Uber for Business CO2 emissions reporting methodology note

At Uber, we aim to be transparent about our progress as we move toward becoming a zero-emission platform. This includes being transparent about the methodology that underlies our calculations. To that end, this document provides a high-level synopsis of how we identify vehicle fuel types and estimate the emissions from trips arranged on our platform.

Scope

Geo: All markets where rides services are available through the Uber platform
Coverage: Month-to-month; January 2021 to present
Line of Business

1. For Uber for Business rides services on Uber Travel, Central, Health (where available) and Uber Vouchers products only (does not include Uber Eats)
2. Completed trips only

Emission

The reporting provided is not a guarantee of actual emissions or rates. Estimates may vary depending on the specificity of the data available for the trip(s) at issue and in certain regions, as further described below.

1. Only tailpipe (Tank-to-Wheel) fossil fuel combustion related CO2 emissions are included.
2. Non CO2 GHG (greenhouse gases) emissions (e.g., methane) are not included, as the majority of GHG gasses resulting from transportation fossil fuel combustion is CO2. For example, in the US transportation sector, more than 99% of fossil fuel combustion related GHG are CO2 (EPA).

Distance

1. The CO2 emissions metrics provided on the Uber for Business dashboard are for the on-trip period only, meaning between rider pickup and dropoff. The metrics do not include periods when a driver is waiting for a ride request or when a driver is on the way to pick up a rider.
2. For shared ride trips (e.g., UberX Share), the overlapping portion of the on-trip distances are allocated evenly among the parties involved in the shared ride chain.

Fuel efficiency identification

Obtaining the most accurate fuel efficiency data is a challenge, in particular for non-US+Canada geographies.. We are constantly striving to update and improve our methodology. What follows is a synopsis of our current state of vehicle-level fuel efficiency identification.

Belgium, Canada, Germany, the Netherlands, Portugal, Spain, and US (CAR <10 passenger capacity)

We rely mainly on vehicle identification numbers (VINs) to identify a driver's vehicle details. Each vehicle has a unique VIN, and we source vehicle details per VIN from third-party data providers. This decoding returns fuel type (gasoline or diesel), engine type (hybrid, ICE, electric), and estimated fuel efficiency (fuel consumption per distance, such as mpg) for each vehicle. When VIN decoding is unsuccessful or unavailable, we use the following fallback methods to impute vehicle data:

1. Assign average emission intensity of active vehicles in the same make/model/year (MMY) using third-party data for VINs that did successfully decode (MMY must have at least 3 active vehicles with fuel-efficiency data).
2. Assign continent-level vehicle efficiency estimates. For the US and Canada, assign fuel efficiency of 22.2 mpg (average fuel efficiency for light-duty vehicles in 2019, per US Department of Transportation) and assume gasoline car with non-hybrid internal combustion engine. (This fallback is rarely used for the US and Canada, which are mostly captured by the first fallback.) For vehicles in the UK and 6 EU countries that have model year data, use European Environment Agency average emission intensity data for that year. For example, if the vehicle has a model year of 2020, assign average emission efficiency for 2020 newly sold vehicles.
3. For vehicles in the UK and 6 EU countries that don't have a model year, assign a country-level static emission intensity data based on the Fuel Economy in Major Car Markets report from Global Fuel Economy Initiative (GFEI), International Council on Clean Transportation (ICCT), and International Energy Agency (IEA).

Australia, France, India, and the UK (CAR <10 passenger capacity)

In France and India, we identify zero-emission vehicles (ZEVs) based on vehicle registration information. In Australia and the UK, our operations team has a manual process for tagging ZEVs. We default to those systems, then fall back to the methods outlined above for Belgium, Canada, Germany, the Netherlands, Portugal, Spain, and the US.

The rest of the world (CAR <10 passenger capacity)
For all other regions/countries, we assign average country-level emission intensity based on the ICCT (International Council on Clean Transportation) report. For Brazil, we apply some modifications to capture the improvement in emission intensity over time, based on the IHS report.

As of Q3 2023, if the MM of the vehicle corresponds with a MM that is only associated with ZEVs, that vehicle is tagged as a ZEV.

CAR 10+ passenger capacity
Whenever trips are completed by vehicles with 10+ passenger capacity (e.g. Uber Bus), we use country level emission efficiency based on ICCT report (here) with premium factor (4x). For example, ICCT report states 198gCO2/km as emission efficiency for the US. For 10+ passenger capacity vehicles in the US, emission efficiency is 198x4 = 792gCO2/km. This 4x number is based on AFDC study – US data, but paratransit shuttle & school bus fuel economy = ~ ¼ of ridesourcing vehicles.

Motorcycle & 3 wheeler
According to the Scientific American article (here), Autorickshaw has ⅓ of LDV CO2 emissions. Based on this, whenever a trip is completed by 3 wheelers, we use country level emission efficiency based on ICCT report (here) with discount factor (1/3).

CO_2 emissions calculation

We calculate emissions using the most granular data available. Emissions are only calculated for on-trip miles, not when vehicles are en-route to pick up a passenger. After identifying fuel-efficiency and fuel-type data, we use the following formula to estimate fuel consumption and emissions:

$$CO_2 = \sum_{t,f}\left(\frac{vehicle\ miles\ traveled_t}{fuel\ efficiency_{t,f}} \times emission\ factor_f\right)$$

Where:

- CO_2 is CO_2 emissions from the target trips, in gCO_2
- $vehicle\ miles\ traveled_t$ is vehicle miles traveled[1] of trip t
- $fuel\ efficiency_{t,f}$ is fuel efficiency of the vehicle used for trip t and fuel type is f (for U.S. and Canada, when the average trip speed is less than 30 miles per hour, we use city mpg; when the average trip speed is 30 mph or higher, we use highway mpg)
- $emission\ factor_f$ is CO_2 emitted per unit fuel for fuel type f

[1]Vehicle miles or kilometers traveled during each state is estimated based on GPS data taken from Uber's Driver app. We use a map-matching method whenever possible to accurately reflect real-world city environments. For drivers who complete both rides trips and deliveries, logic assigns P1 mileage to the appropriate LOB based on whether a trip or delivery was completed before/after the P1 state.

Emission factor:

Fuel type	**Emissions in grams CO_2 per gallon (tank-to-wheel)**
• Gasoline • Flex fuel • Electric with gas generator • Gas/electric hybrid • Plug-in gas/electric hybrid	8,887
• Compressed natural gas (CNG) • Propane • Natural gas	5,680
• Biodiesel	9,450
• Diesel • Diesel/electric hybrid	10,180
• Electric • Hydrogen fuel cell	0

CO_2 emissions saved via ZEVs (zero-emission vehicles)

The amount of on-trip CO_2 emissions saved by ZEV trips is calculated by assuming a counterfactual whereby each ZEV trip would have been completed by a vehicle with average emissions intensity (gCO_2/mile) for non-ZEV vehicles on Uber. To add more granularity, the calculation is aggregated by trip country and trip month. This methodology can be expressed by the following formula:

$$CO_2s = \sum_{t,m,c} \left(vehicle\ miles\ traveled_t \times emissions\ intensity_{m,c} \right)$$

Where:

- CO_2s is CO_2 emissions saved from the target trips, in gCO_2
- $vehicle\ miles\ traveled_t$ is the on-trip vehicle miles traveled for trip t
- $emission\ intensity_{m,c}$ is the average emissions intensity, in gCO_2/mile, for non-ZEV vehicles on Uber per month m and country c.