

# 2023 Operational GHG Emissions and Electric Power Use

	2023 <sup>1</sup>	2017 <sup>2</sup>
<b>GHG Emissions (mtCO<sub>2</sub>e)</b>		
<b>Scope 1 GHG Emissions</b>	<b>115,294<sup>3</sup></b>	<b>84,463</b>
Natural gas	48,232	44,628
Propane	50	235
Fuel oil	420	1,387
Jet fuel	13,059	9,116
Fugitive emissions	48,658	27,130
Diesel	2,855	1,648
Fleet	1,892	51 <sup>4</sup>
Other energy use <sup>5</sup>	128	268
<b>Scope 2 GHG Emissions (Location-Based)</b>	<b>792,479<sup>3</sup></b>	<b>944,641</b>
Purchased electricity	788,837	937,012
Purchased steam, district heat and chilled water	3,642	7,629
<b>Scope 1 GHG Emissions + Scope 2 GHG Emissions (Location-Based)</b>	<b>907,773</b>	<b>1,029,104</b>
Percentage reduction in Scope 1 and Scope 2 (location-based) GHG emissions from 2017 baseline	-12%	-
GHG emissions intensity <sup>6</sup>	5.7	10.3
<b>Scope 2 GHG Emissions (Market-Based)</b>	<b>3,642<sup>3</sup></b>	<b>858,769</b>
Purchased electricity	-	851,140
Purchased steam, district heat and chilled water	3,642	7,629
<b>Scope 1 GHG Emissions + Scope 2 GHG Emissions (Market-Based)</b>	<b>118,936</b>	<b>943,232</b>
<b>Scope 3 GHG Emissions (Category 6 - business travel)<sup>7</sup></b>	<b>255,481<sup>3</sup></b>	<b>187,713</b>
<b>Scope 1 GHG Emissions + Scope 2 GHG Emissions (Market-Based) + Scope 3 GHG Emissions (Category 6)</b>	<b>374,417<sup>3</sup></b>	<b>1,130,945</b>
Verified Carbon Offsets <sup>8</sup>	374,417 <sup>3</sup>	175,155
<b>Net emissions: Scope 1 GHG Emissions + Scope 2 GHG Emissions (Market-Based) + Scope 3 GHG Emissions (Category 6)</b>	<b>-</b>	<b>955,790</b>
<b>Electric Power (MWh)</b>		
Purchased electricity	2,016,262 <sup>3</sup>	2,154,995
Electricity from long-term renewable contracts <sup>9</sup>	704,633	N/A
Electricity production (on-site solar)	47,443	2,598
Percentage of electric power needs met with on-site generation and long-term renewable electricity contracts <sup>9</sup>	36%	N/A
Purchased renewable electricity <sup>10</sup>	2,016,262 <sup>3</sup>	200,000
Percentage of electric power from renewable sources (production and instruments)	100%	9%

1. For 2023, we have updated the methodology we use to estimate our operational GHG emissions.

2. Data for 2017 has not been subject to external verification and may be revised. Restatement of our 2017 baseline using our updated methodology resulted in a 1.2% increase in the combined total of our Scope 1, Scope 2 (Location-Based) and Scope 3 (Category 6 - business travel) GHG Emissions compared to the previously reported baseline.

3. We engaged an external third-party to perform a limited assurance engagement over these metrics presented for 2023.

4. For 2017, emissions from fleet were not updated to the current methodology due to data limitations. Total emissions from fleet accounted for approximately 0.06% of the overall Scope 1 GHG emissions and 0.005% of the overall Scope 1 and Scope 2 (location-based) GHG emissions for 2017.

5. Includes heavy fuel oils, anthracite coal, biofuels and waste.

6. Includes Scope 1 and Scope 2 (location-based) GHG emissions; mtCO<sub>2</sub>e/million USD revenue.

7. For 2023, Scope 3 (Category 6 - business travel) includes: air and rail travel, car rental, ride share, expensed mileage and hotel stays. For 2017, Scope 3 (Category 6 - business travel) includes only air travel data. Due to data limitations, and to align with our updated emissions methodology, we applied the percentage breakdown of haul distances and cabin classes from 2023 air travel data as a proxy to calculate 2017 air travel emissions.

8. Carbon offsets, also referred to as "carbon credits," and the market for them are evolving rapidly. Although we endeavor to source high-quality carbon credits verified by independent third parties, the ability to use carbon credits to fully and permanently address unabated emissions relies on certain assumptions and is subject to debate among experts.

9. Tracking began in 2021.

10. Purchased renewable electricity from unbundled energy attribute certificates, contractual instruments which included long-term power purchase agreements, virtual power purchase agreements and renewable supply contracts.



## Report of Independent Accountants

To the Management of JPMorgan Chase & Co.

We have reviewed the accompanying management assertion of JPMorgan Chase & Co. that the greenhouse gas (“GHG”) emissions, verified carbon offsets, purchased electricity, and purchased renewable electricity metrics (“metrics”) for the year ended December 31, 2023 in management’s assertion are presented in accordance with the assessment criteria set forth in management’s assertion. JPMorgan Chase & Co.’s management is responsible for its assertion and for the selection of the criteria, which management believes provide an objective basis for measuring and reporting on the metrics. Our responsibility is to express a conclusion on management’s assertion based on our review.

Our review was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants (AICPA) in AT-C section 105, *Concepts Common to All Attestation Engagements*, and AT-C section 210, *Review Engagements*. Those standards require that we plan and perform the review to obtain limited assurance about whether any material modifications should be made to management’s assertion in order for it to be fairly stated. The procedures performed in a review vary in nature and timing from, and are substantially less in extent than, an examination, the objective of which is to obtain reasonable assurance about whether management’s assertion is fairly stated, in all material respects, in order to express an opinion. Accordingly, we do not express such an opinion. Because of the limited nature of the engagement, the level of assurance obtained in a review is substantially lower than the assurance that would have been obtained had an examination been performed. We believe that the review evidence obtained is sufficient and appropriate to provide a reasonable basis for our conclusion.

We are required to be independent and to meet our other ethical responsibilities in accordance with relevant ethical requirements related to the engagement.

The firm applies the Statements on Quality Control Standards established by the AICPA.

The procedures we performed were based on our professional judgment. In performing our review, we performed inquiries, read relevant policies to understand terms related to relevant information about the metrics, performed tests of mathematical accuracy of computations on a sample basis, and reviewed supporting documentation in regard to the completeness and accuracy of the data in the metrics on a sample basis.

GHG emissions quantification is subject to significant inherent measurement uncertainty because of such things as GHG emissions factors that are used in mathematical models to calculate GHG emissions, and the inability of these models, due to incomplete scientific knowledge and other factors, to accurately measure under all circumstances the relationship between various inputs and the resultant GHG emissions. Environmental and energy use data used in GHG emissions calculations are subject to inherent limitations, given the nature and the methods used for measuring such data. The selection by management of different but acceptable measurement techniques could have resulted in materially different amounts or metrics being reported.

Management establishes criteria, makes determinations as to the relevancy of information to be included, and makes assumptions that affect the reported verified carbon offsets, purchased electricity and purchased renewable electricity metrics. The selection by management of different but acceptable measurement techniques could have resulted in materially different metrics being reported.



As discussed in management's assertion, JPMorgan Chase & Co. has estimated purchased electricity consumption for certain buildings and GHG emissions for certain emissions sources for which no primary usage data is available.

Based on our review, we are not aware of any material modifications that should be made to JPMorgan Chase & Co.'s management assertion in order for it to be fairly stated.

*PricewaterhouseCoopers LLP*

New York, New York  
August 23, 2024

**Management Assertion**

**Overview**

With respect to the greenhouse gas (“GHG”) emissions, verified carbon offsets, purchased electricity, and purchased renewable electricity metrics (“metrics”) presented in the table below for the year ended December 31, 2023, management of JPMorgan Chase & Co. (“JPMC”, “we” or “our”) asserts that these metrics are presented in accordance with the assessment criteria set forth below. Management is responsible for the selection of the criteria, which management believes provide an objective basis for measuring and reporting on the metrics, and for the completeness, accuracy, and validity of the metrics.

JPMC uses the operational control approach to establish the organizational boundary for our metrics. Except for Scope 3 GHG emissions (category 6 – business travel), the boundary includes: company-owned or leased commercial offices, warehouses, residential buildings, ATMs, data centers, disaster recovery centers, non-JPMC facilities, parking, and miscellaneous facility types for which we control the energy usage (collectively, referred to as “buildings”); company-owned or leased vehicles; and company-owned, leased or chartered aircraft (collectively, referred to as “aircraft”). For Scope 3 GHG emissions (category 6 – business travel), the boundary includes business travel related activity by JPMC employees. The metrics presented in the table below exclude data centers used by Neovest, a subsidiary which offers a broker neutral service, due to limited availability of data.

Data related to buildings owned or leased by companies acquired during the current year as well as companies acquired within 18 months prior to the reporting year start date are excluded while the company is integrated into JPMC’s operations. Inclusion of data related to vehicles owned or leased, aircraft, and business travel related activity by employees of companies acquired during the current year is based on an internally developed integration strategy.

Metric	Metric Quantity	Definition of Metric
Scope 1 GHG Emissions <sup>1,2,3,4,5</sup>	115,294 MTCO <sub>2</sub> e	Direct emissions from combustion of fossil fuels and fugitive emissions from refrigerants used in buildings, as well as direct emissions from combustion of fossil fuels from vehicles and aircraft.
Scope 2 GHG Emissions (Location-Based) <sup>1,2,3,4,6</sup>	792,479 MTCO <sub>2</sub> e	Indirect emissions from purchased electricity used in buildings and electric vehicles, as well as from steam, chilled water cooling, and district heat used in buildings using location-based emissions factors.
Scope 2 GHG Emissions (Market-Based) <sup>1,2,3,4,6</sup>	3,642 MTCO <sub>2</sub> e	Indirect emissions from purchased electricity used in buildings and electric vehicles, as well as from steam, chilled water cooling, and district heat used in buildings using market-based emissions factors.
Scope 3 GHG Emissions (category 6 - business travel) <sup>1,2,3,4,7</sup>	255,481 MTCO <sub>2</sub> e	Indirect emissions from commercial air and rail travel, ground transportation (car rental, employee expensed mileage, and rideshare (including taxis) expenses), and hotel stays.
Scope 1 GHG Emissions + Scope 2 GHG Emissions (Market-Based) + Scope 3 GHG Emissions (category 6) <sup>1,2,3,4,5,6,7</sup>	374,417 MTCO <sub>2</sub> e	Sum of Scope 1 GHG emissions, Scope 2 GHG emissions (market-based), and Scope 3 GHG emissions (category 6).

Metric	Metric Quantity	Definition of Metric
Verified Carbon Offsets <sup>1,2 3,4,8</sup>	374,417 MTCO <sub>2</sub> e	Purchased verified carbon offsets from nature-based, hybrid and engineered removal projects which included improved forest management (IFM), afforestation, blue carbon, biochar, and bio-oil sequestration.
Purchased Electricity <sup>1,4,9</sup>	2,016,262 MWh	Electricity consumed from purchased electricity used in buildings and electric vehicles.
Purchased Renewable Electricity <sup>1,4,9</sup>	2,016,262 MWh	Purchased renewable electricity from unbundled energy attribute certificates (“EACs”), contractual instruments which included long-term power purchase agreements (“PPAs”), virtual power purchase agreements (“vPPAs”) and renewable supply contracts.

### Metric Footnotes

1. JPMC considers the principles and guidance of the World Resources Institute (WRI) and the World Business Council for Sustainable Development’s (WBCSD) *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition*; *GHG Protocol Scope 2 Guidance: An amendment to the GHG Protocol Corporate Standard*; and *Corporate Value Chain (Scope 3) Accounting and Reporting Standard: Supplement to the GHG Protocol Corporate Accounting and Reporting Standard* (together, the “GHG Protocol”) to guide the criteria to assess, calculate, and report direct and indirect GHG emissions, purchased electricity, and purchased renewable electricity. JPMC additionally considers the principles and guidance of RE100 to guide the criteria for purchased renewable electricity, and the Integrity Council for the Voluntary Carbon Market’s (IC-VCM) *Core Carbon Principles*, and the Voluntary Carbon Market Integrity Initiative (VCMI) to guide the criteria for purchasing EACs and verified carbon offsets.

2. GHG emissions quantification is subject to significant inherent measurement uncertainty because of such things as GHG emission factors that are used in mathematical models to calculate GHG emissions, and the inability of these models, due to incomplete scientific knowledge and other factors, to accurately measure under all circumstances the relationship between various inputs and the resultant GHG emissions. Environmental and energy use data used in GHG emissions calculations are subject to inherent limitations, given the nature and the methods used for measuring such data. The selection by management of different but acceptable measurement techniques could have resulted in materially different amounts or metrics being reported.

3. Carbon dioxide equivalent (“CO<sub>2</sub>e”) emissions are inclusive of carbon dioxide (“CO<sub>2</sub>”), methane (“CH<sub>4</sub>”), nitrous oxide (“N<sub>2</sub>O”), hydrofluorocarbons (“HFCs”), perfluorocarbons (“PFCs”), sulfur hexafluoride (“SF<sub>6</sub>”), and nitrogen trifluoride (“NF<sub>3</sub>”). Emissions data by individual gas is not disclosed as a majority of CO<sub>2</sub>e relates to CO<sub>2</sub>. These CO<sub>2</sub>e emissions utilize Global Warming Potentials (“GWPs”) as follows: (i) where the GWP is not embedded in the emission factor, GWPs defined by the Intergovernmental Panel on Climate Change’s (“IPCC”) Sixth Assessment Report (AR 6, 100-year horizon), (ii) where the GWP is embedded in the emission factor but the emission factor by individual gas is not disclosed, the embedded GWP is applied, or (iii) where the GWP is embedded in the emission factor and the emission factor by individual gas is disclosed, the embedded GWP is converted to AR 6.

4. The following units of measure were used: MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalent; and MWh = megawatt hour.

5. Scope 1 GHG emissions include the emissions sources listed below. Approximately 55% of reported Scope 1 GHG emissions were estimated.

- Buildings
  - Emissions from fossil fuels (natural gas, fuel cell, diesel fuel, propane, coal, oil, and biofuel) used in buildings were calculated using the following approach:
  - Where fuel consumption or spend was available, emissions were calculated based on:

- For fossil fuel consumption excluding fuel cells: Monthly fuel consumption was collected from third-party invoices or internal usage records.
    - For fuel cells: Electricity consumed via fuel cells in kilowatt hour (kWh) was collected from customer reports supplied by the vendor.
    - For spend related to diesel fuel: Spend data was collected from third-party invoices. Considering guidance set forth in the United States (“US”) Environmental Protection Agency’s (“EPA”) *Supply Chain Greenhouse Gas Emission Factors for US Industries and Commodities*, spend was converted to 2018 dollars to account for inflation or deflation using industry-level price index data (2022) published by the US Bureau of Economic Analysis to align with the 2018 dollar amounts used in the Comprehensive Environmental Data Archive (“CEDA”) model.
  - Where fuel consumption was not available, an estimate was determined using square footage from internal building records multiplied by a fuel mix per square foot assumption (if applicable and as outlined below), and the median fuel energy use intensity (“EUI”) by building type from the Department of Energy’s (“DOE”) Building Performance Database (“BPD”), accessed on 4/20/2023.
    - For buildings located in the US and buildings that are located in countries not covered by the International Energy Agency (“IEA”) Energy Efficiency Indicators (2023), we assumed that building heat is provided entirely by natural gas.
    - For buildings located in all other countries (those covered by the IEA), we used the IEA Energy Efficiency Indicators (2023) to calculate fuel mix (i.e., proportion of buildings energy consumption by this fuel type).
  - We used the following emissions factors (EFs):
    - Fossil fuels (excluding fuel cell and biofuel):
      - US EPA Emission Factors Hub (September 2023): (category: *US EPA EF fuel type*)
        - Natural gas: *Natural gas*
        - Diesel fuel: *Distillate Fuel Oil No. 2*
        - Propane: *Propane*
        - Coal: *Anthracite*
        - Oil: *Heavy Gas Oils*
      - Spend: CEDA Global 5 (2022) diesel emissions factors.
    - Fuel cell:
      - JPMC used Bloom Energy for fuel cell. Bloom Energy’s technical note “How Bloom Reduces Emissions: Technical Note”, accessed on 4/7/2023, provided an equipment specific range of emissions. We applied a 0.75 factor to the emissions rate range (which was supplied in lb/MWh) for a conservative emissions rate and converted the rate to kilograms (“kg”) per kWh.
    - Biofuel:
      - CH<sub>4</sub> and N<sub>2</sub>O emission factors are sourced from the Department for Energy Security and Net Zero (“DESNZ”) UK Government GHG Conversion Factors for Company Reporting (June 2023).
      - Following the GHG Protocol, CO<sub>2</sub> emissions from biogenic combustion related to biofuel (heating energy) were not included in our reported Scope 1 GHG emissions.
- Refrigerants
  - Emissions from refrigerants used in buildings were calculated by inputting building type into the US EPA’s *Simplified Screening Approach 1* (October 2016), which provided the refrigerant type (R-410A, R-404A and R-134a) and refrigerant (in kg) per square foot. This refrigerant by square foot was multiplied by the square footage collected from internal building records.
  - We used the following GWPs:

- For R-134a, GWPs from the IPCC's AR6, 100-year horizon.
    - For blended refrigerants (R-404A and R-410A), refrigerant composition was sourced from the US EPA's *Compositions of Refrigerant Blends*, accessed on 3/14/2024, to appropriately apply GWPs from the IPCC's AR6, 100-year horizon.
  - Vehicles
    - Emissions from fossil fuels (ethanol, diesel fuel, and motor gasoline) used in vehicles were calculated using the following approach:
    - Where fuel consumption was available, emissions were calculated using fuel consumption (gallons) for each month collected from internal company vehicle records.
    - Where fuel consumption was not available, a distance-based method was used to estimate consumption based on number of vehicles and distance traveled collected from internal company vehicle records.
    - We used the following emissions factors:
      - Where fuel consumption was available: US EPA Emission Factors Hub (September 2023). For ethanol emissions, stationary combustion emission factors were used as a proxy for mobile combustion.
        - Following the GHG Protocol, CO<sub>2</sub> emissions from biogenic combustion related to ethanol (car travel) were not included in our reported Scope 1 GHG emissions.
      - Where fuel consumption was not available:
        - International light-duty trucks only: US EPA Emission Factors Hub (September 2023).
        - For International hybrid vehicles only: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
        - For International (all other vehicle types): Ecoinvent Emissions Factors for transport by various modes (Ecoinvent 3.9.1).
  - Aircraft
    - Emissions from jet fuels used in aircraft were calculated using the following approach:
    - Where fuel consumption was available, emissions were calculated based on fuel consumption (gallons) collected from internal records. If fuel consumption was provided in pounds, we assumed 6.7 lb. / gallon density of jet fuel per Sustainable Aviation Fuel *Metrics Fact Sheet #13* (2021).
    - Where fuel consumption was not available, fuel consumption was estimated based flight hours and fuel economy collected from the vendor.
    - We used the following emissions factors:
      - Kerosene-Type Jet Fuel emissions factor from the US EPA Emission Factors Hub (September 2023).

6. Scope 2 GHG emissions include the emissions sources listed below. Approximately 13% of reported Scope 2 GHG emissions were estimated.

- Purchased electricity used in buildings were calculated using the following approach:
  - Where electricity consumption was available, emissions were calculated based on monthly consumption collected from third-party invoices.
  - Where electricity consumption was not available, an estimate was determined as follows:
    - For primary-use data centers (buildings where data centers are the primary use), electricity consumption in kWh was estimated based on load capacity in kW multiplied by hours assuming the building is running at maximum capacity 24 hours a day for the entire month. Load capacity was collected from internal records.
    - For secondary- or tertiary- use data centers (buildings where data centers are not the primary use), we considered the primary use of the building and applied the same methodology as “all other buildings” noted below.

- For ATM locations, electricity consumption was estimated based on the total number of ATMs obtained from internal company records and median kWh of electricity consumption, which was calculated based on electricity consumption available for ATMs of a similar type.
    - For all other buildings, electricity consumption was estimated based on square footage from internal building records and the median electricity EUI by building type from the DOE's BPD, accessed on 4/20/2023.
  - For locations where actual sub metered consumption does not include landlord overhead, utility invoices were treated as actuals without the inclusion of landlord overhead. In the absence of sub metered consumption, we did not estimate for landlord overhead.
  - Emissions from device locations (JPMC owned devices at non-JPMC facilities) were excluded from the footprint due to limited availability of electricity consumption data.
  - We used the following emissions factors:
    - Market-based emissions factors:
      - JPMC follows and applies the market-based data hierarchy outlined in the GHG Protocol Scope 2 Guidance (Table 6.3) (from highest to lowest precision):
        - Unbundled EACs purchased and retired by JPMC.
          - Sourcing and retirement of EACs considered the guidelines on geography, vintage, certification, and retirement established by the GHG Protocol Scope 2 Guidance and RE100.
          - The EACs applied to the 2023 reporting year have been contracted for and will be retired before November 30, 2024.
          - JPMC was unable to source certain EACs from within the same market boundary where the electricity consumption occurred due to limited availability of EACs within those market boundaries. These EACs make up 39,203 MWh of purchased renewable electricity. The exclusion of the use of these EACs from Scope 2 market-based GHG emissions would result in 15,431 MTCO<sub>2</sub>e. In these cases, JPMC sourced the EACs from outside market boundaries. These EACs therefore do not follow the application and retirement guidelines on geography established by the GHG Protocol Scope 2 Guidance and RE100.
        - Contractual instruments for electricity which included PPAs and vPPAs and which allow JPMC to consume renewable electricity or purchase EACs.
        - Renewable supply contracts which included green tariffs (i.e., JPMC buildings signed up for a local clean energy program).
        - Residual mix emissions factors:
          - US: 2022 Green-e® Residual Mix Emissions Rates (2020 data) for CO<sub>2</sub>, with the EFs for CH<sub>4</sub> and N<sub>2</sub>O from the US EPA Emissions & Generation Resource Integrated Database (“eGRID”) subregions with 2022 data (January 2024).
          - European countries: Association of Issuing Bodies 2022 European Residual Mixes, Version 1.0 (June 2023) for CO<sub>2</sub>, with the EFs for CH<sub>4</sub> and N<sub>2</sub>O from the DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
          - If no other market-based emissions factors were available, location-based emissions factors (as described below) were applied.
    - Location-based emissions factors:
      - US: US EPA eGRID subregions with 2022 data (January 2024).



- UK: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
  - Australia: Australian Government Department of Climate Change, Energy, the Environment and Water Australian National Greenhouse Accounts Factors (February 2023).
  - Canada: Environment and Climate Change Canada National Inventory Report 1990 – 2020: Greenhouse Gas Sources and Sinks in Canada (2022).
  - Other countries included in IEA’s data set: IEA Emissions Factors, 1990-2000, for each country’s grid (September 2022).
  - All other countries: Ecoinvent Emissions Factors for each country’s grid (Ecoinvent 3.9.1).
- Purchased electricity used in electric vehicles were calculated using the following approach:
  - Emissions were calculated based on distance traveled collected from internal records. Distance was converted into electricity consumption based on a kWh per mile traveled efficiency per the AFLEET Tool 2020 from the Argonne National Laboratory (April 2021). No estimates were necessary as actual data was available.
  - We used the following emissions factors (market-based and location-based):
    - Same as the emissions factors applied in calculating Scope 2 location-based purchased electricity used in buildings.
- Steam, chilled water cooling, and district heat used in buildings were calculated using the following approach:
  - Where steam, chilled water cooling, and district heat consumption was available, emissions were calculated based on consumption data collected from third-party invoices.
  - Where steam, chilled water cooling, and district heat consumption was not available, an estimate was determined using square footage from internal building records multiplied by a fuel mix per square foot assumption (if applicable and as outlined below), and the median fuel EUI by building type from the DOE’s BPD, accessed on 4/20/2023.
    - For buildings located in the US and buildings that are located in countries not covered by the IEA Energy Efficiency Indicators (2023), we assumed that building heat is provided entirely by natural gas, and therefore, no emissions were estimated for steam, chilled water cooling, and district heat.
    - For buildings located in all other countries (those covered by the IEA), we used the IEA Energy Efficiency Indicators (2023) to calculate fuel mix (i.e., proportion of buildings energy consumption by this fuel type).
  - We used the following emissions factors (market-based and location-based) based on the countries which reported the following emissions sources:
    - For steam: US: US EPA Emissions Factor Hub (September 2023).
    - For chilled water cooling:
      - Denmark and other EU-27 countries (countries in the European Union as defined by the European Commission): Johansen & Werner (2022) EFs (data from 2017) for CO<sub>2</sub>, with the EFs for CH<sub>4</sub> and N<sub>2</sub>O from the DESNZ and Department for Business, Energy & Industrial Strategy (“BEIS”) UK Government GHG Conversion Factors for Company Reporting (June 2022). US: US EPA Emissions Factor Hub (September 2023).
    - For district heat:
      - UK: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
      - EU-27 countries (countries in the European Union as defined by the European Commission): Johansen & Werner (2022) EFs (data from 2017) for CO<sub>2</sub>, with the EFs for CH<sub>4</sub> and N<sub>2</sub>O from the DESNZ and BEIS UK Government GHG Conversion Factors for Company Reporting (June 2022).

- All other countries: Ecoinvent Emissions Factors for Heat - district or industrial – other than natural gas (Ecoinvent 3.9.1).

7. Scope 3 GHG emissions (category 6 - business travel) include the emissions sources listed below.

- Commercial air travel
  - Emissions were calculated based on flight distance and cabin class collected from third-party business travel vendors or air travel spend, which included booking fees, collected from JPMC's internal expense platform. Spend was adjusted for inflation or deflation as described in Footnote 5.
  - We used the following emissions factors:
    - Flight distance and cabin class of passenger: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2022) for Long, Medium (short haul), and Short (domestic). When cabin class was not available, JPMC used the average passenger emission factor supplied by the DESNZ publication noted.
    - Spend: CEDA Global 5 (2022) commercial air travel emissions factors.
- Rail travel
  - Emissions were calculated based on distance traveled and travel type collected from third-party business travel vendors or rail travel spend, which included booking fees, from JPMC's internal expense platform. Spend was adjusted for inflation or deflation as described in Footnote 5.
  - We used the following emissions factors:
    - Activity level data based on travel type (US commuter travel (intracity), US intercity travel (intercity), non-US domestic rail travel, and international rail travel):
      - International rail and non-US domestic rail travel: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
      - Intercity and intracity rail travel: US EPA Emission Factors Hub (September 2023).
    - Spend: CEDA Global 5 (2022) rail emissions factors.
- Ground transportation (car rentals and employee expensed mileage)
  - For employee expensed mileage, emissions were calculated based on vehicle class and distance travelled by location collected from JPMC's internal expense platform.
  - For car rentals, emissions were calculated based on spend from JPMC's internal expense platform. Spend was adjusted for inflation or deflation as described in Footnote 5.
  - We used the following emissions factors:
    - Employee expensed mileage:
      - US: US EPA Emission Factors Hub (September 2023).
      - UK: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
      - All other countries: Ecoinvent Emissions Factors for transport by various modes (Ecoinvent 3.9.1).
    - Car rentals:
      - We derived vendor specific emissions factors based on emissions and revenue reported to the CDP. Emissions reported by vendors in their CDP reports were used to the extent that they included the relevant emissions scope (i.e., Scope 1, Scope 2, etc.) for the spend category (i.e., car rental, air travel, etc.).
      - Where vendor specific emissions factors were not used, CEDA Global 5 (2022) car rental emissions factors.
- Hotel stays
  - Emissions were calculated based on hotel night count (number of nights booked multiplied by the number of rooms) collected from third-party business travel vendors or hotel spend data, which included booking fees, collected from JPMC's internal expense platform. Spend was adjusted for inflation or deflation as described in Footnote 5.

- We used the following emissions factors
  - Hotel night count: DESNZ UK Government GHG Conversion Factors for Company Reporting (June 2023).
    - If country level detail was not provided, we used a global emissions factor that was calculated using the 50th percentile of all available country specific factors in the “Hotel Stay” tab from DESNZ emissions factors referenced above.
  - Spend: CEDA Global 5 (2022) hotel emissions factors.
- Ground transportation (rideshare (including taxis) expenses)
  - Emissions were calculated based on spend collected from JPMC’s internal expense platform. Spend was adjusted for inflation or deflation as described in Footnote 5.
  - We used the following emissions factors:
    - CEDA Global 5 (2022) ground transportation emissions factors.

#### 8. Verified Carbon Offsets

- We establish criteria, make determinations as to the relevancy of information to be included, and make assumptions that affect the reported verified carbon offsets metric. Our selection of different but acceptable measurement techniques could have resulted in a materially different metric being reported.
- Carbon offsets are sourced directly through carbon suppliers.
  - JPMC entered into purchase agreements with suppliers to address Scope 1, 2 (non-electricity) and 3 (category 6 – business travel) GHG emissions. The purchased credits were verified by a third-party validation and verification body (VVB) and issued by one of the following registries: American Carbon Registry (ACR), Climate Action Reserve, Verra or Puro.earth. Once verified and validated, suppliers retired credits in JPMC’s name and provided the retirement certificates as evidence. All carbon credits purchased have been retired.

#### 9. Purchased electricity and purchased renewable electricity

- We establish criteria, make determinations as to the relevancy of information to be included, and make assumptions that affect the reported purchased electricity and purchased renewable electricity metrics. Our selection of different but acceptable measurement techniques could have resulted in materially different metrics being reported.
- Purchased electricity
  - Calculated based on the actual and estimated consumption data from purchased electricity used in buildings and electric vehicles as described in Footnote 6.
  - Approximately 13% of reported purchased electricity was estimated.
- Purchased renewable electricity
  - Calculated based on the (1) renewable electricity purchased through renewable supply contracts and (2) application of unbundled EACs and contractual instruments which included PPAs and vPPAs as described in Footnote 6.