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# GHG Emissions Basis of Reporting – FY2022

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## About this document

This document describes the calculation boundaries, methodologies, assumptions, and key references used in the preparation of the 2022 GHG inventory, as published in the Lightsource bp Sustainability Report, available online at [Responsible Solar | Sustainable energy | Lightsource bp](#)

Emissions for our business are calculated using methodologies consistent with the Greenhouse Gas (GHG) Protocol: A Corporate Accounting and Reporting Standard, with reference to the additional guidance provided in the GHG Protocol: Scope 2 Guidance (amendment to GHG Protocol), GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3 Standard) and GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (Scope 3 Guidance) as appropriate.

Scope 1 and Scope 2 market-based and location-based emissions for 2022 were subject to an independent limited assurance engagement by PwC, as set out in the independent limited assurance report on page 40 in our 2022 Sustainability Report.

## Organisational boundary, data consolidation and frameworks

Lightsource bp's emissions calculations follow the operational control approach, accounting for all emissions from operations over which we have operational control. Data from joint ventures where we do not have operational control are not included in the dataset.

Data is submitted by business teams including operations and maintenance, asset management, construction, HSE&C, finance, and HR. This data is consolidated by the sustainability team. The data is consolidated according to the same principles as the financial statements. Thus, the consolidated GHG data comprises the ultimate holding company – Lightsource bp Renewable Energy Investments Limited, and subsidiaries controlled by Lightsource bp.

We aim to disclose relevant and transparent information to our stakeholders. Our reporting is guided by the following ESG frameworks: Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB) and Task Force on Climate-Related Financial Disclosures (TCFD). We also report emissions under the UK Streamlined Energy and Carbon Reporting (SECR) requirements as part of our annual financial report.

## Changes from prior year

Due to business activity and improved data sources, some significant changes were made to the 2022 calculations. These have also required a restatement of our 2021 baseline, as per GHG Protocol Base Year Adjustment guidance (impacts >5%).

- Improved methodology and data source for scope 1 including: utilizing fuel invoices instead of mileage for O&M vehicle fuel usage, and separation of natural gas use and electricity consumption for offices instead of assuming all office energy use was electric.
- Inclusion of purchased electricity consumption at solar sites both in location and market-based scope 2 accounting methods. Renewable energy consumption considered in market-based accounting methodology.
- Adjustments to scope 3 emissions including Inclusion of indirect and development spend in purchased goods and services, adjusted capital goods product emissions factors to remove use-phase emissions for transformers and separation of equipment transportation emissions from capital goods category.

Further, Lightsource bp divested operational assets in Spain in 2022. The emissions from these assets were removed from the 2022 dataset, and removed from the 2021 baseline, in line with GHG Protocol.

## Scope 1 emissions

The reporting of direct scope 1 emissions is based on the Greenhouse Gas Protocol and covers all direct emissions of greenhouse gases including carbon dioxide, methane, nitrous oxide, and sulphur hexafluoride. Emissions are calculated as energy consumption multiplied by emission factors.

This includes the emissions for Lightsource bp owned assets, and from our operations which includes providing O&M services to third party owned assets.

Under mobile combustion, emissions are primarily from fuel purchases for owned or long term leased vehicles and usage of fuel for generators or tractors. For our long term leased vehicles and other vehicles such as quadbikes and tractors, we utilize fuel invoices to calculate emissions, and for our on-site generators, usage is gathered from invoices of fuel delivery to sites.

Under fugitive emissions, we include releases of sulphur hexafluoride, a common insulating gas in electrical equipment. Releases of SF6 are captured in our global HSE incident reporting and investigation system. The operations and maintenance (O&M) team reports both the dates and volumes of any releases from our global Lightsource bp owned assets. Where we do not self-perform O&M services, our O&M contractor is contractually obligated to report environmental releases or spills at our solar sites, including SF6.

Under stationary combustion, we have included the natural gas usage at our office buildings. Our offices are under lease agreements, and as such, we have limited visibility to energy usage. We have utilized actual office floor space or estimated floor space based on headcount to estimate the energy usage, per CIBSE guidance. We have assumed that energy usage is a mix of electricity and natural gas. Based on commercial building benchmarks, we estimate water heaters and office heating, comprise 2.2% and 8.9% of the energy usage, respectively, and are fuelled by natural gas, and is part of scope 1. The remaining energy consumption is assumed to be fuelled by electricity and is considered scope 2.

**Exclusions:** Due to the nature of our lease agreements and limited visibility on refrigerant losses, we have excluded fugitive emissions due to A/C and refrigeration from the utilization of our commercial office buildings. We will seek to improve visibility in the future.

## Scope 2 emissions

The reporting of indirect scope 2 emissions is based on the Greenhouse Gas Protocol and includes the indirect GHG emissions from the generation of power consumed by Lightsource bp.

Scope 2 emissions are primarily calculated as electricity consumption multiplied by country-specific emission factors, and state-level emissions factors in the US. Location-based emissions are calculated based on average emission factors, whereas market-based emissions consider renewable energy purchases or supplier specific emissions factors where available. Where renewable energy has not been purchased or supplier specific emissions factors are unavailable, available residual emissions factors are used.

Where a current residual emissions factor is unavailable, a previous year's factor has been used. Where no previous factors are available, the location-based emissions factor has been adjusted to remove renewable energy generation, based on published renewable energy production amounts for the region.

Electricity consumption data is a mix of actual and estimated information. Office electricity consumption is largely estimated, utilizing either actual office area or actual headcount received from HR. Headcount was then multiplied by an estimate of 5m<sup>2</sup>/person. Energy consumption utilizes CIBSE guidance for a standard air-conditioned commercial office supplied by a fossil fuel mix. As described above, some of this energy is assumed to be natural gas and is part of scope 1. The portion of energy usage that is assumed to be electric. (c.90%) is defined as purchased electricity and is captured under scope 2 emissions.

Site purchased electricity consumption is captured by our asset management teams as part of our power generation and consumption tracking, based on metered usage or bills from the local utility. The sites will sometimes pull power from the grid to run some functions at night when the asset is not producing power, or to power operations and maintenance buildings that can be on our larger sites.

We also consider whether the imported electricity is renewable energy or is from the grid, for the purposes of Scope 2 market-based emissions accounting. In Australia, power purchased from the grid to run our solar assets is netted off the generation of solar energy provided to the grid. This means renewable certificates are not issued and resold for the imported energy, meaning the site electricity consumption in Australia is considered 100% renewable energy per Scope 2 market guidance.

In the UK, our current sites are under a contract where the supplier provides 80% renewable energy, as of 1Q 2022, with no further update. In addition, some of our UK offices are on a mix of renewable tariffs. The calculation of market-based emissions is based on the electricity suppliers fulfilling its contractual obligations under the terms of its renewable tariff to back all energy supplied to all its customers on such tariffs by Renewable Energy Guarantees of Origin (REGOs). We have no oversight over that process. In other regions, the purchased electricity is assumed to be from the grid and emissions factors are used as described above.

## Scope 3 emissions

The reporting of indirect scope 3 emissions is based on the Greenhouse Gas Protocol.

**Category 1, Purchased Goods and Services:** Categorised spend data multiplied by relevant spend-category-specific emission factors. This includes EPC and O&M contractor activities, office purchases, development spend and indirect spend.

**Category 2, Capital Goods** includes upstream GHG emissions in the production and manufacture of key components of our assets, including modules, inverters, transformers, trackers or fixed structures and energy storage systems. This is from raw material to factory gate and is based on the date the project started construction – referred internally to as FNTF (Final Notice to Proceed).

**Category 3, Fuel and Energy Related Activities** includes transmission and distribution energy losses (T&D) related to energy consumption in Scope 2 and Well-to-Tank (WTT) emissions for all fuels consumed across scopes 1 and 3.

**Category 4, Upstream Transportation and Distribution** includes the emissions associated with the transportation of capital goods from supplier manufacturing locations to site locations, based on mileage and relevant emissions factors for assumed transportation modes.

**Category 5, Waste Generated in Operations** is calculated based on estimates for municipal waste from offices and a mix of estimates and actual data on construction and operation waste related to Lightsource bp owned assets.

**Category 6, Business Travel** includes expensed business travel for personal vehicles, hire cars, travel agency bookings and other employee business travel by air rail and taxi.

**Category 7, Employee Commuting** includes estimates for the distance travelled and travel type, based on country.

**Category 12, End of Life Treatment of Sold Products** includes estimates for end-of-life disposal of solar farm components, based on material composition and expected disposal method by country.

The subcategories 8, 9, 10, 11, 13, and 14 are not relevant for Lightsource bp. Category 15, investments, is estimated to be minimal and is excluded from the data reported.

## Calculation Factors

For the 2022 year, the following calculation factors were used.

Indicator	Factor	Comment	Reference
Scope 1	Carbon equivalent emissions for fuel usage by transit vans, dual purpose 4x4 vehicles	Based on fuel invoices, by type of fuel, from average diesel Van (up to 3.5t), and diesel dual purpose 4x4	UK Department for Environment, Food, and Rural Affairs (DEFRA)
Scope 1	Carbon equivalent emissions for fuel usage on-site	Based on fuel invoices including litres of diesel (mineral) used in tractors, land tools, quad bikes; generator fuel usage (gas oil)	DEFRA
Scope 1	Carbon equivalent emissions for sulphur hexafluoride (SF6)	Based on released volume (kg)	DEFRA
Scope 1	Carbon equivalent emissions for natural gas consumption	Estimated total consumption volume (m3)	DEFRA
Scope 2	Purchased electricity	Factor for translating square footage to energy consumption in commercial office building	CIBSE Guidance on Energy Efficiency in Buildings
Scope 2	Purchased electricity	United Kingdom	DEFRA
Scope 2	Purchased electricity	European countries	Association of Issuing Bodies (AIB)
Scope 2	Purchased electricity	United States	United States EPA eGrid Database and Green-e.org residual mix emissions rates
Scope 2	Purchased electricity	Australia	Australian Government Department of Environment & Energy Emissions Factors
Scope 2	Purchased electricity	Singapore, Taiwan, South Korea, Brazil	Singapore Energy Market Authority, IRENA, Taiwan Bureau of Energy, Ember Global Electricity Review 2021, Climate Transparency
Scope 3	Carbon emissions from water consumption	Estimated water consumption for all offices (m3)	DEFRA

Scope 3	Carbon emissions for purchased goods and services	Including technical and professional services, based on spend	Supply Chain GHG Emission Factors for US Commodities and Industries
Scope 3	Carbon emissions for contractor vehicle activity	Based on km driven during construction, assuming average petrol car	DEFRA
Scope 3	Carbon emissions for contractor fuel usage	Litre fuel used at construction and O&M sites for generators (gas oil)	DEFRA
Scope 3	Capital Goods	Solar components	Life Cycle Analyses (LCAs) from suppliers
Scope 3	Upstream Transportation	Transportation of solar components (including WTT)	DEFRA
Scope 3	Fuel & Energy Related Activities	T&D and WTT for purchased electricity and mobile combustion	DEFRA
Scope 3	Waste generated	Based on volume of waste recycled or landfill across offices and sites	DEFRA
Scope 3	Business Travel	Expensed mileage and hire cars, including WTT emissions, assuming average petrol car	DEFRA
Scope 3	Business Travel	Rail & flight distance (km), broken down by class; Expensed air, rail, and taxi travel (USD)	DEFRA
Scope 3	Employee commuting	Based on km travelled and transport type, including WTT emissions	DEFRA
Scope 3	End of life treatment	Based on core material (e.g., steel, glass) by weight using material based emission factors for recycling and landfill	DEFRA