

# Carbon Footprint Allocation Methodology across Multiple Business Teams and Activities

## Amazon

### BUSINESS PROBLEM

Amazon commits to measure and report GHG emissions and to achieve net-zero emissions in 2040 by physically decarbonizing its business activities and offsetting residual emissions. Logistic businesses are accountable to execute and track their progress and are doing so at different speeds, which is influenced by external policies and technologies. However, businesses often share responsibility over the emissions of single asset or decisions, benefitting from a centralized carbon allocation logic. This will be a source of information for decarbonization strategies and cross-business collaboration that accelerate the physical decarbonization.

### DATA SOURCES

Historical trip data, available in Amazon's SQL/Redshift servers

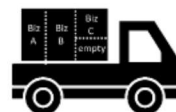
### Data Types and Format

Time series

### APPROACH

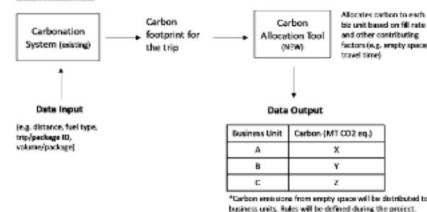
The logic embedded in Amazon's cost allocation and carbonation systems will be the foundation for carbon allocation models. Steps include (1) build internal business cases and process mapping, (2) collate, integrate, and validate data sets, (3) build and deploy allocation tool and reporting mechanisms, and (4) recommend implementation framework to logistics other business segments.

#### Use Case Example



A truck, owned and operated by business unit A, is carrying and delivering packages for business units A, B, and C.

#### Data Process Flow



## IMPACT

Amazon is one of the most complex companies in the world, with several layers of interdependencies and relationship among different business teams. By developing a new mechanism to measure the carbon contribution of these interdependencies across Amazon's business teams, we will empower and enable new strategies and opportunities to accelerate Amazon's physical decarbonization. Inspired by the existing cost allocation system, carbon allocation will add a new layer of the impact of business decisions and identify investment, collaboration and efficiency opportunities aligned with a holistic strategy, that is inclusive and highlights accountability across all business segments towards Amazon 2040 Net Zero goal. As a side effect, this carbon allocation model will provide opportunities to increase data quality and completeness, aiding to materialize carbon metrics and reduce the ambiguity on business impact. The carbon allocation mechanism will standardize and provide a platform to scale beyond logistics to other concrete assets (facilities), and more ambiguous business activities (supply chain topology) or and increase visibility of Supply Chain (Scope 3) emissions. We first begin with building use cases for business teams within transportation segment, and then aim to scale the mechanism to other business segments in Amazon, such as Devices and Buildings.

### DRIVERS

Framework for calculating carbon emission of a trip has been studied very well in the industry. Therefore, it was clear what data categories were necessary for building a carbon allocation methodology in transportation.

### BARRIERS

Access to trip data that were considered confidential limited the scope of this project.

### ENABLERS

Amazon is fully committed to achieving its sustainability goals. To meet those goals as a company, internal business teams are also encouraged to come up with innovative ways to reduce GHG emission from its operations. This strong commitment to sustainability at both company and team level helped my project move forward.

### ACTIONS



We spoke with internal stakeholders who have interdependency with other stakeholders (e.g., borrowing a truck space for delivery), and developed multiple use cases for carbon allocation in transportation. We then extracted actual trip data to test the carbon allocation logics and develop a decision tree model.

### INNOVATION

Introduced a decision tree mechanism for deciding what Carbon Intensity unit to use for carbon allocation in transportation teams.

### IMPROVEMENT

A standardized method for multiple teams in transportation to allocate carbon among interdependent teams.

### BEST PRACTICES

Understand how the company/team is calculating its carbon emission and what data is available for carbon allocation. Assess how using a particular carbon intensity unit as KPI may affect the team's system and whether it will contribute to efficient decarbonization.

### OTHER APPLICATIONS

Similar concept could be used for non-transportation teams at Amazon that also contribute to the company's carbon footprint (e.g., servers, corporate buildings).