

Appendix D: Calculation formula summary tables

Summary of calculation methods for category 1 (Purchased goods and services)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Supplier-specific method	<p>sum across purchased goods and services: Σ (quantities of good purchased (e.g., kg) × supplier-specific product emission factor of purchased good or service (e.g., kg CO₂e/kg))</p>	<ul style="list-style-type: none"> Quantities or units of goods or services purchased 	<ul style="list-style-type: none"> Supplier-specific emission factors for the purchased goods or services (e.g., if the supplier has conducted a reliable cradle-to-gate GHG inventory, product footprint or internal LCA report)
Hybrid method (where supplier-specific activity data is available for all activities associated with producing the purchased goods)	<p>sum across purchased goods and services: Σ scope 1 and 2 emissions of tier 1 supplier relating to purchased good or service (kg CO₂e) + sum across material inputs of the purchased goods and services: Σ (mass or quantity of material inputs used by tier 1 supplier relating to purchased good or service (kg or unit) × cradle-to-gate emission factor for the material (kg CO₂e/kg or kg CO₂e/unit)) + sum across transport of material inputs to tier 1 supplier: Σ (distance of transport of material inputs to tier 1 supplier (km) × mass or volume of material input (tonnes or TEUs) × cradle-to-gate emission factor for the vehicle type (kg CO₂e/tonne or TEU/km)) + sum across waste outputs by tier 1 supplier relating to purchased goods and services: Σ (mass of waste from tier 1 supplier relating to the purchased good or service (kg) × emission factor for waste activity (kg CO₂e/kg)) + other emissions emitted in provision of the good or service as applicable</p>	<ul style="list-style-type: none"> Allocated scope 1 and 2 data (including emissions from electricity use and fuel use and any process and fugitive emissions) by supplier relating to the good or service purchased by the reporting company. For guidance on allocating emissions, refer to chapter 8 of the <i>Scope 3 Standard</i>. Mass or quantity of material inputs (e.g., bill of materials) used by supplier to produce purchased goods Mass or quantity of fuel inputs used by supplier to produce purchased goods Distance from the origin of the raw material inputs to the supplier (the transport emissions from the supplier to the reporting company is calculated in category 4 so should not be included here) Quantities of waste output by supplier to produce purchased goods Other emissions emitted in provision of the purchased goods as applicable 	<p>Depending what activity data has been collected from the supplier, companies may need to collect:</p> <ul style="list-style-type: none"> Cradle-to-gate emission factors for materials used by tier 1 supplier to produce purchased goods (Note: these emission factors can either be supplier-specific emission factors provided by the supplier, or industry average emission factors sourced from a secondary database. In general, preference should be given to more specific and verified emission factors) Life cycle emission factors for fuel used by incoming transport of input materials to tier 1 supplier Emission factors for waste outputs by tier 1 supplier to produce purchased goods Other emission factors as applicable (e.g., process emissions) The secondary emission factors required will also depend on what data is available for the purchased good. Companies will need to collect either: <ul style="list-style-type: none"> Cradle-to-gate emission factors of the purchased goods or services per unit of mass or unit of product (e.g., kg CO₂e/kg or kg CO₂e/hour spent); or Cradle-to-gate emission factors of the purchased goods or services per unit of economic value (e.g., kg CO₂e/\$)

Summary of calculation methods for category 1 (Purchased goods and services) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Hybrid method (where only allocated scope 1 and 2 emissions and waste data are available from supplier)	<p>sum across purchased goods and services:</p> $\sum \text{scope 1 and scope 2 emissions of tier 1 supplier relating to purchased good or service (kg CO}_2\text{e)}$ $+$ $\sum (\text{mass of waste from tier 1 supplier relating to the purchased good (kg)} \times \text{emission factor for waste activity (kg CO}_2\text{e/kg)})$ $+$ $\sum (\text{mass or quantity of units of purchased good or service (kg)} \times \text{emission factor of purchased good excluding scope 1, scope 2, and emissions from waste generated by producer (kg CO}_2\text{e/kg or unit or \$)})$		
Average-data method	<p>sum across purchased goods and services:</p> $\sum (\text{mass of purchased good or service (kg)} \times \text{emission factor of purchased good or service per unit of mass (kg CO}_2\text{e/kg)})$ <p>or</p> $\sum (\text{unit of purchased good or service (e.g., piece)} \times \text{emission factor of purchased good or service per reference unit (e.g., kg CO}_2\text{e/piece)})$	<ul style="list-style-type: none"> Mass or number of units of purchased goods or services for a given year (e.g., kg, hours spent, etc.) 	<ul style="list-style-type: none"> Cradle-to-gate emission factors of the purchased goods or services per unit of mass or unit of product (e.g., kg CO₂e/kg or kg CO₂e/hour spent)
Spend-based method	<p>sum across purchased goods and services:</p> $\sum (\text{value of purchased good or service (\$)} \times \text{emission factor of purchased good or service per unit of economic value (kg CO}_2\text{e/\$)})$	<ul style="list-style-type: none"> Amount spent on purchased goods or services, by product type, using market values (e.g., dollars) 	<ul style="list-style-type: none"> Cradle-to-gate emission factors of the purchased goods or services per unit of economic value (e.g., kg CO₂e/\\$)

Summary of calculation methods for category 2 (Capital goods)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Supplier-specific method	<p>sum across capital goods: Σ (quantities of capital good purchased (e.g., kg) \times supplier-specific product emission factor of capital good (e.g., kg CO₂e/kg))</p>	<ul style="list-style-type: none"> Quantities or units of capital goods purchased in the reporting year 	<ul style="list-style-type: none"> Supplier-specific emission factors for the capital goods (e.g., if the supplier has conducted a reliable cradle-to-gate GHG inventory, product footprint or internal LCA report)
Hybrid method (where supplier-specific activity data is available for all activities associated with producing the purchased goods)	<p>sum across capital goods: Σ scope 1 and 2 emissions of tier 1 supplier relating to capital good (kg CO₂e) $+$ sum across material inputs of the capital goods: Σ (mass or quantity of material inputs used by tier 1 supplier relating to capital good (kg or unit) \times cradle-to-gate emission factor for the material (kg CO₂e/kg or kg CO₂e/unit)) $+$ sum across transport of material inputs to tier 1 supplier: Σ (distance of transport of material inputs to tier 1 supplier (km) \times mass or volume of material input (tonnes or TEUs) \times cradle-to-gate emission factor for the vehicle type (kg CO₂e/tonne or TEU/km)) $+$ sum across waste outputs by tier 1 supplier relating to capital goods: Σ (mass of waste from tier 1 supplier relating to the capital good (kg) \times emission factor for waste activity (kg CO₂e/kg)) $+$ other emissions emitted in provision of capital goods as applicable</p>	<ul style="list-style-type: none"> Allocated scope 1 and 2 data (including emissions from electricity use and fuel use and any process and fugitive emissions) by supplier relating to the capital good purchased by the reporting company. For guidance on allocating emissions, refer to chapter 8 of the <i>Scope 3 Standard</i>. Mass or quantity of material inputs (e.g., bill of materials) used by supplier to produce capital goods Mass or quantity of fuel inputs used by supplier to produce capital goods Distance from the origin of the raw material inputs to the supplier (the transport emissions from the supplier to the reporting company is calculated in category 4 so should not be included here) Quantities of waste output by supplier to produce capital goods Other emissions emitted in provision of the capital goods as applicable 	<ul style="list-style-type: none"> Depending what activity data has been collected from the supplier, companies may need to collect: Cradle-to-gate emission factors for materials used by tier 1 supplier to produce capital goods (Note: these emission factors can either be supplier-specific emission factors provided by the supplier, or industry average emission factors sourced from a secondary database. In general, preference should be given to more specific and verified emission factors) Life cycle emission factors for fuel used by incoming transport of input materials to tier 1 supplier Emission factors for waste outputs by tier 1 supplier to produce capital goods Other emission factors as applicable (e.g., process emissions) The secondary emission factors required will also depend on what data is available for the capital good. Companies will need to collect either: Cradle-to-gate emission factors of the capital goods per unit of mass or unit of product (e.g., kg CO₂e/kg); or Cradle-to-gate emission factors of the capital goods per unit of economic value (e.g., kg CO₂e/\$)
Hybrid method (where only allocated scope 1 and 2 emissions and waste data are available from supplier)	<p>sum across capital goods: Σ scope 1 and scope 2 emissions of tier 1 supplier relating to capital good (kg CO₂e) $+$ Σ (mass of waste from tier 1 supplier relating to the capital good (kg) \times emission factor for waste activity (kg CO₂e/kg)) $+$ Σ (mass or quantity of units of capital good (e.g., kg) \times emission factor of capital good excluding scope 1, scope 2, and emissions from waste generated by producer (kg CO₂e/kg or unit or \$))</p>		
Average-data method	<p>sum across capital goods: Σ (mass of capital good (kg) \times emission factor of capital good per unit of mass (kg CO₂e/kg)) or Σ (unit of capital good (e.g., piece) \times emission factor of capital good per reference unit (e.g., kg CO₂e/piece))</p>	<ul style="list-style-type: none"> Mass or number of units of capital goods for a given year (e.g., kg) 	<ul style="list-style-type: none"> Cradle-to-gate emission factors of the capital goods per unit of mass or unit of product (e.g., kg CO₂e/kg or kg CO₂e/hour spent)
Spend-based method	<p>sum across capital goods: Σ (value of capital good (\$) \times emission factor of capital good per unit of economic value (kg CO₂e/\$))</p>	<ul style="list-style-type: none"> Amount spent on capital goods, by product type, using market values (e.g., \$) 	<ul style="list-style-type: none"> Cradle-to-gate emission factors of the capital goods per unit of economic value (e.g., kg CO₂e/\$)

Summary of Calculation Methods for Category 3 (Fuel- and energy-related activities not included in scope 1 or scope 2)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
A. Upstream emissions of purchased fuels			
Supplier-specific or average-data method	<p>sum across each fuel type consumed:</p> $\Sigma (\text{fuel consumed (e.g., kWh)} \times \text{upstream fuel emission factor (kg CO}_2\text{e)/kWh))$ <p>where:</p> <p>upstream fuel emission factor = life cycle emission factor – combustion emission factor</p>	Quantities and types of fuel consumed	<p>Supplier-specific method</p> <ul style="list-style-type: none"> Fuel-provider-specific emission factors on extraction, production and transportation of fuels per unit of fuel consumed by the reporting company (e.g., kg CO₂e/kWh), by fuel type and country or region <p>Average-data method</p> <ul style="list-style-type: none"> Average emission factors for upstream emissions per unit of consumption (e.g., kg CO₂e/kWh)
B. Upstream emissions of purchased electricity			
Supplier-specific or average-data method	<p>sum across suppliers, regions, or countries:</p> $\begin{aligned} &\Sigma (\text{electricity consumed (kWh)} \times \text{upstream electricity emission factor (kgCO}_2\text{e)/kWh)) \\ &+ (\text{steam consumed (kWh)} \times \text{upstream steam emission factor (kg CO}_2\text{e)/kWh)) \\ &+ (\text{heating consumed (kWh)} \times \text{upstream heating emission factor (kg CO}_2\text{e)/kWh)) \\ &+ (\text{cooling consumed (kWh)} \times \text{upstream cooling emission factor (kg CO}_2\text{e)/kWh)) \end{aligned}$ <p>where:</p> <p>upstream emission factor = life cycle emission factor – combustion emissions factor – T&D losses</p> <p>Note: T&D losses need to be subtracted only if they are included in the life cycle emission factor. Companies should check the emission factor to establish whether or not T&D losses have been taken into account.</p>	Total quantities of electricity, steam, heating or cooling purchased and consumed per unit of consumption (e.g., MWh), broken down by supplier, grid region or country	<p>Supplier-specific method</p> <ul style="list-style-type: none"> Utility-specific emission factors for extraction, production and transportation of fuels consumed per MWh of electricity, steam, heating or cooling generated <p>Average-data method</p> <ul style="list-style-type: none"> Grid-region, country, or regional emission factors for extraction, production and transportation of fuels per unit of consumption (e.g., kg CO₂e/kWh) of electricity, steam, heating or cooling generated
C. T&D losses			
Supplier-specific or average-data method	<p>sum across suppliers, regions, or countries:</p> $\begin{aligned} &\Sigma (\text{electricity consumed (kWh)} \times \text{electricity life cycle emission factor ((kg CO}_2\text{e)/kWh)} \\ &\quad \times \text{T\&D loss rate (\%))} \\ &+ (\text{steam consumed (kWh)} \times \text{steam life cycle emission factor ((kg CO}_2\text{e)/kWh)} \\ &\quad \times \text{T\&D loss rate (\%))} \\ &+ (\text{heating consumed (kWh)} \times \text{heating life cycle emission factor ((kg CO}_2\text{e)/kWh)} \\ &\quad \times \text{T\&D loss rate (\%))} \\ &+ (\text{cooling consumed (kWh)} \times \text{cooling life cycle emission factor ((kg CO}_2\text{e)/kWh)} \\ &\quad \times \text{T\&D loss rate (\%))} \end{aligned}$	<ul style="list-style-type: none"> Electricity, steam, heating or cooling per unit of consumption (e.g., MWh), broken down by grid region or country; and/or Scope 2 emissions data 	<p>Supplier-specific method</p> <ul style="list-style-type: none"> Utility-specific transmission & distribution loss rate (%), specific to grid where energy is generated and consumed <p>Average-data method</p> <ul style="list-style-type: none"> Country average transmission & distribution loss rate (%) Regional average transmission & distribution loss rate (%) Global average transmission & distribution loss rate (%)

Summary of Calculation Methods for Category 3 (Fuel- and energy-related activities not included in scope 1 or scope 2) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
D. Generation of purchased electricity that is sold to end users			
Supplier-specific or average-data method	<p>sum across suppliers, regions or countries:</p> $\Sigma (\text{electricity purchased for resale (kWh)} \times \text{electricity life cycle emission factor (kg CO}_2\text{e)/kWh})$ $+ (\text{steam purchased for resale (kWh)} \times \text{steam life cycle emission factor (kg CO}_2\text{e)/kWh})$ $+ (\text{heating purchased for resale (kWh)} \times \text{heating life cycle emission factor (kg CO}_2\text{e)/kWh})$ $+ (\text{cooling purchased for resale (kWh)} \times \text{cooling life cycle emission factor (kg CO}_2\text{e)/kWh})$	Quantities and specific source (e.g., generation unit) of electricity purchased and re-sold	<p>Supplier-specific method</p> <ul style="list-style-type: none"> Specific emissions data for generation unit from which purchased power is generated <p>Average-data method</p> <ul style="list-style-type: none"> Grid average rate for the origin of purchased power

Summary of Calculation Methods for Category 4 (Upstream transportation and distribution)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
Calculating Emissions from Transportation			
Fuel-based method	<p>sum across fuel types: Σ (quantity of fuel consumed (liters) × emission factor for the fuel (e.g., kg CO₂e/liter)) + sum across grid regions: Σ (quantity of electricity consumed (kWh) × emission factor for electricity grid (e.g., kg CO₂e/kWh)) + sum across refrigerant and air-conditioning types: Σ (quantity of refrigerant leakage × global warming potential for the refrigerant (e.g., kg CO₂e))</p> <p>If fuel data is unavailable, companies may use the following two formulae to calculate quantities of fuel consumed:</p> <p>Calculating fuel use from fuel spend</p> <p>sum across fuel types: $\Sigma \frac{\text{total fuel spend (e.g., \\$)}}{\text{average fuel price (e.g., \\$/liter)}}$</p> <p>Calculating fuel use from distance travelled</p> <p>sum across transport steps: Σ (total distance travelled (e.g., km) × fuel efficiency of vehicle (e.g., liters/km))</p> <p>Allocated fuel use = = total fuel consumed (litres) × $\left(\frac{\text{mass/volume of company's goods}}{\text{mass/volume of goods transported}} \right)$</p> <p>Companies may optionally substitute mass of goods by volume with dimensional mass or chargeable mass where data is available to prove that the alternative method is more suitable. Dimensional mass is a calculated mass that takes into account packaging volume as well as the actual mass of the goods. Chargeable mass is the higher value of either the actual or the dimensional mass of the goods.</p> <p>(Optional) CO₂e emissions from unladen backhaul = for each fuel type: Σ (quantity of fuel consumed from backhaul × emission factor for the fuel (e.g., kg CO₂e/liter))</p> <p>where: quantity of fuel consumed from backhaul = average efficiency of vehicles unladen (l/km) × total distance travelled unladen</p>	<ul style="list-style-type: none"> Quantities of fuel (e.g., diesel, gasoline, jet fuel, biofuels, etc.) consumed; Amount spent on fuel and average cost of fuel Amount of refrigerant leakage; and <p>If applicable:</p> <ul style="list-style-type: none"> Distance travelled; Average fuel efficiency of the vehicle, expressed in units of liters of fuel consumed per tonne per kilometer transported; Mass of purchased goods in the vehicle (tonnes) Information on whether the products are refrigerated during transport 	<ul style="list-style-type: none"> Fuel emission factors, expressed in units of emissions per unit of energy consumed (e.g., kg CO₂e/liters, CO₂e/Btu, etc.) For electric vehicles (if applicable), electricity emission factors, expressed in units of emissions per unit of electricity consumed (e.g., kg CO₂e/kWh) Refrigerant leakage emission factors, expressed in units of emissions per unit of refrigerant leaked (e.g., kg CO₂e/kg leakage) <p>Emission factors should include scope 1 and scope 2 emissions of the fuel and optionally include cradle-to-gate emissions.</p>

Summary of Calculation Methods for Category 4 (Upstream transportation and distribution) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
Distance-based method	<p>sum across transport modes and/or vehicle types:</p> $\Sigma (\text{mass of goods purchased (tonnes or volume)} \times \text{distance travelled in transport leg (km)} \times \text{emission factor of transport mode or vehicle type (kg CO}_2\text{e/tonne or volume/km)})$	<ul style="list-style-type: none"> • Mass or volume of the products sold • Actual distances provided by transportation suppliers • Online maps or calculators; and/or • Published port-to-port travel distances 	<p>Emission factor by mode of transport (e.g., rail, air, etc) or vehicle types (e.g., articulated lorry, container vessel, etc), expressed in units of greenhouse gases (CO₂, CH₄, N₂O) per unit of mass (tonne) or volume (e.g., TEU) travelled (e.g., km)</p>
Spend-based method	<p>sum across transport modes and/or vehicle types:</p> $\Sigma (\text{amount spent on transportation by type (\$)} \times \text{relevant EEIO emission factors per unit of economic value (kg CO}_2\text{e/\$)})$	<ul style="list-style-type: none"> • Amount spent on transportation by type (e.g. road, rail, air, barge), using market values (e.g., dollars). 	<ul style="list-style-type: none"> • Cradle-to-gate emission factors of the transportation type per unit of economic value (e.g., kg CO₂e/\\$) • Where applicable, inflation data to convert market values between the year of the EEIO emissions factors and the year of the activity data.
Calculating Emissions from Distribution			
Site-specific method	<p>for each storage facility:</p> $\begin{aligned} &\text{emissions of storage facility (kg CO}_2\text{e)} = \\ &(\text{fuel consumed (kWh)} \times \text{fuel emission factor (kg CO}_2\text{e/kWh)}) \\ &+ (\text{electricity consumed (kWh)} \times \text{electricity emission factor (kg CO}_2\text{e/kWh)}) \\ &+ (\text{quantity of refrigerant leakage (kg)} \times \text{global warming potential for the refrigerant (e.g., kg CO}_2\text{e)}) \end{aligned}$ <p>then, allocate emissions based on volume that company's products take within storage facility:</p> $= \frac{\text{allocated emissions of storage facility} \times \text{volume of reporting company's purchased goods (m}^3\text{)}}{\text{total volume of goods in storage facility (m}^3\text{)} \times \text{emissions of storage facility (kg CO}_2\text{e)}}$ <p>finally, sum across all storage facilities:</p> $\Sigma \text{ allocated emissions of storage facility}$	<ul style="list-style-type: none"> • Site-specific fuel, electricity use; and • Site-specific refrigerant leakage • The average occupancy rate of the storage facility (i.e., average total volume of goods stored) 	<ul style="list-style-type: none"> • Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and • Refrigerant emission factors of fugitive and process emissions (kg HFC/kg of refrigerant leakage)

Summary of Calculation Methods for Category 4 (Upstream transportation and distribution) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
<p>Average-data method</p>	<p>sum across storage facilities: Σ (volume of stored goods (m³ or pallet or TEU) × average number of days stored (days) × emission factor for storage facility (kg CO₂e/m³ or pallet or TEU/day))</p>	<ul style="list-style-type: none"> • Companies should collect data based upon the throughput • Volume of purchased goods that are stored (e.g., m², m³, pallet, TEU) or number of pallets needed to store purchased goods • Average number of days that goods are stored 	<p>Companies should collect data which allows the calculation of emissions per unit stored. This can be expressed in several different ways, including;</p> <ul style="list-style-type: none"> • Emission factor per pallet stored in facility • Emission factor per m²/m³ stored in facility • Emission factor per TEU (twenty-foot equivalent unit) stored in facility

Summary of Calculation Methods for Category 5 (Waste generated in operations)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
Supplier-specific method	<p>sum across waste treatment providers: Σ allocated scope 1 and 2 emissions of waste treatment company</p>	<ul style="list-style-type: none"> Allocated scope 1 and 2 emissions of waste-treatment company (allocated to the waste collected from the reporting company) 	<ul style="list-style-type: none"> If using the waste treatment company method, the reporting company collects emissions data from waste treatment companies, so no emission factors are required (the w company would have already used emission factors to calculate the emissions).
Waste-type-specific method	<p>sum across waste types: Σ (waste produced (tonnes or m³) × waste type and waste treatment specific emission factor (kg CO₂e/tonne or m³))</p>	<ul style="list-style-type: none"> Waste produced (e.g., tonne, m³) and type of different waste generated in operations For each waste type, specific waste treatment method applied (e.g., landfilled, incinerated, recycled, etc.) 	<ul style="list-style-type: none"> Waste type-specific and waste treatment-specific emission factors. The emission factors should include end-of-life processes only. Emission factors may include emissions from transportation of waste.
Average-data method	<p>sum across waste treatment methods: Σ (total mass of waste (tonnes) × proportion of total waste being treated by waste treatment method × emission factor of waste treatment method (kg CO₂e/tonne))</p>	<ul style="list-style-type: none"> Total mass of waste generated in operations Proportion of this waste being treated by different methods (e.g., % landfilled, incinerated, recycled, etc) 	<ul style="list-style-type: none"> Average waste treatment specific emission factors based upon all waste disposal types

Summary of Calculation Methods for Category 6 (Business travel)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Fuel-based method	<p>sum across fuel types: Σ (quantity of fuel consumed (liters) × emission factor for the fuel (e.g., kg CO₂e/liter)) + sum across grid regions: Σ (quantity of electricity consumed (kWh) × emission factor for electricity grid (e.g., kg CO₂e/kWh)) + sum across refrigerant and air-conditioning types: Σ (quantity of refrigerant leakage × global warming potential for the refrigerant (e.g., kg CO₂e))</p> <p>If fuel data is unavailable, companies may use the following two formulae to calculate quantities of fuel consumed:</p> <p>Calculating fuel use from fuel spend sum across fuel types: $\Sigma \frac{\text{total fuel spend (e.g., \\$)}}{\text{average fuel price (e.g., \\$/liter)}}$</p> <p>Calculating fuel use from distance travelled sum across transport steps: Σ (total distance travelled (e.g., km) × fuel efficiency of vehicle (e.g., liters/km)) + (optional) Σ (annual number of hotel nights (nights) × hotel emission factor (kg CO₂e/night))</p>	<ul style="list-style-type: none"> Quantities of fuel (e.g., diesel, gasoline, jet fuel, biofuels, etc.) consumed; Amount spent on fuel and average cost of fuel Fugitive emissions (e.g., refrigerant leakage); and <p>If applicable:</p> <ul style="list-style-type: none"> Distance travelled; Average fuel efficiency of the vehicle 	<ul style="list-style-type: none"> Life cycle fuel emission factors, expressed in units of emissions per unit of energy consumed (e.g., kg CO₂e/liters, kg CO₂e/Btu, etc.) For electric vehicles (if applicable), electricity emission factors, expressed in units of emissions per unit of electricity consumed (e.g., kg CO₂e/kWh) Fugitive emission factors, expressed in units of emissions per unit of fugitive emission (e.g., kg CO₂e/kg refrigerant leakage)
Distance-based method	<p>sum across vehicle types: Σ (distance travelled by vehicle type (vehicle-km or passenger-km) × vehicle specific emission factor (kg CO₂e/vehicle-km or kg CO₂e/passenger-km)) + (optional) Σ (annual number of hotel nights (nights) × hotel emission factor (kg CO₂e/night))</p>	<ul style="list-style-type: none"> Total distance travelled by each mode of transport (air, train, bus, car, etc.) for all employees in the reporting year. Countries of travel (since transportation emission factors vary by country) Specific types of vehicles used for travel (since transportation emission factors vary by vehicle types) from transport providers 	<ul style="list-style-type: none"> Emission factors that represent kilograms of CO₂e emitted per kilometer or passenger-kilometer for each mode of transport (e.g., aircraft, rail, metro, bus, taxi, bus, etc.) For electric vehicles (if applicable), electricity emission factors, expressed in units of emissions per kilometer or passenger-kilometer

Summary of Calculation Methods for Category 7 (Employee commuting)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Fuel-based method	<p>sum across fuel types: Σ (quantity of fuel consumed (liters) \times emission factor for the fuel (e.g., kg CO₂e/liter)) + sum across grid regions: Σ (quantity of electricity consumed (kWh) \times emission factor for electricity grid (e.g., kg CO₂e/kWh)) + sum across refrigerant and air-conditioning types: Σ (quantity of refrigerant leakage \times global warming potential for the refrigerant (e.g., kg CO₂e))</p> <p>If fuel data is unavailable, companies may use the following two formulae to calculate quantities of fuel consumed:</p> <p>Calculating fuel use from fuel spend sum across fuel types: $\Sigma \frac{\text{total fuel spend (e.g., \\$)}}{\text{average fuel price (e.g., \\$/liter)}}$</p> <p>Calculating fuel use from distance travelled sum across transport steps: Σ (total distance travelled (e.g., km) \times fuel efficiency of vehicle (e.g., liters/km))</p>	<ul style="list-style-type: none"> Quantities of fuel (e.g., diesel, gasoline, jet fuel, biofuels, etc.) consumed; Amount spent on fuel and average cost of fuel 	<ul style="list-style-type: none"> Life cycle fuel emission factors, expressed in units of emissions per unit of energy consumed (e.g., kg CO₂e/liters, CO₂e/Btu, etc.) For electric vehicles (if applicable), electricity emission factors, expressed in units of emissions per unit of electricity consumed (e.g., kg CO₂e/kWh)
Distance-based method	<p>first, sum across all employees to determine total distance travelled using each vehicle type: total distance travelled by vehicle type (vehicle-km or passenger-km) $= \Sigma$ (daily one-way distance between home and work (km) \times 2 \times number of commuting days per year)</p> <p>then, sum across vehicle types to determine total emissions: kg CO₂e from employee commuting $= \Sigma$ (total distance travelled by vehicle type (vehicle-km or passenger-km) \times vehicle specific emission factor (kg CO₂e/vehicle-km or kg CO₂e/passenger-km)) + (optionally) for each energy source used in teleworking: Σ (quantities of energy consumed (kWh) \times emission factor for energy source (kg CO₂e/kWh))</p>	<ul style="list-style-type: none"> Total distance travelled by employees over the reporting period Mode of transport used for commuting (e.g., train, subway, bus, car, bicycle, etc.) 	Emission factors for each mode of transport (usually expressed in units of greenhouse gas (CO ₂ , CH ₄ , N ₂ O, or CO ₂ e) emitted per passenger-kilometer travelled)
Average-data method	<p>sum across each transport mode: Σ (total number of employees \times % of employees using mode of transport \times one way commuting distance (vehicle-km or passenger-km) \times 2 \times working days per year \times emission factor of transport mode (kg CO₂e/vehicle-km or kg CO₂e/passenger-km))</p>	<ul style="list-style-type: none"> Number of employees Average distance travelled by an average employees per day Average breakdown of transport modes used by employees Average number working days per year 	Emission factors for each mode of transport (usually expressed in units of greenhouse gas (CO ₂ , CH ₄ , N ₂ O, or CO ₂ e) emitted per passenger-kilometer travelled)

Summary of Calculation Methods for Category 8 (Upstream Leased Assets)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Asset-specific method	<p>calculate the scope 1 and scope 2 emissions associated with each leased asset:</p> <p style="text-align: center;">scope 1 emissions of leased asset $= \sum (\text{quantity of fuel consumed (e.g., liter)} \times \text{emission factor for fuel source (e.g., kg CO}_2\text{e/liter)})$ $+ \sum (\text{quantity of refrigerant leakage (kg)} \times \text{emission factor for refrigerant (kg CO}_2\text{e/kg)})$ + process emissions</p> <p style="text-align: center;">scope 2 emissions of leased asset $= \sum (\text{quantity of electricity, steam, heating, cooling consumed (e.g., kWh)})$ $\times \text{emission factor for electricity, steam, heating, cooling (e.g., kg CO}_2\text{e/kWh)}$</p> <p>then sum across leased assets:</p> <p style="text-align: center;">\sum scope 1 and scope 2 emissions of each leased asset</p> <p>For leased building spaces not sub-metered by the tenant, the following formula can be used to allocate emissions:</p> $= \frac{\text{energy use from leased space (kWh)}}{\text{reporting company's area (m}^2\text{)}} \times \frac{\text{building's total area (m}^2\text{)} \times \text{building's occupancy rate (e.g., 0.75)}}{\text{building's total energy use (kWh)}}$	<ul style="list-style-type: none"> Asset-specific fuel use; electricity, steam, heating and cooling use; process emissions; and fugitive emissions (e.g., refrigerant leakage), or; Asset-specific scope 1 and scope 2 emissions data 	<ul style="list-style-type: none"> Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and Emission factors of fugitive and process emissions
Lessor-specific method	<p>calculate the scope 1 and scope 2 emissions associated with each lessor:</p> <p style="text-align: center;">scope 1 emissions of lessor $= \sum (\text{quantity of fuel consumed (e.g., liter)} \times \text{emission factor for fuel source (e.g., kg CO}_2\text{e/liter)})$ $+ \sum ((\text{quantity of refrigerant leakage (kg)} \times \text{emission factor for refrigerant (kg CO}_2\text{e/kg)})$ + process emissions)</p> <p style="text-align: center;">scope 2 emissions of lessor $= \sum (\text{quantity of electricity, steam, heating, cooling consumed (e.g., kWh)})$ $\times \text{emission factor for electricity, steam, heating, cooling (e.g., kg CO}_2\text{e/kWh)}$</p> <p>then allocate emissions from each lessor and then sum across lessors:</p> $\sum \text{scope 1 and scope 2 emissions of lessor (kg CO}_2\text{e)}$ $\times \frac{\text{area, volume, quantity, etc. of the leased asset}}{\text{total area, volume, quantity, etc., of lessor assets}}$	<ul style="list-style-type: none"> Lessor's fuel use, electricity use process emissions and fugitive emissions (refrigerant leakage), or; Lessor's scope 1 and scope 2 emissions data Physical or financial data for allocation (e.g., total area/volume/quantity of lessor's assets and total area/volume/quantity of leased assets) 	<ul style="list-style-type: none"> Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and Emission factors of fugitive and process emissions
Average-data method	<p style="text-align: center;">sum across building types: $\sum (\text{total floor space of building type (m}^2\text{)} \times \text{average emission factor for building type (kg CO}_2\text{e/m}^2\text{/year)})$</p> <p>Reporting company's scope 3 emissions from leased assets other than buildings and for leased buildings where floor space data is unavailable:</p> <p style="text-align: center;">sum across asset types: $\sum (\text{number of assets} \times \text{average emissions per asset type (kg CO}_2\text{e/asset type/year)})$</p>	<ul style="list-style-type: none"> Floor space of each leased asset Number of leased assets, by building type; and/or Number of leased assets that give rise to Scope 2 emissions (e.g., company cars, trucks, etc). 	<ul style="list-style-type: none"> Average emission factors by floor space, expressed in units of emissions per square meter, square foot occupied (e.g., kg CO₂e/m²/year); Average emission factors by building type, expressed in units of emissions per building (e.g., kg CO₂e/small office block/year) Emission factors by asset type, expressed in units of emissions per asset (e.g., kg CO₂e/car/year)

Summary of Calculation Methods for Category 9 (Downstream transportation and distribution)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
Calculating Emissions from Transportation			
Fuel-based method	<p>sum across fuel types: $\Sigma (\text{quantity of fuel consumed (liters)} \times \text{emission factor for the fuel (e.g., kg CO}_2\text{e/liter)})$ + sum across grid regions: $\Sigma (\text{quantity of electricity consumed (kWh)} \times \text{emission factor for electricity grid (e.g., kg CO}_2\text{e/kWh)})$ + sum across refrigerant and air-conditioning types: $\Sigma (\text{quantity of refrigerant leakage} \times \text{global warming potential for the refrigerant (e.g., kg CO}_2\text{e)})$</p> <p>If fuel data is unavailable, companies may use the following two formulae to calculate quantities of fuel consumed:</p> <p>Calculating fuel use from fuel spend</p> $\Sigma \frac{\text{sum across fuel types: total fuel spend (e.g., \$)}}{\text{average fuel price (e.g., \$/liter)}}$ <p>Calculating fuel use from distance travelled</p> <p>sum across transport steps: $\Sigma (\text{total distance travelled (e.g., km)} \times \text{fuel efficiency of vehicle (e.g., liters/km)})$</p> <p>Allocated fuel use = = total fuel consumed (litres) $\times \frac{\text{mass/volume of company's goods}}{\text{mass/volume of goods transported}}$</p> <p>Companies may optionally substitute mass of goods by volume with dimensional mass or chargeable mass where data is available to prove that the alternative method is more suitable. Dimensional mass is a calculated mass that takes into account packaging volume as well as the actual mass of the goods. Chargeable mass is the higher value of either the actual or the dimensional mass of the goods.</p> <p>(Optional) CO₂e emissions from unladen backhaul = for each fuel type: $\Sigma (\text{quantity of fuel consumed from backhaul} \times \text{emission factor for the fuel (e.g., kg CO}_2\text{e/liter)})$</p> <p>where: quantity of fuel consumed from backhaul = average efficiency of vehicles unladen (l/km) \times total distance travelled unladen</p>	<ul style="list-style-type: none"> Quantities of fuel (e.g., diesel, gasoline, jet fuel, biofuels, etc.) consumed; Amount spent on fuel and average cost of fuel Amount of refrigerant leakage; and <p>If applicable:</p> <ul style="list-style-type: none"> Distance travelled; Average fuel efficiency of the vehicle, expressed in units of liters of fuel consumed per tonne per kilometer transported; Mass of purchased goods in the vehicle (tonnes) Information on whether the products are refrigerated during transport 	<ul style="list-style-type: none"> Fuel emission factors, expressed in units of emissions per unit of energy consumed (e.g., kg CO₂e/liters, CO₂e/Btu, etc.) For electric vehicles (if applicable), electricity emission factors, expressed in units of emissions per unit of electricity consumed (e.g., kg CO₂e/kWh) Refrigerant leakage emission factors, expressed in units of emissions per unit of refrigerant leaked (e.g., kg CO₂e/kg leakage) <p>Emission factors should include scope 1 and scope 2 emissions of the fuel and optionally include cradle-to-gate emissions.</p>

Summary of Calculation Methods for Category 9 (Downstream transportation and distribution) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factors Needed
Distance-based method	<p>sum across transport modes and/or vehicle types:</p> $\sum (\text{mass of goods purchased (tonnes or volume)} \times \text{distance travelled in transport leg (km)} \times \text{emission factor of transport mode or vehicle type (kg CO}_2\text{e/tonne or volume/km)})$	<ul style="list-style-type: none"> Mass or volume of the products sold Actual distances provided by transportation suppliers Online maps or calculators; and/or Published port-to-port travel distances 	<ul style="list-style-type: none"> Emission factor by mode of transport (e.g., rail, air, etc) or vehicle types (e.g., articulated lorry, container vessel, etc), expressed in units of greenhouse gases (CO₂, CH₄, N₂O) per unit of mass (tonne) or volume (e.g., TEU) travelled (e.g., km)
Spend-based method	<p>sum across transport modes and/or vehicle types:</p> $\sum (\text{amount spent on transportation by type (\$)} \times \text{relevant EEIO emission factors per unit of economic value (kg CO}_2\text{e/\$)})$	<ul style="list-style-type: none"> Amount spent on transportation by type (e.g. road, rail, air, barge), using market values (e.g., dollars). 	<ul style="list-style-type: none"> Cradle-to-gate emission factors of the transportation type per unit of economic value (e.g., kg CO₂e/\$) Where applicable, inflation data to convert market values between the year of the EEIO emissions factors and the year of the activity data.
Calculating Emissions from Distribution			
Site-specific method	<p>for each storage facility:</p> $\begin{aligned} &\text{emissions of storage facility (kg CO}_2\text{e)} \\ &= (\text{fuel consumed (kWh)} \times \text{fuel emission factor (kg CO}_2\text{e/kWh)}) \\ &+ (\text{electricity consumed (kWh)} \times \text{electricity emission factor (kg CO}_2\text{e/kWh)}) \\ &\quad + (\text{refrigerant leakage (kg)} \\ &\quad \times \text{refrigerant emission factor (e.g., kg HFC/kg of refrigerant leakage)}) \end{aligned}$ <p>then, allocate emissions based on volume that company's products take within storage facility:</p> $\text{allocated emissions of storage facility} = \frac{\text{volume of reporting company's purchased goods (m}^3\text{)} \times \text{emissions of storage facility (kg CO}_2\text{e)}}{\text{total volume of goods in storage facility (m}^3\text{)}}$ <p>finally, sum across all storage facilities:</p> $\sum \text{allocated emissions of storage facility}$	<ul style="list-style-type: none"> Site-specific fuel, electricity use; and Site-specific refrigerant leakage The average occupancy rate of the storage facility (i.e., average total volume of goods stored) 	<ul style="list-style-type: none"> Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and Refrigerant emission factors of fugitive and process emissions (kg HFC/kg of refrigerant leakage)
Average-data method	<p>sum across storage facilities:</p> $\sum (\text{volume of stored goods (m}^3\text{ or pallet or TEU)} \times \text{average number of days stored (days)} \times \text{emission factor for storage facility (kg CO}_2\text{e/m}^3\text{ or pallet or TEU/day)})$	<ul style="list-style-type: none"> Companies should collect data based upon the throughput Volume of purchased goods that are stored (e.g., m³, m³, pallet, TEU) or number of pallets needed to store purchased goods Average number of days that goods are stored 	<ul style="list-style-type: none"> Companies should collect data which allows the calculation of emissions per unit stored. This can be expressed in several different ways, including; Emission factor per pallet stored in facility Emission factor per m³/m³ stored in facility Emission factor per TEU (twenty-foot equivalent unit) stored in facility

Summary of Calculation Methods for Category 10 (Processing of Sold Products)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Site-specific method	<p>sum across fuel consumed in the processing of sold intermediate products: Σ (quantity of fuel consumed (e.g., liter) \times life cycle emission factor for fuel source (e.g., kg CO₂e/liter)) +</p> <p>sum across electricity consumed in the processing of sold intermediate products: Σ (quantity of electricity consumed (e.g., kWh) \times life cycle emission factor for electricity (e.g., kg CO₂e/kWh)) +</p> <p>sum across refrigerants used in the processing of sold intermediate products: Σ (quantity of refrigerant leakage (kg) \times Global Warming Potential for refrigerant (kg CO₂e/kg)) +</p> <p>sum across process emissions released in the processing of sold intermediate products +</p> <p>to the extent possible, sum across waste generated in the in the processing of sold intermediate products: Σ (mass of waste output (kg) \times emission factor for waste activity (kg CO₂e/kg))</p>	<p>Companies should first collect data on the types and quantities of intermediate goods sold by the reporting company. Companies should then collect either site-specific GHG emissions data provided by downstream value chain partners, or site-specific activity data from downstream processes, including:</p> <ul style="list-style-type: none"> Quantities of energy (including electricity and fuels) consumed in process(es) To the extent possible, mass of waste generated in process(es); and If applicable, activity data related to non-combustion emissions (i.e., industrial process or fugitive emissions) 	<ul style="list-style-type: none"> If site-specific activity data is collected, companies should also collect: Emission factors for fuels Emission factors for electricity To the extent possible, emission factors for waste outputs; and If applicable, emission factors related to non-combustion emissions (i.e., industrial process or fugitive emissions)
Average-data method	<p>sum across intermediate products: Σ (mass of sold intermediate product (kg) \times emission factor of processing of sold products (kg CO₂e/kg of final product))</p>	<p>For each type of sold intermediate product, companies should collect data on:</p> <ul style="list-style-type: none"> The process(es) involved in transforming or processing sold intermediate products into an usable state final product, subsequent to sale by the reporting company; Information needed for allocation (e.g., mass, economic value, etc.) 	<ul style="list-style-type: none"> Companies should collect either: Average emission factors for downstream processes to transform the sold intermediate product, expressed in units of emissions (e.g., CO₂, CH₄, N₂O) per unit of product (e.g., kg CO₂/kg of final product) <p>Or:</p> <ul style="list-style-type: none"> Life cycle emission factors of sold products Life cycle emission factors of final products

Summary of Calculation Methods for Category 11 (Use of sold products)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Direct Use-Phase Emissions			
Products that directly consume energy (fuels or electricity) during use	<p>sum across fuels consumed from use of products: $\sum (\text{total lifetime expected uses of product} \times \text{number sold in reporting period} \times \text{fuel consumed per use (kWh)} \times \text{emission factor for fuel (kg CO}_2\text{e/kWh)})$ + sum across electricity consumed from use of products: $\sum (\text{total lifetime expected uses of product} \times \text{number sold in reporting period} \times \text{electricity consumed per use (kWh)} \times \text{emission factor for electricity (kg CO}_2\text{e/kWh)})$ + sum across refrigerant leakage from use of products: $\sum (\text{total lifetime expected uses of product} \times \text{number sold in reporting period} \times \text{refrigerant leakage per use (kg)} \times \text{global warming potential (kg CO}_2\text{e/kg)})$</p>	<ul style="list-style-type: none"> Total lifetime expected uses of product(s); and Quantities of products sold Fuel used per use of product Electricity consumption per use of product Refrigerant leakage per use of product 	<ul style="list-style-type: none"> Emission factors for fuels Emission factors for electricity Emission factors for refrigerants
Fuels and Feed-stocks	<p>sum across fuels/feedstocks: $\sum (\text{total quantity of fuel/feedstock sold (e.g., kWh)} \times \text{combustion emission factor for fuel/feedstock (e.g., kg CO}_2\text{e/kWh)})$</p>	<ul style="list-style-type: none"> Total quantities of fuels/feedstocks sold 	<ul style="list-style-type: none"> Combustion emission factors of fuel/feedstock
Greenhouse gases and products that contain or form greenhouse gases that are emitted during use	<p>sum across GHGs released in a product or product group: $\sum (\text{GHG contained per product} \times \text{Total Number of products sold} \times \text{\% of GHG released during lifetime use of product} \times \text{GWP of the GHG})$</p> <p>then: sum across products or product groups: $\sum (\text{use phase emissions from product or product group 1,2,3...})$</p> <p>Note: if the % released is unknown 100% should be assumed.</p>	<ul style="list-style-type: none"> Total quantities of products sold Quantities of GHGs contained per product % of GHGs released throughout the lifetime of the product 	<ul style="list-style-type: none"> GWP of the GHGs contained in the product, expressed in units of carbon dioxide per unit kilogram of the GHG (e.g., 25 kg CO₂/kg)

Summary of Calculation Methods for Category 11 (Use of sold products) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Indirect Use-Phase Emissions			
Products that indirectly consume energy (fuels or electricity) during use	<p>The generation of a typical use phase may be difficult as the same product may consume more or less energy dependent on the conditions in which it is used. For example, a potato may be roasted, boiled and microwaved, each using different amount of energy and hence different emissions. Companies may choose to identify several different use-phase scenarios for a product and create a weighted average based upon actual activity.</p> <p>sum across fuels consumed from use scenarios: Σ (total lifetime expected uses of product \times % of total lifetime uses using this scenario \times number sold in reporting period \times fuel consumed per use in this scenario (e.g., kWh) \times emission factor for fuel (e.g., kg CO₂e/kWh)) + sum across electricity consumed from use scenarios: Σ (total lifetime expected uses of product \times % of total lifetime uses using this scenario \times number sold in reporting period \times electricity consumed per use in this scenario (kWh) \times emission factor for electricity (kg CO₂e/kWh)) + sum across refrigerant leakage from use scenarios: Σ (total lifetime expected uses of product \times % of total lifetime uses using this scenario \times number sold in reporting period \times refrigerant leakage per use in this scenario (kg) \times emission factor for refrigerant (kg CO₂e/kg)) + sum across GHG emitted indirectly from use scenarios: Σ (total lifetime expected uses of product \times % of total lifetime uses using this scenario \times number sold in reporting period \times GHG emitted indirectly (kg) \times GWP of the GHG)</p>	<ul style="list-style-type: none"> • Average number of uses over lifetime of product • Average use scenarios (e.g., weighted average of scenarios) • Fuel consumed in use scenarios • Electricity consumed in use scenarios • Refrigerant leakage in use scenarios • GHGs emitted indirectly in use scenarios 	<ul style="list-style-type: none"> • Combustion emission factors of fuels and electricity • GWP of GHGs
Intermediate products that directly consume energy (fuels or electricity) during use	<p>sum across sold intermediate products total use phase emissions: Σ (total intermediate products sold \times total lifetime uses of final sold product \times emissions per use of sold intermediate product (kg CO₂e/use))</p>	<ul style="list-style-type: none"> • Type(s) of final product(s) produced from reporting company's intermediate product(s) • Percentage of reporting company's intermediate product sales going to each type of final product • Activity data required to calculate the use-phase emission of the final product will be the same as described previously in this chapter. 	<ul style="list-style-type: none"> • Depending on the type of final product, emission factors required will be the same as described earlier in this chapter.

Summary of Calculation Methods for Category 12 (End-of-life treatment of sold products)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Waste-type-specific method	<p>sum across waste treatment methods for sold products and packaging:</p> $\sum (\text{total mass of sold products and packaging from point of sale to end of life after consumer use (kg)} \times \% \text{ of total waste being treated by waste treatment method} \times \text{emission factor of waste treatment method (kg CO}_2\text{e/kg)})$	<ul style="list-style-type: none"> Total mass of sold products and packaging from the point of sale by the reporting company to the end-of-life after consumer use (including packaging used to transport products through to the point of retail and any packaging that is disposed of prior to the end-of-life of the final product. Proportion of this waste being treated by different methods (e.g., % landfilled, incinerated, recycled, etc.) 	<ul style="list-style-type: none"> Average waste treatment specific emission factors based upon all waste disposal types

Summary of Calculation Methods for Category 13 (Downstream Leased Assets)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Asset-specific method	<p>calculate the scope 1 and scope 2 emissions associated with each leased asset:</p> <p style="text-align: center;">scope 1 emissions of leased asset</p> $= \sum (\text{quantity of fuel consumed (e.g., liter)} \times \text{emission factor for fuel source (e.g., kg CO}_2\text{e/liter)}) + \sum ((\text{quantity of refrigerant leakage (kg)} \times \text{emission factor for refrigerant (kg CO}_2\text{e/kg)}) + \text{process emissions})$ <p style="text-align: center;">scope 2 emissions of leased asset</p> $= \sum (\text{quantity of electricity, steam, heating, cooling consumed (e.g., kWh)} \times \text{emission factor for electricity, steam, heating, cooling (e.g., kg CO}_2\text{e/kWh)})$ <p>then sum across leased assets:</p> $\sum \text{scope 1 and scope 2 emissions of each leased asset}$ <p>For leased building spaces not sub-metered by the tenant, the following formula can be used to allocate emissions:</p> $\text{energy use from leased space (kWh)} = \frac{\text{reporting company's area (m}^2\text{)}}{\text{building's total area (m}^2\text{)}} \times \text{building's occupancy rate (e.g., 0.75)} \times \text{building's total energy use (kWh)}$	<ul style="list-style-type: none"> Asset-specific fuel use; electricity, steam, heating and cooling use; process emissions; and fugitive emissions (e.g., refrigerant leakage), or; Asset-specific scope 1 and scope 2 emissions data 	<ul style="list-style-type: none"> Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and Emission factors of fugitive and process emissions

Summary of Calculation Methods for Category 13 (Downstream Leased Assets) (continued)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Lessee-specific method	<p>calculate the scope 1 and scope 2 emissions associated with each lessee:</p> <p style="text-align: center;">scope 1 emissions of lessee</p> $= \sum (\text{quantity of fuel consumed (e.g., liter)} \times \text{emission factor for fuel source (e.g., kg CO}_2\text{e/liter)})$ $+ \sum ((\text{quantity of refrigerant leakage (kg)} \times \text{emission factor for refrigerant (kg CO}_2\text{e/kg)})$ $+ \text{process emissions})$ <p style="text-align: center;">scope 2 emissions of lessee</p> $= \sum (\text{quantity of electricity, steam, heating, cooling consumed (e.g., kWh)}$ $\times \text{emission factor for electricity, steam, heating, cooling (e.g., kg CO}_2\text{e/kWh)})$ <p>then allocate emissions from each lessee and then sum across lessees:</p> $\frac{\sum \text{scope 1 and scope 2 emissions of lessee (kg CO}_2\text{e)} \times ((\text{area, volume, quantity, etc., of the leased asset})}{(\text{total area, volume, quantity, etc. of lessee assets})}$	<ul style="list-style-type: none"> • Lessee’s fuel use, electricity use process emissions and fugitive emissions (refrigerant leakage), or; • Lessee’s scope 1 and scope 2 emissions data • Physical or financial data for allocation (e.g., total area/volume/quantity of lessee’s assets and total area/volume/quantity of leased assets) 	<ul style="list-style-type: none"> • Site or regionally specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and • Emission factors of fugitive and process emissions
Average-data method	<p>Reporting company’s scope 3 emissions from leased assets (downstream):</p> <p style="text-align: center;">sum across building types:</p> $\sum (\text{total floor space of building type (m}^2\text{)} \times \text{average emission factor for building type (kg CO}_2\text{e/m}^2\text{/year)})$ <p>reporting company’s scope 3 emissions from leased assets other than buildings and for leased buildings where floor space data is unavailable:</p> <p style="text-align: center;">sum across asset types:</p> $\sum (\text{number of assets} \times \text{average emissions per asset type (kg CO}_2\text{e/asset type/year)})$	<ul style="list-style-type: none"> • Floor space of each leased asset • Number of leased assets, by building type; and/or • Number of leased assets that give rise to Scope 2 emissions (e.g., company cars, trucks, etc). 	<ul style="list-style-type: none"> • Average emission factors by floor space, expressed in units of emissions per square meter, square foot occupied (e.g., kg CO₂e/m²/year); • Average emission factors by building type, expressed in units of emissions per building (e.g., kg CO₂e/small office block/year) • Emission factors by asset type, expressed in units of emissions per asset (e.g., kg CO₂e/car/year)

Summary of Calculation Methods for Category 14 (Franchises)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Franchise-specific method	<p>sum across franchises: Σ (scope 1 emissions + scope 2 emissions of each franchise (kg CO₂e))</p> <p>If franchise buildings are not submetered, the following equation can be used:</p> $\frac{\text{energy use from franchise (kWh)}}{(\text{franchise's area (m}^2\text{)}) / (\text{building's total area (m}^2\text{)}) \times \text{building's occupancy rate}} \times \text{building's total energy use (kWh)}$	<p>Companies should collect data on either:</p> <ul style="list-style-type: none"> • Scope 1 and scope 2 emissions data from franchisees; or • Site-specific fuel use, electricity use, and other process and fugitive emissions activity data 	<p>If collecting fuel and energy data, companies should also collect:</p> <ul style="list-style-type: none"> • Site- or regionally-specific emission factors for energy sources (e.g., electricity and fuels) per unit of consumption (e.g., kg CO₂e/kWh for electricity, kg CO₂e/liter for diesel); and • Emission factors of process emissions (e.g., refrigeration and air conditioning)
Average-data method	<p>For leased buildings (if floor space data is available), sum across building types: Σ (total floor space of building type (m²) × average emission factor for building type (kg CO₂e/m²/year))</p> <p>For other asset types or for leased buildings where floor space data is not available, sum across building/asset types:</p> <p>sum across building/asset types: Σ (number of buildings or assets × average emissions per building or asset type per year (kg CO₂e/building or asset type/year))</p>	<ul style="list-style-type: none"> • Floor space of each franchise, by floor space • Number of franchises, by building type • Number of franchise assets that give rise to Scope 2 emissions (e.g., company cars, trucks, etc). 	<ul style="list-style-type: none"> • Average emission factors by floor space, expressed in units of emissions per square meter, square foot occupied (e.g., kg CO₂e/m²) • Average emission factors by building type, expressed in units of emissions per building (e.g., kg CO₂e/small office block) • Emission factors by asset type, expressed in units of emissions per asset (e.g., kg CO₂e/car)

Summary of Calculation Methods for Category 15 (Investments)

Method	Calculation Formula	Activity Data Needed	Emission Factor Needed
Calculating emissions from equity investments			
Investment-specific method	<p>sum across equity investments: Σ (scope 1 and scope 2 emissions of equity investment x share of equity (%))</p>	<ul style="list-style-type: none"> Scope 1 and 2 emissions of investee company The investor's proportional share of equity in the investee If significant, companies should also collect scope 3 emissions of investee company (if investee companies are unable to provide scope 3 emissions data, scope 3 emissions may need to be estimated using the Average-data method) 	<ul style="list-style-type: none"> If using the investment-specific method, the reporting company collects emissions data from investees, so no emission factors are required
Average-data method	<p>sum across equity investments: Σ ((investee company total revenue (\$) x emission factor for investee's sector (kg CO₂e/\$ revenue)) x share of equity (%))</p>	<ul style="list-style-type: none"> Sector(s) the investee company operates in; Revenue of investee company (if the investee company operates in more than one sector, the reporting company should collect data on the revenue for each sector in which the investee company operates); and The investor's proportional share of equity in the investee 	<ul style="list-style-type: none"> EEIO emission factors for the sectors of the economy that the investments are related to (kg CO₂e/\$ revenue)
Calculating emissions from project finance and from debt investments with known use of proceeds			
Project-specific method	<p>sum across projects: Σ (scope 1 and scope 2 emissions of relevant project in the reporting year x share of total project costs (%))</p>	<ul style="list-style-type: none"> Scope 1 and 2 emissions that occur in the reporting year for the relevant projects The investor's proportional share of total project costs (total equity plus debt) 	<ul style="list-style-type: none"> If using the project-specific method, the reporting company collects emissions data from investees, so no emission factors are required
Average-data method	<p>sum across projects in the construction phase: Σ ((project construction cost in the reporting year (\$) x emission factor of relevant construction sector (kg CO₂e/\$ revenue)) x share of total project costs (%))</p> <p>sum across projects in the operational phase: Σ ((project revenue in the reporting year (\$) x emission factor of relevant operating sector (kg CO₂e/\$ revenue)) x share of total project costs (%))</p>	<ul style="list-style-type: none"> Project costs in the reporting year (if the project is in the construction phase); or Revenue of the project (if the project is in the operational phase); and The investor's proportional share of total project costs (total equity plus debt). 	<ul style="list-style-type: none"> EEIO emission factors for the relevant construction sector that the investments are related to (kg CO₂e/\$) (if the project is in the construction phase); or EEIO emission factors for the relevant operating sector that the investments are related to (kg CO₂e/\$) (if the project is in the operational phase)
Calculating total projected lifetime emissions from project finance and debt investments with known use of proceeds			
Project-specific method	<p>Σ ((projected annual emissions of project x projected lifetime of project) x share of total project costs (%))</p>	<p>Calculating projected lifetime emissions typically requires making assumptions about the operation of the asset and its expected lifetime. The data needed to calculate expected emissions will depend on the type of project. Companies should collect:</p> <ul style="list-style-type: none"> Expected average annual emissions of project. For power plants for example, emissions can be derived from the plant's capacity and heat rate, the carbon content of the fuel, and projected capacity utilization. Expected lifetime of project 	