§ 98.420 Definition of the source category.

(a) The carbon dioxide (CO\(_2\)) supplier source category consists of the following:

1. Facilities with production process units that capture a CO\(_2\) stream for purposes of supplying CO\(_2\) for commercial applications or that capture and maintain custody of a CO\(_2\) stream in order to sequester or otherwise inject it underground. Capture refers to the initial separation and removal of CO\(_2\) from a manufacturing process or any other process.

2. Facilities with CO\(_2\) production wells that extract or produce a CO\(_2\) stream for purposes of supplying CO\(_2\) for commercial applications or that extract and maintain custody of a CO\(_2\) stream in order to sequester or otherwise inject it underground.

3. Importers or exporters of bulk CO\(_2\).

(b) This source category is focused on upstream supply. It does not cover:

1. Storage of CO\(_2\) above ground or in geologic formations.

2. Use of CO\(_2\) in enhanced oil and gas recovery.

3. Transportation or distribution of CO\(_2\).

4. Purification, compression, or processing of CO\(_2\).

5. On-site use of CO\(_2\) captured on site.

(c) This source category does not include CO\(_2\) imported or exported in equipment, such as fire extinguishers.

§ 98.421 Reporting threshold.

Any supplier of CO\(_2\) who meets the requirements of §98.2(a)(4) of subpart A of this part must report the mass of CO\(_2\) captured, extracted, imported, or exported.

§ 98.422 GHGs to report.

(a) Mass of CO\(_2\) captured from production process units.

(b) Mass of CO\(_2\) extracted from CO\(_2\) production wells.

(c) Mass of CO\(_2\) imported.

(d) Mass of CO\(_2\) exported.


§ 98.423 Calculating CO\(_2\) supply.

(a) Except as allowed in paragraph (b) of this section, calculate the annual mass of CO\(_2\) captured, extracted, imported, or exported through each flow meter in accordance with the procedures specified in either paragraph (a)(1) or (a)(2) of this section. If multiple flow meters are used, you shall calculate the annual mass of CO\(_2\) for all flow meters according to the procedures specified in paragraph (a)(3) of this section.

1. For each mass flow meter, you shall calculate quarterly the mass of CO\(_2\) in a CO\(_2\) stream in metric tons by multiplying the mass flow rate measurement in the composition data, according to Equation PP–1 of this section. Mass flow and composition data measurements shall be made in accordance with §98.424 of this subpart.

\[
CO_{2,u} = \sum_{p=1}^{4} Q_{pu} \times C_{CO_{2,p,u}}
\]

(Eq. PP-1)

Where:

- \(CO_{2,u}\) = Annual mass of CO\(_2\) (metric tons) through flow meter \(u\).
- \(C_{CO_{2,p,u}}\) = Quarterly CO\(_2\) concentration measurement in flow for flow meter \(u\) in quarter \(p\) (wt. \%CO\(_2\)).
- \(Q_{pu}\) = Quarterly mass flow rate measurement for flow meter \(u\) in quarter \(p\) (metric tons).

\(p\) = Quarter of the year.
\(u\) = Flow meter.

2. For each volumetric flow meter, you shall calculate quarterly the mass of CO\(_2\) in a CO\(_2\) stream in metric tons by multiplying the volumetric flow by
the concentration and density data, according to Equation PP–2 of this section. Volumetric flow, concentration and density data measurements shall be made in accordance with §98.424 of this section.

\[
\text{CO}_2, u = \sum_{p=1}^{4} Q_p \cdot D_p \cdot C_{\text{CO}_2, p}
\]  

(Eq. PP–2)

Where:

- \( \text{CO}_2, u \) = Annual mass of \( \text{CO}_2 \) (metric tons) through flow meter \( u \).
- \( C_{\text{CO}_2, p} \) = Quarterly \( \text{CO}_2 \) concentration measurement in flow for flow meter \( u \) in quarter \( p \) (measured as either volume % \( \text{CO}_2 \) or weight % \( \text{CO}_2 \)).
- \( Q_p \) = Quarterly volumetric flow rate measurement for flow meter \( u \) in quarter \( p \) (standard cubic meters).
- \( D_p \) = Density of \( \text{CO}_2 \) in quarter \( p \) (metric tons \( \text{CO}_2 \) per standard cubic meter) for flow meter \( u \) if \( C_{\text{CO}_2, p} \) is measured as volume % \( \text{CO}_2 \), or density of the whole \( \text{CO}_2 \) stream for flow meter \( u \) (metric tons per standard cubic meter) if \( C_{\text{CO}_2, p} \) is measured as weight % \( \text{CO}_2 \).
- \( p \) = Quarter of the year.
- \( u \) = Flow meter.

(3) To aggregate data, use either Equation PP–3a or PP–3b in this paragraph, as appropriate.

(i) For facilities with production process units or production wells that capture or extract a \( \text{CO}_2 \) stream and either measure it after segregation or do not segregate the flow, calculate the total \( \text{CO}_2 \) supplied in accordance with Equation PP–3a in paragraph (a)(3).

\[
\text{CO}_2 = \sum_{p=1}^{U} \text{CO}_2, u
\]  

(Eq. PP–3a)

where:

- \( \text{CO}_2 \) = Total annual mass of \( \text{CO}_2 \) (metric tons).
- \( \text{CO}_2, u \) = Annual mass of \( \text{CO}_2 \) (metric tons) through flow meter \( u \).
- \( u \) = Flow meter.

(ii) For facilities with production process units that capture a \( \text{CO}_2 \) stream and measure it ahead of segregation, calculate the total \( \text{CO}_2 \) supplied in accordance with Equation PP–3b.

\[
\text{CO}_2 = \sum_{p=1}^{U} \text{CO}_2, u - \sum_{p=1}^{V} \text{CO}_2, v
\]  

(Eq. PP–3b)

where:

- \( \text{CO}_2 \) = Total annual mass of \( \text{CO}_2 \) (metric tons).
- \( \text{CO}_2, u \) = Annual mass of \( \text{CO}_2 \) (metric tons) through main flow meter \( u \).
- \( \text{CO}_2, v \) = Annual mass of \( \text{CO}_2 \) (metric tons) through subsequent flow meter \( v \) for use on site.
- \( u \) = Main flow meter.
- \( v \) = Subsequent flow meter.

(b) As an alternative to paragraphs (a)(1) through (3) of this section for \( \text{CO}_2 \) that is supplied in containers, calculate the annual mass of \( \text{CO}_2 \) supplied in containers delivered by each \( \text{CO}_2 \) stream in accordance with the procedures specified in either paragraph (b)(1) or (b)(2) of this section. If multiple \( \text{CO}_2 \) streams are used to deliver \( \text{CO}_2 \) to containers, you shall calculate the annual mass of \( \text{CO}_2 \) supplied in containers delivered by all \( \text{CO}_2 \) streams according to the procedures specified in paragraph (b)(3) of this section.
(1) For each CO₂ stream that delivers CO₂ to containers, for which mass is measured, you shall calculate CO₂ supply in containers using Equation PP–1 of this section.

where:

\[ \text{CO}_2,u = \text{Annual mass of CO}_2 \text{ (metric tons) supplied in containers delivered by CO}_2 \text{ stream } u. \]

\[ \text{C}_{\text{CO}_2,p,u} = \text{Quarterly CO}_2 \text{ concentration measurement of CO}_2 \text{ stream } u \text{ that delivers CO}_2 \text{ to containers in quarter } p \text{ (wt. } \% \text{CO}_2). \]

\[ \text{Q}_p,u = \text{Quarterly mass of contents supplied in all containers delivered by CO}_2 \text{ stream } u \text{ in quarter } p \text{ (metric tons).} \]

\( p = \text{Quarter of the year.} \)

\( u = \text{CO}_2 \text{ stream that delivers to containers.} \)

(2) For each CO₂ stream that delivers to containers, for which volume is measured, you shall calculate CO₂ supply in containers using Equation PP–2 of this section.

where:

\[ \text{CO}_2,u = \text{Annual mass of CO}_2 \text{ (metric tons) supplied in containers delivered by CO}_2 \text{ stream } u. \]

\[ \text{C}_{\text{CO}_2,p} = \text{Quarterly CO}_2 \text{ concentration measurement of CO}_2 \text{ stream } u \text{ that delivers CO}_2 \text{ to containers in quarter } p \text{ (measured as either volume } \% \text{ CO}_2 \text{ or weight } \% \text{ CO}_2). \]

\[ \text{Q}_p = \text{Quarterly volume of contents supplied in all containers delivered by CO}_2 \text{ stream } u \text{ in quarter } p \text{ (standard cubic meters).} \]

\[ \text{D}_p = \text{Quarterly CO}_2 \text{ density determination for CO}_2 \text{ stream } u \text{ in quarter } p \text{ (metric tons per standard cubic meter).} \]

\( p = \text{Quarter of the year.} \)

\( u = \text{CO}_2 \text{ stream that delivers to containers.} \)

(3) To aggregate data, sum the mass of CO₂ supplied in containers delivered by all CO₂ streams in accordance with Equation PP–3a of this section.

where:

\[ \text{CO}_2 = \text{Annual mass of CO}_2 \text{ (metric tons).} \]

\[ \text{Q} = \text{Annual mass in all CO}_2 \text{ containers imported or exported during the reporting year (metric tons).} \]


§ 98.424 Monitoring and QA/QC requirements.

(a) Determination of quantity. (1) Reporters following the procedures in §98.423(a)(3)(i) shall determine quantity using a flow meter or meters located in accordance with this paragraph.

(i) If the CO₂ stream is segregated such that only a portion is captured for commercial application or for injection, you must locate the flow meter according to the following:

A) For reporters following the procedures in §98.423(a)(3)(i), you must locate the flow meter(s) after the point of segregation.

B) For reporters following the procedures in paragraph (a)(3)(ii) of §98.423, you must locate the main flow meter(s) on the captured CO₂ stream(s) prior to the point of segregation and the subsequent flow meter(s) on the CO₂ stream(s) for on-site use after the point of segregation. You may only follow the procedures in paragraph (a)(3)(ii) of §98.423 if the CO₂ stream(s) for on-site use is/are the only diversion(s) from the main, captured CO₂ stream(s) after the main flow meter location(s).