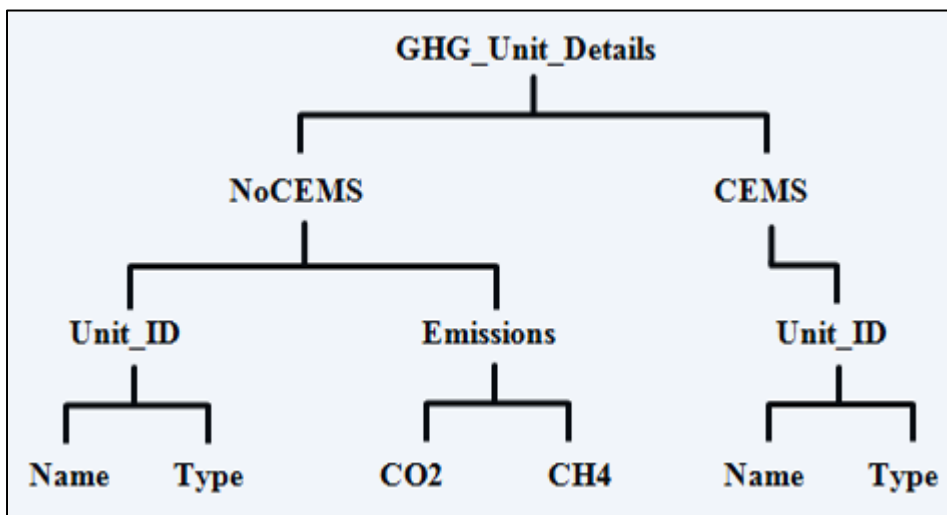
number: <FacilitySiteIdentifier>23222</FacilitySiteIdentifier>. The information shaded in blue represents the data element’s value.

If a data element does not contain a value, then a single empty tag name may be used. An empty tag has a slash placed after the element’s name <FacilitySiteIdentifier/>. **Note:** If you do not intend to report a value for a particular data element, then it is recommended that you do not include the data element in the XML file.

- **Attribute:** An XML attribute contains additional information about a specific data element. An attribute for a data element is placed within the opening tag. The syntax for including an attribute in an element is <elementName attributeName="value">. For example, <TotalCH4CombustionEmissionsmassUOM="Metric Tons">.
- **Root/Parent/Child Element:** The schema’s structure can be thought of as a family tree. At the top of the tree is some early ancestor and at the bottom of the tree are the latest children. With a tree structure you can see which children belong to which parents and many other relationships.

XML data elements are sometimes referenced in terms of how they relate to each other, e.g., parent-child relationships, within the schema’s tree structure, also known as hierarchy. The top of the XML tree is considered the root – it is the parent to all data elements within the schema. In the example below, “GHG_Unit_Details” is the root, and just like in many other family trees, there is more than one item with the same name (e.g., “Unit_ID”). The easiest way to distinguish these items is by referencing them in terms of their parent-child relationships, e.g., NoCEMS /Unit_ID vs. CEMS/Unit_ID.

Figure 1
Example of an XML Tree



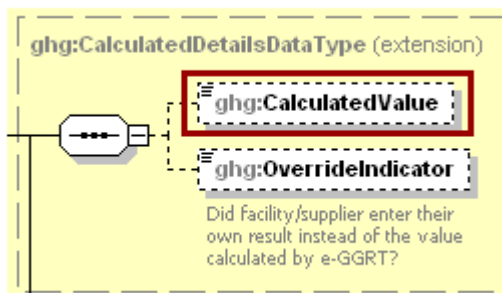
This document provides a step-by-step description of how to report emissions data using the XML schema. Please note the following:

- **Non-applicable data elements should not be included in the facility's XML file.** The schema contains many data elements, some of which may not be applicable to XML reporters in general or to a particular situation. If a data element is not referenced in the instructions (definition tables), then **do not** report or include it in the facility's XML file.
- **Data elements must be reported in a specific order.** The figures and tables in this document depict the specific sequence in which data elements must be arranged in the facility's XML file in order to produce a well-formed XML report.
- **Enumerations are case sensitive.** Many data elements have a defined set of allowable values, also known as enumerations. Values for enumerations must be entered exactly as they are defined within the schema (including punctuation marks) in order to be accepted by schema validation. See the definition tables for a complete list of enumerations.
- **Schema diagrams depict the hierarchy (or tree structure).** The primary purpose of the schema diagrams is to indicate the sequence in which data elements must appear within the facility's XML file and to identify the data elements that are required (must be reported) and conditionally required (see last bullet). Required data elements are boxed in red and conditionally required data elements are noted.
- **Definition tables provide details for required and conditionally required data elements.** The tables are designed to provide unique instructions for reporting a given data element, including the list of enumerations and required units of measure, if defined. As noted above, there are some data elements in the schema that are not applicable to XML reporters or to a particular situation. For example, the "OverrideIndicator" data element is used solely by e-GGRT to indicate that the web form reporter chose to override the system's calculated value with their own. These non-applicable data elements **are not** included in the definition tables. If a data element is not referenced in a definition table, then **do not** report or include it in the facility's XML file.
- **Commonly used data types are not depicted in the schema diagrams nor listed separately in the definition tables.** The schema diagrams display almost every data element in the schema except those that are associated with the three most commonly occurring data types:
 - Calculated Details
 - Measurement Details
 - Unit Identification Details

Once defined, these data types (static collection of data elements) are then associated as children to every data element in the schema containing a measured or calculated value or unit details. These child data elements do not appear in the diagrams and are not listed on separate rows in the definition tables in order to reduce their redundancy. They are however, referenced in the tables in the description of their parent data element. See Figures 2-4 and Tables 2-4.

- **Some data elements are conditionally required.** Data elements which are conditionally required are noted in the schema diagrams and the data element definitions tables. If your facility meets the condition specified for the data element, then the data element is required and you must report it in the facility's XML file. If your facility does not meet the condition specified for the data element, then **do not** include the data element in the facility's XML file. If a parent element is not required, then **do not** include any of its child data elements in the facility's XML file.

Figure 2
Calculated Details Data Type Schema Diagram

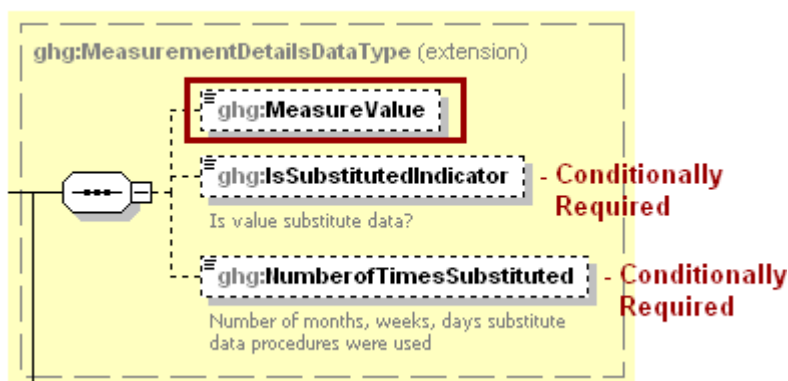


Note: Data elements boxed in red are required.

Table 2
Calculated Details Data Element Definitions

Data Element Name	Description
CalculatedDetailsDataType	
CalculatedValue	Calculated value (decimal).
OverrideIndicator	Note: Do not include this data element in the facility’s XML file because it only applies to web form reporters. It is a flag set by e-GGRT to indicate that the system-calculated value was overridden with the web form reporter’s value.

Figure 3
Measurement Details Data Type Schema Diagram

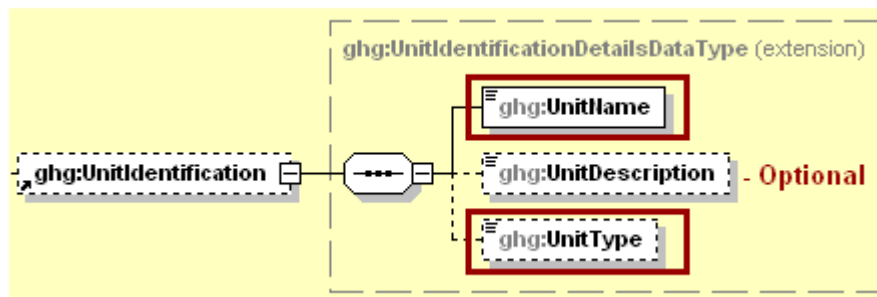


Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

**Table 3
Measurement Details Data Element Definitions**

Data Element Name	Description
MeasurementDetailsDataType	
MeasureValue	Measured value (decimal).
IsSubstitutedIndicator	An indication (Y/N) that the measure value contains substituted data. Note: Do not include this data element in your XML file unless noted in the instructions for the particular measured value.
NumberOfTimesSubstituted	The number (integer) of days, months, weeks or hours in the reporting year that missing data procedures were followed. Note: Do not include this data element in your XML file unless noted in the instructions for the particular measured value.

**Figure 4
Unit Identification Details Data Type Schema Diagram**



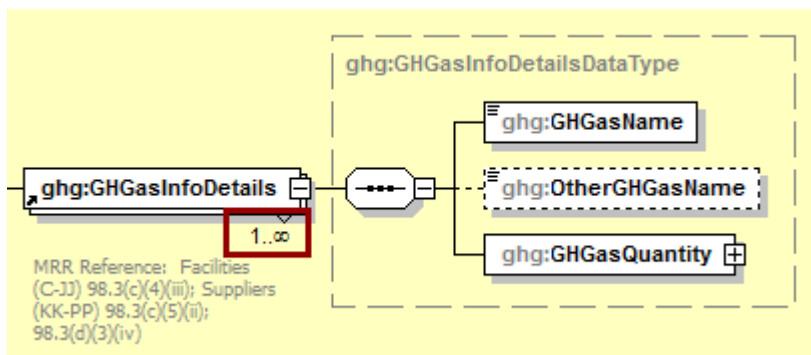
Note: Data elements boxed in red are required.

**Table 4
Unit Identification Details Data Element Definitions**

Data Element Name	Description
UnitIdentificationDetails	
UnitName	A unique name (ID) for each unit so that the data for different units can be recorded, maintained and retrieved clearly.
UnitDescription	Optional brief description of the unit.
UnitType	The type of unit. The list of allowable values varies. For more information, see the instructions for the specific unit process to be reported. For example, if reporting Flare Gas details, the unit type would be “Flare”.

The XML symbol “1..∞” shown in Figure 5 means that the parent element is “unbounded” so that multiple instances of the parent element can be reported. XML Excerpt 1 shows an example of reporting multiple instances of a parent element.

Figure 5
“Unbounded” Symbol in Schema Diagram

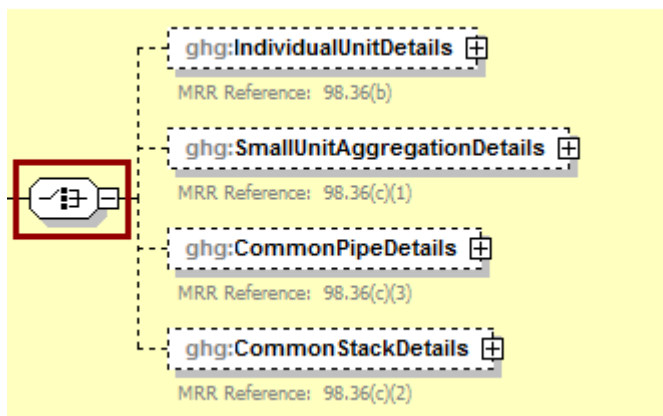


XML Excerpt 1
Example for “Unbounded” Parent Element

```
<ghg:GHGasInfoDetails>
  <ghg:GHGasName>Carbon Dioxide </ghg:GHGasName>
  <ghg:GHGasQuantity massUOM="Metric Tons">
    <ghg:CalculatedValue>384781.2</ghg:CalculatedValue>
  </ghg:GHGasQuantity></ghg:GHGasInfoDetails>
<ghg:GHGasInfoDetails>
<ghg:GHGasInfoDetails>
  <ghg:GHGasName>Methane</ghg:GHGasName>
  <ghg:GHGasQuantity massUOM="Metric Tons">
    <ghg:CalculatedValue>4004.12</ghg:CalculatedValue>
  </ghg:GHGasQuantity></ghg:GHGasInfoDetails>
</ghg:GHGasInfoDetails>
```

The XML symbol for a logical “Or” shown in Figure 6 means that **only one** of the data elements following the symbol can be reported for the current instance of the parent element.

Figure 6
Logical “Or” Symbol in Schema Diagram



II. Summary of Changes

The following modifications were applied to the GHG XML schema in relation to Subpart N (GHG_SubPartN_v2.0.xsd).

Table 5
Summary of Changes to the Schema for Subpart N

No.	Change Description
1	The enumeration list for data element "CarbonateTypeforAllFurnaces" was changed to match that of the data element "CarbonateType". (XPath = SubPartN/CarbonateTypeQuantityDetails/CarbonateTypeforAllFurnaces, SubPartN/CemsGlassUnitDetails/GlassProductionFurnaceDetails/GlassProductionCemsDetails/CarbonateType)

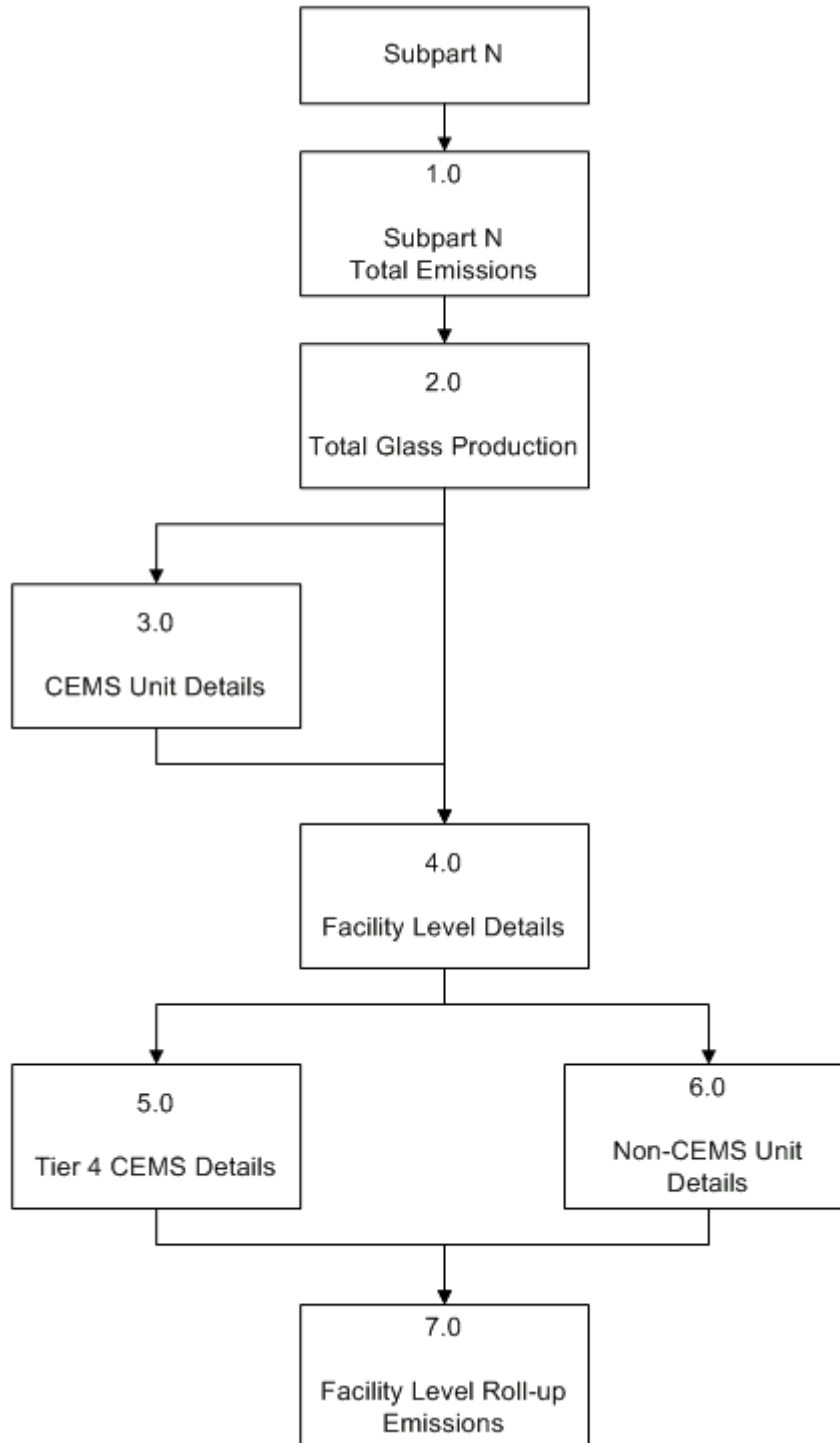
Document Changes:

3-15-2012 – Modified some of the emissions values within the XML excerpts to emphasize the rounding rules. Added "ParentCompanyDetails" to sample XML document. Deleted "Part75BiogenicEmissionsIndicator" in sample XML document.

III. Subpart N Overview

This document provides a step-by-step description of how to report data for Subpart N Glass Production and overall total Subpart N emissions for a facility using the XML schema.

**Figure 7
Subpart N Reporting Diagram**

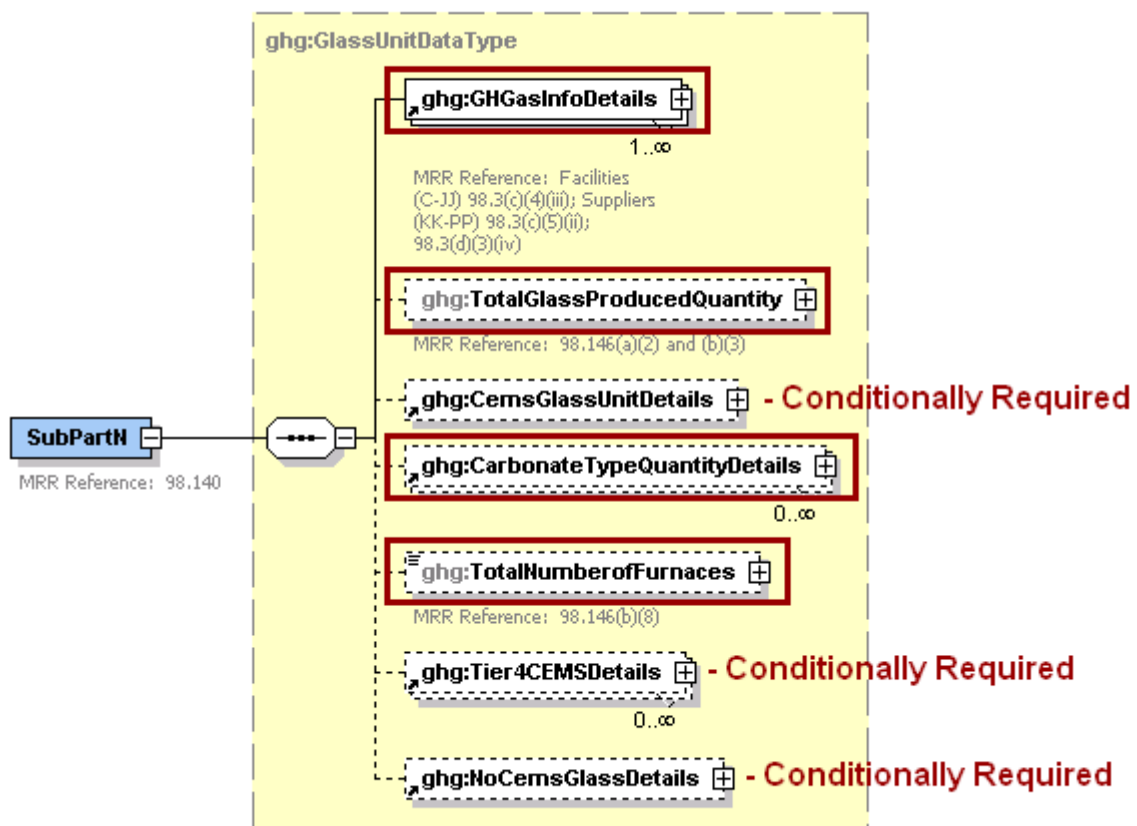


The XML schema includes the following areas for reporting for Subpart N as shown in the reporting diagram:

- 1.0 Subpart N Total Emissions: includes the total annual emissions for greenhouse gases required to be reported.
- 2.0 Total Glass Production: includes the total annual glass production quantity for the facility.
- 3.0 CEMS Unit Details: includes information on unit identification and details if using CEMS.
- 4.0 Facility Level Details: includes information on carbonate-based raw materials and the number of furnaces in the facility.
- 5.0 Tier 4 CEMS Details: includes information on each CEMS monitoring location and emissions (CO₂, CH₄, N₂O and biogenic CO₂) details.
- 6.0 Non-CEMS Unit Details: includes information on unit identification, emissions and glass production if not using CEMS.
- 7.0 Facility Level Roll-up Emissions: includes information on how to report total emissions for CO₂e (excluding biogenic CO₂) and total biogenic CO₂.

If your facility is subject to reporting under Subpart N (Glass Production), EPA recommends that you also consider Subpart C (General Stationary Fuel Combustion) in your facility applicability determination. This source category is only provided as a suggestion - additional Subparts may be relevant for a given facility/supplier and the listed Subpart may not be relevant for all facilities/suppliers.

Figure 8
Subpart N Schema Diagram

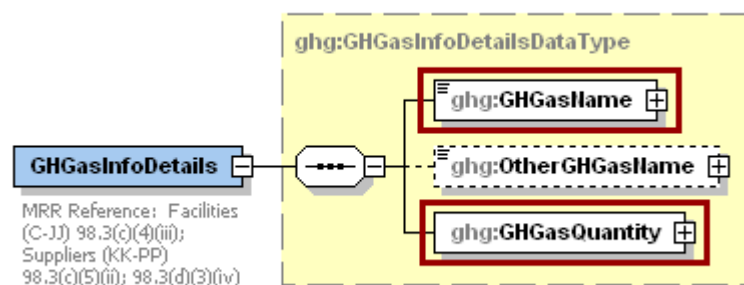


Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

1.0 Subpart N Total Emissions

Greenhouse gas information details comprise a collection of data elements to report the total annual emissions of each greenhouse gas (GHG) listed in Table A-1 of 40 CFR 98 Mandatory Reporting of Greenhouse Gases, reported under Subpart N, expressed in metric tons.

Figure 9
Greenhouse Gas Information Details Schema Diagram



Note: Data elements boxed in red are required.

For Subpart N, report total emissions for carbon dioxide (excluding biogenic CO₂), biogenic carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). For greenhouse gas quantity, report the calculated value and mass unit of measure (metric tons) only according to the following guidelines:

- For carbon dioxide, report the sum of the following:
 - The total annual CO₂ process emissions from each furnace (Equation N-1) in metric tons for each non-CEMS unit.
 - The total annual CO₂ mass emissions measured by the CEMS in metric tons minus the total annual biogenic CO₂ mass emissions in metric tons (the difference of the total CO₂ monitored by the CEMS and the total biogenic CO₂) for each CEMS monitoring location (CML).
- For biogenic carbon dioxide, report the sum of the total annual biogenic CO₂ mass emissions in metric tons for each CML.
- For methane, report the sum of the total CH₄ emissions in metric tons for each CML.
- For nitrous oxide, report the sum of the total N₂O emissions in metric tons for each CML.

Note: You must follow the rounding rules found in [Table 1](#).

Table 6
Greenhouse Gas Information Details Data Element Definitions

Data Element Name	Description
GHGasInfoDetails	Parent Element: A collection of data elements containing the total annual emissions of each greenhouse gas (GHG) listed in Table A-1 of 40 CFR 98 Mandatory Reporting of Greenhouse Gases reported under this Subpart, expressed in metric tons.
GHGasName	Specify the name of the greenhouse gas. See list of allowable values: Carbon Dioxide Biogenic Carbon dioxide Methane Nitrous Oxide
GHGasQuantity	A collection of data elements that quantify the annual emissions from this source category. Report the value in the child data element CalculatedValue according to the guidelines above. Set the units of measure to "Metric Tons" in the attribute massUOM .

XML Excerpt 2
Example for Greenhouse Gas Information Details

```

<ghg:SubPartN>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Biogenic Carbon dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>500.1</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Methane</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>111.23</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>11.456</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>249500.7</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>

```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

2.0 Total Glass Production

This section provides a description of how to report Subpart N information for total glass production for the facility.

Figure 10
Total Glass Production Schema Diagram



Note: Data elements boxed in red are required.

For Subpart N, report the total annual quantity of glass produced from all furnaces combined in short tons [98.146(a)(2) and 98.146(b)(3)].

Table 7
Total Glass Production Data Element Definitions

Data Element Name	Description
TotalGlassProducedQuantity	A collection of data elements containing information on the total quantity of glass produced across all furnaces. Report the value in the child data element MeasureValue . Set the units of measure to “Short Tons” in the attribute massUOM .

XML Excerpt 3
Example for Total Glass Production

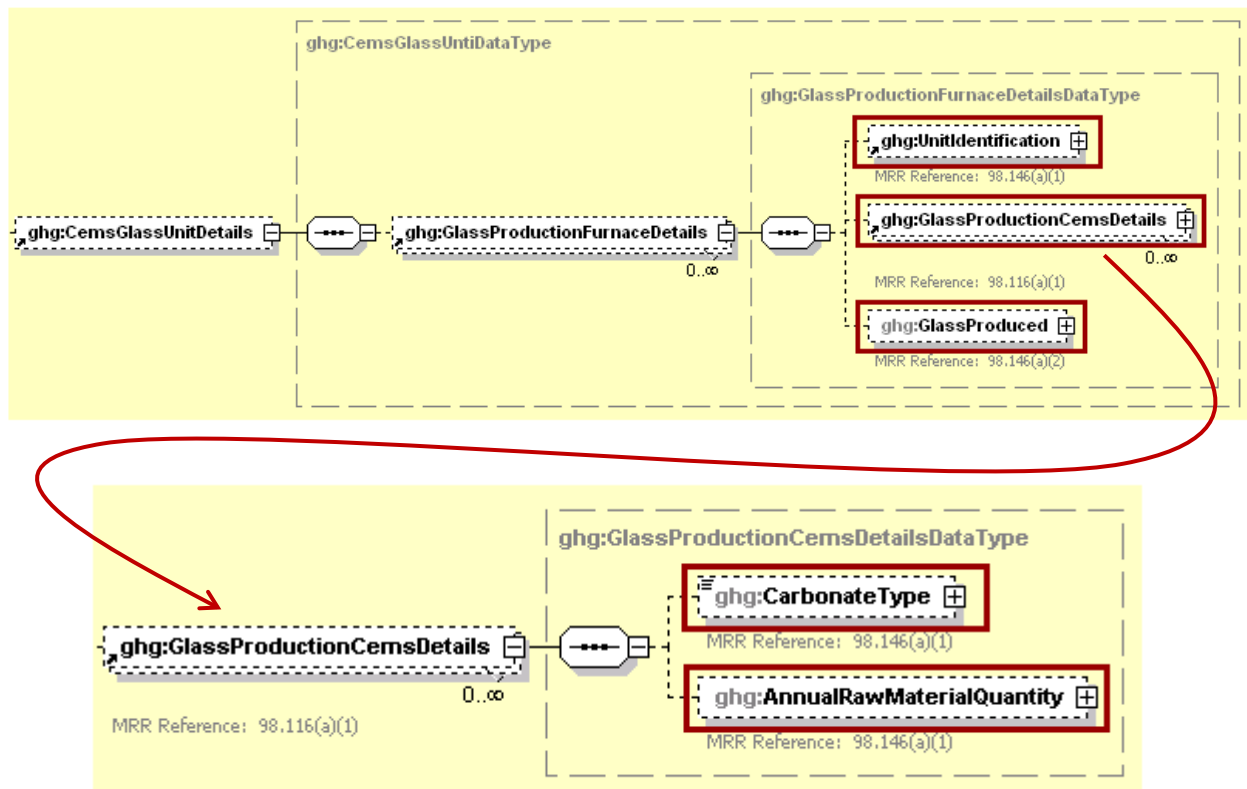
```
<ghg:TotalGlassProducedQuantity massUOM="tons">
  <ghg:MeasureValue>30000.346793</ghg:MeasureValue>
</ghg:TotalGlassProducedQuantity>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

3.0 CEMS Unit Details

Conditionally Required: This section describes unit information that must be reported for units if a continuous emissions monitoring system (CEMS) was in use during the reporting year.

Figure 11
CEMS Unit Details Schema Diagram



Note: Data elements boxed in red are required.

Subpart N requires the following identification information for each continuous glass melting furnace that had emissions monitored using a CEMS [98.146(a)]:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- The type of unit: "Continuous Glass Melting Furnace".

For each continuous glass melting furnace monitored by CEMS in your facility, Subpart N requires you to report the following information:

- The type of each carbonate-based raw material charged to each continuous glass melting furnace from the following list [98.146(a)]:
 - Limestone
 - Dolomite
 - Sodium carbonate
 - Barium carbonate
 - Potassium carbonate
 - Lithium carbonate
 - Strontium carbonate

- The annual quantity of each carbonate-based raw material charged to each furnace in short tons [98.146(a)(1)].
- The annual quantity of glass produced by each continuous glass melting furnace in short tons [98.146(a)(2)].

**Table 8
CEMS Unit Details Data Element Definitions**

Data Element Name	Description
CemsGlassUnitDetails	Parent Element (Conditionally Required): A collection of data elements containing details about furnaces which were monitored using a CEMS.
GlassProductionFurnaceDetails	Parent Element: A collection of data elements containing details about each furnace which was monitored using a CEMS.
UnitIdentification	A collection of data elements containing the identity of each continuous glass melting furnace that uses a CEMS to measure CO ₂ emissions. Report a unique unit name (ID) in the child data element UnitName , an optional brief description in the child data element UnitDescription and the type of unit in the child data element UnitType : Continuous Glass Melting Furnace
GlassProductionCemsDetails	Parent Element: A collection of data elements containing information about the quantity of each carbonate-based raw material charged to a continuous glass melting furnace.
CarbonateType	Each carbonate-based raw material charged to the specified continuous glass melting furnace. See list of allowable values: Limestone Dolomite Sodium carbonate Barium carbonate Potassium carbonate Lithium carbonate Strontium carbonate
AnnualRawMaterialQuantity	A collection of data elements containing information on the annual quantity of each carbonate-based raw material charged to the specified continuous glass melting furnace. Report the value in the child data element MeasureValue . Set the units of measure to “Short Tons” in the attribute massUOM .
GlassProduced	A collection of data elements containing information on the annual quantity of glass produced by the specified glass melting furnace. Report the value in the child data element MeasureValue . Set the units of measure to “Short Tons” in the attribute massUOM .

XML Excerpt 4 Example for CEMS Unit Details

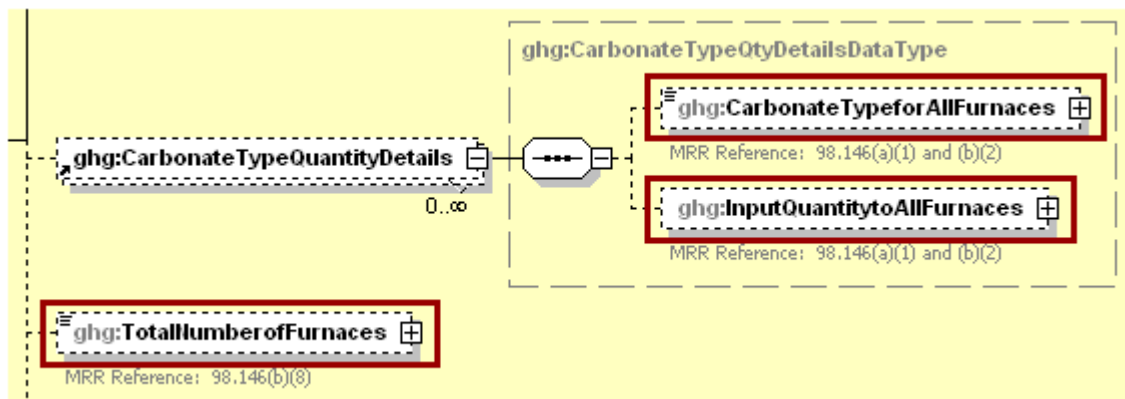
```
<ghg:CemsGlassUnitDetails>
  <ghg:GlassProductionFurnaceDetails>
    <ghg:UnitIdentification>
      <ghg:UnitName>002- CEMS</ghg:UnitName>
      <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
      <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
    </ghg:UnitIdentification>
    <ghg:GlassProductionCemsDetails>
      <ghg:CarbonateType>Limestone</ghg:CarbonateType>
      <ghg:AnnualRawMaterialQuantity massUOM="tons">
        <ghg:MeasureValue>5000.234211</ghg:MeasureValue>
      </ghg:AnnualRawMaterialQuantity>
    </ghg:GlassProductionCemsDetails>
    <ghg:GlassProductionCemsDetails>
      <ghg:CarbonateType>Barium carbonate</ghg:CarbonateType>
      <ghg:AnnualRawMaterialQuantity massUOM="Short Tons">
        <ghg:MeasureValue>6000.867856</ghg:MeasureValue>
      </ghg:AnnualRawMaterialQuantity>
    </ghg:GlassProductionCemsDetails>
    <ghg:GlassProduced massUOM="Short Tons">
      <ghg:MeasureValue>20000.12</ghg:MeasureValue>
    </ghg:GlassProduced>
  </ghg:GlassProductionFurnaceDetails>
</ghg:CemsGlassUnitDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

4.0 Facility Level Details

This section describes information that must be reported for Subpart N at the facility level.

**Figure 12
Facility Level Details Schema Diagram**



Note: Data elements boxed in red are required.

Subpart N requires the following information be reported:

- The type of each carbonate-based raw material for all furnaces combined from the following list [98.146(a) and 98.146(b)].
 - Limestone
 - Dolomite
 - Sodium carbonate
 - Barium carbonate
 - Potassium carbonate
 - Lithium carbonate
 - Strontium carbonate
- The annual quantity of each carbonate-based raw material for all furnaces combined in short tons [98.146(a)(1) and (b)(2)].
- The total number of continuous glass melting furnaces [98.146(b)(8)].

**Table 9
Facility Level Details Data Element Definitions**

Data Element Name	Description
CarbonateTypeQuantityDetails	Parent Element: A collection of data elements with information on the quantity of each carbonate-based raw material.
CarbonateTypeforAllFurnaces	Each carbonate-based raw material charged to a continuous glass melting furnace. See list of allowable values: Limestone Dolomite Sodium carbonate Barium carbonate Potassium carbonate Lithium carbonate Strontium carbonate

Data Element Name	Description
InputQuantitytoAllFurnaces	A collection of data elements containing information on the annual quantity of the specified carbonate-based raw material. Report the value in the child data element MeasureValue . Set the units of measure to "Short Tons" in the attribute massUOM .
TotalNumberofFurnaces	The total number of continuous glass melting furnaces.

XML Excerpt 5 Example for Facility Level Details

```

<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Limestone</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1000.356</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Dolomite</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1100.5</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Sodium carbonate</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1200.23</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Barium carbonate</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1300.1</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Strontium carbonate</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1400.98</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Lithium carbonate</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1500.4565643</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:CarbonateTypeQuantityDetails >
  <ghg:CarbonateTypeforAllFurnaces>Potassium carbonate</ghg:CarbonateTypeforAllFurnaces >
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1600.165577</ghg:MeasureValue >
  </ghg:InputQuantitytoAllFurnaces >
</ghg:CarbonateTypeQuantityDetails >
<ghg:TotalNumberofFurnaces>2</ghg:TotalNumberofFurnaces >

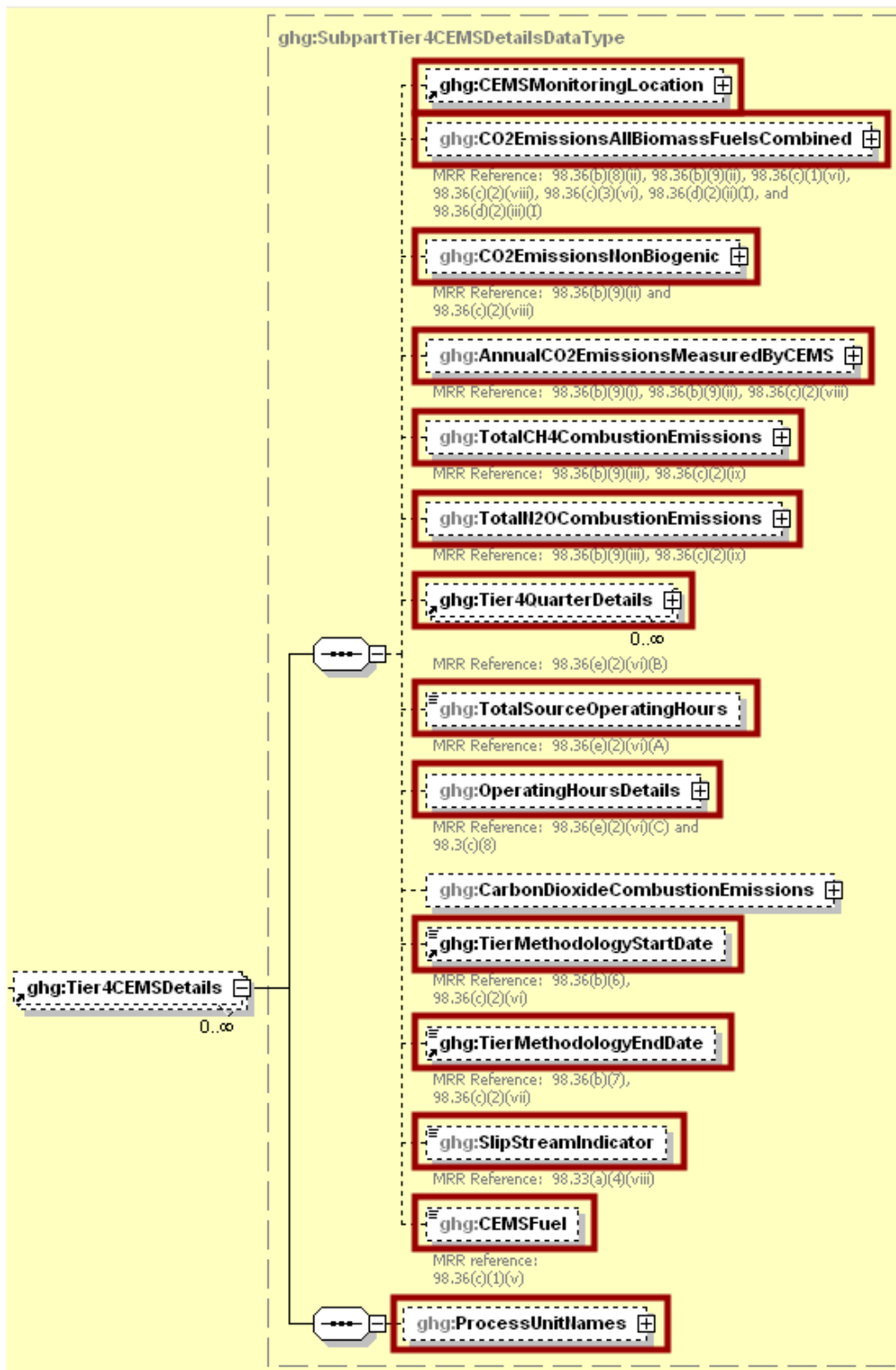
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

5.0 Tier 4 CEMS Details

Conditionally Required: This section includes information to be reported for each CEMS monitoring location (CML).

Figure 13
Tier 4 CEMS Details Schema Diagram



Note: Data elements boxed in red are required.

For Subpart N, information on each CEMS monitoring location (CML) is required including the name, an optional description and the configuration type. For each CML identified by the facility, the facility must specify the configuration type from the following list [98.176(e)]:

- 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.

For each CEMS monitoring location identified, the following emissions data must be reported:

- The total annual biogenic CO₂ mass emissions from combustion of all biomass fuels combined [98.36(b)(9)(ii), 98.36(c)(2)(viii)].
- The total annual non-biogenic CO₂ mass emissions (i.e., CO₂ mass emissions from fossil fuels, sorbent use and process emissions) [98.36(b)(9)(ii), 98.36(c)(2)(viii)].
- The total annual CO₂ mass emissions measured by the CEMS [98.36(b)(9)(i)-(ii), 98.36(c)(2)(viii)].
- The total annual CH₄ 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 [98.36(c)(2)(ix), 98.246(b)(5)(i)-(ii)].
- The total annual 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 [98.36(c)(2)(ix), 98.246(b)(5)(i)-(ii)].

Figure 14
Tier 4 CEMS Location and Emission Details Schema Diagram



Note: Data elements boxed in red are required.

**Table 10
Tier 4 CEMS Location and Emission Details Data Element Definitions**

Data Element Name	Description
Tier4CEMSDetails	Parent Element (Conditionally Required): A collection of data elements containing information on emissions from combustion sources monitored with Tier 4 CEMS methodology. Report data for each CML separately.
CEMSMonitoringLocation	A collection of data elements containing information on each CEMS monitoring location (CML). Report a unique CML name (ID) in the child data element Name , an optional brief description in the child data element Description and the type of configuration in the child data element Type . See the list of allowable configuration types: Single process/process unit exhausts to dedicated stack Multiple processes/process units share common stack Process/stationary combustion units share common stack
CO2EmissionsAllBiomassFuelsCombined	A collection of data elements containing information on the total annual biogenic CO ₂ mass emissions for the specified CML. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
CO2EmissionsNonBiogenic	A collection of data elements containing information on the total annual non-biogenic CO ₂ mass emissions (includes fossil fuel, sorbent and process CO ₂ emissions) for the specified CML. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
AnnualCO2EmissionsMeasuredByCEMS	A collection of data elements containing information on the total annual CO ₂ mass emissions measured by the CEMS at the specified monitoring location. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
TotalCH4CombustionEmissions	A collection of data elements containing information on the annual CH ₄ mass emissions from combustion in the CML configuration during the reporting year calculated using Equation C-10 expressed in mass of CH ₄ . Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
TotalN2OCombustionEmissions	A collection of data elements containing information on the annual N ₂ O mass emissions from combustion in the CML configuration during the reporting year calculated using Equation C-10 expressed in mass of N ₂ O. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .

XML Excerpt 6 Example for Tier 4 CEMS Location and Emission Details

```

<ghg:Tier4CEMSDetails>
  <ghg:CEMSMonitoringLocation>
    <ghg:Name>003- CML</ghg:Name>
    <ghg:Description>CML</ghg:Description>
    <ghg:Type>Single process/process unit exhausts to dedicated stack</ghg:Type>
  </ghg:CEMSMonitoringLocation>
  <ghg:CO2EmissionsAllBiomassFuelsCombined massUOM="Metric Tons">
    <ghg:CalculatedValue>500.4</ghg:CalculatedValue>
  </ghg:CO2EmissionsAllBiomassFuelsCombined>
  <ghg:CO2EmissionsNonBiogenic massUOM="Metric Tons">
    <ghg:CalculatedValue>999500.7</ghg:CalculatedValue>
  </ghg:CO2EmissionsNonBiogenic>
  <ghg:AnnualCO2EmissionsMeasuredByCEMS massUOM="Metric Tons">
    <ghg:CalculatedValue>100000.3</ghg:CalculatedValue>
  </ghg:AnnualCO2EmissionsMeasuredByCEMS>
  <ghg:TotalCH4CombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>111.89</ghg:CalculatedValue>
  </ghg:TotalCH4CombustionEmissions>
  <ghg:TotalN2OCombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>11.345</ghg:CalculatedValue>
  </ghg:TotalN2OCombustionEmissions>

```

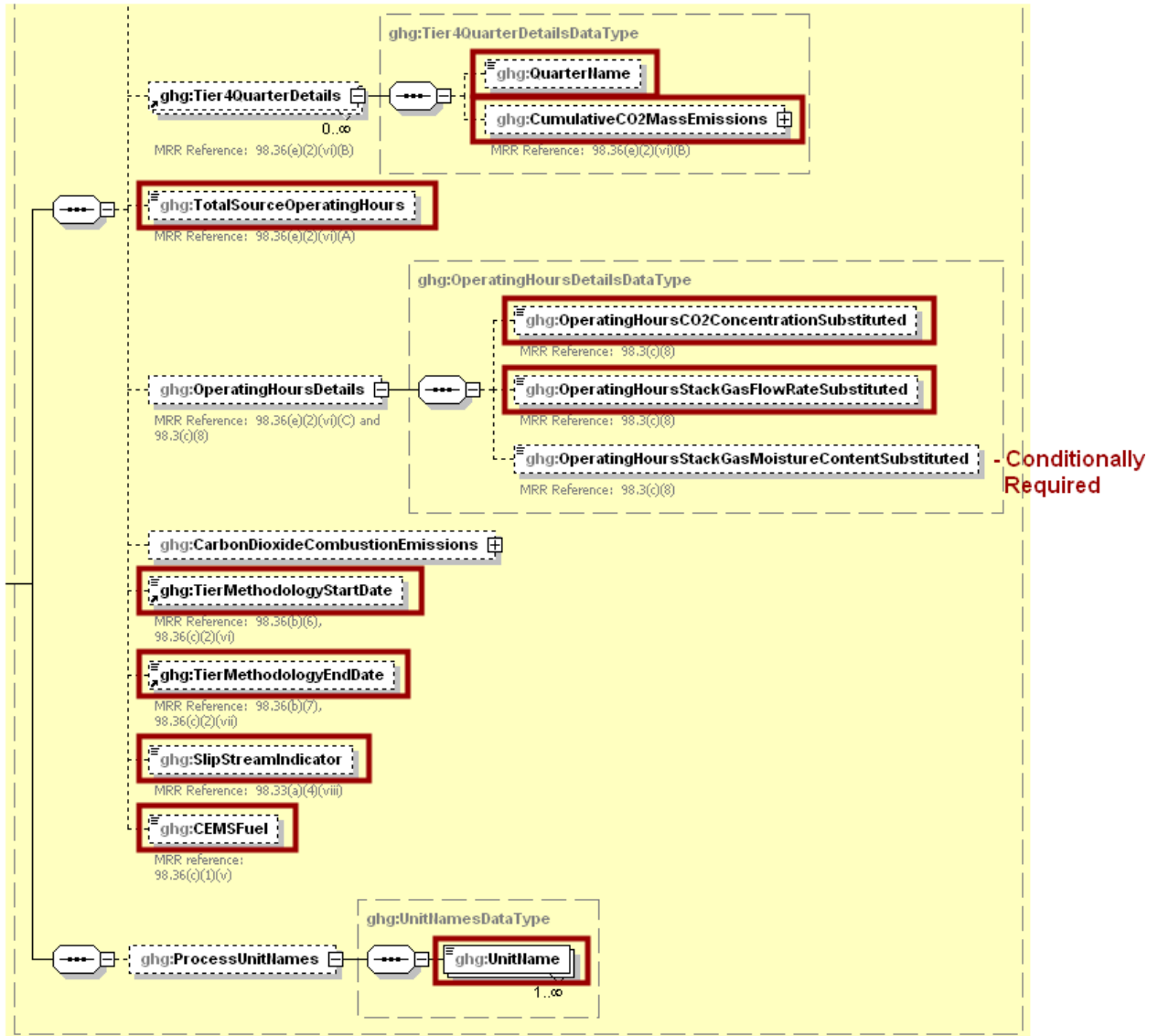
Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

For each quarter of the reporting year, the facility must provide the cumulative CO₂ mass emissions for each CML [98.36(e)(2)(vi)(B)].

The facility must provide the following additional information for each CML:

- The total number of source operating hours in the reporting year [98.36(e)(2)(vi)(A)].
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter [98.36(e)(2)(vi)(C), 98.3(c)(8)].
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter [98.36(e)(2)(vi)(C), 98.3(c)(8)].
- **Conditionally Required:** 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 [98.36(e)(2)(vi)(C), 98.3(c)(8)].
- The Tier 4 methodology start date [98.36(b)(6), 98.36(c)(2)(vi)].
- The Tier 4 methodology end date [98.36(b)(7), 98.36(c)(2)(vii)].
- Specify if emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS [98.33(a)(4)(viii)]
- Each type of fuel combusted in the group of units during the reporting year [98.36(b)(4), 98.36(c)(2)(iv)]
- The name/ID of each process unit sharing the stack. **Note:** Use the same identification for each unit as was used for the parent element “CemsGlassUnitDetails”.

Figure 15
Tier 4 CEMS Quarter and Additional Details Schema Diagram



Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

Table 11
Tier 4 CEMS Quarter and Additional Details Data Element Definitions

Data Element Name	Description
Tier4QuarterDetails	Parent Element: A collection of data elements containing Tier 4 quarterly information.
QuarterName	The name of the quarter. See list of allowable values: First Quarter Second Quarter Third Quarter Fourth Quarter

Data Element Name	Description
CumulativeCO2MassEmissions	A collection of data elements containing information on the cumulative CO ₂ mass emissions for the specified CEMS monitoring location for the specified quarter of the reporting year. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
TotalSourceOperatingHours	The total number of source operating hours in the reporting year for the specified CEMS monitoring location..
OperatingHoursDetails	Parent Element: A collection of data elements containing information on the number of operating hours in which substitute data values were used.
OperatingHoursCO2ConcentrationSubstituted	The total operating hours in which a substitute data value was used in the emissions calculations for the CO ₂ concentration parameter at the specified CEMS monitoring location.
OperatingHoursStackGasFlowRateSubstituted	The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter at the specified CEMS monitoring location.
OperatingHoursStackGasMoistureContentSubstituted	Conditionally Required: 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 at the specified CEMS monitoring location.
TierMethodologyStartDate	The tier methodology start date for the specified CEMS monitoring location (YYYY-MM-DD).
TierMethodologyEndDate	The tier methodology end date for the specified CEMS monitoring location (YYYY-MM-DD).
SlipStreamIndicator	An indication (Y/N) that the emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS.
CEMSFuel	Each type of fuel combusted in the group of units during the reporting year.
ProcessUnitNames	Parent Element: A collection of data elements identifying each unit or furnace which was monitored at the specified CEMS monitoring location.
UnitName	The unit name/ID for each unit or furnace which was monitored at the specified CEMS monitoring location. Note: Use the same identification for each unit as was used for the parent element “CemsGlassUnitDetails”

XML Excerpt 7

Example for Tier 4 CEMS Quarter and Additional Details

```

<ghg: Tier4QuarterDetails >
  <ghg: QuarterName >First Quarter</ghg: QuarterName >
  <ghg: CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg: CalculatedValue >10000.2</ghg: CalculatedValue >
  </ghg: CumulativeCO2MassEmissions >
</ghg: Tier4QuarterDetails >
<ghg: Tier4QuarterDetails >
  <ghg: QuarterName >Second Quarter</ghg: QuarterName >
  <ghg: CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg: CalculatedValue >12000.4</ghg: CalculatedValue >
  </ghg: CumulativeCO2MassEmissions >
</ghg: Tier4QuarterDetails >
<ghg: Tier4QuarterDetails >
  <ghg: QuarterName >Third Quarter</ghg: QuarterName >
  <ghg: CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg: CalculatedValue >14000.8</ghg: CalculatedValue >
  </ghg: CumulativeCO2MassEmissions >
</ghg: Tier4QuarterDetails >
<ghg: Tier4QuarterDetails >
  <ghg: QuarterName >Fourth Quarter</ghg: QuarterName >
  <ghg: CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg: CalculatedValue >16000.1</ghg: CalculatedValue >
  </ghg: CumulativeCO2MassEmissions >
</ghg: Tier4QuarterDetails >
<ghg: TotalSourceOperatingHours >10</ghg: TotalSourceOperatingHours >
<ghg: OperatingHoursDetails >
  <ghg: OperatingHoursCO2ConcentrationSubstituted >11</ghg: OperatingHoursCO2ConcentrationSubstituted >
  <ghg: OperatingHoursStackGasFlowRateSubstituted >12</ghg: OperatingHoursStackGasFlowRateSubstituted >
  <ghg: OperatingHoursStackGasMoistureContentSubstituted >13</ghg: OperatingHoursStackGasMoistureContentSubstituted >
</ghg: OperatingHoursDetails >
<ghg: TierMethodologyStartDate >2011-01-01</ghg: TierMethodologyStartDate >
<ghg: TierMethodologyEndDate >2011-12-31</ghg: TierMethodologyEndDate >
<ghg: SlipStreamIndicator >Y</ghg: SlipStreamIndicator >
<ghg: CEMSFuel >natural gas, coal</ghg: CEMSFuel >
<ghg: ProcessUnitNames >
  <ghg: UnitName >002- CEMS</ghg: UnitName >
</ghg: ProcessUnitNames >
</ghg: Tier4CEMSDetails >

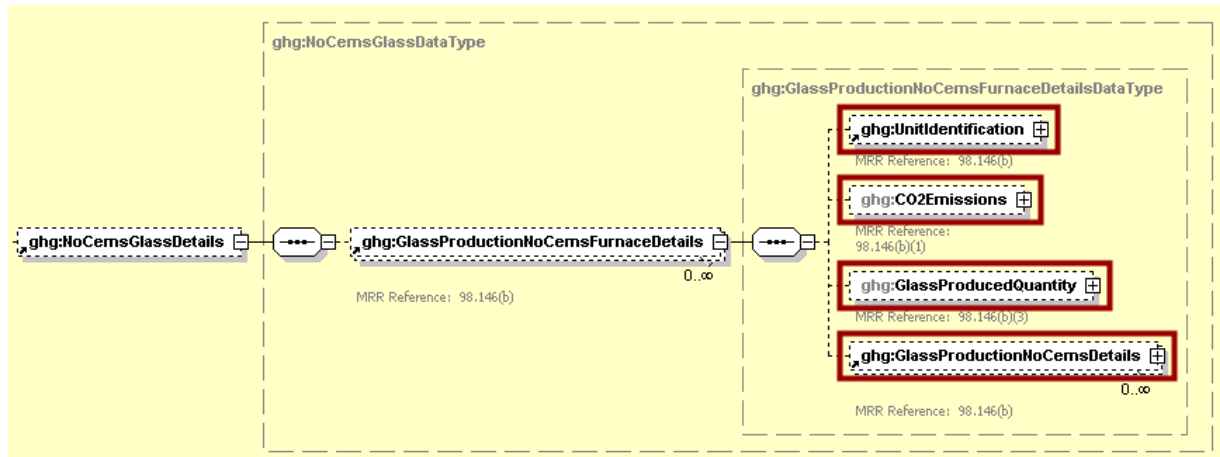
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

6.0 Non-CEMS Unit Details

Conditionally Required: This section includes information to be reported for each unit which was not monitored by a CEMS during the reporting year.

Figure 16
Non-CEMS Unit Details Schema Diagram



Note: Data elements boxed in red are required.

Subpart N requires the following identification information for each continuous glass melting furnace that did not have emissions monitored using a CEMS [98.146(b)]:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- The type of unit: "Continuous Glass Melting Furnace".

For each continuous glass melting furnace in your facility, Subpart N requires you to report the following information:

- The total annual CO₂ process emissions for each furnace in metric tons (the output of Equation N-1) [98.146(b)(1)].
- The annual quantity of glass produced by each glass melting furnace in short tons [98.146(b)(3)].

**Table 12
Non-CEMS Unit Details Data Element Definitions**

Data Element Name	Description
NoCemsGlassDetails	Parent Element (Conditionally Required): A collection of data elements containing details about furnaces which were not monitored using a CEMS.
GlassProductionNoCemsFurnaceDetails	Parent Element: A collection of data elements containing details about each furnace which was not monitored using a CEMS.
UnitIdentification	A collection of data elements containing the identity of each continuous glass melting furnace that does not use a CEMS to measure CO ₂ emissions. Report a unique unit name (ID) in the child data element UnitName , an optional brief description in the child data element UnitDescription and the type of unit in the child data element UnitType .: Continuous Glass Melting Furnace
CO2Emissions	A collection of data elements containing information on CO ₂ process emissions for the specified furnace. Report the value in the child data element CalculatedValue . Set the units of measure to “Metric Tons” in the attribute massUOM .
GlassProducedQuantity	A collection of data elements containing information on the total quantity of glass produced by the specified furnace. Report the value in the child data element MeasureValue . Set the units of measure to “Short Tons” in the attribute massUOM .

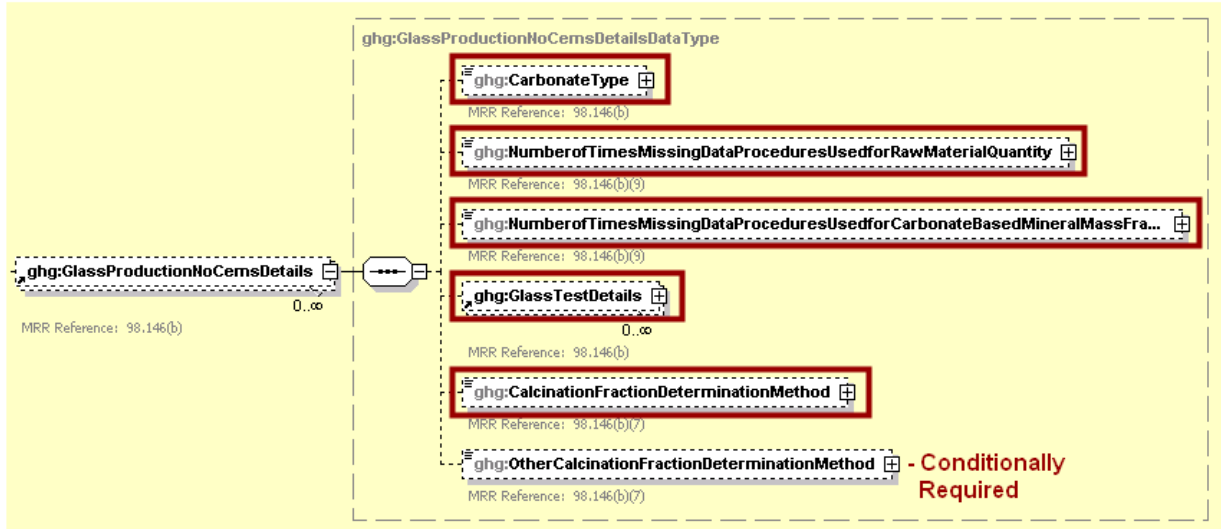
**XML Excerpt 8
Example for Non-CEMS Unit Details**

```

<ghg:NoCemsGlassDetails>
  <ghg:GlassProductionNoCemsFurnaceDetails>
    <ghg:UnitIdentification>
      <ghg:UnitName>001- Non-CEMS</ghg:UnitName>
      <ghg:UnitDescription>Non-CEMS unit</ghg:UnitDescription>
      <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
    </ghg:UnitIdentification>
    <ghg:CO2Emissions massUOM="Metric Tons">
      <ghg:CalculatedValue>150000.2</ghg:CalculatedValue>
    </ghg:CO2Emissions>
    <ghg:GlassProducedQuantity massUOM="Short Tons">
      <ghg:MeasureValue>10000.4564569</ghg:MeasureValue>
    </ghg:GlassProducedQuantity>
  </ghg:GlassProductionNoCemsFurnaceDetails>
</ghg:NoCemsGlassDetails>
  
```

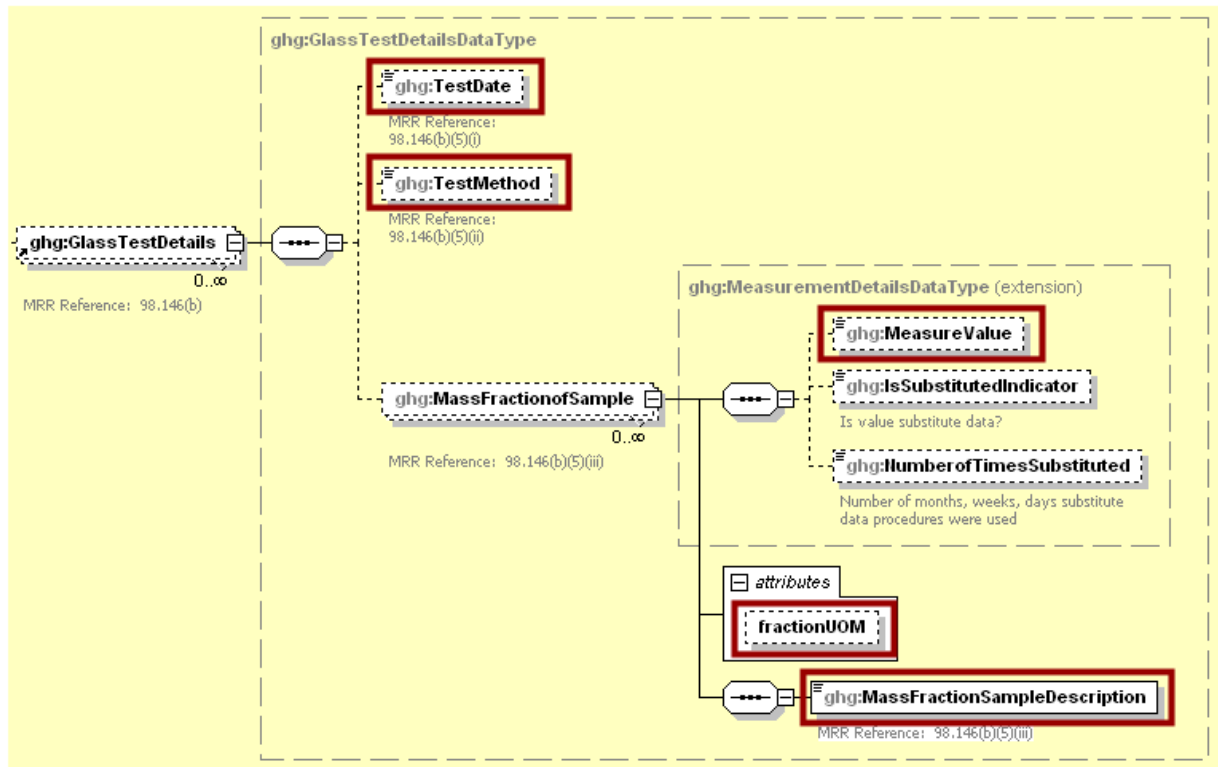
Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Figure 17
Glass Production Details Schema Diagram



Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

Figure 18
Glass Test Details Schema Diagram



Note: Data elements boxed in red are required.

For each continuous glass melting furnace, the system shall require the facility to identify each carbonate-based raw material charged to the furnace from the following list [98.146(b)]:

- Limestone
- Dolomite
- Sodium carbonate
- Barium carbonate
- Potassium carbonate
- Lithium carbonate
- Strontium carbonate

For each carbonate-based raw material charged to each continuous glass melting furnace, the following must be reported:

- The number of months that missing data procedures were followed to measure monthly quantities of the carbonate-based raw material [98.146(b)(9)].
- The number of months that missing data procedures were followed to measure monthly mass fraction of the carbonate-based raw material [98.146(b)(9)].

For each carbonate-based raw material charged to each continuous glass melting furnace, data for one or more mass fraction verification tests must be reported. For each test, provide the following:

- The date of the test [98.146(b)(5)(i)].
- The method(s) and any variations used in the analyses [98.146(b)(5)(ii)].
- Data for one or more samples analyzed. For each sample analyzed, provide the following:
 - The mass fraction determined by analysis of the sample [98.146(b)(5)(iii)].
 - A unique description/label for the sample [98.146(b)(5)(iii)].

For each carbonate-based raw material charged to each continuous glass melting furnace, report the method used to determine the fraction of calcinations [98.146(b)(7)]:

- Default value (1.0)
- Chemical analysis using x-ray fluorescence
- Other method used, if applicable

Table 13
Glass Production Details Data Element Definitions

Data Element Name	Description
GlassProductionNoCemsDetails	Parent Element: A collection of data elements containing information about the quantity of each carbonate-based raw material charged to a continuous glass melting furnace.
CarbonateType	Each carbonate-based raw material charged to the specified continuous glass melting furnace. See list of allowable values: Limestone Dolomite Sodium carbonate Barium carbonate Potassium carbonate Lithium carbonate Strontium carbonate

Data Element Name	Description
NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity	For the specified carbonate-based raw material charged to the specified continuous glass melting furnace, the number of months that missing data procedures were followed to measure monthly quantities of the carbonate-based raw material.
NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction	For the specified carbonate-based raw material charged to the specified continuous glass melting furnace, the number of months that missing data procedures were followed to measure monthly mass fractions.
GlassTestDetails	Parent Element: A collection of data elements containing information on the results of all tests used to verify the carbonate-based mineral mass fraction for the specified carbonate-based raw material charged to the specified continuous glass melting furnace
TestDate	The date of each mass fraction verification test for the specified carbonate-based raw material charged to the specified continuous glass melting furnace (YYYY-MM-DD).
TestMethod	The method(s) and any variations used in the analyses for each mass fraction verification test for the specified carbonate-based raw material charged to the specified continuous glass melting furnace.
MassFractionofSample	A collection of data elements containing information on the mass fraction determined by analysis of each sample by a mass fraction verification test. Report each value separately. Report the value in the child data element MeasureValue . Report a unique description/label for each sample analyzed by a mass fraction verification test in the child data element MassFractionSampleDescription . Set the units of measure to "decimal fraction" in the attribute massUOM .
CalcinationFractionDeterminationMethod	The method used to determine the fraction of calcinations. See list of allowable values: Default value (1.0) Chemical analysis using x-ray fluorescence Other
OtherCalcinationFractionDeterminationMethod	Conditionally Required: Specify the method used to determine the fraction of calcinations if "Other" was specified.

XML Excerpt 9 Example for Glass Production

```

<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Dolomite</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>1</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>2</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-04-04</ghg:TestDate>
    <ghg:TestMethod>Method A</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.2565</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 1</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.3565</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 2</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Default value (1.0)</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Limestone</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>3</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>4</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-12-01</ghg:TestDate>
    <ghg:TestMethod>Method B</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.4456</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 3</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.5654</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 4</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Chemical analysis using x-ray fluorescence</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Potassium carbonate</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>7</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>8</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-11-11</ghg:TestDate>
    <ghg:TestMethod>Method E</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.2224</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 5</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Default value (1.0)</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
</ghg:GlassProductionNoCemsFurnaceDetails>
</ghg:NoCemsGlassDetails>

```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

7.0 Facility-Level Roll-up Emissions

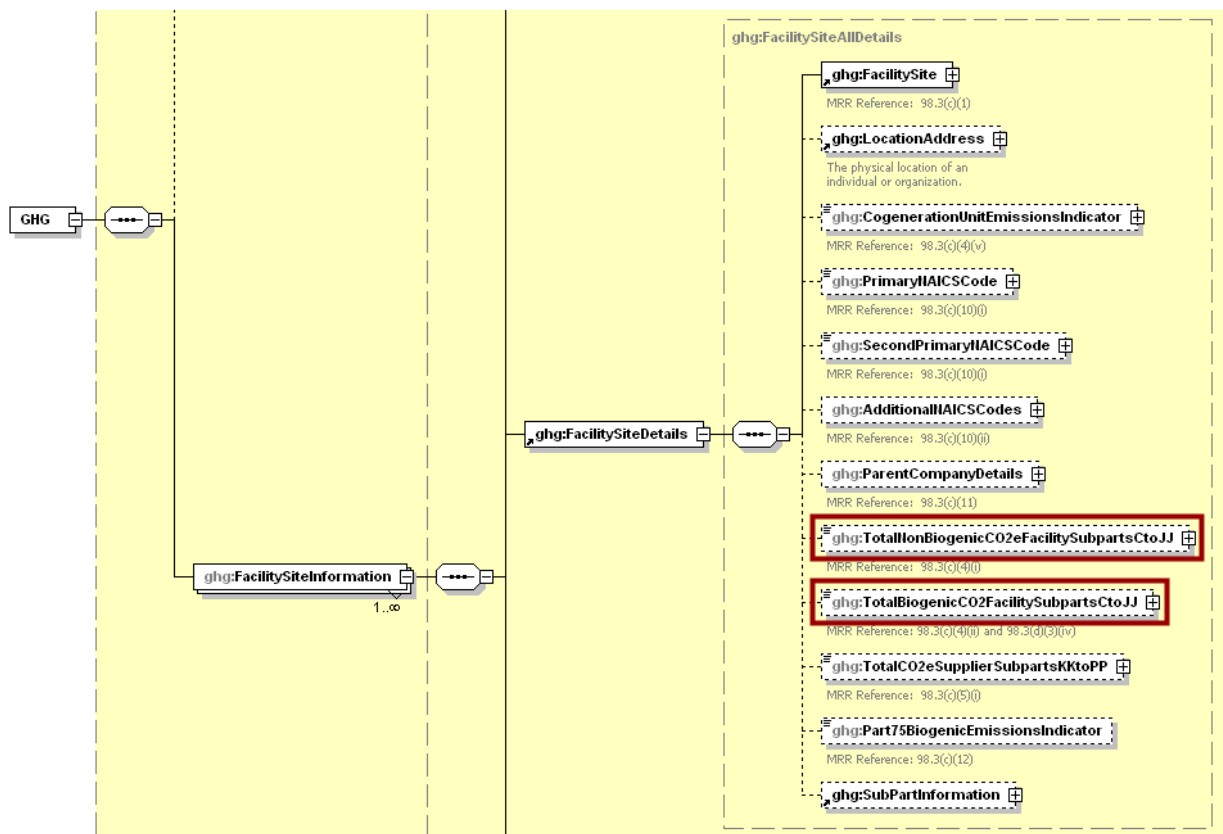
Each facility must report the following facility-level emission totals:

- Total CO₂ equivalent (CO₂e) emissions (excluding biogenic CO₂) aggregated across all direct emitter source categories (Subparts C-HH) associated with the facility.
- Total biogenic CO₂ emissions aggregated across all direct emitter source categories (Subparts C-HH) associated with the facility.

Each supplier must report the following supplier totals:

- Total CO₂e associated with products supplied aggregated across Subparts NN, OO and PP (as applicable). **Note:** Do not include Subpart LL and MM totals in this data element as these values are not being collected in e-GGRT.

Figure 19
Facility-Level Roll-up Emissions Schema Diagram



Note: Data elements boxed in red are required.

1) Add the total CO₂e value for Subpart N in metric tons to the total CO₂e emissions (excluding biogenic CO₂) aggregated across all source category Subparts associated with the facility according to the following guidelines:

- Add the total annual CO₂ process emissions from each furnace (Equation N-1) in metric tons for each non-CEMS unit.

- Add the total annual CO₂ mass emissions measured by the CEMS in metric tons minus the total annual biogenic CO₂ mass emissions for the CML in metric tons (the difference of the total CO₂ monitored by the CEMS and the total biogenic CO₂) for each CML.
 - Multiply the total CH₄ emissions in metric tons by the Global Warming Potential for CH₄ (21) for each CML and add the resulting value.
 - Multiply the total N₂O emissions in metric tons by the Global Warming Potential for N₂O (310) for each CML and add the resulting value.
- 2) Add the total annual biogenic CO₂ mass emissions in metric tons for each CML to the total biogenic CO₂ aggregated across all source category Subparts associated with the facility.

Note: You must follow the rounding rules found in [Table 1](#).

Table 14
Facility Level Roll-up Emissions Data Element Definitions

Data Element Name	Description
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ	Add the total CO ₂ e value for Subpart N in metric tons to the total CO ₂ e emissions (excluding biogenic CO ₂) aggregated across all source category Subparts associated with the facility according to the guidelines above. Set the units of measure to “Metric Tons” in the attribute massUOM .
TotalBiogenicCO2FacilitySubpartsCtoJJ	Add the total annual biogenic CO ₂ value for Subpart N in metric tons to the total biogenic CO ₂ emissions aggregated across all source category Subparts associated with the facility according to the guideline above. Set the units of measure to “Metric Tons” in the attribute massUOM .

XML Excerpt 10
Example for Facility Level Roll-up Emissions

```
<ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric Tons">255387.8</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
<ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">500.1</ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Appendix A Sample XML Document for Subpart N

(Note: Data values do not reflect an actual facility's emissions.)

```

<ghg:GHG xmlns="http://www.ccdsupport.com/schema/ghg" >
  <ghg:FacilitySiteInformation >
    <ghg:CertificationStatement>The designated representative or alternate designated representative must sign (i.e., agree to) this certification statement. If you are an agent and you click on
"SUBMIT", you are not agreeing to the certification statement, but are submitting the certification statement on behalf of the designated representative or alternate designated representative who
is agreeing to the certification statement. An agent is only authorized to make the electronic submission on behalf of the designated representative, not to sign (i.e., agree to) the certification
statement. </ghg:CertificationStatement >
    <ghg:ReportingYear>2011 </ghg:ReportingYear >
    <ghg:FacilitySiteDetails >
      <ghg:FacilitySite >
        <ghg:FacilitySiteIdentifier>524657 </ghg:FacilitySiteIdentifier >
        <ghg:FacilitySiteName>Test Facility N </ghg:FacilitySiteName >
      </ghg:FacilitySite >
      <ghg:LocationAddress >
        <ghg:LocationAddressText>1 Main St. </ghg:LocationAddressText >
        <ghg:LocalityName>Charlottesville </ghg:LocalityName >
        <ghg:StateIdentity >
          <ghg:StateCode>VA </ghg:StateCode >
        </ghg:StateIdentity >
        <ghg:AddressPostalCode>22911 </ghg:AddressPostalCode >
      </ghg:LocationAddress >
      <ghg:CogenerationUnitEmissionsIndicator>N </ghg:CogenerationUnitEmissionsIndicator >
      <ghg:PrimaryNAICSCode>327211 </ghg:PrimaryNAICSCode >
      <ghg:ParentCompanyDetails >
        <ghg:ParentCompany >
          <ghg:ParentCompanyLegalName>Soda Ash Corporation </ghg:ParentCompanyLegalName >
          <ghg:StreetAddress>108 Hillcrest Street </ghg:StreetAddress >
          <ghg:City>Sandpoint </ghg:City >
          <ghg:State>ID </ghg:State >
          <ghg:Zip>83864 </ghg:Zip >
          <ghg:PercentOwnershipInterest>100.0 </ghg:PercentOwnershipInterest >
        </ghg:ParentCompany >
      </ghg:ParentCompanyDetails >
      <ghg>TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric Tons">255387.8 </ghg>TotalNonBiogenicCO2eFacilitySubpartsCtoJJ >
      <ghg>TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">500.1 </ghg>TotalBiogenicCO2FacilitySubpartsCtoJJ >
      <ghg>TotalCO2eSupplierSubpartsKktoPP massUOM="Metric Tons">0 </ghg>TotalCO2eSupplierSubpartsKktoPP >
    <ghg:SubPartInformation >
      <ghg:SubPartN >
        <ghg:GHGasInfoDetails >
          <ghg:GHGasName>Biogenic Carbon dioxide </ghg:GHGasName >
          <ghg:GHGasQuantity massUOM="Metric Tons" >
            <ghg:CalculatedValue>500.1 </ghg:CalculatedValue >
          </ghg:GHGasQuantity >
        </ghg:GHGasInfoDetails >
      </ghg:SubPartN >
    </ghg:SubPartInformation >
  </ghg:FacilitySiteInformation >
</ghg:GHG >

```



```

    <ghg:GHGasName>Methane</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>111.23</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>11.456</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>249500.6</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:TotalGlassProducedQuantity massUOM="tons">
    <ghg:MeasureValue>30000</ghg:MeasureValue>
  </ghg:TotalGlassProducedQuantity>
  <ghg:CemsGlassUnitDetails>
    <ghg:GlassProductionFurnaceDetails>
      <ghg:UnitIdentification>
        <ghg:UnitName>002- CEMS</ghg:UnitName>
        <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
        <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
      </ghg:UnitIdentification>
      <ghg:GlassProductionCemsDetails>
        <ghg:CarbonateType>Limestone</ghg:CarbonateType>
        <ghg:AnnualRawMaterialQuantity massUOM="Short Tons">
          <ghg:MeasureValue>5000.67575</ghg:MeasureValue>
        </ghg:AnnualRawMaterialQuantity>
      </ghg:GlassProductionCemsDetails>
      <ghg:GlassProductionCemsDetails>
        <ghg:CarbonateType>Barium carbonate</ghg:CarbonateType>
        <ghg:AnnualRawMaterialQuantity massUOM="Short Tons">
          <ghg:MeasureValue>6000.5463</ghg:MeasureValue>
        </ghg:AnnualRawMaterialQuantity>
      </ghg:GlassProductionCemsDetails>
      <ghg:GlassProduced massUOM="Short Tons">
        <ghg:MeasureValue>20000.1</ghg:MeasureValue>
      </ghg:GlassProduced>
    </ghg:GlassProductionFurnaceDetails>
  </ghg:CemsGlassUnitDetails>
  <ghg:CarbonateTypeQuantityDetails>
    <ghg:CarbonateTypeforAllFurnaces>Limestone</ghg:CarbonateTypeforAllFurnaces>
    <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
      <ghg:MeasureValue>1000.234</ghg:MeasureValue>
    </ghg:InputQuantitytoAllFurnaces>
  </ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeQuantityDetails>
    <ghg:CarbonateTypeforAllFurnaces>Dolomite</ghg:CarbonateTypeforAllFurnaces>
    <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
      <ghg:MeasureValue>1100.2345</ghg:MeasureValue>
    </ghg:InputQuantitytoAllFurnaces>
  </ghg:CarbonateTypeQuantityDetails>

```

```

    </ghg:InputQuantitytoAllFurnaces>
  </ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeforAllFurnaces>Sodium carbonate</ghg:CarbonateTypeforAllFurnaces>
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1200.16989</ghg:MeasureValue>
  </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeforAllFurnaces>Barium carbonate</ghg:CarbonateTypeforAllFurnaces>
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1300.2456</ghg:MeasureValue>
  </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeforAllFurnaces>Strontium carbonate</ghg:CarbonateTypeforAllFurnaces>
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1400.765</ghg:MeasureValue>
  </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeforAllFurnaces>Lithium carbonate</ghg:CarbonateTypeforAllFurnaces>
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1500.876</ghg:MeasureValue>
  </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
  <ghg:CarbonateTypeforAllFurnaces>Potassium carbonate</ghg:CarbonateTypeforAllFurnaces>
  <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
    <ghg:MeasureValue>1600.4</ghg:MeasureValue>
  </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:TotalNumberofFurnaces>2</ghg:TotalNumberofFurnaces>
<ghg:Tier4CEMSDetails>
  <ghg:CEMSMonitoringLocation>
    <ghg:Name>003- CML</ghg:Name>
    <ghg:Description>CML</ghg:Description>
    <ghg:Type>Single process/process unit exhausts to dedicated stack</ghg:Type>
  </ghg:CEMSMonitoringLocation>
  <ghg:CO2EmissionsAllBiomassFuelsCombined massUOM="Metric Tons">
    <ghg:CalculatedValue>500.1</ghg:CalculatedValue>
  </ghg:CO2EmissionsAllBiomassFuelsCombined>
  <ghg:CO2EmissionsNonBiogenic massUOM="Metric Tons">
    <ghg:CalculatedValue>999500.3</ghg:CalculatedValue>
  </ghg:CO2EmissionsNonBiogenic>
  <ghg:AnnualCO2EmissionsMeasuredByCEMS massUOM="Metric Tons">
    <ghg:CalculatedValue>100000.7</ghg:CalculatedValue>
  </ghg:AnnualCO2EmissionsMeasuredByCEMS>
  <ghg:TotalCH4CombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>111.45</ghg:CalculatedValue>
  </ghg:TotalCH4CombustionEmissions>
  <ghg:TotalN2OCombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>11.986</ghg:CalculatedValue>
  </ghg:TotalN2OCombustionEmissions>

```

```

<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>First Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>10000.1</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Second Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>12000.2</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Third Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>14000.8</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Fourth Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>16000.8</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg>TotalSourceOperatingHours>10</ghg>TotalSourceOperatingHours>
<ghg:OperatingHoursDetails>
  <ghg:OperatingHoursCO2ConcentrationSubstituted>11</ghg:OperatingHoursCO2ConcentrationSubstituted>
  <ghg:OperatingHoursStackGasFlowRateSubstituted>12</ghg:OperatingHoursStackGasFlowRateSubstituted>
  <ghg:OperatingHoursStackGasMoistureContentSubstituted>13</ghg:OperatingHoursStackGasMoistureContentSubstituted>
</ghg:OperatingHoursDetails>
<ghg:TierMethodologyStartDate>2011-01-01</ghg:TierMethodologyStartDate>
<ghg:TierMethodologyEndDate>2011-12-31</ghg:TierMethodologyEndDate>
<ghg:SlipStreamIndicator>Y</ghg:SlipStreamIndicator>
<ghg:CEMSFuel>natural gas, coal</ghg:CEMSFuel>
<ghg:ProcessUnitNames>
  <ghg:UnitName>002- CEMS</ghg:UnitName>
</ghg:ProcessUnitNames>
</ghg:Tier4CEMSDetails>
<ghg>NoCemsGlassDetails>
  <ghg:GlassProductionNoCemsFurnaceDetails>
    <ghg:UnitIdentification>
      <ghg:UnitName>001- Non-CEMS</ghg:UnitName>
      <ghg:UnitDescription>Non-CEMS unit</ghg:UnitDescription>
      <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
    </ghg:UnitIdentification>
    <ghg:CO2Emissions massUOM="Metric Tons">
      <ghg:CalculatedValue>150000.1</ghg:CalculatedValue>
    </ghg:CO2Emissions>
    <ghg:GlassProducedQuantity massUOM="Short Tons">
      <ghg:MeasureValue>10000.43532</ghg:MeasureValue>
    </ghg:GlassProducedQuantity>
  </ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Dolomite</ghg:CarbonateType>

```

```

<ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>1</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
<ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>2</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
<ghg:GlassTestDetails>
  <ghg:TestDate>2011-04-04</ghg:TestDate>
  <ghg:TestMethod>Method A</ghg:TestMethod>
  <ghg:MassFractionofSample fractionUOM="decimal fraction">
    <ghg:MeasureValue>0.2512</ghg:MeasureValue>
    <ghg:MassFractionSampleDescription>Test 1</ghg:MassFractionSampleDescription>
  </ghg:MassFractionofSample>
  <ghg:MassFractionofSample fractionUOM="decimal fraction">
    <ghg:MeasureValue>0.35</ghg:MeasureValue>
    <ghg:MassFractionSampleDescription>Test 2</ghg:MassFractionSampleDescription>
  </ghg:MassFractionofSample>
</ghg:GlassTestDetails>
<ghg:CalcinationFractionDeterminationMethod>Default value (1.0)</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Limestone</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>3</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>4</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-12-01</ghg:TestDate>
    <ghg:TestMethod>Method B</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
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      <ghg:MassFractionSampleDescription>Test 3</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
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      <ghg:MassFractionSampleDescription>Test 4</ghg:MassFractionSampleDescription>
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  <ghg:CalcinationFractionDeterminationMethod>Chemical analysis using x-ray fluorescence</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
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  <ghg:CarbonateType>Potassium carbonate</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>7</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>8</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-11-11</ghg:TestDate>
    <ghg:TestMethod>Method E</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.2227</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 5</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Default value (1.0)</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>

```

```

<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Lithium carbonate</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>3</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>4</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
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    <ghg:TestDate>2011-02-09</ghg:TestDate>
    <ghg:TestMethod>Method H</ghg:TestMethod>
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      <ghg:MassFractionSampleDescription>Test 6</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
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      <ghg:MassFractionSampleDescription>Test 7</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Default value (1.0)</ghg:CalcinationFractionDeterminationMethod>
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  <ghg:CarbonateType>Sodium carbonate</ghg:CarbonateType>
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  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>6</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-08-19</ghg:TestDate>
    <ghg:TestMethod>Method D</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.1187</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 8</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.1208</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 9</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Other</ghg:CalcinationFractionDeterminationMethod>
  <ghg:OtherCalcinationFractionDeterminationMethod>Method C</ghg:OtherCalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Strontium carbonate</ghg:CarbonateType>
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  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>2</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-12-30</ghg:TestDate>
    <ghg:TestMethod>Method G</ghg:TestMethod>
    <ghg:MassFractionofSample fractionUOM="decimal fraction">
      <ghg:MeasureValue>0.5554</ghg:MeasureValue>
      <ghg:MassFractionSampleDescription>Test 10</ghg:MassFractionSampleDescription>
    </ghg:MassFractionofSample>
  </ghg:GlassTestDetails>

```

```
</ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Chemical analysis using x-ray fluorescence</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
<ghg:GlassProductionNoCemsDetails>
  <ghg:CarbonateType>Barium carbonate</ghg:CarbonateType>
  <ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>9</ghg:NumberOfTimesMissingDataProceduresUsedforRawMaterialQuantity>
  <ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>10</ghg:NumberOfTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction>
  <ghg:GlassTestDetails>
    <ghg:TestDate>2011-06-06</ghg:TestDate>
    <ghg:TestMethod>Method F</ghg:TestMethod>
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    </ghg:MassFractionofSample>
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  </ghg:GlassTestDetails>
  <ghg:CalcinationFractionDeterminationMethod>Chemical analysis using x-ray fluorescence</ghg:CalcinationFractionDeterminationMethod>
</ghg:GlassProductionNoCemsDetails>
</ghg:GlassProductionNoCemsFurnaceDetails>
</ghg:NoCemsGlassDetails>
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