NET ZERO METHODOLOGY FOR HOTELS

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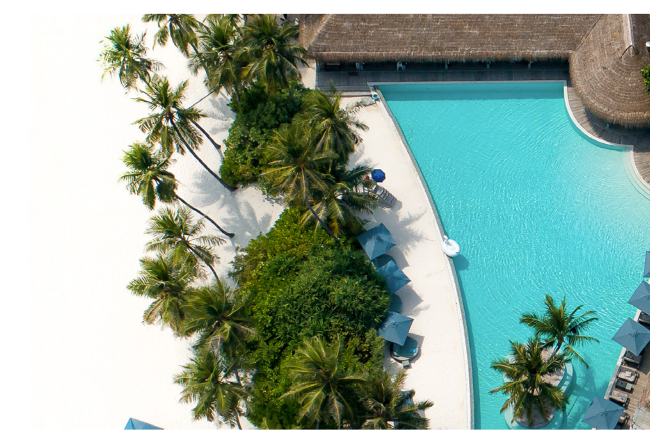
APPENDIX A

UNDERSTANDING THE CONCEPT OF GHG EMISSION SCOPES



GREENVIEW

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APPENDIX A: UNDERSTANDING THE CONCEPT OF GHG EMISSIONS SCOPES

A CARBON NEUTRAL TRIP OR HOTEL STAY VS NET ZERO

This methodology seeks to address a hotel or organization approach to pursuing a net-zero pathway, a long-term pathway that will require significant efforts for a hotel to achieve. It does not seek to define what is a 'carbon neutral hotel stay' or 'carbon neutral trip'. Although such products are offered, no common definition or criteria exist which has been specifically developed and adopted by the industry at large for a hotel stay, and as such claims are difficult to regulate or certify across the industry. Further work needs to be undertaken to identify the parameters of these claims, and differentiation should be noted between the possibility of the instance of a particular hotel stay being carbon neutral, vs a hotel or hotel company being entirely net zero. Further guidance on how to measure the carbon footprint of a hotel stay for offsetting or Scope 3 accounting purposes can be found in Section 5, and tools for support are listed in Appendix N.

The Greenhouse Gas Protocol (GHG Protocol) was established by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) to develop a standard for accounting and reporting GHG emissions. The **GHG Protocol Corporate Accounting and Reporting Standard** (Corporate Standard) was developed and is now widely used by organizations to understand, quantify, and manage their GHG emissions. The Corporate Standard categorizes emissions into three scopes:

- Scope 1 – Direct GHG emissions that occur from sources owned or controlled by the organization.
- Scope 2 – Indirect GHG emissions from generation of purchased electricity consumed by the organization.
- Scope 3 – Other indirect GHG emissions that occur as a consequence of the activities of the organization, but occur from sources not owned or controlled by the organization

The GHG Protocol also released the **GHG Protocol Scope 2 Guidance** which standardizes how organizations corporations measure their Scope 2 emissions from purchased electricity, steam, heat and cooling.

For GHG emissions calculation, seven gases are included:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF6)
- Nitrogen trifluoride (NF3)

Though water vapor and ozone (O3) are also greenhouse gases, they are not counted.

For hotels, CO2, CH4, and N2O are prevalent, as they are released in the burning of fossil fuels as well as attributed to the burning of fuels to generate electricity purchased by the hotel.

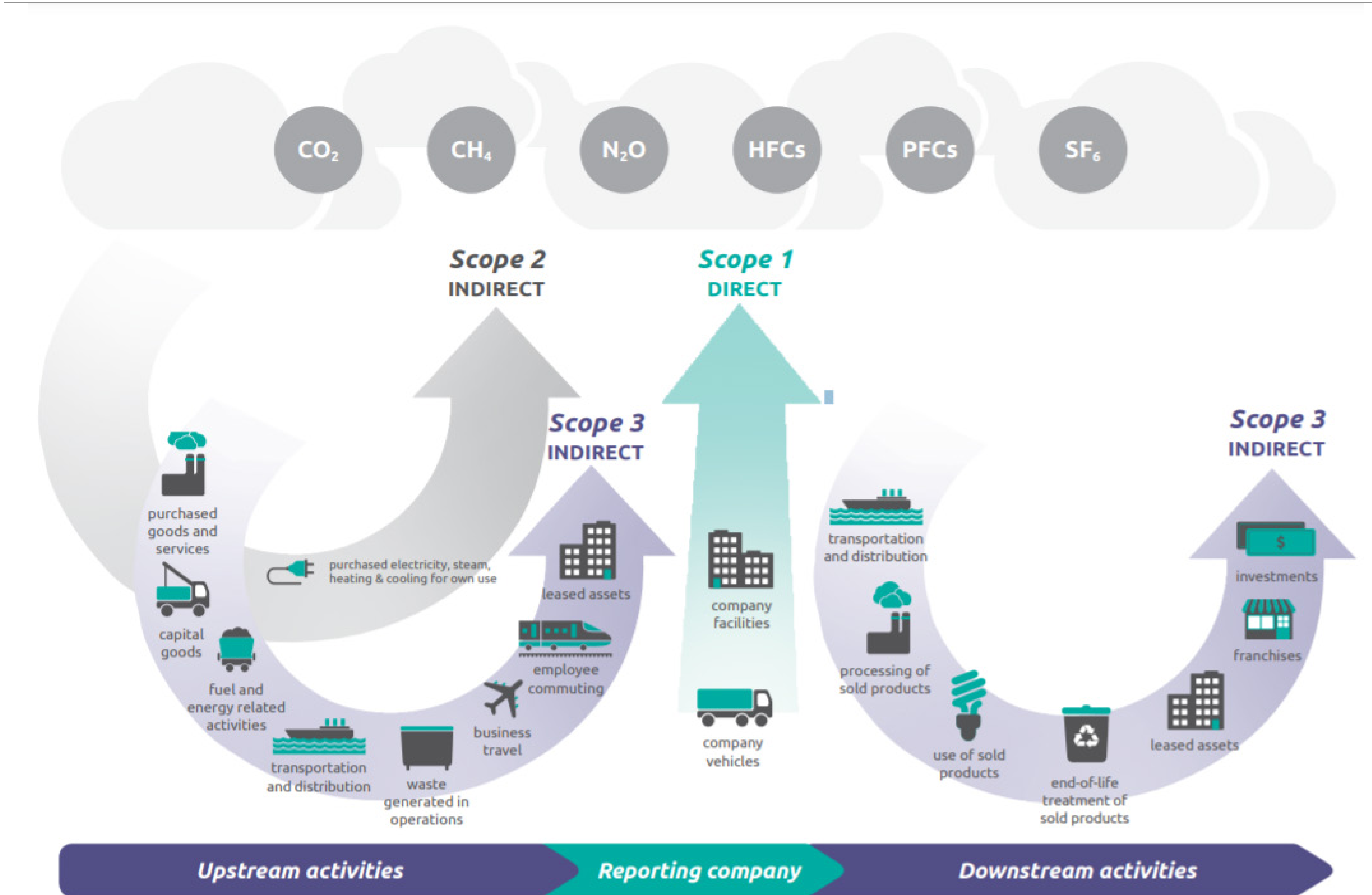
HFCs are refrigerants and common in hotels, found in chillers and refrigerators. Some of the most common are R-12, R-22, and R-134a.

For the purposes of GHG emissions calculation, the gases are normalized by the Global Warming Potential (GWP) of each gas, which refers to the effect it has in the atmosphere in contributing to the greenhouse effect over a specified period of time (i.e., 100 years) in comparison to Carbon Dioxide. This GWP is quantified in a unit of Carbon Dioxide Equivalent (CO2e). Methane is currently calculated at 28 times more potent than Carbon Dioxide, and Nitrous Oxide is 265 times more potent, though both of these are only found in trace amounts in the energy sources used by hotels.

Though HFCs are common and can have extremely high GWP values depending on the gas, they are found in closed loop piping, and only released into the atmosphere when leakage occurs. HFCs are also planned for global phaseout per the Kigali Amendment to the Montreal Protocol. Thus, they are not routinely included in hotel inventory calculations, or are estimated at a small percentage. However, phasing out to low-GWP refrigerants should be part of a net-zero plan.

Beyond tackling Scope 1 and 2 emissions, there is a need for organizations to address the significant Scope 3 emissions that result from upstream and downstream value chain activities. The GHG Protocol address this gap by developing the supplementary **Corporate Value Chain (Scope 3) Accounting and Reporting Standard** which takes a value chain approach to GHG accounting, helping organizations account for emissions at the corporate level and engage suppliers along the value chain. The Corporate Value Chain (Scope 3) Standard also classifies the Scope 3 emissions into 15 distinct categories. Figure A.1 illustrates the scopes and categories of emissions across the value chain of a reporting organization.

▼ **Figure A.1** Defining Scope 1, 2, 3 Emissions Source: GHG Protocol



These categories provide organizations with a framework to understand the diversity of Scope 3 activities along the corporate value chain. The following Table A.1 provides the descriptions for each of the 15 categories, enabling hotel companies to better understand on how this methodology for the hotel industry aligns with the GHG Protocol's categorization.

▼ **Table A.1: Scope 3 Categories**

CAT. NO.	CATEGORY NAME AND DESCRIPTION	EMISSIONS BOUNDARY
1	**Purchased goods and services** An extraction, production, and transportation of goods and services purchased or acquired based on the cradle-to-gate emissions covering all activities that occur in the life cycle of purchased products or services from sources that are not owned or controlled by the reporting company. Emissions from the use of products purchased by the reporting company are excluded from Scope 3 and accounted for in either scope 1 or 2.	Emissions from purchased goods and services activities including and not limited to the following: **Purchased goods** **a.** Purchase of materials or goods (e.g., raw materials, food & beverages etc.) **b.** Purchase of operating supplies, and consumables **c.** Purchase of writing materials (paper, stationery, etc.) **d.** Bottled amenities: shampoo, conditioner, bath gel, hand soap, lotion **e.** Paper **f.** Facial tissue **g.** Cleaning agents **h.** Linens and towels **i.** Staff uniforms **Purchase of services** **a.** Outsourced laundry, in facility not owned nor operated by the hotel **b.** Outsourced data servers **c.** Vendor software used within hotels **d.** Subscription of cloud-based applications **e.** Maintenance services
2	**Capital goods** As an extraction, production, and transportation of capital goods purchased or acquired including all upstream emissions. Emissions from the use of capital goods purchased by the reporting company are excluded from Scope 3 and accounted for in either scope 1 or 2.	Emissions from the acquisition or purchase of fixed assets, plant and equipment, capital expenditure (CAPEX) ("collectively known as capital goods) including during the reporting year. These may include: ■ Furnishings, fixtures, and equipment (FF&E) ■ Durable goods ■ Embodied carbon of hotel building
3	**Fuel- and energy-related activities (not included in Scope 1 or Scope 2)** Emissions related to the production of fuels and energy purchased and consumed from sources not owned or controlled by the reporting company and not included in scope 1 or scope 2.	■ Upstream emissions from direct and indirect energy and fuel consumption under Scope 1 and Scope 2 emissions; and ■ Transmission and distribution loss (grid loss) based on electricity consumption of Scope 2.
4	**Upstream transportation and distribution** Emissions from the transportation and distribution of products (excluding fuel and energy products) purchased or acquired by the reporting company in the reporting year in vehicles and facilities not owned or operated by the reporting company	Emissions from transportation and distribution activities including: ■ Outsourced logistics services used to transport purchased goods from tier 1 suppliers to hotel facilities. ■ Any other transportation services purchased including inbound and outbound logistics. ■ Provision of guest transportation services through outsourced purchase arrangement within the destination or to/from hotel. Guest transportation services using own transportation is accounted for under Scope 1 and 2.

CAT. NO.	CATEGORY NAME AND DESCRIPTION	EMISSIONS BOUNDARY
5	Waste generated in operations This category includes emissions from waste generated from operations and wastewater, processed at waste treatment facilities owned or operated by third parties. Waste treated at facilities owned or controlled by the reporting company is accounted for in Scope 1 and Scope 2.	■ Emissions from waste generated from hotel operations preferably identified by waste type e.g., food & kitchen waste, plastic containers and packaging, paper & cardboard, amenities, landscape waste and so on, depending on the disposal and treatment methods such as: **Diverted Method** ■ Recycled ■ Composted ■ Waste-to-energy **Non-Diverted Method** ■ Landfilled ■ Incinerated ■ Emissions from wastewater treatment.
6	**Business travel** Emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties. This category excludes: ■ Emissions for business travel from transportation in vehicles owned or controlled by the reporting company – accounted for in Scope 1 and 2. ■ Emissions from transportation of employees-owned vehicles or other mode of transportation to and from work – accounted for in Category 7. ■ Emissions from leased vehicles operated by the reporting company not included in scope 1 or scope 2 – accounted for in Category 8.	Emissions from business-related travelling activities arising from: ■ Business travel from the following modes of travel: • Air travel • Rail travel • Bus travel • Automobile travel • Other modes of travel; and ■ Hotel stay and accommodation
7	**Employee commuting** Emissions from the transportation of employees between their homes and their worksites. This also includes outsourced services purchased by the reporting company for staff transportation.	Emissions from employee commuting from the following modes of travel: ■ Air travel ■ Rail travel ■ Bus travel ■ Automobile travel ■ Other modes of travel
8	**Upstream leased assets** Emissions from the operation of assets that are leased by the reporting company, not already included in the reporting company's Scope 1 or Scope 2 inventories. This category is only applicable to companies that operate leased assets as a lessee.	Leased assets such as leased vehicle, equipment, office space, leased staff accommodation by the reporting company etc., not included in the Scope 1 and 2.

CAT. NO.	CATEGORY NAME AND DESCRIPTION	EMISSIONS BOUNDARY
9	**Downstream transportation and distribution** Emissions from transportation and distribution of products sold by the reporting company to the end users in vehicles and facilities owned or controlled by third parties, including emissions from retail and storage operation. Purchase of outbound transportation is excluded and accounted for in Category 4.	Emissions from transportation and distribution of goods to the end users including both business-to-consumers (B2C) and business-to-business (B2B) consumers that use, if any. This is not applicable to hotel industry in general; classified as out of bounds.
10	**Processing of sold products** Emissions from processing of sold intermediate products by third parties subsequent to sale by the reporting company and before use by the end consumer.	This is mainly for manufacturing industry as such and not applicable to hotels; classified as out of bounds.
11	**Use of sold products** Emissions from the use of goods and services sold by the reporting company to the end users. Use of goods and services is defined as follows: ▪ Direct use-phase emissions ▪ Indirect use-phase emissions	Not applicable to hotels in general; classified as out of bounds.
12	**End-of-life treatment of sold products** Emissions from the disposal of waste for products sold by the reporting company to end users.	Emissions from products sold by hotels may include and not limited to the following: ▪ Merchandize, souvenirs and gifts. ▪ Spa items ▪ Sell of room amenities The disposal treatment would be similar as described in Category 5 and this includes landfilled, incinerated, recycled and so on. Practically, segregating food waste during preparation (kitchen wastage, Category 5) and after consumption (F&B outlet wastage, Category 12) can be challenging including data gathering, operational process and so on. Where applicable, a single categorization may be considered supported with the relevant and valid justification.
13	**Downstream leased assets** Emissions from the operation of assets that are owned by the reporting company (as a lessor) and leased to other entities, not already included in Scope 1 or Scope 2. As a lessor, it also receives a lease income for the services.	Depending on how a company defines its organizational boundary but in general: ▪ Hotel amenities under lessor-lessee arrangement such as gift shops, fitness centers, spas etc. tend to be included in Scope 1 and 2 of the reporting company as a lessor as they are not sub-metered separately and lessee has minimal operational control over the leased assets. ▪ Hotels leased to operators by Owner – in owner's book, if not already included in Scope 1 and 2, it typically categorized under Category 15.

CAT. NO.	CATEGORY NAME AND DESCRIPTION	EMISSIONS BOUNDARY
14	**Franchises** Emissions from the operation of hotel properties under the franchise arrangement, not included in Scope 1 or Scope 2 as a franchisor. Franchisees should include emissions from operations under their control in this category if they have not included those emissions in Scope 1 and Scope 2. Franchisees may optionally report upstream emissions associated with the franchisor's management operations in Category 1.	■ **As a franchisor** Applicable to hotel properties under a franchise arrangement in which hotel brands (franchise owners) grant licenses or franchises to properties to use their brand. Franchise owners are to account for emissions from the franchisee operations arising from direct and indirect energy consumption (Scope 1 and Scope 2) under this category. ■ **As a franchisee** Franchisees typically account for emissions from their own operations under Scope 1 and 2. If it is not included, franchisees should classify emissions as Category 14, depending on how they define the organizational boundary. Franchisees may also include franchise owners' emissions under Category 1 in their reporting as part of the emissions of services acquired.
15	**Investments** Emissions associated with the reporting company's investments, through equity investment, debt investment, project financing, other managed investment, not already included in Scope 1 or Scope 2.	Depending on how a company defines its organizational boundary, this may be relevant to Hotel Owners which have equity investments, NOT already included in Scope 1 or Scope 2 through the following: ■ Equity investments in subsidiaries with financial control ■ Equity investments in associate companies where the reporting company has significant influence but not financial control ■ Equity investments in joint ventures ■ Other equity investments Hotel owners are to include emissions by the investee arising from its direct and indirect energy consumption from operations under this category and account for their proportional share of equity in the investee.