



How-To Guide to Scope 3 Emissions Accounting for Hospitals and Health Systems

Publication Date: January 2022

ENGIE Impact

450 Lexington Ave, Ste 4-032
New York, NY 10017 U.S.

+1 800 767 4197



Overview

This how-to guide provides a step-by-step process for accounting for a health care organization's Scope 3 greenhouse gas (GHG) emissions. Scope 3 emissions are all GHG emissions within the organization's value chain and not included in Scope 1 or 2. These emissions are "indirect" because they occur within an organization's value chain but are outside of an organization's direct control.

A hospital or health system should use this guide to understand and measure emissions across its value chain. This will identify emissions that can then be reduced, helping to drive a "ripple effect" with other organizations both upstream and downstream in the health care value chain.

Scope 3 emissions accounting can be complex. For most organizations, Scope 3 emissions accounting will be a journey during which their emissions inventories will, over time, become more comprehensive and granular. For this reason, this how-to guide focuses on providing a high-level introduction to Scope 3 emissions accounting, along with instructions on how to use the most relevant calculation approaches for hospitals and health systems. These approaches are also utilized in the [Scope 3 GHG Emissions Accounting Tool](#). To explore more advanced calculation approaches that may increase the accuracy of Scope 3 emissions accounting and provide additional strategic insight, refer to the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

Authors

Joe Bialowitz, ENGIE Impact

Jessica Brooks, ENGIE Impact

Keith Edgerton, Health Care Without Harm

Brandon McNamara, ENGIE Impact

Brian Solomon, ENGIE Impact

Jessica Wolff, Health Care Without Harm

Table of Contents

Acknowledgements	4
The Importance of Scope 3 Emissions Accounting	5
Five Steps to Start Measuring and Reporting a Scope 3 Footprint	7
Category 1: Purchased Goods and Services	13
Category 2: Capital Goods	18
Category 3: Fuel and Energy-Related Activities	19
Category 4: Upstream Transportation and Distribution	22
Category 5: Waste Generated in Operations	23
Category 6: Business Travel	25
Category 7: Employee Commuting	27
Category 8: Upstream Leased Assets	29
Category 9: Downstream Transportation and Distribution	31
Category 10: Processing of Sold Products	32
Category 11: Use of Sold Products	33
Category 12: End-of-life Treatment of Sold Products	34
Category 13: Downstream Leased Assets	35
Category 14: Franchises	36
Category 15: Investments	37
Issues for Further Study	39
Appendix A: Descriptions of economic sectors and commodity names used for Category 1 and 2 (Goods and Services) emissions reporting	40
Appendix B: Descriptions of industry names used for Category 15 (Investments) emissions reporting	54

Acknowledgements

This report was made possible with support from the members of Health Care Without Harm's U.S. Health Care Climate Council.

Health Care Without Harm and ENGIE Impact would like to thank the following individuals for their valuable insight and expertise during the drafting process:

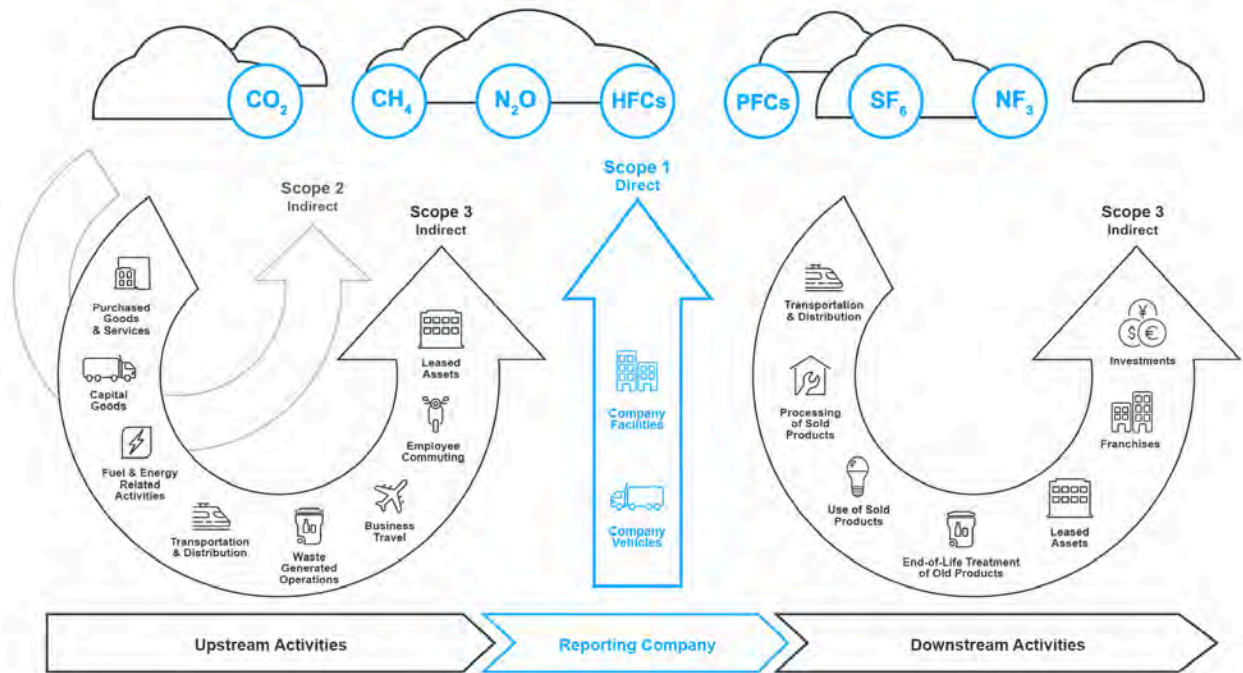
- **Cleveland Clinic:** John Cicero, Scott Dwyer, Brian Jones, Andrew Pettit, Jeffrey Rosner, Travis Tyson, Jon Utech
- **Kaiser Permanente:** Elizabeth Ann Eldridge, Priscilla Ng, Seema Wadhwa
- **Mass General Brigham:** Sarah Fackler
- **Providence Health:** Geoff Glass, Jennie Kim, Beth Schenk
- **Seattle Children's Hospital:** Kris Cermich, Colleen Groll

The Importance of Scope 3 Emissions Accounting

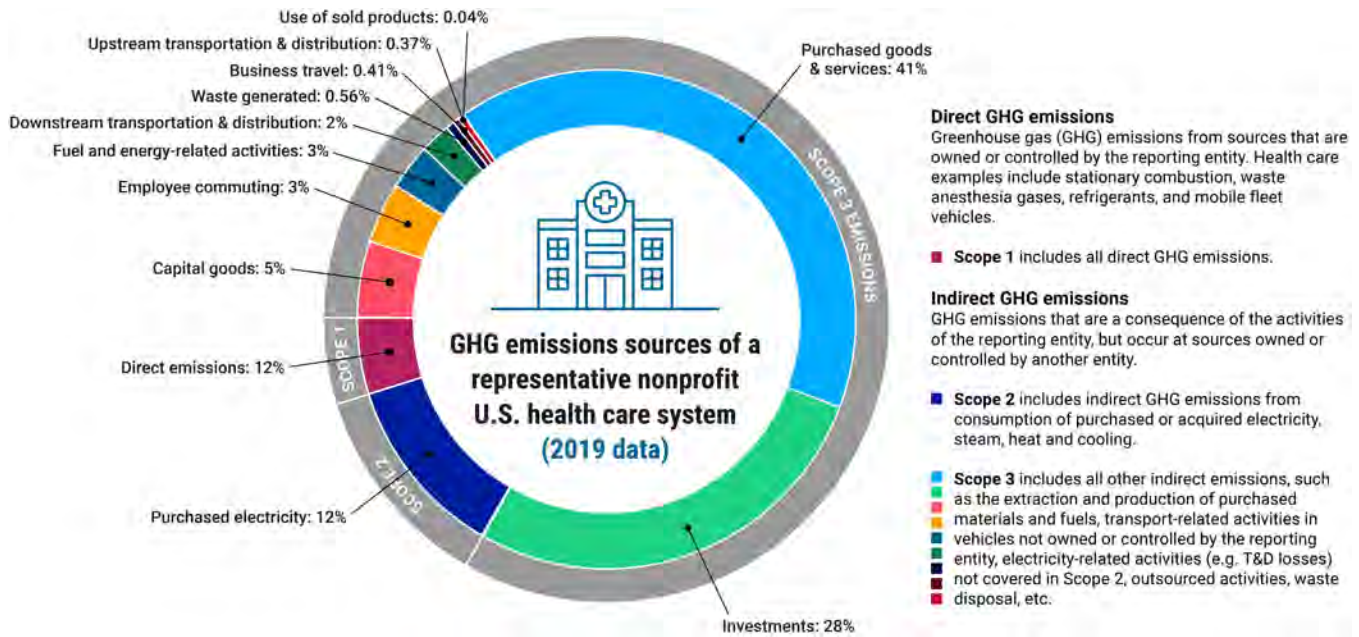
According to the Intergovernmental Panel on Climate Change (IPCC) [2018 report](#), the world must halve its greenhouse gas emissions by 2030 and get to net-zero emissions by 2050 to keep warming to 1.5°C and avoid the most catastrophic impacts of climate change. [Recognizing that the health care sector is responsible for approximately 4.4% of worldwide GHG emissions](#), in April 2021, Health Care Without Harm published the [Global Road Map for Health Care Decarbonization](#) to chart the course for zero emissions health care by 2050, and Practice Greenhealth published [guidance for health systems on setting a net-zero emissions goal](#). To date, many hospitals and health systems have focused on reducing emissions under their direct ownership or operational control (Scope 1) and from their purchase of electricity, heat, and steam (Scope 2). Indirect emissions upstream and downstream in an organization’s value chain (Scope 3) are often left unaddressed. In most sectors – including the health care sector – these emissions represent the largest source of emissions and offer the most significant emissions-reduction opportunities.

The following two diagrams show the 15 distinct Scope 3 categories across both upstream and downstream activities in the value chain, and the relative magnitude of emissions sources across all Scopes for a large not-for-profit US health care system whose 2019 activities were analyzed by ENGIE Impact:

Overview of GHG Protocol Scopes and Emissions Across the Value Chain



Source: [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard, Greenhouse Gas Protocol](#)



Data source: ENGIE Impact analysis

Developing a robust understanding of Scope 3 emissions enables organizations to consider their full emissions impact across the value chain and focus efforts where they can have the greatest impact. Despite the potentially significant challenges associated with reducing high quantities of indirect emissions, achieving these reductions can lead to substantial organizational benefits: organizations can mitigate risks within their value chains, unlock innovations and new collaborations, and respond to mounting pressure from investors, employees, customers, and civil society.

Three key benefits that a hospital or health system can expect to achieve by accounting for Scope 3 emissions are:

- 1. Identifying and managing risks in an organization’s value chain:** The physical and transition risks associated with climate change can impact the operational resilience of hospitals and health systems. Conducting a Scope 3 assessment will give a better sense of where an organization is exposed to these risks. Identifying high GHG emissions hotspots allows organizations to engage with key suppliers, manage risks more effectively and work to reduce emissions across the value chain.

Examples of Potential Climate-Related Disruptions in the Upstream and Downstream Value-Chain Stages of Health Care

Value chain stage	Upstream	Downstream
Examples of potential disruptions	Natural disasters	Trade barriers on waste
	Commodity shortages/price hikes	Waste disposal disruptions
	Sourcing transportation failure	Distribution failure
	Workforce instability	Poor investment returns

- 2. Setting credible and comprehensive decarbonization goals across all scopes of emissions:** An understanding of an organization’s Scope 3 emissions is necessary for setting a credible and comprehensive

decarbonization goal. A growing number of leading organizations are already setting Scope 3 reduction targets. As of December 2021, more than 2,200 of these organizations are setting emissions reduction targets through the [Science Based Targets initiative](#) (SBTi), an organization that assesses and validates corporate emissions reduction targets in line with climate science. To conform with SBTi guidelines, an organization is required to set a Scope 3 target if Scope 3 emissions comprise 40% or more of its total GHG emissions; and such an organization must set one or more near-term emission reduction targets and/or supplier or customer engagement targets that collectively cover(s) at least two-thirds (67%) of total scope 3 emissions considering the minimum boundary of each scope 3 category in conformance with the GHG Protocol's [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#). SBTi is not currently assessing targets for nonprofit entities, but these entities can still follow the SBTi guidelines.

- 3. Multiplying climate impact by decarbonizing across an organization's value chain, from suppliers and distributors to patients and staff.** Scope 3 accounting provides the data foundation needed to inform suppliers about their climate impact, request that they report their GHG emissions and set their own decarbonization goals, and ultimately reduce emissions in companies or countries where climate action might not be high on the agenda. Furthermore, Scope 3 accounting helps to educate colleagues across functions on how to see their roles and responsibilities through a GHG lens and identifies opportunities for them to reduce the climate impact of pollution-intensive activities such as purchasing, construction, employee commuting, business travel, and waste treatment. It also empowers patients – through transparent labeling and reporting – to favor lower-carbon products and services.

Five Steps to Start Measuring and Reporting a Scope 3 Footprint

1. Complete an Inventory of Scope 1 and 2 Emissions

To account for emissions fully, an organization should complete a comprehensive Scope 1 and 2 emissions report before (or at the same time as) completing a Scope 3 inventory. An added advantage of this approach is that data on fuel usage and purchased energy collected for Scope 1 and 2 emissions reporting are necessary for the calculation of the Scope 3 emissions category 3, “Fuel- and energy-related activities (not included in Scope 1 or Scope 2).”

2. Screen Scope 3 Categories

The relative impact of Scope 3 categories varies from organization to organization. For example, some organizations will have emissions within a particular Scope 3 category while other organizations might not have any activity in that category. For this reason, the first step in a Scope 3 inventory is to assess which of the 15 categories are relevant to the organization based on its activities. For each relevant category, conduct a screening leveraging spend-based data or other easily-accessible activity data (e.g., flight records) to calculate a high-level emissions estimate of each category. A list of the 15 upstream and downstream categories is provided below:

List of Upstream and Downstream Scope 3 Categories

Upstream or Downstream	Scope 3 Category
Upstream Scope 3 Emissions	1. Purchased Goods and Services
	2. Capital goods
	3. Fuel and Energy-Related Activities (not included in scope 1 or scope 2)
	4. Upstream Transportation and Distribution
	5. Waste Generated in Operations
	6. Business Travel
	7. Employee Commuting
	8. Upstream Leased Assets
Downstream Scope 3 Emissions	9. Downstream Transportation and Distribution
	10. Processing of Sold Products
	11. Use of Sold Products
	12. End-of-Life Treatment of Sold Products
	13. Downstream Leased Assets
	14. Franchises
	15. Investments

Source: Greenhouse Gas Protocol, [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#)

Setting Scope 3 boundaries consists of identifying which of the 15 Scope 3 categories are relevant to an organization. There are eight criteria to select which Scope 3 categories need to be included:

Criteria for Identifying Relevant Scope 3 Activities

Criteria	How to use criteria to identify relevant Scope 3 activities
Size	Do these activities contribute significantly to total anticipated Scope 3 emissions?
Influence	Do these activities offer potential emissions reductions that could be undertaken or influenced by your organization?
Risk	Do these activities contribute to the organization's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and customer, litigation, and reputational risks)
Stakeholders	Are these activities deemed critical by key internal/external stakeholders (e.g., customers, suppliers, investors, or civil society)?
Outsourcing	Do these activities include outsourced activities previously performed in-house or are they performed in-house by other organizations in the reporting organization's sector?
Sector guidance	Are these activities identified as significant by sector specific guidance?
Spending or revenue analysis	Do these activities require a high level of spending, generate a high level of revenue, and/or are sometimes correlated with high GHG emissions?
Other	Do these activities meet any additional criteria developed by the reporting organization or industry sector?

Adapted from: Greenhouse Gas Protocol, [Technical Guidance for Calculating Scope 3 Emissions](#)

An evaluation by ENGIE Impact of the calendar year 2019 Scope 3 emissions of several large U.S.-based healthcare systems found 11 of the Scope 3 categories are likely to be relevant to all hospitals and health systems

in the United States; a 12th category, investments, will be relevant to any health systems with a significant investment portfolio. The chart below demonstrates how this determination was made by applying the first six criteria for relevance. The following categories are likely to represent only minimal contributions to overall Scope 3 emissions and are therefore unlikely to be relevant: categories 10 (processing of sold products), 12 (end-of-life treatment of sold products), and 14 (franchises). An organization should disclose and justify any Scope 3 emissions that it decides to exclude from its Scope 3 accounting.

Relevance Assessment Results of Scope 3 Categories for Large US-Based Health Care Systems

Scope 3 Categories	Magnitude	Influence	Risk	Stakeholder Interest	Outsourcing	Sector Guidance	Overall Relevance
1. Purchased goods and services	High (>20%)	High	High	High	Med	High	Relevant
2. Capital goods	Med (5-20%)	High	High	High	Med	High	Relevant
3. Fuel- and energy-related activities	Med (5-20%)	Med	High	High	Low	High	Relevant
4. Upstream transportation and distribution	Low (<5%)	Med	Low	Med	Low	Low	Relevant
5. Waste generated in operations	Med (5-20%)	High	High	High	Low	High	Relevant
6. Business travel	Low (<5%)	Med	Low	Low	Low	Low	Relevant
7. Employee commuting	Med (5-20%)	Low	Med	High	Low	Med	Relevant
8. Upstream leased assets	Low (<5%)	Med	Low	Med	High	Med	Relevant
9. Downstream transportation and distribution	Low (<5%)	Med	Med	Med	Low	Med	Relevant
10. Processing of sold products	Likely not relevant						
11. Use of sold products	Low (<5%)	Med	Low	Med	Low	Med	Relevant
12. End-of-life treatment of sold products	Likely not relevant						
13. Downstream leased assets	Low (<5%)	High	Low	Med	High	Low	Relevant

14. Franchises	Likely not relevant						
15. Investments	High (>20%)	High	High	Med	Low	Med	Relevant

3. Select the estimation method(s) and collect activity data

For each category determined to be relevant in Step 1, the estimation method should be selected based on available data. GHG emissions are estimated by multiplying activity data (e.g., the distance covered by an organization’s delivery truck) by an emission factor (e.g., average GHG emissions per mile). There are four main methods recognized by the GHG Protocol, presented in the chart below from least to most complex and accurate. Reporting organizations may choose different methods for each category, depending upon which are relevant to the respective category.

Scope 3 Accounting Methodologies Provided by the GHG Protocol

	GHG estimation method	Description
Least complex and accurate	Spend-based	Relies on spend data from a reporting organization’s general ledger and industry average emission factors
	Average-data	Relies on average consumption and default emission factors by activity (e.g., expressed in kgCO ₂ e per mile/km for commute)
Most complex and accurate	Hybrid	Relies on a combination of supplier-specific activity data (where available) and secondary data to fill the gaps
	Supplier-specific	Relies exclusively on emissions and emission factors provided by suppliers/lessors/investors

The spend-based and average-data methods are typically the simplest methods to use as a starting point in most organizations. The chart below shows the simplest calculation method for each Scope 3 category for a hospital or health care system, along with an overview of the likely stakeholders that can provide the necessary data.

Simplest Emissions Estimation Method and Data Source by Scope 3 Category

Scope 3 categories	Simplest method	Data required	Where to find this data?
1. Purchased goods and services	Spend-based	Quantity of money spent	Finance, Procurement
2. Capital goods	Spend-based	Quantity of money spent	Finance, Procurement
3. Fuel- and energy related activities	Spend-based	Quantity of money spent	Finance, Procurement
4. Upstream transportation and distribution	Spend-based	Quantity of money spent	Finance, Procurement
5. Waste generated in operations	Spend-based	Quantity of money spent	Finance, Procurement
6. Business travel	Spend-based	Quantity of money spent	Finance, Procurement
7. Employee commuting	Average data	Number of employees	Human Resources
8. Upstream leased assets	Average data	Floor space of each leased asset	Operations, Facilities Management
9. Downstream transportation and distribution	Average data	Number of patient visits	Quality
10. Processing of sold products	Average data	Mass of intermediate products sold (e.g., in kg)	Sales, Business Development
11. Use of sold products	Average data	Number and types of metered-dose inhalers sold or prescribed	Pharmacy
12. End-of-life treatment of sold products	Average data	Mass of sold products per waste treatment method	Pharmacy
13. Downstream leased assets	Average data	Floor space of each leased asset	Operations, Facilities Management
14. Franchises	Average data	Investee organization total revenue	Finance, Strategy
15. Investments	Average data	Amount of funds invested in each equity investment of the organization	Finance, Operations

Later sections of this how-to guide provide more details on each calculation method, and these methods are the ones selected for use in the [Scope 3 GHG Emissions Accounting Tool](#). To learn more about additional, more complex calculation methods for each category, visit the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

4. Estimate Scope 3 Emissions

Select a comprehensive online tool such as the health care-specific [Scope 3 GHG Emissions Accounting Tool](#) or utilize a combination of less comprehensive tools to estimate Scope 3 emissions. Two other GHG emissions calculation tools that are user friendly (both in .xls format) are:

- [U.S. EPA Simplified GHG Emissions Calculator](#): Last updated in 2020, this tool has U.S. coverage that can be extrapolated to the world. For Scope 3 emissions, it can be used to calculate only categories 3, 5, 6, 7, 9 and 12. It also covers other sustainability metrics (e.g., water supply, wastewater treatment).
- [GHG Emissions Calculation Tool \(GHG Protocol\)](#): This tool is in beta testing as of March 2021. For Scope 3 emissions, it can be used to calculate only categories 4, 6 and 7. It strictly follows the GHG Protocol.

For additional tools specific to certain categories, the [GHG Protocol website](#) provides a list of tools and reputable databases.

5. Consolidate and Report Scope 3 Footprint

Sum the estimations of the selected Scope 3 categories and report on the organization's Scope 3 footprint. Several best practices to keep in mind when reporting emissions are:

- Report emissions in metric tons (or “tonnes”) of CO₂e (carbon dioxide equivalents; MtCO₂e). This is the standard unit of measure used globally for emissions reporting, which normalizes non-CO₂ GHGs based on their global warming potential relative to CO₂.
- Quality-assure the calculations by carefully checking emission factor units and activity data units; and by comparing the results with other results publicly reported by industry peers to confirm both are of a similar order of magnitude.
- Clearly indicate the year for which emissions were calculated.
- Report Scope 3 emissions in the same report as Scope 1 and 2 emissions.

Consider reporting Scope 3 emissions in multiple places, including an organization's annual:

- Financial report
- Sustainability report
- Response to the [Carbon Disclosure Project](#) survey

Category 1: Purchased Goods and Services

Category 1 includes all upstream emissions (i.e., direct and indirect GHG emissions associated with production of commodities or services from cradle to the point of sale) from the production of products purchased or acquired by the reporting organization in the reporting year. Products include both goods (tangible products) and services (intangible products).

Screening Approach

Screening purchased goods and services (PG&S) involves analyzing the products and services on which an organization spent money across the reporting year. Data can be for either a calendar year or fiscal year, but the most recent year of available data is preferred. The [Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities](#) published by the U.S. Environmental Protection Agency (“EPA Supply Chain Emission Factors”) can be leveraged to assign an emission factor for each dollar spent across an organization’s supply chain. This database of emission factors is based on environmentally-extended input output (EEIO) models that estimate GHG emissions resulting from the production and upstream supply chain activities of different sectors and products in an economy. These emission factors estimate the upstream emissions for each dollar spent across a supply chain, including all emissions that occur in the life cycle of purchased products and services, up to the point of receipt by a reporting organization (excluding emissions from sources that are owned or controlled by the reporting organization). These emissions may include:

- Extraction of raw materials
- Agricultural activities
- Manufacturing, production, and processing
- Generation of electricity consumed by upstream activities
- Disposal/treatment of waste generated by upstream activities
- Land use and land-use change
- Transportation of materials and products between suppliers
- Any other activities prior to acquisition by the reporting organization

Reporting organizations should match each line item of spend data to the most appropriate emission factor based on the specific industry/commodity sector (e.g., product classification) that each purchase is made, and the level of detail available. To prevent double counting, be sure to exclude any spend categories that should be assigned to other categories of Scope 1, 2, or 3 emissions. Also do not include spending on any pharmaceuticals that were ultimately returned to the manufacturer as part of a reverse distribution arrangement. The screening of PG&S will provide valuable insight into the most significant sources of emissions and exposure to risk across an organization’s supply chain. The analysis will reveal the top vendors by GHG impact, allowing a reporting organization to focus on areas of highest reduction potential.

Data Requirements

Screening PG&S requires spend data from across an organization’s entire supply chain. In many cases, this is available from an organization’s procurement or financial team in the form of a general ledger. This data can be separated by vendor, product classification, and/or internal department. The more granular the data, the easier it will be to assign the most accurate emission factor. For example, if the only data available is spend-by-vendor, it can be difficult to determine exactly what was purchased from a given vendor, which then makes selecting an appropriate emission factor more challenging. It is best to have the vendor, a short description of what was purchased (e.g., G/L code or natural account), and the total dollar amount spent (in USD) for the reporting year.

The [Scope 3 GHG Emissions Accounting Tool](#) leverages the EPA Supply Chain Emission Factors to estimate the GHG impact of spending across an organization’s supply chain. These spend-based emission factors are relevant for the calculation of Scope 3 emissions associated with both purchased goods and services (category 1) and

capital goods (category 2). Reporting organizations should assign the most appropriate emission factors based on the level of detail available in the spend data. To facilitate the assignment of these factors, the [Scope 3 GHG Emissions Accounting Tool](#) includes a dropdown menu with emission factors that are the most relevant for hospitals and health systems. The following table provides consolidated emission factors for a selection of product categories that are commonly purchased in health care:

Emission Factors for Product Categories Commonly Purchased in Health Care

Item #	Product classification Industry to which a reporting organization's supplier belongs	Spend-based emission factor in 2020 Expressed in kgCO _{2e} /USD
1	Ambulatory health care services - General	0.091
2	Ambulatory health care services - Ambulances	0.193
3	Ambulatory health care services - Healthcare practitioners (except physicians and dentists)	0.102
4	Ambulatory health care services - Home healthcare	0.133
5	Ambulatory health care services - Medical laboratories	0.092
6	Ambulatory health care services - Outpatient healthcare	0.145
7	Ambulatory health care services - Physicians	0.076
8	Apparel and leather and allied products - General	0.441
9	Apparel and leather and allied products - Clothing	1.974
10	Chemical products - General	0.333
11	Chemical products - Adhesives	0.247
12	Chemical products - Blood sugar, pregnancy, and other diagnostic test kits	0.167
13	Chemical products - Chemicals (except basic chemicals, agrichemicals, polymers, paints, pharmaceuticals, soaps, cleaning compounds)	0.561
14	Chemical products - Compressed Gases	1.842
15	Chemical products - Medicinal and botanical ingredients	0.341
16	Chemical products - Other basic inorganic chemicals	0.839
17	Chemical products - Other basic organic chemicals	1.518
18	Chemical products - Pharmaceutical products (pills, powders, solutions, etc.)	0.466
19	Chemical products - Soap and cleaning compounds	0.414
20	Chemical products - Toiletries	0.427
21	Chemical products - Vaccines and other biological medical products	0.092
22	Computer and electronic products - General	0.079
23	Computer and electronic products - Analytical laboratory instruments	0.077
24	Computer and electronic products - Audio and video equipment	1.244

25	Computer and electronic products - Computer storage device readers	0.211
26	Computer and electronic products - Computer terminals and other computer peripheral equipment	0.311
27	Computer and electronic products - Computers	0.494
28	Computer and electronic products - Electromedical apparatuses	0.097
29	Computer and electronic products - Electronic capacitors, resistors, coils, transformers, connectors and other components (except semiconductors and printed circuit assemblies)	0.114
30	Computer and electronic products - Irradiation apparatuses	0.154
31	Computer and electronic products - Telephones	0.239
32	Computer systems design and related services - General	0.064
33	Computer systems design and related services - Computer systems design	0.062
34	Computer systems design and related services - Custom computer programming	0.080
35	Computer systems design and related services - Other computer related services, including facilities management	0.070
36	Construction - General	0.335
37	Construction - Health care structures	0.304
38	Data processing, internet publishing, and other information services - General	0.085
39	Data processing, internet publishing, and other information services - Data processing and hosting	0.162
40	Farms - Fresh fruits and tree nuts	0.580
41	Farms - Fresh vegetables, melons, and potatoes	0.586
42	Food Manufacturing - General	0.832
43	Food Manufacturing - Corn products	0.877
44	Food Manufacturing - Refined vegetable, olive, and seed oils	0.710
45	Food Manufacturing - Breakfast cereals	0.806
46	Food Manufacturing - Sugar, candy, and chocolate	0.607
47	Food Manufacturing - Frozen food	0.972
48	Food Manufacturing - Fruit and vegetable preservation	0.541
49	Food Manufacturing - Cheese	1.751
50	Food Manufacturing - Dry, condensed, and evaporated dairy	1.468
51	Food Manufacturing - Fluid milk and butter	1.610
52	Food Manufacturing - Ice cream and frozen desserts	0.756
53	Food Manufacturing - Packaged poultry	0.966
54	Food Manufacturing - Packaged meat (except poultry)	2.151
55	Food Manufacturing - Seafood	0.449

56	Food Manufacturing - Bread and other baked goods	0.305
57	Food Manufacturing - Cookies, crackers, pastas, and tortillas	0.866
58	Food Manufacturing - Snack foods	0.249
59	Food Manufacturing - Coffee and tea	0.255
60	Food Manufacturing - Flavored drink concentrates	0.129
61	Food Manufacturing - Seasonings and dressings	0.252
62	Furniture and related products - General	0.295
63	Furniture and related products - Institutional furniture	0.608
64	Furniture and related products - Office furniture and custom architectural woodwork and millwork	0.404
65	Miscellaneous manufacturing - General	0.260
66	Miscellaneous manufacturing - Office supplies (not paper)	0.524
67	Miscellaneous manufacturing - Surgical and medical instruments	0.214
68	Miscellaneous manufacturing - Surgical appliance and supplies	0.284
69	Miscellaneous professional, scientific, and technical services - General	0.141
70	Miscellaneous professional, scientific, and technical services - Architectural, engineering, and related services	0.150
71	Miscellaneous professional, scientific, and technical services - Environmental and other technical consulting services	0.067
72	Miscellaneous professional, scientific, and technical services - Scientific research and development	0.190
73	Nursing and residential care facilities - General	0.173
74	Nursing and residential care facilities - Nursing and community care facilities	0.174
75	Nursing and residential care facilities - Residential mental retardation, mental health, substance abuse and other facilities	0.204
76	Other services, except government - General	0.156
77	Other services, except government - Commercial machinery repair	0.172
78	Other services, except government - Dry-cleaning and laundry	0.201
79	Other services, except government - Electronic equipment repair and maintenance	0.098
80	Paper products - General	0.399
81	Paper products - Paper	1.004
82	Paper products - Sanitary paper (tissues, napkins, diapers, etc.)	0.664
83	Paper products - All other converted paper products	0.484
84	Publishing industries, except internet (includes software) - General	0.057
85	Publishing industries, except internet (includes software) - Magazines and journals	0.155

86	Textile mills and textile product mills - General	0.383
87	Textile mills and textile product mills - Carpets and rugs	0.741
88	Textile mills and textile product mills - Curtains and linens	1.182
89	Textile mills and textile product mills - Fabric	0.490
90	Textile mills and textile product mills - Other textiles	0.652
91	Waste management and remediation services	1.519

Source: [Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities](#)

The data underlying the EPA Supply Chain Emission Factors are primarily U.S.-based so the level of resolution across commodity categories (~400) and the interactions between the industries at this level of resolution are likely to yield more accurate calculations of emissions than would be generated by sets of emission factors drawn from multiple countries but with less resolution across commodity categories. However, when using the EPA Supply Chain Emission Factors to calculate emissions of suppliers based outside the United States, reporting organizations should clearly indicate that they are using this U.S.-based factor set.

Calculation Methodology

Once spend data with adequate detail is made available, match each line item with the appropriate emission factor. The calculation methodology is as follows:

Sum across purchased goods or services:

$$\sum (\text{value of purchased good or service } (\$))$$

$$\times \text{emission factor of purchased good or service per unit of economic value (kg CO}_2\text{e/\$)}$$

Sort by highest impact line item after the calculations are completed. Then select a threshold (anywhere from 30 to 50% of total spend) to review with a closer analysis. If the initial calculations relied upon emission factors for general product classifications (e.g., Chemical products – General), then attempt as part of the closer analysis to apply emission factors for more specific product classifications (e.g., Chemical products - Pharmaceutical products (pills, powders, solutions, etc.)). This second analysis will ensure the most impactful spend categories have the best and most accurate emission factor assigned.

Category 2: Capital Goods

Category 2 includes all upstream (i.e., from cradle to the point of sale) emissions from the production of capital goods purchased or acquired by the reporting organization in the reporting year. Emissions from the use of capital goods by the reporting organization are accounted for in either Scope 1 (e.g., for fuel use) or Scope 2 (e.g., for electricity use), rather than in Scope 3.

Screening Approach

The screening approach for capital goods is very similar to the approach for PG&S. The goal of this category is to separately account for emissions associated with the procurement of capital goods. In financial accounting, capital goods (sometimes called “capital assets”) are typically depreciated or amortized over the life of the asset.

For purposes of accounting for Scope 3 emissions, organizations should not depreciate, discount, or amortize the emissions from the production of capital goods over time. Instead, reporting organizations should account for the total cradle-to-shelf emissions of purchased capital goods in the year of acquisition, in the same way the organization accounts for emissions from other purchased products in category 1. If major capital purchases occur only once every few years, Scope 3 emissions from capital goods may fluctuate significantly from year to year.

Data Requirements

Much like PG&S, capital goods require spend data on any capital goods or capital assets across the reporting year. Please review data requirements under PG&S for more details.

Calculation Methodology

The calculation methodology for capital goods is the same as for PG&S. Please review the calculation methodology under PG&S for more details.

Category 3: Fuel and Energy-Related Activities

Category 3 includes emissions from extraction, production, and transportation of fuels and energy purchased or acquired by the reporting organization that are not already included in Scope 1 and 2. (Emissions from the combustion of fuels or electricity are excluded because they are already included in Scope 1 or 2.)

Screening Approach

The screening for category 3 assesses the embodied emissions of fuels and energy used across an organization's operations. The table below provides an overview of the different energy categories to consider:

Fuel and Energy-Related Activities

Activity	Description	Applicability
Upstream emissions of purchased fuels	Extraction, production, and transportation of fuels consumed by the reporting organization Examples: oil extraction, gasoline refining, natural gas transmission and distribution, biofuel production, etc.	End users of fuel
Upstream emissions of purchased electricity	Extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, cooling that is consumed by the reporting organization Examples: coal mining, coal refining	End users of electricity, steam, heating, and cooling
Transmission and distribution (T&D) losses	Generation (upstream activities and combustion) of electricity, steam, heating, and cooling that is lost in the T&D system from point of generation to the end user	End users of electricity, steam, heating, and cooling
Generation of purchased electricity sold to end users	Generation (upstream activities and combustion) of electricity, steam, heating, and cooling that is purchased by the reporting organization and sold to end users. Relevant for utility organizations that purchase wholesale electricity from independent power producers (IPP).	Only for utility organizations and energy retailers*

Note: *Energy retailers include any reporting organizations selling excess power to the grid.

Adapted from: [Greenhouse Gas Protocol, Technical Guidance for Calculating Scope 3 Emissions \(v1.0\)](#)

Data Requirements

The screening of the three categories applicable to end users of energy (i.e., upstream emissions of purchased fuels, upstream emissions of purchased electricity, and transmission and distribution losses) requires all Scope 1 fuel consumption data and Scope 2 purchased energy data. This can be exported directly from the underlying data within an organization's Scope 1 and 2 GHG emissions inventory. This underlying data typically includes information collected from fuel records, vendors, and utility invoices; and estimations of energy usage in buildings with unknown energy usage.

Calculation Methodology

1. Upstream emissions of purchased fuels

The upstream emissions of purchased fuels are calculated by multiplying the total fuel and energy consumed by the applicable upstream emission factors.

$$\sum \left(\text{fuel consumed (e.g., therms)} \times \text{upstream fuel emission factor (e.g., kg CO}_2\text{e/therm)} \right)$$

Sum across each fuel type consumed:

The following table provides upstream emission factors for a selection of fuel types that are commonly used in healthcare:

Upstream Emission Factors for Fuel Types

Fuel type	Emission factors in 2021	Unit of measure
Natural gas	0.918777846	kg CO ₂ e/therm
Diesel (100% mineral diesel)	2.380039817	kg CO ₂ e/gallon
Gasoline	2.281959797	kg CO ₂ e/gallon
Fuel oil	2.639302672	kg CO ₂ e/gallon
Biodiesel	2.308571242	kg CO ₂ e/gallon
CNG	0.359122018	kg CO ₂ e/gallon

Source: Derived from the [UK Government GHG Conversion Factors for Company Reporting](#)

2. Upstream emissions of purchased electricity

The upstream emissions of purchased electricity are calculated by multiplying the total electricity consumed by the applicable upstream emission factors.

$$\sum \left(\text{electricity consumed (kWh)} \times \text{upstream electricity emission factor (kg CO}_2\text{e/kWh)} \right)$$

Sum across suppliers, regions, or countries:

The upstream emission factor for electricity usage in the United States was 0.066436478 kgCO₂e/kWh in 2020 and 0.106571000 kgCO₂e/kWh in 2021, according to the [UK Government GHG Conversion Factors for Company Reporting](#) (based on data published by the IEA).

3. Transmission and distribution (T&D) losses

T&D losses occur both upstream and downstream of combustion, so T&D loss rates must be applied to life cycle emissions that are calculated by multiplying total consumption by both the combustion and upstream emission factors. Emissions from T&D losses associated with electricity, steam, heating, and cooling are calculated by multiplying total consumption by a geographically relevant life cycle emission factor and grid loss rate. Grid loss rates can be regional rates such as those published by the US EPA in its Emissions and Generation Resource Integrated Database (eGRID); national rates; or global average rates. The [Scope 3 GHG Emissions Accounting](#)

[Tool](#) utilizes a US-average electricity life cycle emission factor of 0.479094371 kgCO₂e/kWh (derived from IEA 2020) and a US average grid loss factor of 5.91% ([published by the World Bank for calendar year 2014](#)).

Sum across suppliers, regions or countries:

$$\sum \left(\text{electricity consumed (kWh)} \times \text{electricity life cycle emission factor (kg CO}_2\text{e/kWh)} \right. \\ \left. \times \text{average grid loss factor} \right)$$

Category 4: Upstream Transportation and Distribution

Category 4 includes emissions from transportation and distribution of products purchased in the reporting year, between an organization’s tier 1 suppliers and its own operations in vehicles not owned or operated by the reporting organization (including multi-modal shipping where multiple carriers are involved in the delivery of a product but excluding fuel and energy products).

Screening Approach

Transportation and distribution result from both inbound and outbound logistics purchased by the reporting organization. Emissions arise from a variety of sources including air transport, rail transport, marine transport, road transport, and warehousing/storage. Outbound logistics services purchased by the reporting organization are categorized as upstream because they are a purchased service.

To screen for Upstream transportation and distribution, employ the same EPA Supply Chain Emission Factors utilized in categories 1 and 2, as they pertain to fees spent for inbound/outbound logistics (e.g., freight and shipping fees), and based on the method of transport (e.g., truck transportation).

Data Requirements

Utilize the same spend data provided in categories 1 and 2 to complete the screening for upstream transportation and distribution. Be sure to allocate any spend on air, marine, rail, and road transport to upstream transportation and distribution, rather than PG&S. Investigate any additional sources of internal data on logistics procurement.

Organizations should identify any relevant data that may improve the accuracy of the GHG impact figure. If a higher tier of data is available around internal logistics procurement (for example, total fuel consumed or total miles traveled by each transport type), employ more accurate calculation methodologies (e.g., “supplier-specific” or “average-data” methods) to build a better estimate of the GHG impact.

Calculation Methodology

For any spend on transportation and distribution activities (air, marine, rail, and road transport), the calculation methodology is as follows:

$$CO_2e \text{ Emissions from transportation} = \sum \frac{\text{amount spent on transportation by type (\$)} \times \text{relevant EEIO emission factors per unit of economic value (kg CO}_2 \text{ e/\$)}}{1}$$

The following table provides emission factors utilized in the [Scope 3 GHG Emissions Accounting Tool](#) for transportation and distribution activities:

Emission Factors for Transportation and Distribution Activities

Industry name - Summary category	Emission factors	UoM
Air transportation	0.930	kg CO2e/\$
Rail transportation	0.724	kg CO2e/\$
Truck transportation	1.408	kg CO2e/\$
Water transportation	0.758	kg CO2e/\$
Transit and ground passenger transportation	0.158	kg CO2e/\$
Other transportation and support activities	0.371	kg CO2e/\$

Source: EPA Supply Chain Emission Factors

Category 5: Waste Generated in Operations

Category 5 includes emissions from third-party disposal and treatment of waste (including both solid waste and wastewater) generated in the reporting organization's owned or controlled operations in the reporting year.

Screening Approach

This category includes emissions from waste and wastewater treatment in facilities owned and operated by third parties. It also includes all future emissions that result from waste generated in the reporting year. Therefore, the data should not be interpreted to mean that emissions have already occurred but rather emissions are expected to occur as a result of activities in the reporting year. These waste treatment activities may include but are not limited to: disposal in a landfill, disposal in a landfill with landfill-gas-to-energy (LFGTE), recovery for recycling, incineration, composting, waste-to-energy (WTE), energy-from-waste (EfW), and wastewater treatment.

For hospitals and health systems, emissions from third-party treatment of wastewater are assumed to be insignificant, and difficult to quantify because the volume of wastewater generated is not always metered. However, organizations that wish to calculate wastewater treatment emissions can reasonably estimate these emissions by estimating their wastewater volume as 95% of their water use volume, and then multiplying this quantity by a factor published by the UK government in the [Greenhouse Gas Conversion Factors for Company Reporting](#) (the published factor for wastewater treatment in 2021 was 0.272 kgCO₂e/cubic meter of wastewater).

Data Requirements

IMPORTANT NOTE: Emissions associated with off-site treatment/disposal of regulated medical/infectious waste and hazardous waste (e.g., biohazard, needles/sharps, pathological and large tissue waste, dual infectious plus hazardous waste, cytotoxic drugs and chemotherapy waste, etc.) should be estimated by reporting related spending under the "Waste management and remediation services" subcategory of Scope 3, category 1 (PG&S).

Three types of data – weights of generated wastes, types of wastes, and waste treatment methods – are required to estimate emissions associated with the treatment/disposal of the following mixed material types: paper, metals, plastics, recyclables, organics, municipal solid waste (MSW), and electronics. If information on types and treatment methods is unavailable, these can be defaulted to mixed MSW and landfilled, respectively, to provide a conservative estimate (since, for example, landfilling is generally more emissions-intensive than recycling). However, the total mass of waste generated is a critical data component.

In the absence of reliable data for all locations within the organization's operations, an intensity factor can be developed to estimate the waste emissions of locations where waste data is unavailable. This requires a minimum of five data samples to reliably develop a representative intensity factor.

Calculation Methodology

Waste emissions are calculated by taking the total mass and multiplying by the appropriate emission factor depending on the waste type and treatment method. In the absence of a specific waste type and treatment method, one can assume all waste types are MSW and are being landfilled, for the most conservative estimate.

Sum across waste types:

$$\sum \left(\text{waste produced (e.g. tons)} \times \text{waste treatment emission factor by waste type} \left(\text{MT CO}_2\text{e/ton} \right) \right)$$

The following table provides the emission factors utilized in the [Scope 3 GHG Emissions Accounting Tool](#) for waste generated in operations.

Emission Factors for Waste Generated in Operations

Material	Recycled	Landfilled	Combusted (incineration)	Composted	Unit of measure
Mixed paper	0.07	0.80	0.05	NA	MTCO ₂ e/short ton
Mixed metals	0.23	0.02	0.01	NA	MTCO ₂ e/short ton
Mixed plastics	0.22	0.02	2.34	NA	MTCO ₂ e/short ton
Mixed recyclables	0.09	0.68	0.11	NA	MTCO ₂ e/short ton
Mixed organics	NA	0.48	0.05	0.17	MTCO ₂ e/short ton
Mixed MSW	NA	0.52	0.43	NA	MTCO ₂ e/short ton
Mixed electronics	NA	0.02	0.87	NA	MTCO ₂ e/short ton

Source: [EPA Emission Factors for Greenhouse Inventories](#) (last modified 4/1/2021)

Category 6: Business Travel

Category 6 includes emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars. Reporting organizations may optionally include emissions from business travelers staying in hotels.

Screening Approach

The GHG impact of business travel can be calculated using a variety of data sources. Due to the nature of business travel being expensed and tracked closely, it is often easy to obtain a report of all business travel for a given reporting year. For example, reports related to air travel usually include each flight and total mileage. This data can be leveraged for an accurate calculation of business travel. In some cases, organizations can also obtain a mileage report for any rental cars paid for by the reporting organization. The distance traveled by rental cars can be used to estimate the GHG impact.

If activity data around business travel is unavailable, spend data can be leveraged to estimate the GHG impact. Specific spend data in the following categories of business travel are required:

Categories of Business Travel

Mode	Description
Air travel	Any travel by air
Passenger ground travel	Includes buses, trains, taxis, Lyft, Uber, etc.
Rental car	Any rental cars paid for by the organization
Rail travel	Any travel by rail
Marine travel	Any travel by water
Hotel stays*	Any hotel stays paid for by the organization

*Reporting organizations that wish to optionally report emissions from business travelers staying in hotels can multiply the number of hotel nights by country-specific factors published by the UK government in the [Greenhouse Gas Conversion Factors for Company Reporting](#) (the published factor for hotel stays in the United States in 2021 was 19.7 kgCO₂e per room per night).

Data Requirements

As described above, there are two distinct methods available to calculate the GHG impact of business travel. The choice of method will depend on the data availability.

If activity data is available: Request data providing details of business travel activities from the appropriate internal stakeholders.

If activity data is not available: Leverage spend data to calculate GHG impact. Identify the specific spend data representative of business travel activities. This is the method utilized in the [Scope 3 GHG Emissions Accounting Tool](#).

Calculation Methodology

If activity data is available: Estimate the GHG impact of business travel using activity data. The following equation describes the general approach taken across each mode of transportation:

CO2e Emissions from business travel =

Sum across vehicle types:

$$\sum (\text{distance traveled by vehicle type (vehiclemile or passengermile)} \times \text{vehicle specific emission factor (kg CO2e/vehicle-mile or kg CO2e/passenger-mile)})$$

Reporting organizations using activity data to estimate emissions should consult the most recent emission factors published in the [EPA Emission Factors for Greenhouse Inventories](#).

If activity data is not available: For any spend data across the different modes of business travel, the calculation methodology is as follows:

Sum across travel modes:

$$\sum (\text{amount spent on business travel by mode (\$)} \times \text{relevant EEIO emission factors per unit of economic value (kg CO}_2\text{ e/\$)})$$

The following table provides the spend-based emission factors utilized in the [Scope 3 GHG Emissions Accounting Tool](#) for travel modes:

Emission Factors for Travel Modes

Travel mode	Emission factor	Unit of measure
Air transportation	0.93	kg CO2e/\$
Rail transportation	0.724	kg CO2e/\$
Water transportation	0.758	kg CO2e/\$
Transit and ground passenger transportation	0.158	kg CO2e/\$
Hotels and campgrounds	0.205	Kg CO2e/\$

Source: [EPA Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities](#)
(last revised 8/27/2020)

Category 7: Employee Commuting

Category 7 includes emissions from the transportation of employees between their homes and their worksites.

Screening Approach

Commuting emissions may arise from different transportation modes including automobile, bus, rail, subway, and air travel. This includes emissions from employees of entities and facilities owned, operated, or leased by the reporting organization. Organizations may also include employees of other relevant entities such as franchises or outsourced operations as well as consultants, contractors, and other individuals who are not employees of the organization but commute to facilities owned and operated by the organization.

It is optional to include emissions from remote workers; however, with the onset of widespread remote working due to COVID-19, it is recommended to include these emissions. For guidance on how to estimate emissions by remote workers, organizations can consult the [open-source carbon calculation methodology for homeworking](#) developed by EcoAct.

Data Requirements

The most accurate emissions accounting methodology involves collecting actual commuting data. Some key data points include:

- transportation mode
- distance traveled
- number of trips per week
- total number of employees

This information can be collected via a survey or a questionnaire targeted to the entire organization or a representative group of employees. While it requires moderate time and effort to develop a questionnaire and collect information, the data will provide valuable insights and allow for a more accurate result.

In the absence of actual commuting data, national average data on commuting mode and distance, published by the Bureau of Transportation Statistics and the Department of Transportation, can be used via the average-data method. This is the simplest approach and it is included in the [Scope 3 GHG Emissions Accounting Tool](#).

Calculation Methodology

The simplest method is to use average secondary data from the aforementioned sources to estimate emissions.

$$\sum \left(\begin{array}{l} \textit{number employees} \times \textit{median one way commute distance by state (vehicle mile)} \times 2 \\ \times \textit{working days per year} \\ \times \textit{emission factor for average mode of commuting by state (kg CO}_2\textit{e/vehicle mile)} \end{array} \right)$$

If organization-specific actual commuting data is available, the distance-based method can be employed.

Sum across all employees to determine total distance traveled:

$$\sum (\text{daily one way distance between home and work} \times 2 \times \text{number of commuting days per year})$$

then, sum across vehicle types to determine total emissions:

$$\sum \left(\text{total distance traveled by vehicle type} \times \text{vehicle specific emission factor} \left(\text{kg CO}_2\text{e/mile} \right) \right)$$

Category 8: Upstream Leased Assets

Category 8 includes emissions from the operation of assets that are leased by the reporting organization in the reporting year and not already included in the organization's Scope 1 or Scope 2 inventories. This category is applicable only to organizations that operate leased assets (i.e., lessees). For organizations that own and lease assets to others (i.e., lessors), see category 13 (downstream leased assets).

Screening Approach

Screening this category is only necessary if the reporting entity operates leased assets. The reporting entity's organizational boundary should be carefully reviewed to understand if any upstream leased assets are already accounted for in the reporting organization's Scope 1 and 2 emissions inventory – which is likely to be the case if the reporting entity uses operational control criteria to define its organizational boundaries. If any upstream leased assets are not accounted for in Scope 1 and 2, they should be accounted for in this Scope 3 category.

Annual energy consumption data of leased assets is preferred for calculating this Scope 3 category. Where energy consumption data is known, it can be multiplied by the appropriate emission factors to calculate the GHG impact. If energy consumption data is not known, the average data method can be employed.

The average-data method involves estimating the energy use based on average energy intensity factors and square foot data across leased assets. The [US Commercial Buildings Energy Consumption Survey](#) (CBECS) provides industry average energy consumption across a variety of building types. By using the square feet of leased building spaces, total annual energy consumption can be estimated, and GHG impact can then be calculated using the most recent US-average emission factors for stationary combustion and purchased electricity published in the [EPA Emission Factors for Greenhouse Inventories](#).

For any non-building leased assets (e.g., vehicles), a similar approach can be taken. If energy consumption is known, primary data is preferred. Where primary data is not available, energy consumption can be estimated using industry averages based on the asset type.

Data Requirements

If energy consumption data in upstream leased assets is available, this will be multiplied by the appropriate emission factors to yield the GHG impact. If this data is not available, then the reporting entity will need to gather the square feet of all upstream leased assets. Identify the best industry average data (e.g., CBECS) to estimate the energy consumption based on square feet of the leased building space and the type of building space (outpatient clinic, warehouse, etc.). For non-building leased assets where energy consumption is not known, identify the best industry average data to estimate energy use.

Calculation Methodology

If energy use data for upstream leased assets is available:

Sum across upstream leased assets (for each energy type):

$$\sum \text{energy consumption (kWh or therms)} \times \text{emission factor (kg CO}_2\text{e/unit of energy)}$$

If energy consumption data is not available (for buildings):

Sum across upstream leased assets (for each energy type):

Σ total floor space of building type (sqft) \times CBECS annual electricity use factor for building type or
CBECS annual electricity use factor for building type \times
emission factor for energy type (kg CO₂e/unit of energy)

If energy consumption data is not available (for vehicles):

Sum across upstream leased assets:

Σ average fuel consumption of each vehicle type \times quantity of each vehicle type
 \times emission factor for fuel type (kg CO₂e/unit of fuel)

Category 9: Downstream Transportation and Distribution

Category 9 includes emissions that occur in the reporting year from patients traveling to and from health care facilities because patients are customers who receive a service provided by reporting organizations. (Visitor travel should be excluded because visitors are not receiving a service from the hospitals or healthcare system.)

Category 9 also includes emissions that occur in the reporting year from transportation and distribution of sold products in vehicles and facilities not owned or controlled by the reporting organization. Hospitals and health care systems typically will have no emissions to report from transportation and distribution of sold products. Although they may sell medications to patients, the emissions from the transportation and distribution of these products to patients are already included in the reporting organization's Scope 1 and 2 emissions (if medications are distributed in inhouse pharmacies).

Screening Approach

The average-data method can be employed to quantify emissions from patient visits, with emissions based on state-by-state median one-way commute distance and average mode of commuting, as published by the Bureau of Transportation Statistics and the Department of Transportation (similar to category 7 - Employee commuting).

Data Requirements

Estimation of emission from patients traveling to and from healthcare facilities requires data on the total number of patient visits, including inpatient admissions and outpatient visits.

Calculation Methodology

The calculation methodology is as follows:

$$\begin{aligned} & \text{GHG impact of downstream transportation and distribution:} \\ & \sum \left(\text{number patient visits} \times \text{median one way commute distance by state (vehicle mile)} \times 2 \right. \\ & \quad \left. \times \text{emission factor for average mode of commuting by state (kg CO}_2\text{e/vehicle mile)} \right) \end{aligned}$$

Category 10: Processing of Sold Products

Category 10 includes downstream emissions generated from the processing of intermediate products sold by the reporting organization to third parties (e.g., manufacturers). Intermediate products are products that require further processing, transformation, or inclusion in another product before use, and therefore result in emissions from processing before use by the end consumer.

This category is unlikely to be relevant to hospitals and health systems because typically these organizations do not sell intermediate products to manufacturers. Organizations that wish to report emissions within category 10 should refer to the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

Category 11: Use of Sold Products

Category 11 includes emissions from the use of goods and services sold by the reporting organization in the reporting year. A reporting organization's Scope 3 emissions from use of sold products include the Scope 1 and 2 emissions of end users. End users include both consumers and business customers that use final products.

Screening Approach

For hospitals and health care systems, the primary sources of emissions within this category are likely to be metered-dose inhalers (MDIs) sold to patients by the reporting organization. Reporting organizations that wish to be as comprehensive as possible in their Scope 3 accounting can optionally quantify emissions from all MDIs prescribed to patients, regardless of whether the MDIs were sold to patients by an in-house pharmacy (operated by the reporting organization) or a retail pharmacy (operated by another entity). Publicly available estimates of the emissions of each inhaler on the market as of October 2021 can be obtained from the [Prescquipp bulletin endorsed by the NHSEI Inhaler Working Group](#). Alternatively, the [Scope 3 GHG Emissions Accounting Tool](#) can track emissions from the two main types of hydrofluorocarbons (HFCs) currently used as propellants in MDIs: HFC-227ea and HFC-134a. Hospitals and health systems will need to identify the types and quantities of metered-dose inhalers sold or prescribed, identify the types of propellants within each inhaler, make assumptions about how these products are used, and disclose the methodologies and assumptions used to calculate the emissions. Reporting organizations should assume that any propellants contained in MDIs are not metabolized by patients and are therefore fully released into the atmosphere during the lifetime of the product.

Data Requirements

Organizations should collect:

- Types and quantities of metered-dose inhalers sold or prescribed
- Types and quantities of propellants contained within each of the products sold or prescribed

Calculation Methodology

Calculating emissions for sold products requires multiplying the quantity of products sold (or prescribed) and emission factor per unit sold (or prescribed).

$$\begin{aligned}
 & \text{Sum across propellants emitted from use of products:} \\
 & \sum \left(\text{quantity of units sold or prescribed in reporting period} \right. \\
 & \times \text{mass of GHG propellant per unit sold or prescribed (grams)} \\
 & \left. \times \text{emission factor (kg CO}_2\text{e / gram of HFC - 227ea or gram of HFC - 134a)} \right)
 \end{aligned}$$

The relevant emission factors utilized in the [Scope 3 GHG Emissions Accounting Tool](#) are:

Emission factors for common propellants used in metered-dose inhalers

Refrigerant-based propellant type	Average-data emission factors Expressed in kgCO ₂ e/gram of propellant
HFC-227ea	0.00335
HFC-134a	0.00130

Source: Derived from [Global Warming Potentials \(IPCC Second Assessment Report\)](#)

Category 12: End-of-life Treatment of Sold Products

Category 12 includes emissions from the waste disposal and treatment of products sold by the reporting organization (in the reporting year) at the end of their life. This category includes the total expected end-of-life emissions from all products sold in the reporting year.

This category is unlikely to be relevant to hospitals and health systems because typically these organizations do not sell significant quantities of products to consumers. Organizations that wish to report emissions within category 12 should refer to the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

Category 13: Downstream Leased Assets

Category 13 includes emissions from the operation of assets that are owned by the reporting organization (acting as lessor) and leased to other entities in the reporting year that are not already included in Scope 1 or Scope 2. This category is applicable to lessors (i.e., organizations that receive payments from lessees). Organizations that operate leased assets (i.e., lessees) should refer to category 8 (upstream leased assets).

Screening Approach

Screening of this category is only necessary if the reporting organization leases assets to other entities. The reporting organization's organizational boundary should be carefully reviewed to understand if any downstream leased assets are already accounted for in the reporting organization's Scope 1 and 2 emissions inventory – which is likely to be the case if the reporting entity uses financial control criteria to define its organizational boundaries. If any upstream leased assets are not accounted for in Scope 1 and 2, they should be accounted for in this Scope 3 category.

Annual energy consumption data of leased assets is preferred for calculating this Scope 3 category. Where energy consumption data is known, it can be multiplied by the appropriate emission factors to calculate the GHG impact. If energy consumption data is unknown, the average data method can be employed.

The average-data method involves estimating the energy use based on average energy intensity factors and square foot data across leased assets. The [US Commercial Buildings Energy Consumption Survey \(CBECS\)](#) provides industry average energy consumption across a variety of building types. By using the square feet of leased assets, total annual energy consumption can be estimated; and GHG impact can then be calculated by applying the most recent US-average emission factors for stationary combustion and purchased electricity published in the [EPA Emission Factors for Greenhouse Inventories](#).

For hospitals and health systems, it is assumed there will be no non-building assets (e.g., vehicles) leased by these organizations to others.

Data Requirements

If energy consumption data in upstream leased assets is available, this will be multiplied through by the appropriate emission factors to yield the GHG impact. If this data is not available, then the reporting organization will need to gather the square feet of all downstream leased assets. Identify the best industry average data (e.g., CBECS) to estimate the energy consumption based on square feet of the leased asset.

Calculation Methodology

If energy use data for downstream leased assets is available:

$$\text{Sum across downstream leased assets (for each energy type):}$$
$$\sum \text{energy consumption (kWh)} \times \text{emission factor (kg CO}_2\text{e/kWh)}$$

If energy consumption data is not available (for buildings):

$$\text{Sum across downstream leased assets (for each energy type):}$$
$$\sum \text{total floor space of building type (square feet)} \times \text{CBECS annual electricity use factor for building type or}$$
$$\text{CBECS annual electricity use factor for building type} \times$$
$$\text{emission factor for energy type (kg CO}_2\text{e/unit of energy)}$$

Category 14: Franchises

Category 14 includes emissions from the operation of franchises not included in Scope 1 or Scope 2. A franchise is a business operating under a license to sell or distribute another organization's goods or services within a certain location. This category applies to franchisors (i.e., organizations that grant licenses to other entities to sell or distribute their goods or services in return for payments, such as royalties for the use of trademarks and other services). Franchisors should account for emissions that occur from the operation of franchises (i.e., the Scope 1 and Scope 2 emissions of franchisees) in this category.

This category is unlikely to be relevant to hospitals and health systems because typically these organizations do not operate as franchisors. Organizations that wish to report emissions within category 14 should refer to the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

Category 15: Investments

Category 15 includes Scope 3 emissions associated with the reporting organization's investments in the reporting year, not already included in Scope 1 or Scope 2. This category applies to investors (i.e., organizations that invest with the objective of making a profit) and organizations that provide financial services (including health insurance). This category also applies to investors that are not profit-driven (e.g., multilateral development banks), and the same calculation methods should be used. Investments are categorized as a downstream Scope 3 category because providing capital or financing is a service provided by the reporting organization.

In practice, most hospitals and health systems may find it challenging to collect the data needed to calculate the Scope 3 emissions associated with their investments. For this reason, organizations that wish to report these emissions should first ask their asset managers to provide any pre-calculated emissions reports that are increasingly available to them through proprietary tools that report the emissions intensities of specific investment portfolios. Organizations that wish to report emissions within category 15 should also refer to the GHG Protocol's [Technical Guidance for Calculating Scope 3 Emissions](#).

Screening Approach

For GHG accounting, financial investments are split into four categories:

- Equity investments
- Debt investments
- Project finance
- Managed investments and client services

This Scope 3 category covers all investments made by the reporting organization using the organization's own capital and balance sheet, and not already accounted for in its Scope 1 and 2 emissions inventories. Emissions from investments are allocated to the reporting organization based on the reporting organization's proportional share of investment in the investee. For example, if the reporting organization has a 10% financial stake in a startup organization, the reporting organization would account for 10% of the annual emissions from that startup organization in its Scope 3 emissions (as long as emissions are not already accounted for in the reporting organization's Scope 1 and 2 emissions inventories based on the consolidation approach).

The consolidation approach of the reporting organization is crucial in determining what investments to include in this Scope 3 category. The reporting organization should carefully review its consolidation approach to understand which investments are already accounted for in its Scope 1 and 2 emissions inventories. The [Scope 3 GHG Emissions Accounting Tool](#) assumes that hospitals and health systems will define the organizational boundaries of their Scope 1 and 2 emissions inventories to include only emissions that are under the operational- or financial-control of the reporting organization; and therefore emissions from its investments will be allocated exclusively to Scope 3 unless the reporting organization controls an investee either operationally or financially.

Although the equity stake for each investment is used to allocate emissions from that investment activity, reporting organizations may establish a threshold (e.g., equity share of 1%) below which the company excludes equity investments from the inventory, if disclosed and justified.

In the case of integrated health systems that collect health insurance premiums from their plan members, insurance premiums should be regarded as the reporting organization's own capital; therefore, equity investments made by organizations using insurance premiums are required to be reported (although organizations may establish a threshold for equity investments, as noted above).

Because investment portfolios are dynamic and can change frequently throughout the reporting year, organizations should identify investments by choosing a fixed point in time, such as December 31 of the reporting year, or by using a representative average for the reporting year.

Data Requirements

A list of all investment instruments owned by the reporting organization in the reporting year is required. For equity investment instruments (e.g., common stock), the primary variables are: 1. the total equity stake (outstanding amount); and 2. the enterprise value including cash (EVIC) or the market capitalization. These variables are used to calculate the attribution factor (total equity stake/EVIC or total equity stake/market capitalization). The same variables are required for private investment activities and sourcing this data may require further engagement with the reporting organization's financial team.

To complete the calculation, the Scope 1, 2 and 3 emissions of each investee company or the total annual revenue of the investee company is required. Emissions data can either come directly from the investee entities or be estimated using EEIO emission factors. If Scope 1, 2 and 3 emissions are available, this data is preferred. If Scope 1, 2 and 3 emissions are not available, EEIO emission factors can be multiplied by the attribution factor and the investee company's annual revenue to estimate annual emissions.

Calculation Methodology

If Scope 1, 2 and 3 emissions of the investee company are available:

Sum across all investment instruments:

$$\sum \text{Attribution factor (\%)} \times \text{investee company's Scope 1, 2 and 3 emissions}$$

If Scope 1, 2 and 3 emissions of the investee company are not available:

Sum across all investment instruments:

$$\sum \text{Attribution factor (\%)} \times \text{investee company's annual revenue (\$ USD)} \times$$

EEIO emission factor based on investee company's economic sector (kg CO₂e/\$)

Issues for Further Study

Several sources of Scope 3 emissions are not addressed in this how-to guide because an appropriate methodology was not readily available or feasible to develop. However, these emissions sources may be relevant to hospitals and health systems and could therefore warrant inclusion in future efforts to measure Scope 3 emissions.

Below is a brief discussion of two additional emission sources and potential methodologies for estimating emissions from each of them.

- 1. Visitor travel:** The UK National Health Service (NHS) estimates emissions from patient- and visitor-travel by using data from a national travel survey (<https://www.gov.uk/government/statistical-data-sets/nts03-modal-comparisons>) that reports average miles traveled per person per travel mode per year for “personal business medical,” “other social,” and “escort shopping/personal” purposes. Then the NHS applies the relevant emissions intensity factor for each travel mode. Emissions associated with patient visits can be estimated, as discussed in Category 9 (downstream transportation). However, emissions associated with ancillary travel by visitors to patients will likely be challenging for healthcare systems to accurately measure, due to a lack of existing systems to track visitors. Healthcare systems would need to design their own methodology to estimate emissions from visitor travel. The full NHS methodology is described here: [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30271-0/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30271-0/fulltext).
- 2. End-of-life treatment of sold products:** With the exception of integrated healthcare systems that may sell pharmaceuticals directly to their members, hospitals and health systems typically do not sell significant quantities of products to consumers. However, hospitals and health systems have influence over procurement- and prescribing-practices that can reduce emissions caused by the disposal of prescribed medications (including packaging and unused/expired products) used at home. In the future, organizations that wish to develop an estimation methodology for disposed pharmaceuticals at home (either sold or prescribed) may be able to derive one by using existing emission factors for waste disposal published by the US EPA, and partnering with major retail pharmacies to understand the product weight of dispensed medications (for potential inclusion in Category 12 – End of life treatment of sold products). Walgreens Boots Alliance (WBA) currently estimates its emissions within this category, but its [CDP responses](#) do not yet disclose the underlying values needed to derive an estimation methodology.

Contact Us

engieimpact.com

info.impact@engie.com



Appendix A: Descriptions of economic sectors and commodity names used for Category 1 and 2 (Goods and Services) emissions reporting

The following table provides descriptions corresponding to the drop-down options in the “Cat 1 and 2 (Goods & Services)” tab in the [Scope 3 GHG Emissions Accounting Tool](#).

Category 1 and 2 - Economic Sector (Commodity Name)	Category 1 and 2 - Economic Sector (Commodity Name) - Descriptions
Ambulatory health care services - General	A general category encompassing all "Ambulatory health care services". Industries in the Ambulatory Health Care Services subsector provide health care services directly or indirectly to ambulatory patients and do not usually provide inpatient services. Health practitioners in this subsector provide outpatient services, with the facilities and equipment not usually being the most significant part of the production process.
Ambulatory health care services - Ambulances	This industry group comprises establishments primarily engaged in providing ambulatory health care services (except offices of physicians, dentists, and other health practitioners; outpatient care centers; medical laboratories and diagnostic imaging centers; and home health care providers).
Ambulatory health care services - Healthcare practitioners (except physicians and dentists)	Offices of other health practitioners. This industry group comprises establishments of independent health practitioners (except physicians and dentists).
Ambulatory health care services - Home healthcare	This industry comprises establishments primarily engaged in providing skilled nursing services in the home, along with a range of the following: personal care services; homemaker and companion services; physical therapy; medical social services; medications; medical equipment and supplies; counseling; 24- hour home care; occupation and vocational therapy; dietary and nutritional services; speech therapy; audiology; and high-tech care, such as intravenous therapy.
Ambulatory health care services - Medical laboratories	This industry comprises establishments known as medical and diagnostic laboratories primarily engaged in providing analytic or diagnostic services, including body fluid analysis and diagnostic imaging, generally to the medical profession or to the patient on referral from a health practitioner.
Ambulatory health care services - Outpatient healthcare	This industry group comprises (1) Family Planning Centers, (2) Outpatient Mental Health and Substance Abuse Centers, and (3) Other Outpatient Care Centers including: (a) HMO Medical Centers, (b) Kidney Dialysis Centers, (c) Freestanding Ambulatory Surgical and Emergency Centers, and (d) All Other Outpatient Care Centers.
Ambulatory health care services - Physicians	This industry comprises establishments of health practitioners having the degree of M.D. (Doctor of Medicine) or D.O. (Doctor of Osteopathy) primarily engaged in the independent practice of general or specialized medicine (e.g., anesthesiology, oncology, ophthalmology, psychiatry) or surgery. These practitioners operate private or group practices in their own

offices (e.g., centers, clinics) or in the facilities of others, such as hospitals or HMO medical centers.

Apparel and leather and allied products - General

A general category encompassing all "Apparel and leather and allied products". Industries in the Apparel Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment) and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. The Apparel Manufacturing subsector includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers, performing entrepreneurial functions involved in apparel manufacturing; and tailors, manufacturing custom garments for individual clients. Knitting fabric, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in the Apparel Manufacturing subsector.

Apparel and leather and allied products - Clothing

Industries in the Apparel Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment), and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. The Apparel Manufacturing subsector includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients are all included. Knitting, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in Apparel Manufacturing.

Chemical products - General

A general category encompassing all "Chemical products". The Chemical Manufacturing subsector is based on the transformation of organic and inorganic raw materials by a chemical process and the formulation of products. This subsector distinguishes the production of basic chemicals that comprise the first industry group from the production of intermediate and end products produced by further processing of basic chemicals that make up the remaining industry groups.

This subsector does not include all industries transforming raw materials by a chemical process. It is common for some chemical processing to occur during mining operations. These beneficiating operations, such as copper concentrating, are classified in Sector 21, Mining, Quarrying, and Oil and Gas Extraction. Furthermore, the refining of crude petroleum is included in Subsector 324, Petroleum and Coal Products Manufacturing. In addition, the manufacturing of aluminum oxide is included in Subsector 331, Primary Metal Manufacturing; and beverage distilleries are classified in Subsector 312, Beverage and Tobacco Product Manufacturing. As is the case of these two activities, the grouping of industries into subsectors may take into account the association of the activities performed with other activities in the subsector.

Chemical products - Adhesives	This industry comprises establishments primarily engaged in manufacturing adhesives, glues, and caulking compounds.
Chemical products - Blood sugar, pregnancy, and other diagnostic test kits	This U.S. industry comprises establishments primarily engaged in manufacturing in-vitro (i.e., not taken internally) diagnostic substances, such as chemical, biological, or radioactive substances. The substances are used for diagnostic tests that are performed in test tubes, petri dishes, machines, and other diagnostic test-type devices.
Chemical products - Chemicals (except basic chemicals, agrichemicals, polymers, paints, pharmaceuticals, soaps, cleaning compounds)	This industry group comprises establishments primarily engaged in manufacturing chemical products (except basic chemicals; resins, synthetic rubber, cellulosic and noncellulosic fibers and filaments; pesticides, fertilizers, and other agricultural chemicals; pharmaceuticals and medicines; paints, coatings, and adhesives; soaps and cleaning compounds; and toilet preparations).
Chemical products - Compressed Gases	This industry comprises establishments primarily engaged in manufacturing industrial organic and inorganic gases in compressed, liquid, and solid forms.
Chemical products - Medicinal and botanical ingredients	This U.S. industry comprises establishments primarily engaged in (1) manufacturing uncompounded medicinal chemicals and their derivatives (i.e., generally for use by pharmaceutical preparation manufacturers) and/or (2) grading, grinding, and milling uncompounded botanicals.
Chemical products - Other basic inorganic chemicals	Other basic inorganic chemical manufacturing. This industry comprises establishments primarily engaged in manufacturing basic inorganic chemicals (except industrial gases and synthetic dyes and pigments).
Chemical products - Other basic organic chemicals	This industry comprises establishments primarily engaged in manufacturing basic organic chemicals (except petrochemicals, industrial gases, and synthetic dyes and pigments).
Chemical products - Pharmaceutical products (pills, powders, solutions, etc.)	This U.S. industry comprises establishments primarily engaged in manufacturing in-vivo diagnostic substances and pharmaceutical preparations (except biological) intended for internal and external consumption in dose forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.
Chemical products - Soap and cleaning compounds	This industry comprises establishments primarily engaged in manufacturing and packaging soap and other cleaning compounds, surface active agents, and textile and leather finishing agents used to reduce tension or speed the drying process.
Chemical products - Toiletries	This industry comprises establishments primarily engaged in preparing, blending, compounding, and packaging toilet preparations, such as perfumes, shaving preparations, hair preparations, face creams, lotions (including sunscreens), and other cosmetic preparations.
Chemical products - Vaccines and other biological medical products	This U.S. industry comprises establishments primarily engaged in manufacturing vaccines, toxoids, blood fractions, and culture media of plant or animal origin (except diagnostic).

Computer and electronic products - General

A general category encompassing all "Computer and electronic products". Industries in the Computer and Electronic Product Manufacturing subsector group establishments that manufacture computers, computer peripherals, communications equipment, and similar electronic products, and establishments that manufacture components for such products. The Computer and Electronic Product Manufacturing industries have been combined in the hierarchy of NAICS because of the economic significance they have attained. Their rapid growth suggests that they will become even more important to the economies of all three North American countries in the future, and in addition their manufacturing processes are fundamentally different from the manufacturing processes of other machinery and equipment. The design and use of integrated circuits and the application of highly specialized miniaturization technologies are common elements in the production technologies of the Computer and Electronic Product Manufacturing subsector. Convergence of technology motivates this NAICS subsector. Digitalization of sound recording, for example, causes both the medium (the compact disc) and the equipment to resemble the technologies for recording, storing, transmitting, and manipulating data. Communications technology and equipment have been converging with computer technology. When technologically-related components are in the same sector, it makes it easier to adjust the classification for future changes, without needing to redefine its basic structure. The creation of the Computer and Electronic Product Manufacturing subsector assists in delineating new and emerging industries because the activities that will serve as the probable sources of new industries, such as computer manufacturing and communications equipment manufacturing, or computers and audio equipment, are brought together. As new activities emerge, they are less likely to cross the subsector boundaries of the classification.

Computer and electronic products - Analytical laboratory instruments

This U.S. industry comprises establishments primarily engaged in manufacturing instruments and instrumentation systems for laboratory analysis of the chemical or physical composition or concentration of samples of solid, fluid, gaseous, or composite material.

Computer and electronic products - Audio and video equipment

This industry comprises establishments primarily engaged in manufacturing electronic audio and video equipment for home entertainment, motor vehicles, and public address and musical instrument amplification. Examples of products made by these establishments are video cassette recorders, televisions, stereo equipment, speaker systems, household-type video cameras, jukeboxes, and amplifiers for musical instruments and public address systems.

Computer and electronic products - Computer storage device readers

This U.S. industry comprises establishments primarily engaged in manufacturing computer storage devices that allow the storage and retrieval of data from a phase change, magnetic, optical, or magnetic/optical media. Examples of products made by these establishments are CD-ROM drives, floppy disk drives, hard disk drives, and tape storage and backup units.

Computer and electronic products - Computer terminals and other computer peripheral equipment

Computer terminals and other computer peripheral equipment manufacturing. This industry comprises establishments primarily engaged in manufacturing computer terminals and other computer peripheral equipment (except storage devices).

Computer and electronic products - Computers

This U.S. industry comprises establishments primarily engaged in manufacturing and/or assembling electronic computers, such as mainframes, personal computers, workstations, laptops, and computer servers. Computers can be analog, digital, or hybrid. Digital computers, the most common type, are devices that do all of the following: (1) store the processing program or programs and the data immediately necessary for the execution of the program; (2) can be freely programmed in accordance with the requirements of the user; (3) perform arithmetical computations specified by the user; and (4) execute, without human intervention, a processing program that requires the computer to modify its execution by logical decision during the processing run. Analog computers are capable of simulating mathematical models and contain at least analog, control, and programming elements. The manufacture of computers includes the assembly or integration of processors, coprocessors, memory, storage, and input/output devices into a user-programmable final product.

Computer and electronic products - Electromedical apparatuses

This U.S. industry comprises establishments primarily engaged in manufacturing electromedical and electrotherapeutic apparatus, such as magnetic resonance imaging equipment, medical ultrasound equipment, pacemakers, hearing aids, electrocardiographs, and electromedical endoscopic equipment.

Computer and electronic products - Electronic capacitors, resistors, coils, transformers, connectors and other components (except semiconductors and printed circuit assemblies)

This industry comprises establishments primarily engaged in manufacturing semiconductors and other components for electronic applications. Examples of products made by these establishments are capacitors, resistors, microprocessors, bare and loaded printed circuit boards, electron tubes, electronic connectors, and computer modems.

Computer and electronic products - Irradiation apparatuses

This U.S. industry comprises establishments primarily engaged in manufacturing irradiation apparatus and tubes for applications, such as medical diagnostic, medical therapeutic, industrial, research and scientific evaluation. Irradiation can take the form of beta-rays, gamma-rays, X-rays, or other ionizing radiation.

Computer and electronic products - Telephones

This industry comprises establishments primarily engaged in manufacturing wire telephone and data communications equipment. These products may be standalone or board-level components of a larger system. Examples of products made by these establishments are central office switching equipment, cordless telephones (except cellular), PBX equipment, telephones, telephone answering machines, LAN modems, multi-user modems, and other data communications equipment, such as bridges, routers, and gateways.

Computer systems design and related services - General

A general category encompassing all "Computer systems design and related services". This industry comprises establishments primarily engaged in providing expertise in the field of information technologies through one or more of the following activities: (1) writing, modifying, testing, and supporting software to meet the needs of a particular customer; (2) planning and designing computer systems that integrate computer hardware, software, and communication technologies; (3) on-site management and operation of clients' computer systems and/or data processing facilities; and (4) other professional and technical computer related advice and services.

Computer systems design and related services - Computer systems design

This U.S. industry comprises establishments primarily engaged in planning and designing computer systems that integrate computer hardware, software, and communication technologies. The hardware and software components of the system may be provided by this establishment or company as part of integrated services or may be provided by third parties or vendors. These establishments often install the system and train and support users of the system.

Computer systems design and related services - Custom computer programming

This U.S. industry comprises establishments primarily engaged in writing, modifying, testing, and supporting software to meet the needs of a particular customer.

Computer systems design and related services - Other computer related services, including facilities management

This industry comprises establishments primarily engaged in providing expertise in the field of information technologies through one or more of the following activities (1) writing, modifying, testing, and supporting software to meet the needs of a particular customer; (2) planning and designing computer systems that integrate computer hardware, software, and communication technologies; (3) on-site management and operation of clients computer systems and/or data processing facilities; and (4) other professional and technical computer-related advice and services.

Construction - General

A general category encompassing all "Construction" (commercial and institutional). This industry comprises establishments primarily responsible for the construction (including new work, additions, alterations, maintenance, and repairs) of commercial and institutional buildings and related structures, such as stadiums, grain elevators, and indoor swimming facilities. This industry includes establishments responsible for the on-site assembly of modular or prefabricated commercial and institutional buildings. Included in this industry are commercial and institutional building general contractors, commercial and institutional building for-sale builders, commercial and institutional building design-build firms, and commercial and institutional building project construction management firms.

Construction - Health care structures

This industry comprises construction of health care structures

Data processing, internet publishing, and other information services - General

A general category encompassing all industries in the Data Processing, Hosting, and Related Services subsector group - establishments that provide the infrastructure for hosting and/or data processing services.

Data processing, internet publishing, and other information services - Data processing and hosting	Establishments primarily engaged as independent contractors in the installation and maintenance of broadcasting and telecommunications systems are classified in Sector 23, Construction. Establishments known as Internet cafes, primarily engaged in offering limited Internet connectivity in combination with other services such as facsimile services, training, rental of on-site personal computers, game rooms, or food services are classified in Subsector 561, Administrative and Support Services, or Subsector 722, Food Services and Drinking Places, depending on the primary activity.
Farms - Fresh fruits and tree nuts	This industry group comprises establishments primarily engaged in growing fruit and/or tree nut crops. The crops included in this industry group are generally not grown from seeds and have a perennial life cycle.
Farms - Fresh vegetables, melons, and potatoes	The vegetable and melon farming industry comprises establishments primarily engaged in one or more of the following: (1) growing vegetable and/or melon crops; (2) producing vegetable and/or melon seeds; and (3) growing vegetable and/or melon bedding plants. The crops included in this industry have an annual growth cycle and are grown in open fields. Climate and cultural practices limit producing areas but often permit the growing of a combination of crops in a year. The potato farming industry comprises establishments primarily engaged in growing potatoes and/or producing seed potatoes.
Food Manufacturing - General	Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.
Food Manufacturing - Corn products	This U.S. industry comprises establishments primarily engaged in wet milling corn and other vegetables (except to make ethyl alcohol). Examples of products made in these establishments are corn sweeteners, such as glucose, dextrose, and fructose; corn oil; and starches (except laundry).
Food Manufacturing - Refined vegetable, olive, and seed oils	This U.S. industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing shortening and margarine from purchased fats and oils; (2) refining and/or blending vegetable, oilseed, and tree nut oils from purchased oils; and (3) blending purchased animal fats with purchased vegetable fats.
Food Manufacturing - Breakfast cereals	This industry comprises establishments primarily engaged in manufacturing breakfast cereal foods.
Food Manufacturing - Sugar, candy, and chocolate	This industry group comprises (1) establishments that process agricultural inputs, such as sugarcane, beet, and cacao, to give rise to a new product (sugar or chocolate), and (2) those that begin with sugar and chocolate and process these further.

Food Manufacturing - Frozen food	This industry comprises establishments primarily engaged in manufacturing frozen fruit, frozen juices, frozen vegetables, and frozen specialty foods (except seafood), such as frozen dinners, entrees, and side dishes; frozen pizza; frozen whipped toppings; and frozen waffles, pancakes, and french toast.
Food Manufacturing - Fruit and vegetable preservation	This industry comprises establishments primarily engaged in manufacturing canned, pickled, and dried fruits, vegetables, and specialty foods. Establishments in this industry may package the dried or dehydrated ingredients they make with other purchased ingredients. Examples of products made by these establishments are canned juices; canned baby foods; canned soups (except seafood); canned dry beans; canned tomato-based sauces, such as catsup, salsa, chili, spaghetti, barbeque, and tomato paste, pickles, relishes, jams and jellies, dried soup mixes and bullions, and sauerkraut.
Food Manufacturing - Cheese	This U.S. industry comprises establishments primarily engaged in (1) manufacturing cheese products (except cottage cheese) from raw milk and/or processed milk products and/or (2) manufacturing cheese substitutes from soybean and other nondairy substances.
Food Manufacturing - Dry, condensed, and evaporated dairy	This U.S. industry comprises establishments primarily engaged in manufacturing dry, condensed, and evaporated milk and dairy substitute products.
Food Manufacturing - Fluid milk and butter	This industry group comprises establishments that manufacture dairy products from raw milk, processed milk, and dairy substitutes.
Food Manufacturing - Ice cream and frozen desserts	This industry comprises establishments primarily engaged in manufacturing ice cream, frozen yogurts, frozen ices, sherbets, frozen tofu, and other frozen desserts (except bakery products).
Food Manufacturing - Packaged poultry	This U.S. industry comprises establishments primarily engaged in (1) slaughtering poultry and small game and/or (2) preparing processed poultry and small game meat and meat byproducts.
Food Manufacturing - Packaged meat (except poultry)	This industry comprises establishments primarily engaged in one or more of the following: (1) slaughtering animals; (2) preparing processed meats and meat byproducts; and (3) rendering and/or refining animal fat, bones, and meat scraps. This industry includes establishments primarily engaged in assembly cutting and packing of meats (i.e., boxed meats) from purchased carcasses.
Food Manufacturing - Seafood	This industry comprises establishments primarily engaged in one or more of the following: (1) canning seafood (including soup); (2) smoking, salting, and drying seafood; (3) eviscerating fresh fish by removing heads, fins, scales, bones, and entrails; (4) shucking and packing fresh shellfish; (5) processing marine fats and oils; and (6) freezing seafood. Establishments known as "floating factory ships" that are engaged in the gathering and processing of seafood into canned seafood products are included in this industry.

**Food Manufacturing -
Bread and other baked goods**

Bread and bakery product manufacturing. This industry comprises establishments primarily engaged in manufacturing fresh and frozen bread and other bakery products.

**Food Manufacturing - Cookies,
crackers, pastas, and tortillas**

This industry group comprises establishments primarily engaged in one of the following: (1) manufacturing fresh and frozen bread and other bakery products; (2) retailing bread and other bakery products not for immediate consumption made on the premises from flour, not from prepared dough; (3) manufacturing cookies, crackers, and dry pasta; (4) manufacturing prepared flour mixes or dough from flour ground elsewhere; or (5) manufacturing tortillas. Related NAICS codes are: 31182-3

**Food Manufacturing -
Snack foods**

This industry group comprises establishments primarily engaged in manufacturing food (except animal food; grain and oilseed milling; sugar and confectionery products; preserved fruit, vegetable, and specialty foods; dairy products; meat products; seafood products; and bakeries and tortillas). The industry group includes industries with different production processes, such as snack food manufacturing; coffee and tea manufacturing; concentrate, syrup, condiment, and spice manufacturing; and, in general, an entire range of other miscellaneous food product manufacturing.

**Food Manufacturing -
Coffee and tea**

This industry comprises establishments primarily engaged in one or more of the following: (1) roasting coffee; (2) manufacturing coffee and tea concentrates (including instant and freeze-dried); (3) blending tea; (4) manufacturing herbal tea; and (5) manufacturing coffee extracts, flavorings, and syrups.

**Food Manufacturing -
Flavored drink concentrates**

Flavoring syrup and concentrate manufacturing. This industry comprises establishments primarily engaged in manufacturing flavoring syrup drink concentrates and related products for soda fountain use or for the manufacture of soft drinks.

**Food Manufacturing -
Seasonings and dressings**

Seasoning and dressing manufacturing'. This industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing dressings and sauces, such as mayonnaise, salad dressing, vinegar, mustard, horseradish, soy sauce, tarter sauce, Worcestershire sauce, and other prepared sauces (except tomato-based and gravies); (2) manufacturing spices, table salt, seasoning, and flavoring extracts (except coffee and meat), and natural food colorings; and (3) manufacturing dry mix food preparations, such as salad dressing mixes, gravy and sauce mixes, frosting mixes, and other dry mix preparations.

**Furniture and related products
- General**

A general category encompassing all "Furniture and related products". Industries in the Furniture and Related Product Manufacturing subsector make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The processes used in the manufacture of furniture include the cutting, bending, molding, laminating, and assembly of such materials as wood, metal, glass, plastics, and rattan. However, the production process for furniture is not solely bending metal, cutting and shaping wood, or extruding and molding plastics. Design and fashion trends play an important part in the production of furniture. The integrated design of the article for both esthetic and functional qualities is also a

major part of the process of manufacturing furniture. Design services may be performed by the furniture establishment's work force or may be purchased from industrial designers.

**Furniture and related products
- Institutional furniture**

This U.S. industry comprises establishments primarily engaged in manufacturing institutional-type furniture (e.g., library, school, theater, and church furniture). Included in this industry are establishments primarily engaged in manufacturing general purpose hospital, laboratory, and dental furniture (e.g., tables, stools, and benches). The furniture may be made on a stock or custom basis and may be assembled or unassembled (i.e., knockdown).

**Furniture and related products
- Office furniture and custom
architectural woodwork and
millwork**

This industry comprises establishments primarily engaged in manufacturing office furniture and/or office and store fixtures. The furniture may be made on a stock or custom basis and may be assembled or unassembled (i.e., knockdown).

**Miscellaneous manufacturing -
General**

A general category encompassing all "Miscellaneous manufacturing". Industries in the Miscellaneous Manufacturing subsector make a wide range of products. Processes used by these establishments vary significantly, both among and within industries. For example, a variety of manufacturing processes are used in manufacturing sporting and athletic goods that include products such as tennis racquets and golf balls. The processes for these products differ from each other, and the processes differ significantly from the fabrication processes used in making dolls or toys, the melting and shaping of precious metals to make jewelry, and the bending, forming, and assembly used in making medical products.

**Miscellaneous manufacturing -
Office supplies (not paper)**

This industry comprises establishments primarily engaged in manufacturing office supplies. Examples of products made by these establishments are pens, pencils, felt tip markers, crayons, chalk, pencil sharpeners, staplers, hand operated stamps, modeling clay, and inked ribbons.

**Miscellaneous manufacturing -
Surgical and medical
instruments**

This U.S. industry comprises establishments primarily engaged in manufacturing medical, surgical, ophthalmic, and veterinary instruments and apparatus (except electrotherapeutic, electromedical and irradiation apparatus). Examples of products made by these establishments are syringes, hypodermic needles, anesthesia apparatus, blood transfusion equipment, catheters, surgical clamps, and medical thermometers.

**Miscellaneous manufacturing -
Surgical appliance and
supplies**

This U.S. industry comprises establishments primarily engaged in manufacturing surgical appliances and supplies. Examples of products made by these establishments are orthopedic devices, prosthetic appliances, surgical dressings, crutches, surgical sutures, personal industrial safety devices (except protective eyewear), hospital beds, and operating room tables.

**Miscellaneous professional,
scientific, and technical
services - General**

A general category encompassing all "Miscellaneous professional, scientific, and technical services". Industries in the Professional, Scientific, and Technical Services subsector group establishments engaged in processes where human capital is the major input. These establishments make available the knowledge and skills of their employees, often on an

assignment basis, where an individual or team is responsible for the delivery of services to the client. The individual industries of this subsector are defined on the basis of the particular expertise and training of the services provider.

Miscellaneous professional, scientific, and technical services - Architectural, engineering, and related services

This industry group comprises (1) Architectural Services, (2) Landscape Architectural Services, (3) Engineering Services, (4) Drafting Services, (5) Building Inspection Services, (6) Geophysical Surveying and Mapping Services, (7) Surveying and Mapping (except Geophysical) Services, and (8) Testing Laboratories.

Miscellaneous professional, scientific, and technical services - Environmental and other technical consulting services

This industry group comprises (1) Management Consulting Services, (2) Environmental Consulting Services, and (3) Other Scientific and Technical Consulting Services.

Miscellaneous professional, scientific, and technical services - Scientific research and development

This industry group comprises establishments engaged in conducting original investigation undertaken on a systematic basis to gain new knowledge (research) and/or the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes (experimental development). The industries within this industry group are defined on the basis of the domain of research; that is, on the scientific expertise of the establishment.

Nursing and residential care facilities - General

A general category encompassing all "Nursing and residential care facilities". Industries in the Nursing and Residential Care Facilities subsector provide residential care combined with either nursing, supervisory, or other types of care as required by the residents. In this subsector, the facilities are a significant part of the production process, and the care provided is a mix of health and social services with the health services being largely some level of nursing services.

Nursing and residential care facilities - Nursing and community care facilities

The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry. Excluded from this sector are aerobic classes in Subsector 713, Amusement, Gambling and Recreation Industries and nonmedical diet and weight reducing centers in Subsector 812, Personal and Laundry Services. Although these can be viewed as health services, these services are not typically delivered by health practitioners.

Nursing and residential care facilities - Residential mental retardation, mental health, substance abuse and other facilities

The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry. Excluded from this sector are aerobic classes in Subsector 713, Amusement, Gambling and Recreation Industries and nonmedical diet and weight reducing centers in Subsector 812, Personal and Laundry Services. Although these can be viewed as health services, these services are not typically delivered by health practitioners.

Other services, except government - General

A general category encompassing all "other services, except government". The Other Services (except government) sector comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Other services, except government - Commercial machinery repair

This industry comprises establishments primarily engaged in the repair and maintenance of commercial and industrial machinery and equipment. Establishments in this industry either sharpen/install commercial and industrial machinery blades and saws or provide welding (e.g., automotive, general) repair services; or repair agricultural and other heavy and industrial machinery and equipment (e.g., forklifts and other materials handling equipment, machine tools, commercial refrigeration equipment, construction equipment, and mining machinery).

Other services, except government - Dry-cleaning and laundry

This industry group comprises (1) Coin-Operated Laundries and Drycleaners, (2) Dry cleaning and Laundry Services (except Coin-Operated), and (3) Linen and Uniform Supply.

Other services, except government - Electronic equipment repair and maintenance

This industry group comprises establishments primarily engaged in repairing electronic equipment, such as computers and communications equipment, and highly specialized precision instruments. Establishments in this industry group typically have staff skilled in repairing items having complex, electronic components.

Paper products - General

A general category encompassing all "Paper products". Industries in the Paper Manufacturing subsector make pulp, paper, or converted paper products. The manufacturing of these products is grouped together because they constitute a series of vertically connected processes. More than one is often carried out in a single establishment. There are essentially three activities. The manufacturing of pulp involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet. The manufacturing of converted paper products involves converting paper and other materials by various cutting and shaping techniques and includes coating and laminating activities.

Paper products - Paper

This industry comprises establishments primarily engaged in manufacturing paper from pulp. These establishments may manufacture or purchase pulp. In addition, the establishments may convert the paper they make. The activity of making paper classifies an establishment into this industry regardless of the output.

Paper products - Sanitary paper (tissues, napkins, diapers, etc.)

This U.S. industry comprises establishments primarily engaged in converting purchased sanitary paper stock or wadding into sanitary paper products, such as facial tissues, handkerchiefs, table napkins, toilet paper, towels, disposable diapers, sanitary napkins, and tampons.

Paper products - All other converted paper products

This U.S. industry comprises establishments primarily engaged in converting paper or paperboard into products (except containers, bags, coated and treated paper, stationery products, and sanitary paper products) or converting pulp into pulp products, such as egg cartons, food trays, and other food containers from molded pulp.

Publishing industries, except internet (includes software) - General

A general category encompassing all "Publishing industries, except internet (includes software)". Industries in the Publishing Industries (except Internet) subsector group establishments engaged in the publishing of newspapers, magazines, other periodicals, and books, as well as directory and mailing list and software publishing. In general, these establishments, which are known as publishers, issue copies of works for which they usually possess copyright. Works may be in one or more formats including traditional print form, CD-ROM, or proprietary electronic networks. Publishers may publish works originally created by others for which they have obtained the rights and/or works that they have created in-house. Software publishing is included here because the activity, creation of a copyrighted product and bringing it to market, is equivalent to the creation process for other types of intellectual products.

Publishing industries, except internet (includes software) - Magazines and journals

This industry comprises establishments known either as magazine publishers or periodical publishers. These establishments carry out the operations necessary for producing and distributing magazines and other periodicals, such as gathering, writing, and editing articles, and selling and preparing advertisements. These establishments may publish magazines and other periodicals in print or electronic form.

Textile mills and textile product mills - General

A general category encompassing all "Textile mills and textile product mills". Industries in the Textile Mills subsector group establishments that transform a basic fiber (natural or synthetic) into a product, such as yarn or fabric that is further manufactured into usable items, such as apparel, sheets, towels, and textile bags for individual or industrial consumption. The further manufacturing may be performed in the same establishment and classified in this subsector, or it may be performed at a separate establishment and be classified elsewhere in manufacturing. Industries in the Textile Product Mills subsector group establishments that make textile products (except apparel). With a few exceptions, processes used by these establishments are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make non-apparel textile products, such as sheets and towels).

Textile mills and textile product mills - Carpets and rugs

This industry comprises establishments primarily engaged in (1) manufacturing woven, tufted, and other carpets and rugs, such as art squares, floor mattings, needlepunch carpeting, and door mats and mattings, from textile materials or from twisted paper, grasses, reeds, sisal, jute, or rags and/or (2) finishing carpets and rugs.

Textile mills and textile product mills - Curtains and linens

This industry comprises establishments primarily engaged in manufacturing household textile products, such as curtains, draperies, linens, bedspreads, sheets, tablecloths, towels, and shower curtains, from purchased materials.

Textile mills and textile product mills - Fabric

This industry group comprises (1) Broadwoven Fabric Mills, (2) Narrow Fabric Mills and Schiffli Machine Embroidery, (3) Nonwoven Fabric Mills, and (4) Knit Fabric Mills.

Textile mills and textile product mills - Other textiles

This industry group comprises establishments primarily engaged in making textile products (except carpets and rugs, curtains and draperies, and other household textile products) from purchased materials.

Waste management and remediation services

Industries in the Waste Management and Remediation Services subsector group establishments engaged in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services. There are three industry groups within the subsector that separate these activities into waste collection, waste treatment and disposal, and remediation and other waste management.

Appendix B: Descriptions of industry names used for Category 15 (Investments) emissions reporting

The following table provides descriptions of industry names corresponding to the drop-down options in the "Cat 15 Investments" tab in the [Scope 3 GHG Emissions Accounting Tool](#).

Industry Name	2017 NAICS Code	Industry Description
Accommodation	721	Industries in the Accommodation subsector provide lodging or short-term accommodations for travelers, vacationers, and others. There is a wide range of establishments in these industries. Some provide lodging only, while others provide meals, laundry services, and recreational facilities, as well as lodging. Lodging establishments are classified in this subsector even if the provision of complementary services generates more revenue. The types of complementary services provided vary from establishment to establishment.
Administrative and support services	561	Industries in the Administrative and Support Services subsector group establishments engaged in activities that support the day-to-day operations of other organizations. The processes employed in this sector (e.g., general management, personnel administration, clerical activities, cleaning activities) are often integral parts of the activities of establishments found in all sectors of the economy. The establishments classified in this subsector have specialization in one or more of these activities and can, therefore, provide services to clients in a variety of industries and, in some cases, to households. The individual industries of this subsector are defined on the basis of the particular process that they are engaged in and the particular services they provide.
Air transportation	481	Industries in the Air Transportation subsector provide air transportation of passengers and/or cargo using aircraft, such as airplanes and helicopters. The subsector distinguishes scheduled from nonscheduled air transportation. Scheduled air carriers fly regular routes on regular schedules and operate even if flights are only partially loaded. Nonscheduled carriers often operate during nonpeak time slots at busy airports. These establishments have more flexibility with respect to choice of airport, hours of operation, load factors, and similar operational characteristics. Nonscheduled carriers provide chartered air transportation of passengers, cargo, or specialty flying services. Specialty flying services establishments use general purpose aircraft to provide a variety of specialized flying services.
Ambulatory health care services	621	Industries in the Ambulatory Health Care Services subsector provide health care services directly or indirectly to ambulatory patients and do not usually provide inpatient services. Health practitioners in this subsector provide outpatient services, with the facilities and equipment not usually being the most significant part of the production process.

Amusements, gambling, and recreation industries	713	Industries in the Amusement, Gambling, and Recreation Industries subsector (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.
Apparel and leather and allied products	315	Industries in the Apparel Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment) and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. The Apparel Manufacturing subsector includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers, performing entrepreneurial functions involved in apparel manufacturing; and tailors, manufacturing custom garments for individual clients. Knitting fabric, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in the Apparel Manufacturing subsector.
	316	Establishments in the Leather and Allied Product Manufacturing subsector transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. This subsector also includes the manufacture of similar products from other materials, including products (except apparel) made from "leather substitutes," such as rubber, plastics, or textiles. Rubber footwear, textile luggage, and plastics purses or wallets are examples of "leather substitute" products included in this subsector. The products made from leather substitutes are included in this subsector because they are made in similar ways leather products are made (e.g., luggage). They are made in the same establishments, so it is not practical to separate them.
Broadcasting and telecommunications	515	Industries in the Broadcasting (except Internet) subsector include establishments that create content or acquire the right to distribute content and subsequently broadcast the content. The industry groups (Radio and Television Broadcasting and Cable and Other Subscription Programming) are based on differences in the methods of communication and the nature of services provided. The Radio and Television Broadcasting industry group includes establishments that operate broadcasting studios and facilities for over-the-air or satellite delivery of radio and television programs of entertainment, news, talk, and the like. These establishments are often engaged in the production and purchase of programs and generating revenues from the sale of air time to advertisers and from donations, subsidies, and/or the sale of programs. The Cable and Other Subscription Programming industry group includes establishments operating studios and facilities for the broadcasting of programs that are typically narrowcast in nature (limited format, such as news, sports, education, and youth-oriented programming) on a subscription or fee basis.

517 Industries in the Telecommunications subsector group establishments that provide telecommunications and the services related to that activity (e.g., telephony, including Voice over Internet Protocol (VoIP); cable and satellite television distribution services; Internet access; telecommunications reselling services). The Telecommunications subsector is primarily engaged in operating and/or providing access to facilities for the transmission of voice, data, text, sound, and video. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in the Telecommunications subsector are grouped into three industry groups. The first two are comprised of establishments that operate transmission facilities and infrastructure that they own and/or lease and provide telecommunications services using those facilities. The distinction between the first two industry groups is the type of infrastructure operated (i.e., wired and/or wireless or satellite). The third industry group is comprised of establishments that provide support activities, telecommunications reselling services, or many of the same services provided by establishments in the first two industry groups, but do not operate as telecommunications carriers. Establishments primarily engaged as independent contractors in the installation and maintenance of broadcasting and telecommunications systems are classified in Sector 23, Construction. Establishments known as Internet cafes, primarily engaged in offering limited Internet connectivity in combination with other services such as facsimile services, training, rental of on-site personal computers, game rooms, or food services are classified in Subsector 561, Administrative and Support Services, or Subsector 722, Food Services and Drinking Places, depending on the primary activity.

Chemical products

325 The Chemical Manufacturing subsector is based on the transformation of organic and inorganic raw materials by a chemical process and the formulation of products. This subsector distinguishes the production of basic chemicals that comprise the first industry group from the production of intermediate and end products produced by further processing of basic chemicals that make up the remaining industry groups.

This subsector does not include all industries transforming raw materials by a chemical process. It is common for some chemical processing to occur during mining operations. These beneficiating operations, such as copper concentrating, are classified in Sector 21, Mining, Quarrying, and Oil and Gas Extraction. Furthermore, the refining of crude petroleum is included in Subsector 324, Petroleum and Coal Products Manufacturing. In addition, the manufacturing of aluminum oxide is included in Subsector 331, Primary Metal Manufacturing; and beverage distilleries are classified in Subsector 312, Beverage and Tobacco Product Manufacturing. As is the case of these two activities, the grouping of industries into subsectors may take into account the association of the activities performed with other activities in the subsector.

Computer and electronic products	334	<p>Industries in the Computer and Electronic Product Manufacturing subsector group establishments that manufacture computers, computer peripherals, communications equipment, and similar electronic products, and establishments that manufacture components for such products. The Computer and Electronic Product Manufacturing industries have been combined in the hierarchy of NAICS because of the economic significance they have attained. Their rapid growth suggests that they will become even more important to the economies of all three North American countries in the future, and in addition their manufacturing processes are fundamentally different from the manufacturing processes of other machinery and equipment. The design and use of integrated circuits and the application of highly specialized miniaturization technologies are common elements in the production technologies of the Computer and Electronic Product Manufacturing subsector. Convergence of technology motivates this NAICS subsector. Digitalization of sound recording, for example, causes both the medium (the compact disc) and the equipment to resemble the technologies for recording, storing, transmitting, and manipulating data. Communications technology and equipment have been converging with computer technology. When technologically-related components are in the same sector, it makes it easier to adjust the classification for future changes, without needing to redefine its basic structure. The creation of the Computer and Electronic Product Manufacturing subsector assists in delineating new and emerging industries because the activities that will serve as the probable sources of new industries, such as computer manufacturing and communications equipment manufacturing, or computers and audio equipment, are brought together. As new activities emerge, they are less likely to cross the subsector boundaries of the classification.</p>
Computer systems design and related services	54151	<p>The Computer Systems Design and Related Services industry comprises establishments primarily engaged in providing expertise in the field of information technologies through one or more of the following activities: (1) writing, modifying, testing, and supporting software to meet the needs of a particular customer; (2) planning and designing computer systems that integrate computer hardware, software, and communication technologies; (3) on-site management and operation of clients' computer systems and/or data processing facilities; and (4) other professional and technical computer related advice and services.</p>
Construction	23	<p>The Construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector.</p>
Data processing, internet publishing, and other	518	<p>Industries in the Data Processing, Hosting, and Related Services subsector group establishments that provide the infrastructure for hosting and/or data processing services.</p>

information services	519	Industries in the Other Information Services subsector group establishments supplying information, storing and providing access to information, searching and retrieving information, operating Web sites that use search engines to allow for searching information on the Internet, or publishing and/or broadcasting content exclusively on the Internet. The main components of the subsector are news syndicates, libraries, archives, exclusive Internet publishing and/or broadcasting, and Web search portals.
Educational services	611	Industries in the Educational Services subsector provide instruction and training in a wide variety of subjects. The instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers.
Electrical equipment, appliances, and components	335	Industries in the Electrical Equipment, Appliance, and Component Manufacturing subsector manufacture products that generate, distribute and use electrical power. Electric Lighting Equipment Manufacturing establishments produce electric lamp bulbs, lighting fixtures, and parts. Household Appliance Manufacturing establishments make both small and major electrical appliances and parts. Electrical Equipment Manufacturing establishments make goods, such as electric motors, generators, transformers, and switchgear apparatus. Other Electrical Equipment and Component Manufacturing establishments make devices for storing electrical power (e.g., batteries), for transmitting electricity (e.g., insulated wire), and wiring devices (e.g., electrical outlets, fuse boxes, and light switches).
Fabricated metal products	332	Industries in the Fabricated Metal Product Manufacturing subsector transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture, or treat metals and metal formed products fabricated elsewhere. Important fabricated metal processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; and other processes, such as welding and assembling, used to join separate parts together. Establishments in this subsector may use one of these processes or a combination of these processes.
Farms	331	Industries in the Crop Production subsector grow crops mainly for food and fiber. The subsector comprises establishments, such as farms, orchards, groves, greenhouses, and nurseries, primarily engaged in growing crops, plants, vines, or trees and their seeds.
Federal Reserve banks, credit intermediation, and related activities	521	The Monetary Authorities-Central Bank subsector groups establishments that engage in performing central banking functions, such as issuing currency, managing the Nation's money supply and international reserves, holding deposits that represent the reserves of other banks and other central banks, and acting as a fiscal agent for the central government.

	522	Industries in the Credit Intermediation and Related Activities subsector group establishments that (1) lend funds raised from depositors; (2) lend funds raised from credit market borrowing; or (3) facilitate the lending of funds or issuance of credit by engaging in such activities as mortgage and loan brokerage, clearinghouse and reserve services, and check cashing services.
Food and beverage and tobacco products	311	Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.
	312	Industries in the Beverage and Tobacco Product Manufacturing subsector manufacture beverages and tobacco products. The Beverage Manufacturing industry group includes three types of establishments: (1) those that manufacture nonalcoholic beverages; (2) those that manufacture alcoholic beverages through the fermentation process; and (3) those that produce distilled alcoholic beverages. Ice manufacturing, while not a beverage, is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification...The Tobacco Manufacturing industry group includes two types of establishments: (1) those engaged in redrying and stemming tobacco and (2) those that manufacture tobacco products, such as cigarettes and cigars.
Food and beverage stores	445	Industries in the Food and Beverage Stores subsector usually retail food and beverage merchandise from fixed point-of-sale locations. Establishments in this subsector have special equipment (e.g., freezers, refrigerated display cases, refrigerators) for displaying food and beverage goods. They have staff trained in the processing of food products to guarantee the proper storage and sanitary conditions required by regulatory authority.
Food services and drinking places	722	Industries in the Food Services and Drinking Places subsector prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only, while others provide various combinations of seating space, waiter/waitress services, and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are Special Food Services, such as food service contractors, caterers, and mobile food services; Drinking Places (Alcoholic Beverages); and Restaurants and Other Eating Places.
Forestry, fishing, and related activities	113	Industries in the Forestry and Logging subsector grow and harvest timber on a long production cycle (i.e., of 10 years or more). Long production cycles use different production processes than short production cycles, which require more horticultural interventions prior to harvest, resulting in processes more similar to those found in the Crop Production subsector. Consequently, Christmas tree production and other production involving

production cycles of less than 10 years, are classified in the Crop Production subsector.

- 114 Industries in the Fishing, Hunting and Trapping subsector harvest fish and other wild animals from their natural habitats and are dependent upon a continued supply of the natural resource. The harvesting of fish is the predominant economic activity of this subsector and it usually requires specialized vessels that, by the nature of their size, configuration and equipment, are not suitable for any other type of production, such as transportation
- 115 Industries in the Support Activities for Agriculture and Forestry subsector provide support services that are an essential part of agricultural and forestry production. These support activities may be performed by the agriculture or forestry producing establishment or conducted independently as an alternative source of inputs required for the production process for a given crop, animal, or forestry industry. Establishments that primarily perform these activities independent of the agriculture or forestry producing establishment are in this subsector.

Funds, trusts, and other financial vehicles 525 Industries in the Funds, Trusts, and Other Financial Vehicles subsector group legal entities (i.e., funds, plans, and/or programs) organized to pool securities or other assets on behalf of shareholders or beneficiaries of employee benefit or other trust funds. The portfolios are customized to achieve specific investment characteristics, such as diversification, risk, rate of return, and price volatility. These entities earn interest, dividends, and other investment income, but have little or no employment and no revenue from the sale of services.

Furniture and related products 337 Industries in the Furniture and Related Product Manufacturing subsector make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The processes used in the manufacture of furniture include the cutting, bending, molding, laminating, and assembly of such materials as wood, metal, glass, plastics, and rattan. However, the production process for furniture is not solely bending metal, cutting and shaping wood, or extruding and molding plastics. Design and fashion trends play an important part in the production of furniture. The integrated design of the article for both esthetic and functional qualities is also a major part of the process of manufacturing furniture. Design services may be performed by the furniture establishment's work force or may be purchased from industrial designers.

General merchandise stores 452 Industries in the General Merchandise Stores subsector retail new general merchandise from fixed point-of-sale locations. Establishments in this subsector are unique in that they have the equipment and staff capable of retailing a large variety of goods from a single location. This includes a variety of display equipment and staff trained to provide information on many lines of products.

Hospitals	622	Industries in the Hospitals subsector provide medical, diagnostic, and treatment services that include physician, nursing, and other health services to inpatients and the specialized accommodation services required by inpatients. Hospitals may also provide outpatient services as a secondary activity. Establishments in the Hospitals subsector provide inpatient health services, many of which can only be provided using the specialized facilities and equipment that form a significant and integral part of the production process.
Housing	531 (real estate)	Industries in the Real Estate subsector group establishments primarily engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate related services, such as appraisal services. This subsector includes equity real estate investment trusts (REITs) primarily engaged in leasing buildings, dwellings, or other real estate property to others.
Insurance carriers and related activities	524	Industries in the Insurance Carriers and Related Activities subsector group establishments that are primarily engaged in one of the following: (1) underwriting (assuming the risk, assigning premiums, and so forth) annuities and insurance policies or (2) facilitating such underwriting by selling insurance policies and by providing other insurance and employee benefit related services.
Legal services	541	The Legal Services industry group comprises establishments primarily engaged in offering legal services, such as those offered by offices of lawyers, offices of notaries, and title abstract and settlement offices, and paralegal services.
Machinery	333	Industries in the Machinery Manufacturing subsector create end products that apply mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining that are used to shape individual pieces of metal. Processes, such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine. Moreover, complex assembly operations are an inherent part of the production process.
Management of companies and enterprises	55	The Management of Companies and Enterprises sector comprises (1) establishments that hold the securities of (or other equity interests in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or (2) establishments (except government establishments) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision-making role of the company or enterprise. Establishments that administer, oversee, and manage may hold the securities of the company or enterprise.

Mining, except oil and gas	212	Industries in the Mining (except Oil and Gas) subsector primarily engage in mining, mine site development, and beneficiating (i.e., preparing) metallic minerals and nonmetallic minerals, including coal. The term "mining" is used in the broad sense to include ore extraction, quarrying, and beneficiating (e.g., crushing, screening, washing, sizing, concentrating, and flotation), customarily done at the mine site.
Miscellaneous manufacturing	339	Industries in the Miscellaneous Manufacturing subsector make a wide range of products that cannot readily be classified in specific NAICS subsectors in manufacturing. Processes used by these establishments vary significantly, both among and within industries. For example, a variety of manufacturing processes are used in manufacturing sporting and athletic goods that include products such as tennis racquets and golf balls. The processes for these products differ from each other, and the processes differ significantly from the fabrication processes used in making dolls or toys, the melting and shaping of precious metals to make jewelry, and the bending, forming, and assembly used in making medical products.
Miscellaneous professional, scientific, and technical services	541	Industries in the Professional, Scientific, and Technical Services subsector group establishments engaged in processes where human capital is the major input. These establishments make available the knowledge and skills of their employees, often on an assignment basis, where an individual or team is responsible for the delivery of services to the client. The individual industries of this subsector are defined on the basis of the particular expertise and training of the services provider.
Motion picture and sound recording industries	512	Industries in the Motion Picture and Sound Recording Industries subsector group establishments involved in the production and distribution of motion pictures and sound recordings. While producers and distributors of motion pictures and sound recordings issue works for sale as traditional publishers do, the processes are sufficiently different to warrant placing establishments engaged in these activities in a separate subsector. Production is typically a complex process that involves several distinct types of establishments that are engaged in activities, such as contracting with performers, creating the film or sound content, and providing technical postproduction services. Film distribution is often to exhibitors, such as theaters and broadcasters, rather than through the wholesale and retail distribution chain. When the product is in a mass-produced form, NAICS treats production and distribution as the major economic activity as it does in the Publishing Industries (except Internet) subsector, rather than as a subsidiary activity to the manufacture of such products.
Motor vehicle and parts dealers	441	Industries in the Motor Vehicle and Parts Dealers subsector retail motor vehicles and parts from fixed point-of-sale locations. Establishments in this subsector typically operate from a showroom and/or an open lot where the vehicles are on display. The display of vehicles and the related parts require little by way of display equipment. The personnel generally include both the sales and sales support staff familiar with the requirements for registering and financing a vehicle as well as a staff of parts experts and mechanics trained to provide repair and maintenance services for the vehicles. Specific

industries included in this subsector identify the type of vehicle being retailed.

Motor vehicles, bodies and trailers, and parts	3361	The Motor Vehicle Manufacturing industry group comprises establishments primarily engaged in (1) manufacturing complete automobiles, light duty motor vehicles, and heavy-duty trucks (i.e., body and chassis or unibody) or (2) manufacturing motor vehicle chassis only.
	33621	The Motor Vehicle Body and Trailer Manufacturing industry comprises establishments primarily engaged in (1) manufacturing motor vehicle bodies and cabs or (2) manufacturing truck, automobile and utility trailers, truck trailer chassis, detachable trailer bodies, and detachable trailer chassis. The products made may be sold separately or may be assembled on purchased chassis and sold as complete vehicles. Motor homes are units where the motor and the living quarters are contained in the same integrated unit, while travel trailers are designed to be towed by a motor unit, such as an automobile or a light truck.
	3363	The Motor Vehicle Parts Manufacturing industry group comprises establishments primarily engaged in manufacturing motor vehicle gasoline engines and engine parts, motor vehicle electrical and electronic equipment, motor vehicle steering and suspension components (except springs), motor vehicle brake systems, motor vehicle transmission and power train parts, motor vehicle seating and interior trim, motor vehicle metal stampings, and other motor vehicle parts and accessories. This industry group includes establishments that rebuild motor vehicle parts.
Nonmetallic mineral products	327	The Nonmetallic Mineral Product Manufacturing subsector transforms mined or quarried nonmetallic minerals, such as sand, gravel, stone, clay, and refractory materials, into products for intermediate or final consumption. Processes used include grinding, mixing, cutting, shaping, and honing. Heat often is used in the process and chemicals are frequently mixed to change the composition, purity, and chemical properties for the intended product. For example, glass is produced by heating silica sand to the melting point (sometimes combined with cullet or recycled glass) and then drawn, floated, or blow molded to the desired shape or thickness. Refractory materials are heated and then formed into bricks or other shapes for use in industrial applications.
Nursing and residential care facilities	623	Industries in the Nursing and Residential Care Facilities subsector provide residential care combined with either nursing, supervisory, or other types of care as required by the residents. In this subsector, the facilities are a significant part of the production process, and the care provided is a mix of health and social services with the health services being largely some level of nursing services.
Oil and gas extraction	211	Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in

the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Other real estate	531	See Housing above; Industries in the Real Estate subsector group establishments primarily engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate related services, such as appraisal services. This subsector includes equity real estate investment trusts (REITs) primarily engaged in leasing buildings, dwellings, or other real estate property to others.
Other retail	44-45	The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store and nonstore retailers.
Other services, except government	81	The Other Services (except Public Administration) sector comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and providing drycleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services. Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector. Excluded from this sector are establishments primarily engaged in retailing new equipment and also performing repairs and general maintenance on equipment.
Other transportation and support activities	487	Industries in the Scenic and Sightseeing Transportation subsector utilize transportation equipment to provide recreation and entertainment. These activities have a production process distinct from passenger transportation carried out for the purpose of other types of for-hire transportation. This process does not emphasize efficient transportation; in fact, such activities often use obsolete vehicles, such as steam trains, to provide some extra ambience. The activity is local in nature, usually involving a same-day return to the point of departure.
	492	Industries in the Couriers and Messengers subsector provide intercity, local, and/or international delivery of parcels and documents (including express delivery services) without operating under a universal service obligation. These articles may originate in the U.S. but be delivered to another country and can be described as those that may be handled by one person without using special equipment. This allows the collection, pick-up, and delivery operations to be done with limited labor costs and minimal equipment. Sorting and transportation activities, where necessary, are generally

mechanized. The restriction to small parcels partly distinguishes these establishments from those in the transportation industries. The complete network of courier services establishments also distinguishes these transportation services from local messenger and delivery establishments in this subsector. This includes the establishments that perform intercity transportation as well as establishments that, under contract to them, perform local pick-up and delivery. Messengers, which usually deliver within a metropolitan or single urban area, may use bicycle, foot, small truck, or van.

Other transportation equipment

336

Industries in the Transportation Equipment Manufacturing subsector produce equipment for transporting people and goods. Transportation equipment is a type of machinery. An entire subsector is devoted to this activity because of the significance of its economic size in all three North American countries. Establishments in this subsector utilize production processes similar to those of other machinery manufacturing establishments - bending, forming, welding, machining, and assembling metal or plastic parts into components and finished products. However, the assembly of components and subassemblies and their further assembly into finished vehicles tends to be a more common production process in this subsector than in the Machinery Manufacturing subsector.

Paper products

322

Industries in the Paper Manufacturing subsector make pulp, paper, or converted paper products. The manufacturing of these products is grouped together because they constitute a series of vertically connected processes. More than one is often carried out in a single establishment. There are essentially three activities. The manufacturing of pulp involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet. The manufacturing of converted paper products involves converting paper and other materials by various cutting and shaping techniques and includes coating and laminating activities.

Performing arts, spectator sports, museums, and related activities

71

The Arts, Entertainment, and Recreation sector includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons. This sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

Petroleum and coal products

324

The Petroleum and Coal Products Manufacturing subsector is based on the transformation of crude petroleum and coal into usable products. The dominant process is petroleum refining that involves the separation of crude petroleum into component products through such techniques as cracking and distillation. In addition, this subsector includes establishments that primarily further process refined petroleum and coal products and produce products, such as asphalt coatings and petroleum lubricating oils. However,

		establishments that manufacture petrochemicals from refined petroleum are classified in Industry 32511, Petrochemical Manufacturing.
Pipeline transportation	486	Industries in the Pipeline Transportation subsector use transmission pipelines to transport products, such as crude oil, natural gas, refined petroleum products, and slurry. Industries are identified based on the products transported (i.e., pipeline transportation of crude oil, natural gas, refined petroleum products, and other products). The Pipeline Transportation of Natural Gas industry includes the storage of natural gas because the storage is usually done by the pipeline establishment and because a pipeline is inherently a network in which all the nodes are interdependent.
Plastics and rubber products	326	Industries in the Plastics and Rubber Products Manufacturing subsector make goods by processing plastics materials and raw rubber. The core technology employed by establishments in this subsector is that of plastics or rubber product production. Plastics and rubber are combined in the same subsector because plastics are increasingly being used as a substitute for rubber; however, the subsector is generally restricted to the production of products made of just one material, either solely plastics or rubber.
Primary metals	331	Industries in the Primary Metal Manufacturing subsector smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques. Establishments in this subsector also manufacture metal alloys and superalloys by introducing other chemical elements to pure metals. The output of smelting and refining, usually in ingot form, is used in rolling, drawing, and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products.
Printing and related support activities	32311	The Printing industry comprises establishments primarily engaged in printing on apparel and textile products, paper, metal, glass, plastics, and other materials, except fabric (grey goods). The printing processes employed include, but are not limited to, lithographic, gravure, screen, flexographic, digital, and letterpress. Establishments in this industry do not manufacture the stock that they print, but may perform postprinting activities, such as folding, cutting, or laminating the materials they print, and mailing.
	323120	The Support Activities for Printing industry comprises establishments primarily engaged in performing prepress and postpress services in support of printing activities. Prepress services may include such things as platemaking, typesetting, trade binding, and sample mounting. Postpress services include such things as book or paper bronzing, die cutting, edging, embossing, folding, gilding, gluing, and indexing.
Publishing industries, except internet (includes software)	511	Industries in the Publishing Industries (except Internet) subsector group establishments engaged in the publishing of newspapers, magazines, other periodicals, and books, as well as directory and mailing list and software publishing. In general, these establishments, which are known as publishers, issue copies of works for which they usually possess copyright. Works may be in one or more formats including traditional print form, CD-ROM, or proprietary electronic networks. Publishers may publish works originally

created by others for which they have obtained the rights and/or works that they have created in-house. Software publishing is included here because the activity, creation of a copyrighted product and bringing it to market, is equivalent to the creation process for other types of intellectual products.

Rail transportation

482

Industries in the Rail Transportation subsector provide rail transportation of passengers and/or cargo using railroad rolling stock. The railroads in this subsector primarily either operate on networks, with physical facilities, labor force, and equipment spread over an extensive geographic area, or operate over a short distance on a local rail line. Scenic and sightseeing rail transportation and street railroads, commuter rail, and rapid transit are not included in this subsector but are included in Subsector 487, Scenic and Sightseeing Transportation, and Subsector 485, Transit and Ground Passenger Transportation, respectively. Although these activities use railroad rolling stock, they are different from the activities included in rail transportation. Sightseeing and scenic railroads do not usually involve place-to-place transportation; the passenger's trip typically starts and ends at the same location. Commuter railroads operate in a manner more consistent with local and urban transit and are often part of integrated transit systems.

Rental and leasing services and lessors of intangible assets

532

Industries in the Rental and Leasing Services subsector include establishments that provide a wide array of tangible goods, such as automobiles, computers, consumer goods, and industrial machinery and equipment, to customers in return for a periodic rental or lease payment. The subsector includes two main types of establishments: (1) those that are engaged in renting consumer goods and equipment and (2) those that are engaged in leasing machinery and equipment often used for business operations. The first type typically operates from a retail-like or storefront facility and maintains inventories of goods that are rented for short periods of time. The latter type typically does not operate from retail-like locations or maintain inventories and offers longer-term leases. These establishments work directly with clients to enable them to acquire the use of equipment on a lease basis, or they work with equipment vendors or dealers to support the marketing of equipment to their customers under lease arrangements. Equipment lessors generally structure lease contracts to meet the specialized needs of their clients and use their remarketing expertise to find other users for previously leased equipment. Establishments that provide operating and capital (i.e., finance) leases are included in this subsector.

533

Industries in the Lessors of Nonfinancial Intangible Assets (except Copyrighted Works) subsector include establishments primarily engaged in assigning rights to assets, such as patents, trademarks, brand names, and/or franchise agreements, for which a royalty payment or licensing fee is paid to the asset holder. Establishments in this subsector own the patents, trademarks, and/or franchise agreements that they allow others to use or reproduce for a fee and may or may not have created those assets.

Securities, commodity contracts, and investments	523	Industries in the Securities, Commodity Contracts, and Other Financial Investments and Related Activities subsector group establishments that are primarily engaged in one of the following: (1) underwriting securities issues and/or making markets for securities and commodities; (2) acting as agents (i.e., brokers) between buyers and sellers of securities and commodities; (3) providing securities and commodity exchange services; and (4) providing other services, such as managing portfolios of assets; providing investment advice; and trust, fiduciary, and custody services.
Social assistance	624	Industries in the Social Assistance subsector provide a wide variety of social assistance services directly to their clients. These services do not include residential or accommodation services, except on a short-stay basis.
Support activities for mining	21311	The Support Activities for Mining industry comprises establishments primarily engaged in providing support services, on a contract or fee basis, required for the mining and quarrying of minerals and for the extraction of oil and gas. Drilling, taking core samples, and making geological observations at prospective sites (except geophysical surveying and mapping) for minerals, on a contract or fee basis, are included in this industry.
Textile mills and textile product mills	313	Industries in the Textile Mills subsector group establishments that transform a basic fiber (natural or synthetic) into a product, such as yarn or fabric that is further manufactured into usable items, such as apparel, sheets, towels, and textile bags for individual or industrial consumption. The further manufacturing may be performed in the same establishment and classified in this subsector, or it may be performed at a separate establishment and be classified elsewhere in manufacturing.
	314	Industries in the Textile Product Mills subsector group establishments that make textile products (except apparel). With a few exceptions, processes used by these establishments are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make non-apparel textile products, such as sheets and towels).
Transit and ground passenger transportation	485	Industries in the Transit and Ground Passenger Transportation subsector include a variety of passenger transportation activities, such as urban transit systems; chartered bus, school bus, and interurban bus transportation; and taxis. These activities are distinguished based primarily on such production process factors as vehicle types, routes, and schedules. In this subsector, the principal splits identify scheduled transportation as separate from nonscheduled transportation. The scheduled transportation industry groups are Urban Transit Systems, Interurban and Rural Bus Transportation, and School and Employee Bus Transportation. The nonscheduled industry groups are the Charter Bus Industry and Taxi and Limousine Service. The Other Transit and Ground Passenger Transportation industry group includes both scheduled and nonscheduled transportation. Scenic and sightseeing ground transportation services are not included in this subsector but are included in Subsector 487, Scenic and Sightseeing Transportation. Sightseeing does not usually involve place-to-place transportation; the passenger's trip starts and ends at the same location.

Truck transportation	484	Industries in the Truck Transportation subsector provide over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers. The subsector is subdivided into general freight trucking and specialized freight trucking. This distinction reflects differences in equipment used, type of load carried, scheduling, terminal, and other networking services. General freight transportation establishments handle a wide variety of general commodities, generally palletized, and transported in a container or van trailer. Specialized freight transportation is the transportation of cargo that, because of size, weight, shape, or other inherent characteristics, requires specialized equipment for transportation.
Utilities	221	Industries in the Utilities subsector provide electric power, natural gas, steam supply, water supply, and sewage removal through a permanent infrastructure of lines, mains, and pipes. Establishments are grouped together based on the utility service provided and the particular system or facilities required to perform the service.
Warehousing and storage	493	Industries in the Warehousing and Storage subsector are primarily engaged in operating warehousing and storage facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle. These establishments take responsibility for storing the goods and keeping them secure. They may also provide a range of services, often referred to as logistics services, related to the distribution of goods. Logistics services can include labeling, breaking bulk, inventory control and management, light assembly, order entry and fulfillment, packaging, pick and pack, price marking and ticketing, and transportation arrangement. However, establishments in this industry group always provide warehousing or storage services in addition to any logistic services. Furthermore, the warehousing or storage of goods must be more than incidental to the performance of services, such as price marking.
Waste management and remediation services	562	Industries in the Waste Management and Remediation Services subsector group establishments engaged in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services. There are three industry groups within the subsector that separate these activities into waste collection, waste treatment and disposal, and remediation and other waste management.
Water transportation	483	Industries in the Water Transportation subsector provide water transportation of passengers and cargo using watercraft, such as ships, barges, and boats. The subsector is composed of two industry groups: (1) one for deep sea, coastal, and Great Lakes; and (2) one for inland water transportation. This split typically reflects the difference in equipment used.

Wholesale trade	42	<p>The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing. The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of (a) goods for resale (i.e., goods sold to other wholesalers or retailers), (b) capital or durable nonconsumer goods, and (c) raw and intermediate materials and supplies used in production.</p>
Wood products	321	<p>Establishments in the Wood Product Manufacturing subsector manufacture wood products, such as lumber, plywood, veneers, wood containers, wood flooring, wood trusses, manufactured homes (i.e., mobile homes), and prefabricated wood buildings. The production processes of the Wood Product Manufacturing subsector include sawing, planing, shaping, laminating, and assembling wood products starting from logs that are cut into bolts, or lumber that then may be further cut, or shaped by lathes or other shaping tools. The lumber or other transformed wood shapes may also be subsequently planed or smoothed, and assembled into finished products, such as wood containers. The Wood Product Manufacturing subsector includes establishments that make wood products from logs and bolts that are sawed and shaped, and establishments that purchase sawed lumber and make wood products. With the exception of sawmills and wood preservation establishments, the establishments are grouped into industries mainly based on the specific products manufactured.</p>