

Basis of Reporting: Energy and Emissions Data

Overview

Stepan Company monitors energy use and greenhouse gas (GHG) emissions data in support of sustainability goals and reporting and has collected this data for numerous years across our sites. This information is used to communicate to external stakeholders on our environmental footprint and to identify opportunities for improvement to our global operations. We work to align with broadly recognized frameworks and report annually to the CDP (formerly the Carbon Disclosure Project) on our energy usage and emissions. CDP works to drive further alignment with widely adopted frameworks including the GHG Protocol Corporate Accounting and Reporting Standard. Stepan strives to align with the GHG Protocol for emissions calculations, and we work to drive continuous improvement in our GHG data collection and management process. This Basis of Reporting document provides details on the scope, boundaries, and other details regarding sources of information utilized to calculate 2022 Scope 1 and 2 emissions and energy usage. External Assurance was conducted by ERM CVS for the reporting period of January 1, 2022 to December 31, 2022.

Scope of Reporting

I. GHG Emissions

Stepan's Absolute Greenhouse Gas (GHG) emission sources included within our data assurance process include those associated with our direct operations (Scope 1) and purchased energy and steam (Scope 2). We report both location-based and market-based emissions. Stepan does not currently include Scope 3 emissions in our data assurance process.

Scope 1 emissions are those released directly from our operations through activities associated with business (reported as kilotons carbon dioxide equivalents- CO₂-e):

- a. Generation of electricity, heat, or steam through use of natural gas, propane, diesel, biofuels, or other fuels
- b. Physical or chemical processing
- c. Fugitive emissions
- d. On-site fleet fuel consumption

Scope 2 emissions are those from off-site generation of electricity, heat or steam that is used by Stepan Company or sold (kilotons CO₂-e):

- a. Purchased electricity (relevant for all sites)
- b. Purchased steam (relevant for a few sites)
- c. Purchased heat (not currently relevant for Stepan sites)
- d. Sold steam (relevant for one site)

II. Energy Usage

Energy usage (Terajoules) is calculated for all included emissions categories using either primary data from meter readings and utilities providers or calculations based on modeling or category spend data, with conversion factors and emission factors that have been reviewed by the data assurance team.

III. Boundaries for Annual Reporting

For the purposes of tracking Company energy use and emissions, we include all Stepan manufacturing facilities, laboratories, and offices for which we have operational control. We have worked to collect primary data from utilities providers and meter readings across all manufacturing sites, as well as Stepan's headquarters, Global Technology Center, and Millsdale (Elwood, IL) Distribution Center. We utilize consumption data to estimate GHG emissions based on region of operation, using relevant emissions factors for location based and market-based emissions. The emission factors are provided and updated annually in alignment with U.S. EPA standards and incorporating the most current Intergovernmental Panel on Climate Change (IPCC) information for global warming potentials (GWPs) (e.g., AR6 for analysis of 2022 data).

Additional Stepan emissions sources are estimated using other methods. These include:

- a. Laboratories and offices outside of Stepan's headquarters that are not associated with a manufacturing site: estimate based on square footage and employee number
- b. Lower volume fuels at Stepan's manufacturing sites: estimate based on spend data
- c. Company fleet emissions: estimate based on spend data
- d. Process emissions associated with process gas combustion: based on state emissions reports, stack-test data, or modeling
- e. Ozone depleting substances (which represent a very small percentage of overall emissions): calculated every 2-3 years to confirm their contribution to company emissions based on service records and refrigerant replacement activity
- f. Biogenic sources of emissions calculated based on mass of biobased material combusted and standard emissions factors.

Reporting Criteria

Stepan calculates GHG emissions following the GHG Protocol. Our emissions calculations include CO₂, CH₄, N₂O, HFCs. Other gases represent de-minimis levels (less than 5% of overall emissions) and are not separately accounted for. We utilize a combination of primary data, service records, inputs based on engineering models, stack-test data, and spend data in conjunction with relevant conversion factors and emissions factors. Fugitive emissions are calculated using service records and refrigerant replacement records. These emissions are estimated based on activity level for facilities outside the U.S. Stepan fleet-related emissions (from company-owned and leased vehicles) are estimated based on spend records for this category of activity and excludes business travel and third-party material transport, which is included in Scope 3.

Stepan partners with an outside party for utilities data management. This partner also supports annual updates to our regional Carbon Maps, which incorporate relevant emissions factors, including updates based on IPCC reports and U.S. EPA Rules for Mandatory Reporting of GHG emissions for the industrial sector. Data is monitored, reviewed, summarized and reported in a centralized manner, with reporting from each of our facilities into Stepan's data management platforms.

Restatements

Data is restated according to recommendations outlined in the GHG Protocol, including for acquisitions, divestitures or other changes to organizational boundaries, identification of new emissions sources, or improvements to data quality or accounting that represent at least 5% of total emissions.