



Challenges of Scope 3 Greenhouse Gas Emissions

Stephanie Jarrett, PE

Annual Fall Joint Conference

November 2, 2023



Overview

- Scope 1 and Scope 2
- Definition and Importance of Scope 3 Emissions
- Categories of Scope 3 Emissions
 - Upstream Emissions
 - Downstream Emissions
- Measurement and Reporting
- Strategies to Reduce Scope 3 Emissions
- Conclusion



GHG Emissions Inventories – Scope 1 and 2



Off-site electrical or steam purchased for use at facility



SCOPE 1 - DIRECT

SCOPE 2 - INDIRECT

Definition and Importance of Scope 3 Emissions

Standard Footprint

Full Footprint

CO₂ CH₄ N₂O HFC PFC SF₆

Scope 1 - Direct

Scope 2 - Indirect

Scope 3 - Indirect



On-site combustion



company owned vehicles



Off-site electrical purchased for use at facility



Employee Travel



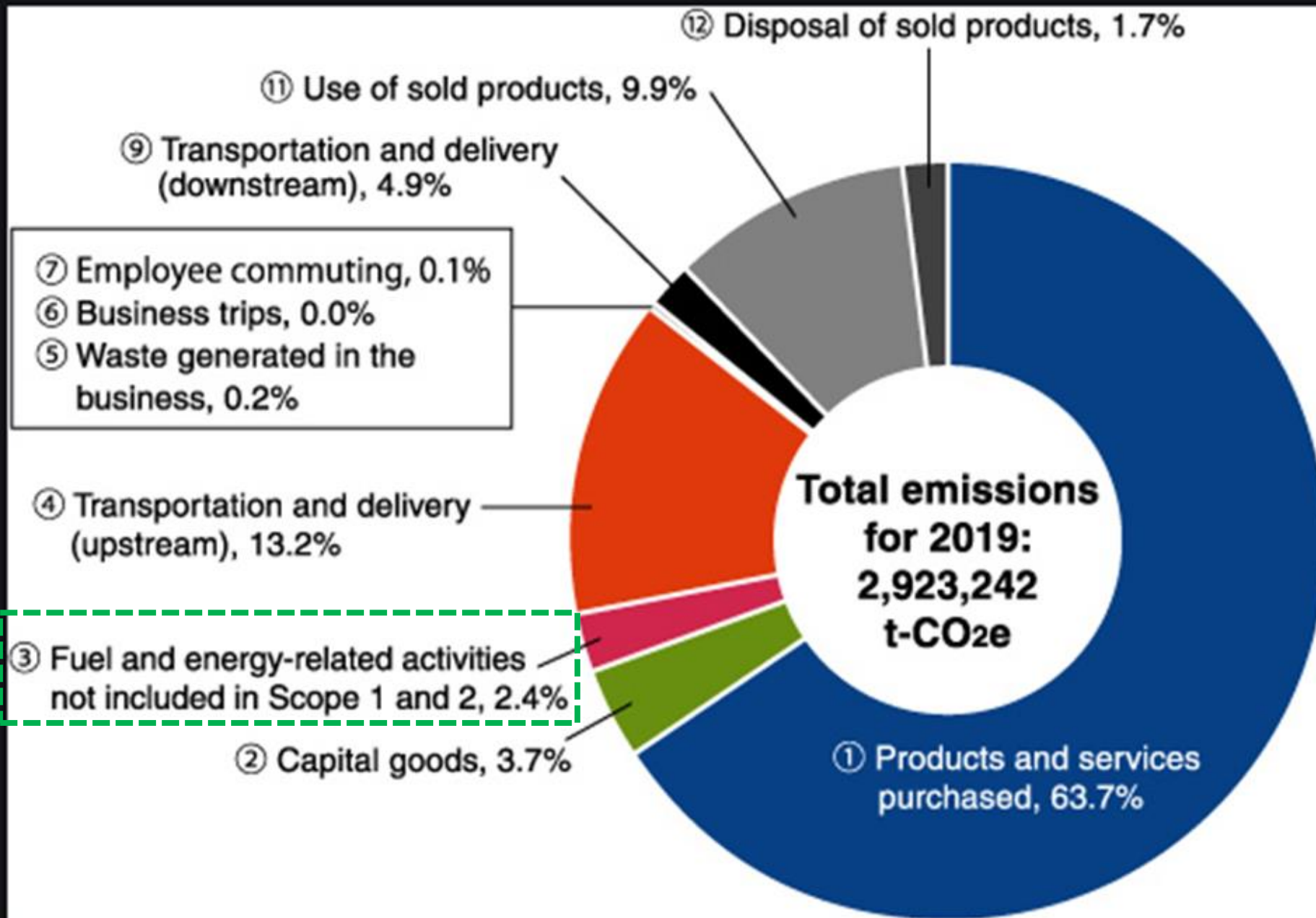
Transport of Purchased Goods & Services

Waste Management



Production of Purchased Goods

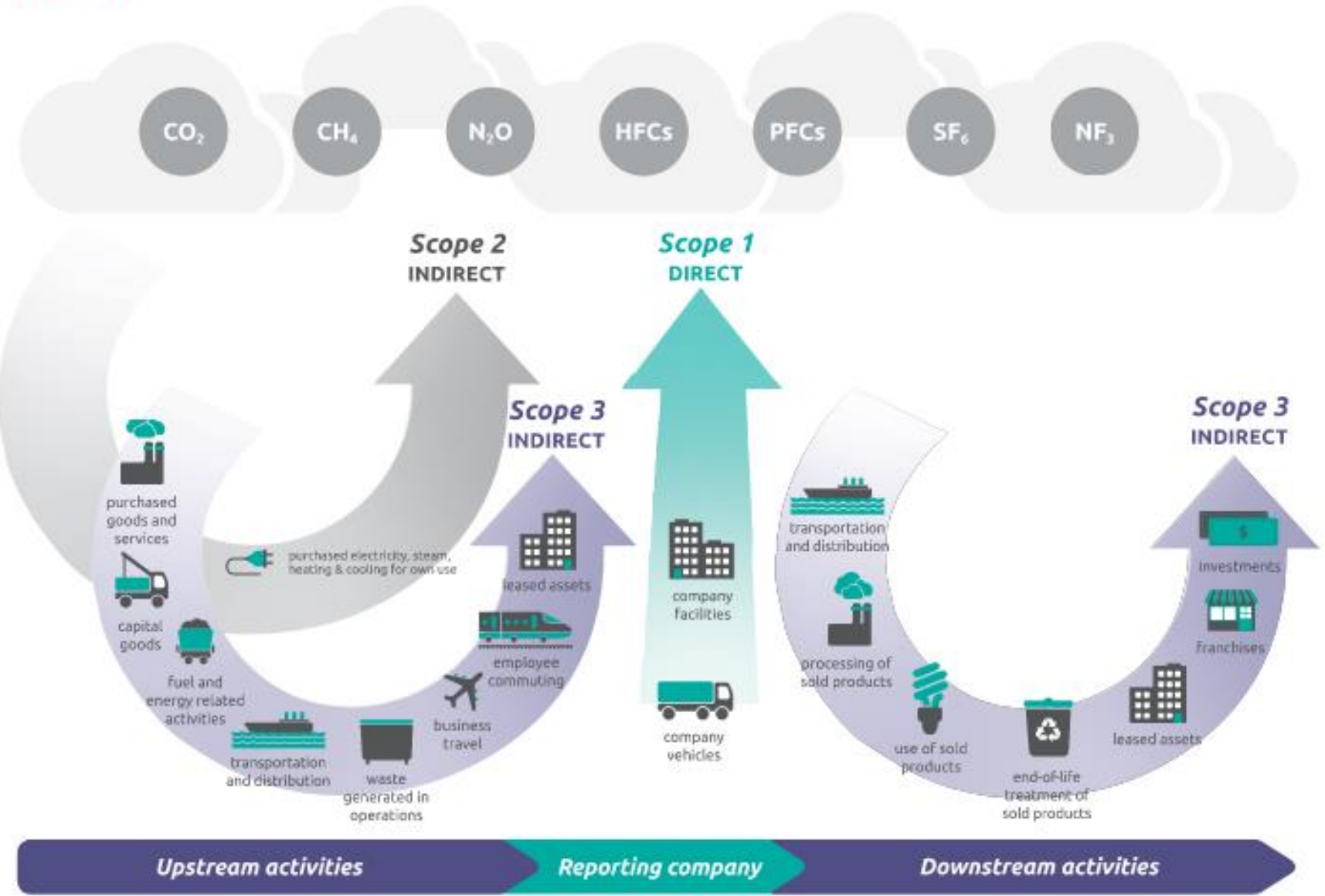




Why Measure?

Scope 3 emissions can be higher than your Scope 1 and 2 emissions for a manufacturer.

Figure [1] Overview of GHG Protocol scopes and emissions across the value chain



Categories of Scope 3 Emissions

Even if you don't have a Scope 3 inventory, please don't reduce Scope 1 and 2 emissions by increasing Scope 3 emissions.

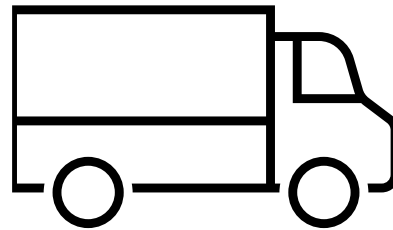
Source: Figure 1.1 of *Scope 3 Standard*.

Categories of Scope 3 Emissions: Upstream Emissions



Purchased Goods and Services

Emissions associated with the production and transportation of purchased goods and services



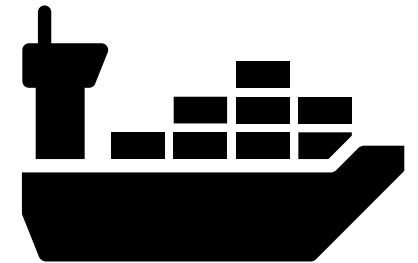
Capital Goods

Emissions from the production and transportation of capital goods, such as machinery and equipment



Fuel And Energy related Activities

Emissions from the extraction, production, and transportation of purchased or acquired fuels and energy



Transportation and Distribution

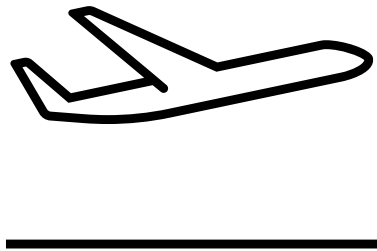
Emissions from transportation and distribution of products and services purchased by the company's suppliers and its own operations

Categories of Scope 3 Emissions: Upstream Emissions



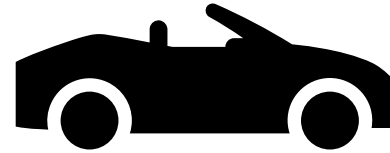
Waste Generated

Emissions from waste disposal and treatment processes



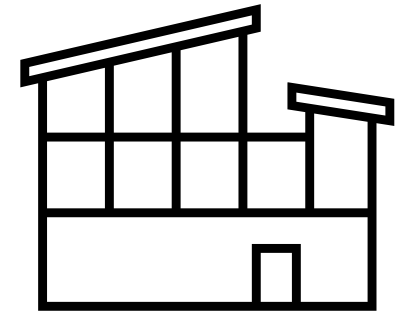
Business Travel

Emissions from the transportation of employees for business-related activities



Employee Commuting

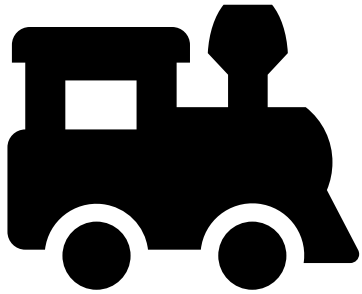
Emissions from the transportation of employees between their homes and their worksites



Upstream Leased Assets

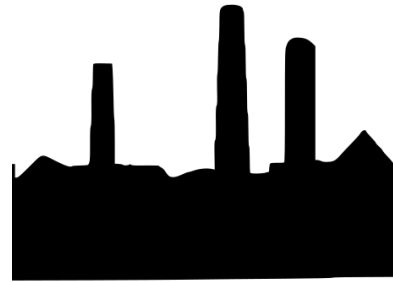
Emissions from the operation of leased assets

Categories of Scope 3 Emissions: Downstream Emissions



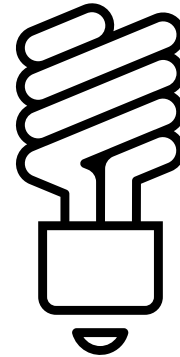
Transportation and Distribution

Emissions from transportation and distribution of products sold to end-users (includes retailers' emissions)



Processing of Sold Products

Emissions from the Processing of intermediate products



Use of Sold Products

Emissions resulting from the use of products or services by end-users



End of Life

Emissions associated with the disposal, recycling, or treatment of products at the end of their life cycle.

Categories of Scope 3 Emissions: Downstream Emissions



Downstream Leased Assets

Emissions from the operation of owned assets and leased to others



Franchises

Emissions from the operation of franchises



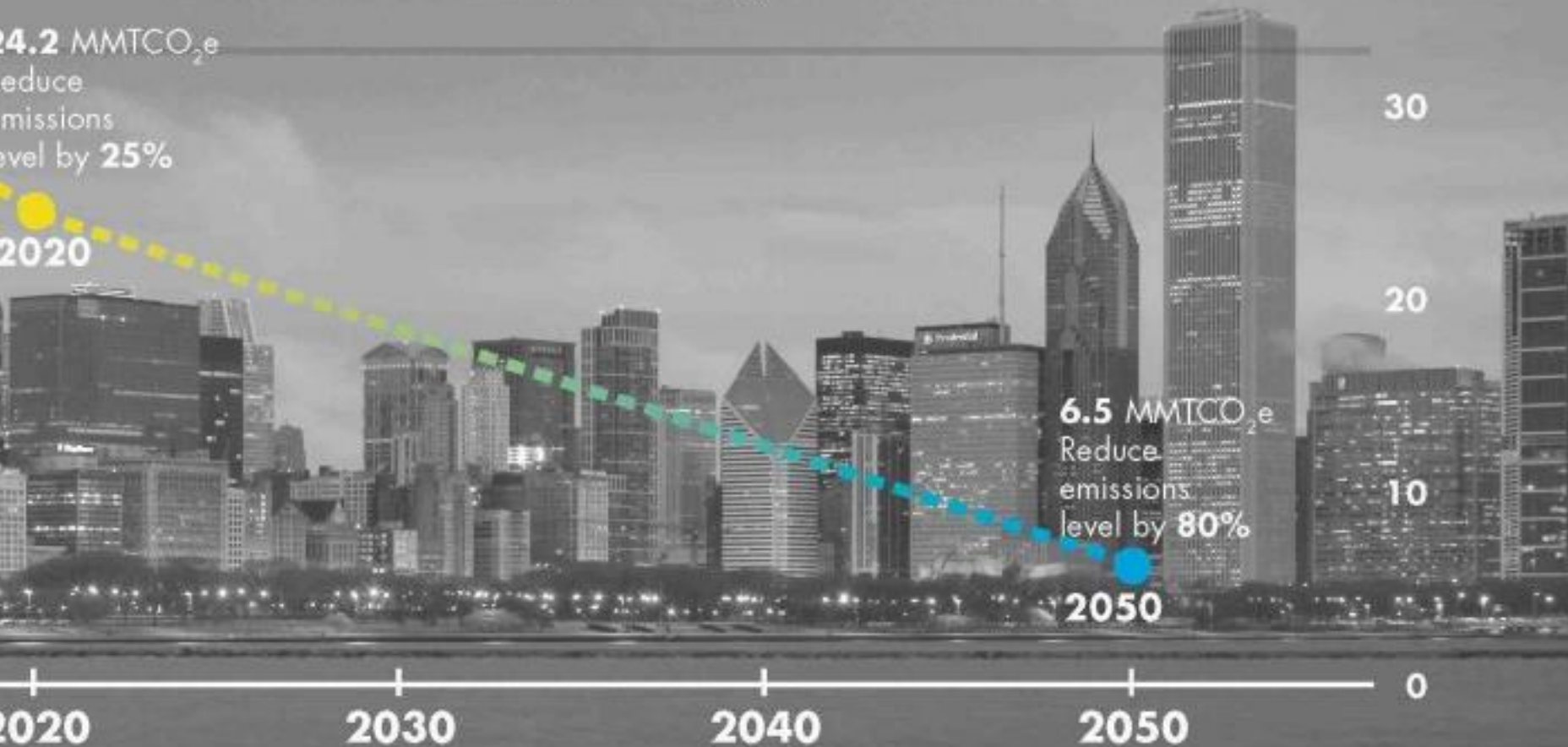
Investments

Emissions from the Operation of investments (including equity and debt investments and project finance)

CHICAGO GREENHOUSE GAS EMISSIONS AND REDUCTION GOALS

Amounts are in million metric tons carbon dioxide equivalent (MMTCO₂e)

Chicago's goal is to reach an 80 percent reduction in greenhouse gas emissions from 1990 levels by 2050, with the sharpest reductions occurring over the next 12 years, by 2020 (the use of 1990 levels follows the Kyoto Protocol). Achieving this goal will also help reduce other forms of harmful gases, such as nitrous oxide, which will improve overall air quality. Achieving this goal will require the commitment and collective action of individuals, businesses, government and other institutions.



Measurement and Reporting of Scope 3 Emissions

Measurement and Reporting of Scope 3 Emissions: Challenges

- **Complex**
 - Identify which activities have the most significant GHG emissions
 - Offer the most significant GHG reduction opportunities
 - Relevant to the company's business goals
 - Most important to customers
- **Use a Screening Process to Begin**
 - Use less specific calculation methods at first
 - Prioritize data collection efforts

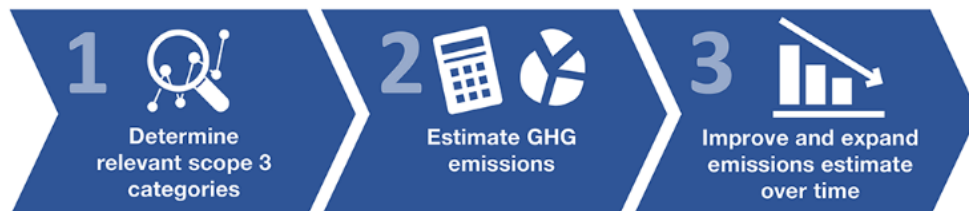
Table [II] Criteria for identifying relevant scope 3 activities

Criteria	Description of activities
Size	They contribute significantly to the company's total anticipated scope 3 emissions
Influence	There are potential emissions reductions that could be undertaken or influenced by the company
Risk	They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, and reputational risks)
Stakeholders	They are deemed critical by key stakeholders (e.g., customers, suppliers, investors or civil society)
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector
Sector guidance	They have been identified as significant by sector-specific guidance
Spending or revenue analysis	They are areas that require a high level of spending or generate a high level of revenue (and are sometimes correlated with high GHG emissions)
Other	They meet any additional criteria developed by the company or industry sector

Source: Adapted from table 6.1 from the *Scope 3 Standard*

Screening Tools – Spend Methods

- Environmentally-extended input output (EEIO) data
 - Quantity of GHGs emitted per unit of revenue
- GHG Protocol Quantis
 - Decommissioned on 8/30/23
- EPA Screening Tools
 - [Scope 3 Inventory Guidance | US EPA](#)
 - Comprehensive set of supply chain emission factors covering all categories of goods and services in the US economy



B	C	D	E	F	G
NAICS Title	GHG	Unit	Supply Chain Emission Factors without Margins	Margins of Supply Chain Emission Factors	Supply Chain Emission Factors with Margins
Soybean Farming	All GHGs	kg CO2e/2021 USD, purchaser price	1.223	0.103	1.326
Wheat and Grain Farming (except Soybean)	All GHGs	kg CO2e/2021 USD, purchaser price	1.223	0.103	1.326
Pea and Bean Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Wheat Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Barley Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Rice Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Wheat and Grain Combination Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Other Grain Farming	All GHGs	kg CO2e/2021 USD, purchaser price	2.874	0.134	3.007
Potato Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.511	0.077	0.588
Other Vegetable (except Potato) and Melon Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.511	0.077	0.588
Orange Groves	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Citrus (except Orange) Groves	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Apple Orchards	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Grape Vineyards	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Strawberry Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Berry (except Strawberry) Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Walnut Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Almond and Tree Nut Combination Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Other Noncitrus Fruit Farming	All GHGs	kg CO2e/2021 USD, purchaser price	0.419	0.081	0.5
Mushroom Production	All GHGs	kg CO2e/2021 USD, purchaser price	0.934	0.108	1.043
Other Food Crops Grown Under Cover	All GHGs	kg CO2e/2021 USD, purchaser price	0.934	0.108	1.043

<https://catalog.data.gov/dataset/supply-chain-greenhouse-gas-emission-factors-v1-2-by-naics-6/resource/fbc78d3c-49bd-40c0-9dac-2ed16c07a305>

Collecting Data and Estimating Emissions



- Secondary Data
 - Use less specific calculation methods
 - industry-average-data (e.g., from published databases, government statistics, literature studies, and industry associations), financial data, proxy data, and other generic data.
 - Helps to prioritize data collection efforts
 - [Life Cycle Databases | GHG Protocol](#)
- Primary Data - Engagement
 - Data Direct from Suppliers
 - GHG Protocol – Preferred method: identify relevant suppliers from which to seek GHG data
 - CDP – at least 2/3 of cradle to gate emission, or
 - 2/3 of annual procurement spend if above is not available

Supplier Engagement

- Strategically Choose Which Suppliers to Engage
- Keep the Questions Simple
- Build Trust with Suppliers
- Provide Training and Capacity Building
- Conduct Pilot Initiatives

EPA CENTER FOR CORPORATE
CLIMATE LEADERSHIP

U.S. Environmental Protection Agency
 The following questions are intended to be a starting point to help customers understand their supplier's greenhouse gas emissions for use in quantifying Scope 3 emissions, developing targets, and quantifying and mitigating risk. Please fill out all questions below to the best of your ability. Detailed instructions are provided in the companion instruction document.

Background Information

Company Name: [Click here to enter text.](#)

Number of Employees: [Click here to enter text.](#)

Contact Name: [Click here to enter text.](#) Title: [Click here to enter text.](#)

Contact Email: [Click here to enter text.](#) Contact Phone: [Click here to enter text.](#)

Environmental Policy and Targets

Do you have a sustainability/environmental/green policy statement? [Click here to enter text.](#)
If yes, please provide link or attach document: [Click here to enter text.](#)

Do you publish a Corporate Social Responsibility (CSR)/Sustainability Report? [Click here to enter text.](#)
If yes, please provide link or attach document: [Click here to enter text.](#)

Do you monitor and track energy consumption at your facilities? [Click here to enter text.](#)
If yes, please describe: [Click here to enter text.](#)

Do you have goals or targets to reduce greenhouse gas emissions? [Click here to enter text.](#)
If yes, what is/are the target(s): [Click here to enter text.](#)

Have you received additional requests from stakeholders to reduce greenhouse gas emissions? Yes No
If yes, describe the types of information requested and information provided: [Click here to enter text.](#)

Do you report greenhouse gas emissions and/or energy efficiency? Yes No
If yes, describe where: [Click here to enter text.](#)

Greenhouse Gas Emissions

Do you calculate your Scope 1 and 2 greenhouse gas emissions? Yes No
If yes, what is the most recent year that data are available? [Click here to enter text.](#)

If yes, please provide:

Total Scope 1 Emissions: Metric Tons CO ₂ e	Click here to enter text.
Total Location-Based Scope 2 Emissions: Metric Tons CO ₂ e	Click here to enter text.
Total Market-Based Scope 2 Emissions: Metric Tons CO ₂ e	Click here to enter text.

Please provide a description of your major Scope 1 and 2 emissions: [Click here to enter text.](#)

Do you seek third party verification/assurance of your Scope 1 and 2 greenhouse gas emissions? Yes No
If yes, please attach your most recent verification statement: [Click here to enter text.](#)

Do you calculate your Scope 3 greenhouse gas emissions? Yes No
If yes, what is the most recent year that data are available? [Click here to enter text.](#)

For each Scope 3 category, state if it is relevant to your business and provide emissions, if available.

Scope 3 Category	Relevance	Quantified Sources	Emissions
Purchased good and services	Select	Click here to enter text.	Metric Tons CO ₂ e
Capital goods	Select	Click here to enter text.	Metric Tons CO ₂ e
Fuel-and-energy-related activities	Select	Click here to enter text.	Metric Tons CO ₂ e
Upstream transportation and distribution	Select	Click here to enter text.	Metric Tons CO ₂ e
Waste generated in operations	Select	Click here to enter text.	Metric Tons CO ₂ e
Business travel	Select	Click here to enter text.	Metric Tons CO ₂ e
Employee commuting	Select	Click here to enter text.	Metric Tons CO ₂ e
Upstream leased assets	Select	Click here to enter text.	Metric Tons CO ₂ e
Investments	Select	Click here to enter text.	Metric Tons CO ₂ e
Downstream transportation and distribution	Select	Click here to enter text.	Metric Tons CO ₂ e
Processing of sold products	Select	Click here to enter text.	Metric Tons CO ₂ e
Use of sold products	Select	Click here to enter text.	Metric Tons CO ₂ e
End of life treatment of sold products	Select	Click here to enter text.	Metric Tons CO ₂ e
Downstream leased assets	Select	Click here to enter text.	Metric Tons CO ₂ e
Franchises	Select	Click here to enter text.	Metric Tons CO ₂ e

Do you seek third party verification/assurance of your Scope 3 emissions? Yes No
If yes, please attach your most recent verification statement: [Click here to enter text.](#)

Energy and Greenhouse Gas Emissions Reduction

Are you able to compare the greenhouse gas emissions reported above with emissions in a previous year? Yes No
If yes, please describe if Scope 1, 2, and 3 emissions have increased or decreased compared to prior years: [Click here to enter text.](#)

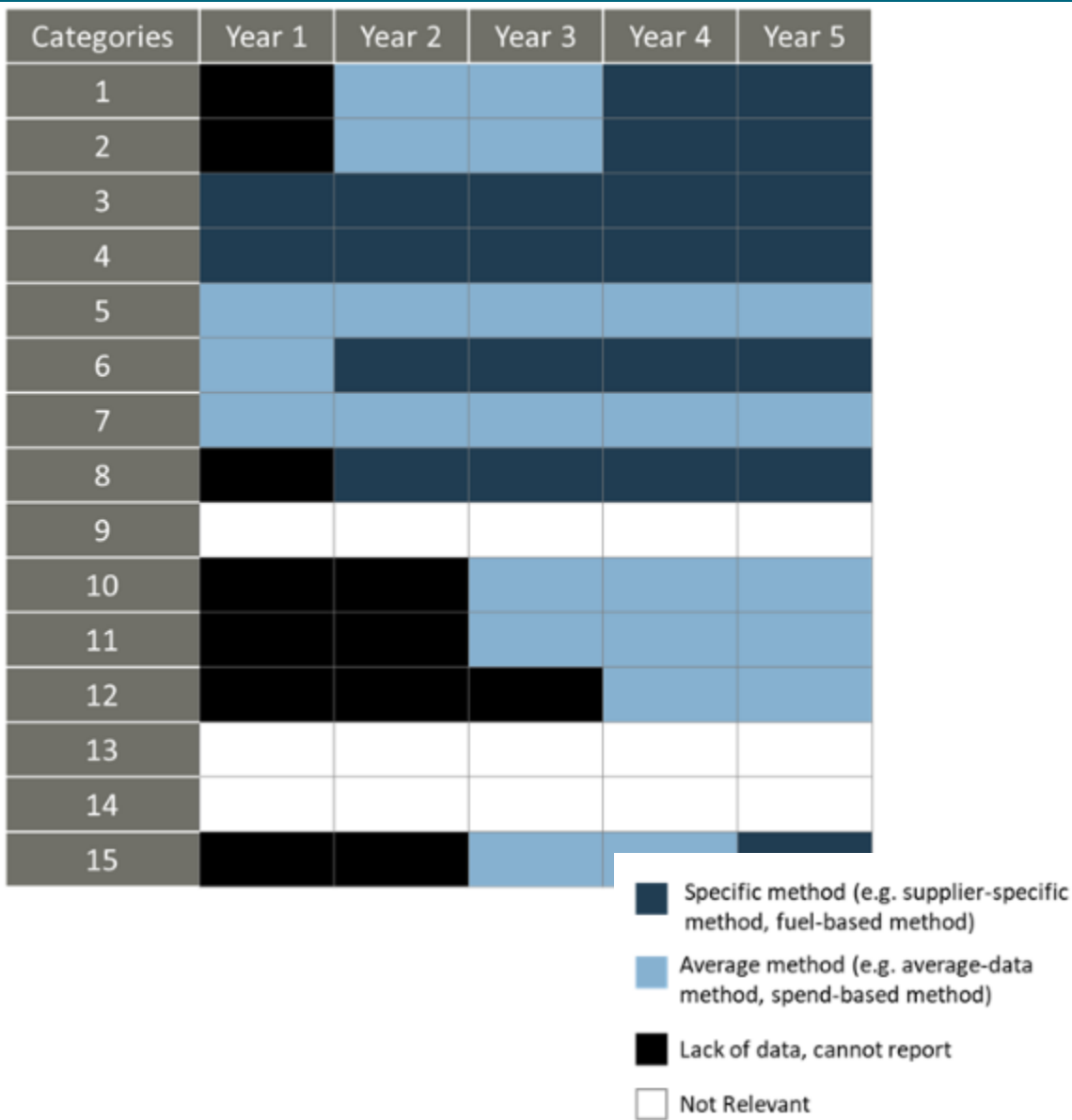
Do you have a program and/or procedures to reduce energy use and greenhouse gas emissions? Yes No
If yes, please describe: [Click here to enter text.](#)

Do you produce or purchase renewable energy? Yes No
If yes, please describe: [Click here to enter text.](#)

Do you have strategies to reduce Scope 3 greenhouse gas emissions? Yes No
If yes, please describe: [Click here to enter text.](#)

Do you engage with your suppliers around environmental issues and performance? Yes No
If yes, please describe: [Click here to enter text.](#)

Do you collect environmental data from your suppliers? Yes No
If yes, please describe the type(s) of data collected and how it is used internally: [Click here to enter text.](#)



Improve Data Over Time

Scope 3 Emission Estimating is time consuming

- Improve
 - More accurate data sources
 - Implement Methods for improving and collecting data
 - Calculation Methods
 - Secondary to Primary
 - Expand suppliers data and engagement
 - Note changes in methods may require historical adjustments
- Expand your boundary
 - Focus first on large data sources
 - Add in smaller sources over time

Source EPA - Scope 3 calculation method improved and boundary expanded over time

A. Supply Chain Collaboration: Engaging suppliers and partners to jointly identify emission reduction opportunities and implement sustainable practices.

B. Product Design and Innovation: Developing products and services with lower carbon footprints, extended lifecycles, and improved energy efficiency.

C. Circular Economy Approach: Promoting recycling, reuse, and responsible end-of-life management to minimize emissions associated with product disposal.

D. Transportation Optimization: Implementing efficient logistics and transportation strategies to reduce emissions from product distribution.

E. Consumer Education and Behavior Change: Encouraging consumers to make sustainable choices and adopt energy-efficient practices.

Strategies to Reduce Scope 3 Emissions

Thank You

Stephanie Jarrett, PE
sajarrett@fishbeck.com
248-324-2146



FISHBECK FACTS



Est. Lansing, Michigan
in 1956

14

OFFICES

Grand Rapids, Michigan
Ann Arbor, Michigan
Canton, Michigan
Cincinnati, Ohio
Columbus, Ohio
Dayton, Ohio
Detroit, Michigan
Indianapolis, Indiana
Kalamazoo, Michigan
Lansing, Michigan
Macomb, Michigan
Novi, Michigan
Toledo, Ohio
Traverse City, Michigan



Architecture/
Engineering



Infrastructure



Environmental



Construction

450+

PROFESSIONALS



EMPLOYEE
OWNED

220

SHAREHOLDERS

TOP 500

DESIGN FIRM
IN THE NATION