

# Addressing Climate Change and Global Health: Baselining Greenhouse Gas Emissions in the USAID Global Health Supply Chain

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# Background and Context



### Background: USAID Climate Strategy

USAID established a target to reduce its operational greenhouse gas (GHG) emissions by 65 percent by FY 2030 from a FY 2008 baseline and to be net-zero by 2050.

Also working to reduce global supply chain carbon footprint.

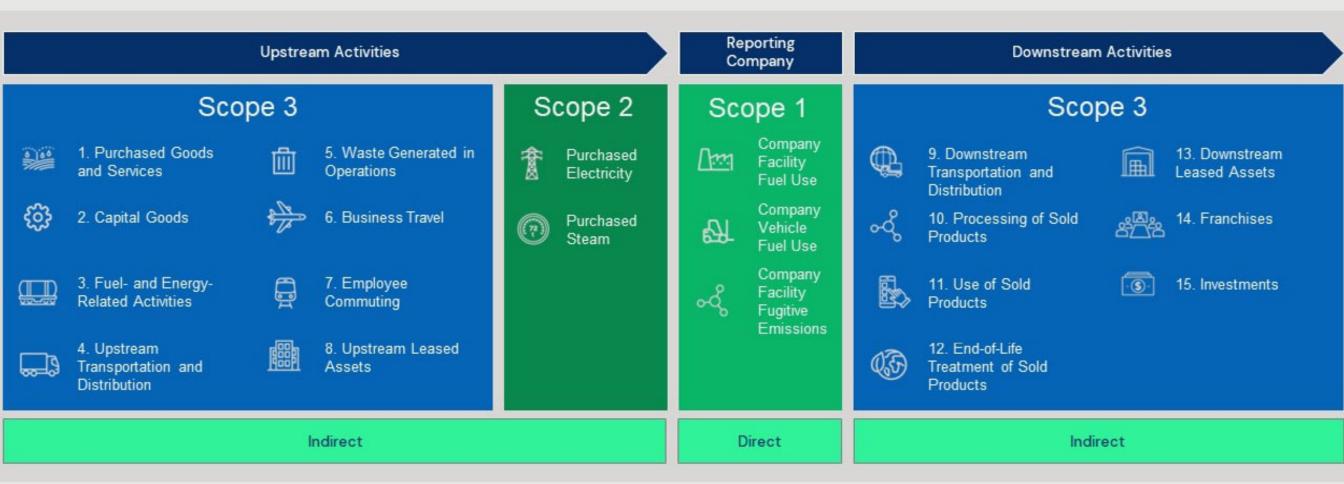


Photos: USAID, USAID Energy, Badre Bahaj/WFP Malawi

Source: USAID Climate Strategy, Progress Update. April 2023. https://www.usaid.gov/sites/default/files/2023-04/2023-USAID-Climate-Strategy-Progress-Update 0.pdf

# GHG Accounting: Emission Scopes and Source Categories

GHG emission inventories account for GHG emissions from different emission sources organized into three scopes



# Federal Agency GHG Accounting

Historically federal agencies have focused on Scope 1 and 2 emissions and a limited group of Scope 3 sources.



Source: ICF 2023. Adapted from the Federal Agency Greenhouse Gas Accounting and Reporting Guidance. https://www.sustainability.gov/pdfs/federal\_ghg%20accounting\_reporting-guidance.pdf

#### Supply Chain GHG Emissions

#### Scope 3



 Purchased Goods and Services



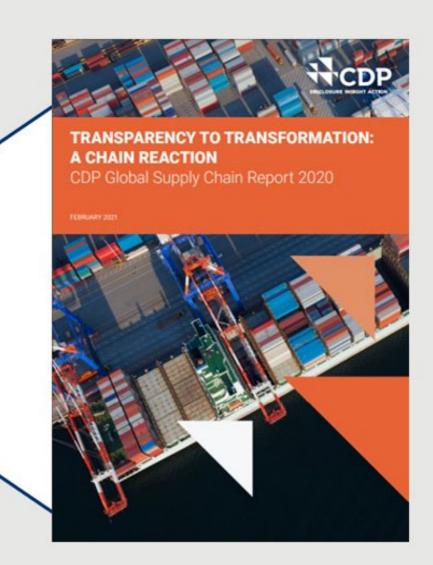
2. Capital Goods



3. Fuel- and Energy-Related Activities



Upstream
 Transportation and
 Distribution



- 2021 CDP Report, Transparency to Transformation: A Chain Reaction
- Surveyed I54 organizations involved in the CDP Supply Chain Program, representing \$4.3 trillion in annual procurement spend
- Found that supply chain emissions are on average I I.4 times greater than operational (Scope I and 2) emissions

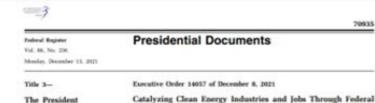
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# Executive Order 14057, Supply Chain Sustainability

Executive Order 14057: Catalyzing Clean Energy Industries and Jobs through Federal Sustainability:

Section 301: Federal Supply Chain Sustainability.
 Federal supply chains should a Government and
 economy that services all Americans
 by...reducing greenhouse gas emissions and
 building resilience to climate change. Consistent
 with applicable law, agencies shall pursue
 procurement strategies to reduce contractor
 emissions and embodied emissions in products
 acquired or used in Federal projects.

Source: <a href="https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/">https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/</a>



By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to reestablish the Federal

Government as a leader in sustainability, it is hersby ordered as follows:

Section 101. Policy. The Federal Government faces broad exposure to the mounting risks and costs already posed by the climate crisis. In responding to this crisis, we have a once-in-a-generation economic upportunity to create and sustain jobs. Including well-paying union jobs: support a just transition to a more sustainable economy for American workers, strengthen America's communities: protect public basilth; and advance servirenmental justion. As the single lengest tand covener, energy consumer, and employer in the Nation, the Federal Government can catalyze private sector investment and expand the economy and American industry by transforming how we build, buy, and manage electricity, vehicles, buildings, and other operations to be clean

We also must build on past pragress and pursue new strategies to improve the Nation's preparedness and realizance to the effects of a changing climate, including advancing the Faderal Government's strategic planning, goverance, financial management, and procurement to ensure climate realizant coversions.

It is therefore the policy of my Administration for the Federal Government to lead by example in order to achieve a carbon polithion-free relaticity sector by 2033 and net-zero emissions economy-wide by no later than 2050. Through a whole-of-government approach, we will demonstrate have insuration and environmental streambling can protect our planet, sufequard Federal investments against the effects of climate change, respond to the needs of all of America's communities, and expend American behaviories, industries, and else.

Sec. 102. Government-scide Gools. (a) Leading the Nation on a firm path to net-zero emissions by 2058 and achieving the policy set furth in section 101 of this order will require hold action to transform Federal procurement and operations and secure a transition to clean, zero-emission technologies. Through a coordinated whole-of-government approach, the Federal Government shall use its scale and procurement power to achieve:

(i) 100 percent carbon pollution-free electricity on a net annual basis by 2000, including 50 percent 24/7 carbon pullution-free electricity, as defined in section 60/3a) of this order.

(iii) 100 percent zero-emission vehicle acquisitions by 2015, including 100 percent zero-emission light-duty vehicle acquisitions by 2027;

(iii) a net-zero emissions building portfolio by 2045, including a 59 percent emissions reduction by 2012:

(iv) a 65 percent reduction in scope I and 2 greenhouse gas emissions, as defined by the Federal Greenhouse Gas Accounting and Reporting Guidance, from Federal operations by 2030 from 2008 levels.

(v) net-zero emissions from Federal procurement, including a Buy Gren policy to promete use of construction materials with lower embodied

#### Disclosure of GHG Emissions and Climate-Related Financial Risk

November 2022 proposed amendment to the Federal Acquisition Regulation (FAR) would require certain suppliers of the US Federal Government to publicly disclose their GHG information, climate-related financial risks, and set science-based emission reduction targets.

Federal Contractor Type	Annual Federal Contract Obligation	Proposed Rule Requirements		
Major Contractors	>\$50 million	<ul> <li>Contractors must disclose emissions from Scopes 1 and 2 and relevant Scope 3 categories from the previous fiscal year in alignment with the GHG Protocol Corporate Accounting and Reporting Standard through CDP.</li> <li>Contractors must address climate risks in alignment with the recommendations of TCFD.</li> <li>Contractors must validate their emissions reductions targets with the Science Based Targets Initiative (SBTi).</li> </ul>		
Significant Contractors	>\$7.5 million - \$50 million	<ul> <li>Contractors must disclose emissions from Scopes 1 and 2 from the previous fiscal year in alignment with the GHG Protocol Corporate Accounting and Reporting Standard through CDP.</li> </ul>		
Other Contractors	<\$7.5 million	No requirements.		

# Port-to-Port (P2P) Analysis



# P2P Analysis

- Account for transportation-related GHG emissions associated with USAID Global Health shipments from USAID custody to in-country port-of-entry.
- Air, land, and sea shipments.
- Falls within Scope 3 Category 4: Upstream Transportation and Distribution
  - Outbound transportation and distribution services that are purchased by the reporting entity.



# Data Collection and Cleansing



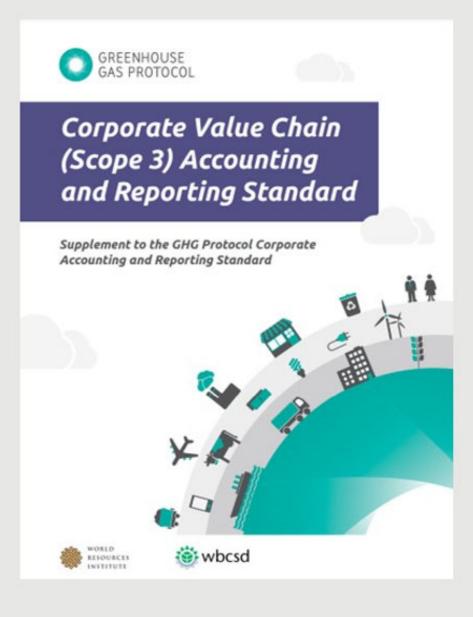
# Data Collection Methodology

- Shipments: USAID GH made shipments by air, land, and sea in 2019
- Shipment weight: Total shipment weight exceeded 43,000 tonnes
- Shipment volume: Available for sea shipments
- Route Information: Over 700 unique shipment routes with origin and destination locations.
- Refrigerated or Non-refrigerated



Source: USAID flickr. Available under Creative Commons, BY-NC 2.0

### Methodology Selection



The Corporate Value Chain (Scope 3) Accounting and Reporting Standard provides three methods to account for transportation-related emissions—fuel based, distance-based, and spend-based.

Minimum Boundary	Upstream Type	Calculation Methods		
Scope 1 and 2 emissions of purchased products.	Transportation     Air transport     Rail transport     Road     transport     Marine	Fuel-Based Method: Determine the amount of fuel consumed.		
	transport	Distance-Based Method: Determine the mass, distance, and mode of each shipment.		
		Spend-Based Method: Determine amount of money spent on each mode of business travel.		
	Distribution	Site-Specific Method: Site-specific fuel, electricity, and fugitive emissions data.		
		Average-Data Method: Estimate emissions for each distribution activity, based on average data.		

# **Shipping Distances**

Shipment dataset included origin-destination information for each shipment, but did not include travel distances.

Shipment Mode	Distance Calculations
Air	Applied the U.S. Department of Transportation (DOT) Statistics Inter-Airport Distance database to estimate flight distances by airport code for over 9,500 flights. <sup>1</sup>
Sea	Estimated shipping distance using Shipping Distance Calculator. <sup>2</sup>
Land	Estimated shipping distance using Google Maps.3

#### Sources:

- I https://www.transtats.bts.gov/Distance.aspx
- 2 http://www.shiptraffic.net/2001/05/sea-distances-calculator.html
- 3 https://www.google.com/maps

# Data Cleansing and Considerations

Shipment Mode	Distance Calculations
Air	<ul> <li>DOT dataset accounted for 75% of flights.</li> <li>Remaining flights included 395 unique flight paths. Of which 55 accounted for 80% of remaining shipment weight. Estimated distance using air miles calculator.</li> <li>Applied average distance by product type to remaining flights.</li> </ul>
Sea	<ul> <li>Identified 728 unique sea shipment routes.</li> <li>273 accounted for 97% of shipped product weight.</li> <li>Remainder were estimated using average shipping distance by product weight.</li> </ul>
Land	<ul> <li>Approximately 200 shipments occurred over land.</li> <li>100% of shipping distances calculated using Google Maps.</li> </ul>

# Metrics and Calculations



# Air Freight Methodology

- Applied UK Department for Business, Energy & Industrial Strategy emission factors (kg GHG/tonne-km) to flights by flight length.
- 95% of flights were long-haul flights.

Length	KgCO₂/ Tonne-Km	KgCH₄/ Tonne-Km	KgN₂O/ Tonne-Km	KgCO₂e/ Tonne-Km	
Short Flights (<460 Kms)	2.35236	0.00188	0.02226	2.3765	
Medium Flights (≥460 & <3,700 1.20568 Kms)		0.00008	0.01141	1.21717	
Long Flights (≥3,700 Kms)	0.53358	0.00004	0.00505	0.53867	



Source: USAID flickr. Available under Creative Commons, BY-NC 2.0

Source: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

# Sea Freight Methodology

 Aligned shipment routes with trade lane emission factors provided in BSR's 2019 Global Container Shipping Trade Lane Emission Factors report.

Trade Lanes	2019 TTW CO <sub>2</sub> Emission Factors (g CO <sub>2</sub> per TEU Km)		
	Dry	Reefer	
Asia to-from Africa	47.1	84.3	
Asia to-from Mediterranean/Black Sea	31.8	66.2	
Asia to-from Middle East/India	35.5	70.2	
Asia to-from North America East Coast/Gulf	37.9	67.7	
Asia to-from North America West Coast	42.2	73.3	
Asia to-from North Europe	26.7	58.7	

JULY 2020 2019 Global Container **Shipping Trade Lane Emissions Factors** Clean Cargo CARGO

Source: https://www.bsr.org/files/clean-cargo/BSR-Clean-Cargo-Emissions-Report-2020.pdf

# Land Freight Methodology

 Applied UK Department for Business, Energy & Industrial Strategy emission factors (kg GHG/tonne-km) for heavy goods vehicles.

Activity	Туре	% Laden	KgCO <sub>2</sub> / Tonne- Km	KgCH√ Tonne- Km	KgN₂O/ Tonne- Km	KgCO₂e/ Tonne- Km
HGV	All HGVs	Average	0.10580	0.00002	0.00167	0.10749
HGV Refrigerated	All HGVs	Average	0.12419	0.00002	0.00167	0.12588

Source: <a href="https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021">https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021</a>



Source: USAID flickr. Available under Creative Commons, BY-NC 2.0

# — Assumptions and Proxies



# Assumptions and Proxies

Fuel Data	<ul> <li>Preferred methodologies for estimating transport GHG emissions rely on fuel use.</li> <li>Used distance-based methods since fuel data were unavailable.</li> </ul>
Distances	<ul> <li>Actual distance traveled was unavailable.</li> <li>Distance estimates are based on origin-destination information and average travel distances.</li> </ul>
Emission Factors	<ul> <li>Emission factors are based on average emissions by mode and do not reflect the actual characteristics (e.g., combustion efficiency) of individual vessels, aircraft, or vehicles.</li> </ul>

# Preliminary Findings



# **Preliminary Findings**

- While activity-based (e.g., mass-distance)
   emission estimates have inherent uncertainties,
   the estimates can still provide valuable insights
   into the scale of shipping-related emission relative
   to other sources.
- Moving freight by air is significantly more emission intensive than moving freight by sea.
- Efforts such as those by the International
   Maritime Organization to collect vessel fuel
   consumption via the Global Integrated Shipping
   Information System may improve access to fuel
   consumption data.



Source: Illustrative based on <u>UK DEFRA</u> emission factors for long-haul freight flights (0.649 kgCO2e/tonne.km) and container ships (0.016 kgCO2e/tonne.km).

# Broader Value Chain



# Regional Distribution Centers



### Category 4: Upstream Transportation and Distribution

- USAID GH is assessing Scope 1 and 2 emissions associated with warehousing products at Regional Distribution Centers (RDCs).
  - Belgium, Dubai, South Africa
- Obtain primary data (e.g., fuel and electricity consumption) directly from RDCs.
- Considering use of offsets and energy attribute certificates.
- Calculate emissions using Intergovernmental Panel on Climate Change (IPCC) and other publicly-avialable emission factors.
- Allocate emissions to USAID GH based on shared of warehouse space.



# Upstream Pharmaceutical Manufacturing



### Category 1: Purchased Goods and Services

- Emissions associated with the extraction, <u>production</u> and transportation of goods and services purchased or acquired by USAID.
- Engaging product suppliers to understand their efforts to account for GHGs and broader sustainability efforts.



# Primary and Secondary Data

Four methods are available to account for Scope 3 emissions from Category 1: Purchased Goods and Services: 1) supplier-specific, 2) hybrid, 3) average data, and 4) spend-based. These methods use either primary or secondary data.

#### Primary Data\*

Data provided directly by suppliers related to specific activities (e.g., emissions, fuel consumption) in the reporting company's value chain.

#### Secondary Data

Financial data, units, mass, or other proxy data on purchases or other industry average data (e.g., published datasets, industry association data)

#### Supplier-specific method

Collect product-level cradle-to-gate GHG inventory data from suppliers.

#### Hybrid method

- Collect allocated Scope 1 and 2 emissions data directly from suppliers.
- Calculate upstream emissions of goods and services from supplier activity data
- Use secondary data to calculate upstream emissions wherever supplier-specific data is not available.

#### Average-data method

 Estimate emissions for goods and services by collecting product information (e.g., mass, units) and industry-average emission factors.

#### Spend-based method

Estimate emissions by collecting product spend data and industry-average emission factors.

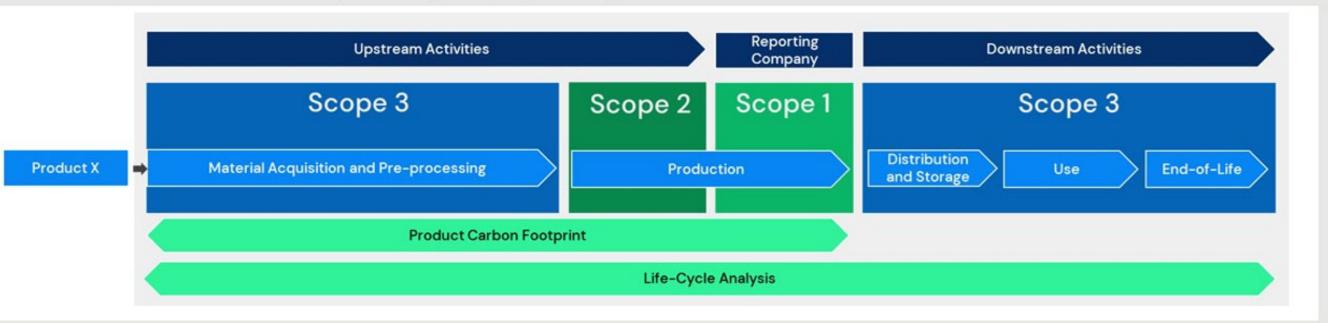
Source: GHG Protocol: Technical Guidance for Calculating Scope 3 Emissions

### GHGs from the Supplier's Perspective

- A product carbon footprint (PCF) considers cradle-to-gate emissions associated with material acquisition and preprocessing, production, distribution and storage, product use, and end-of-life.
- A life-cycle GHG analysis (LCA) considers the full life-cycle (cradle-to-grave) GHGs of a product including material
  acquisition and pre-processing, production, distribution and storage, product use, and end-of-life.
- Steps included within LCAs and PCFs map to emission source categories within each scope of a corporate GHG
  emission inventory.

Illustration of a product's (Product X) life-cycle GHGs attributed to scopes within a supplier's GHG inventory.

Adapted by ICF from the Product Life-Cycle Accounting and Reporting Standard, Figure 1.



# Opportunities for Mitigation



# Opportunities for Mitigation

- Category 1: Purchased Goods and Services
  - Continue to increase visibility into GHG emissions across the value chain
  - Encourage operational improvements (e.g., energy efficiency > electrification > renewable energy)
  - Understand regional regulatory context
    - European Union, Corporate Sustainability Reporting Directive (CSRD)
    - India, Business Responsibility and Sustainability Report (BRSR)
    - United States, SEC Proposed on the Enhancement and Standardization of Climate-Related Disclosures
- Category 4: Upstream Transportation and Distribution
  - Shipping by sea rather than air where operationally viable.
  - Reduce freight weight (e.g., reduced packaging) and encourage low-carbon alternatives
  - Continue to move toward collecting primary data from vessels

# — Questions

