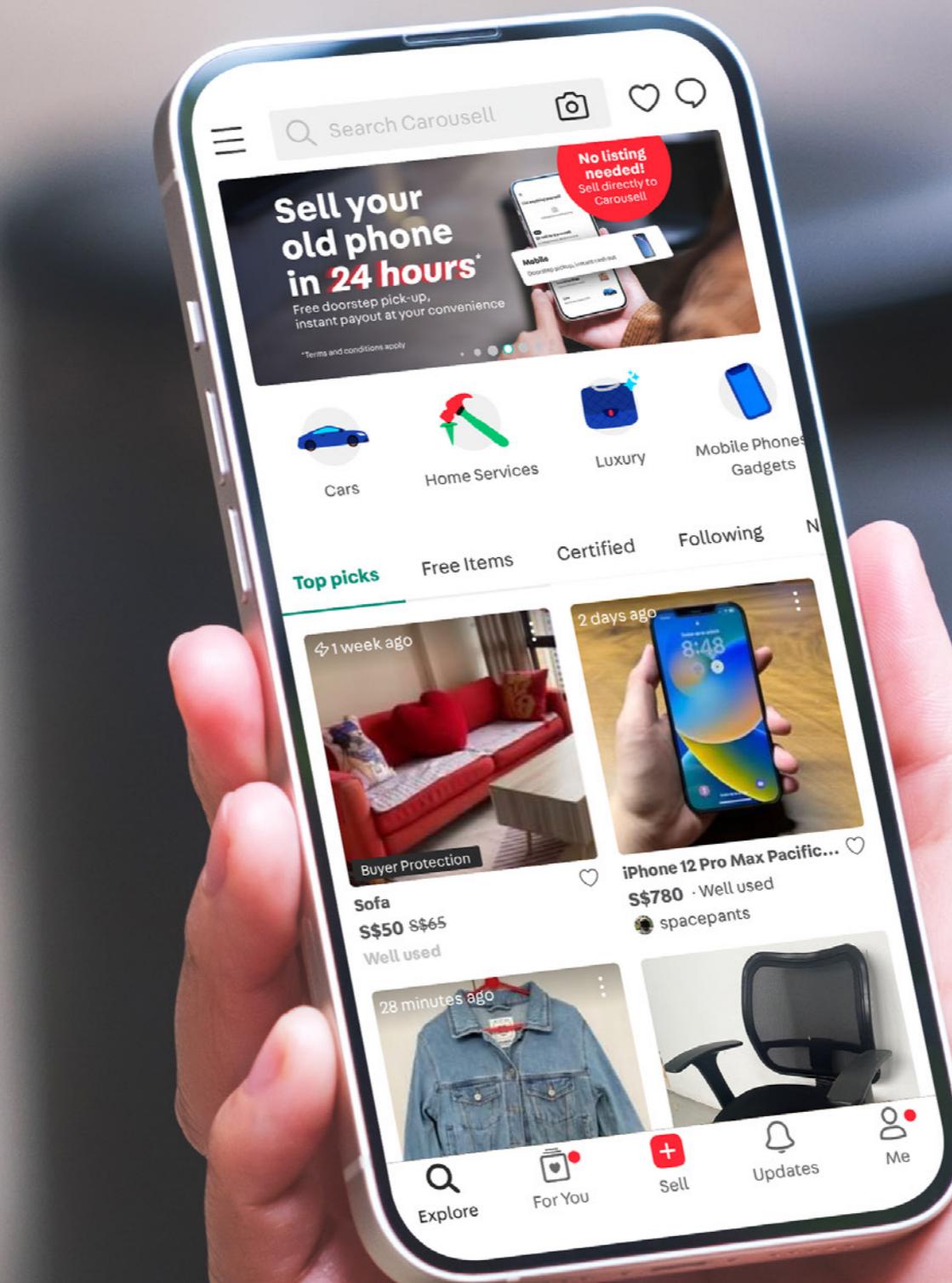




# Carousell Group Circular Economy Impact Report

2023





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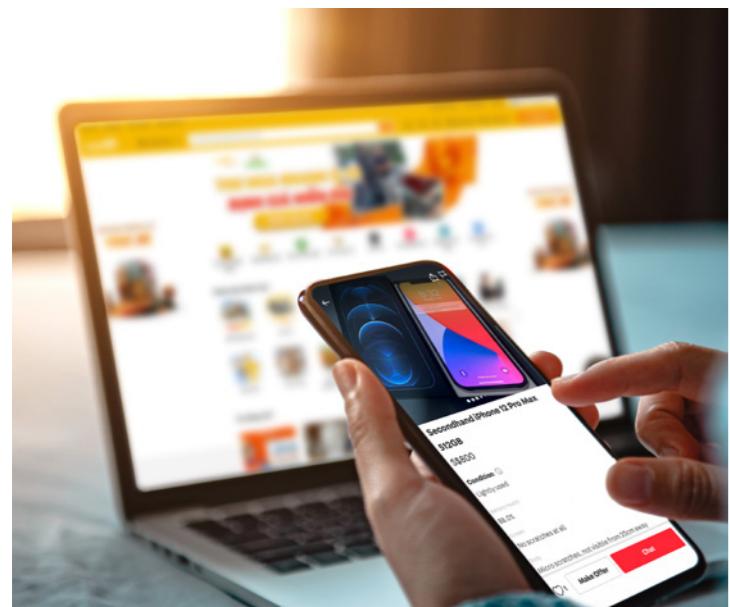
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# About Carousell Group

**Carousell Group is the leading multi-category, multi-brand platform for secondhand in Greater Southeast Asia on a mission to make secondhand the first choice.**



7 markets

Tens of millions  
of monthly active users



Leading multi-category classifieds and recommerce marketplace in Singapore, Hong Kong, Indonesia, Malaysia, the Philippines and Taiwan



Media Group

Leader in the Retail Media industry across Southeast Asia and Hong Kong



Leading online classifieds marketplace in Vietnam



Leading AI-first end-to-end electronics recommerce platform in Indonesia



Largest C2C digital marketplace for selling and finding almost anything in Malaysia



by carousell

Online automotive platform for people to research, sell and buy both new and used cars in Singapore



Leading omnichannel thrift store with around 20 physical stores in Singapore and Malaysia



Financial solutions provider for both businesses' and individuals' automotive needs



# Founders' letter

Sustainability has been an integral part of Carousell's mission from our inception. Buying and selling secondhand items disrupt the need to unnecessarily constantly produce brand new items and extend the availability of limited resources for future generations. Hence, we started Carousell with the goal of inspiring people to sell their underutilised and unused items, and encourage everyone to make secondhand their first choice to give these items a new lease of life instead of having them end up in the landfills.

As the leading enabler of the circular economy in Greater Southeast Asia, we are grateful to have had the support of our user community across our 7 markets in partaking in the circular economy since we started in 2012. A decade on, we are encouraged to see a growing shift in environmental consciousness in our region, notably led by Gen Z and Millennial consumers displaying a substantial surge in their preference for sustainable products<sup>1</sup>. As a region, we can still do more.

<sup>1</sup> — Auto, H. (2021, December 31). More younger consumers interested in sustainability: UOB study

Our goal for Carousell Group in our second decade is to accelerate the future of secondhand through recommerce. Besides advancing the recommerce capabilities of our marketplaces to make buying and selling secondhand items more trusted and convenient, we want to also quantify the circular economy impact made by our user community so as to further advocate for more to join in the push for sustainability.

We first started by calculating the proportion of carbon emissions that were potentially saved when choosing secondhand over new. We are very excited by the findings of the climate impact of our user community, even though we only included a subset of our categories and markets to begin with. Hence we decided to release our inaugural **Circular Economy Impact Report** this year. This is just the beginning, as we continue to expand this study to even more of our categories and markets. We hope that this report will help more people realise how much one person can do to reduce environmental impact, and encourage everyone to join us in advancing the circular economy by choosing secondhand.

**Lucas, Marcus, Siu Rui**



**Our user community avoided 116,577 tonnes of carbon emissions in four goods categories in 2022, the equivalent to 5.3 million trees absorbing CO<sub>2</sub> per year.**



Fashion & Luxury



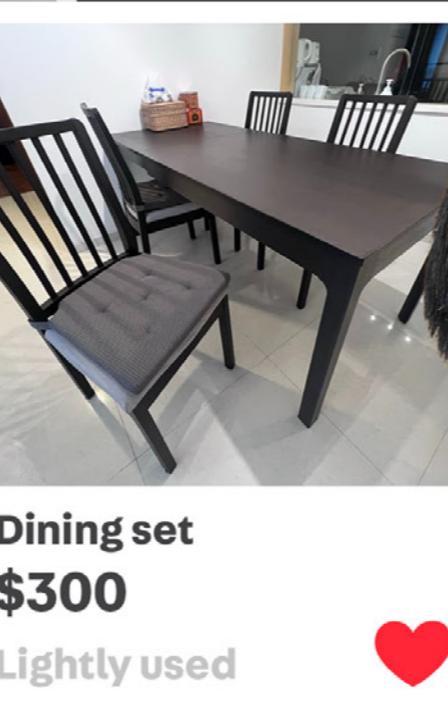
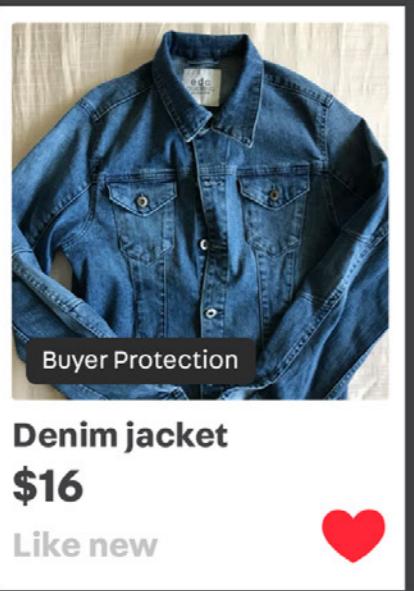
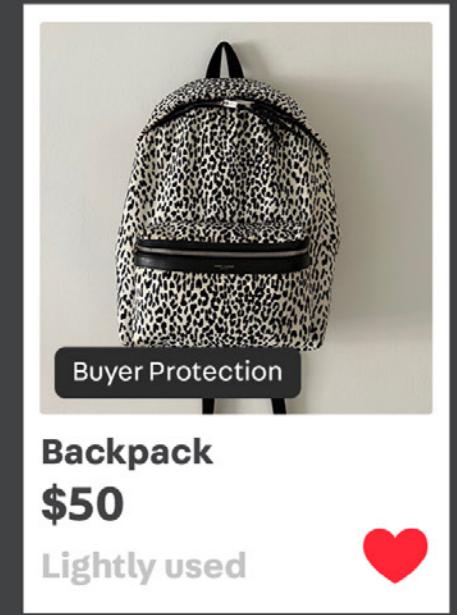
Electronics



Furniture & Home Living



Hobbies & Toys



# Section 1

# Our circular economy impact

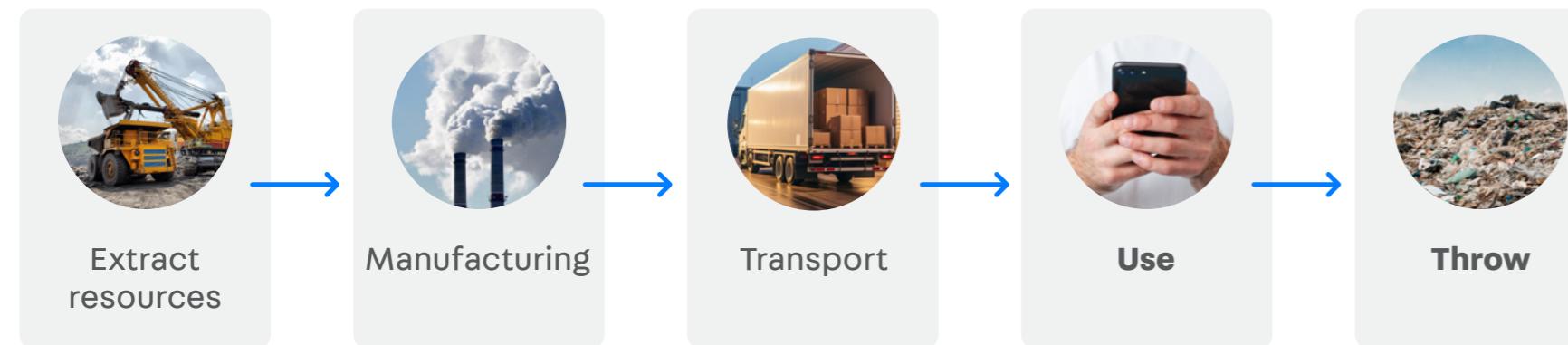




# Buying and selling secondhand is a better choice for the planet

The Earth's resources are finite, and the conventional 'extract - manufacture - buy - use - throw' approach in a linear economy continually depletes these resources, exacerbating this issue. As discarding items in landfills releases carbon emissions, the short life cycle of a product in a linear economy causes additional stress on our planet's delicate ecosystem.

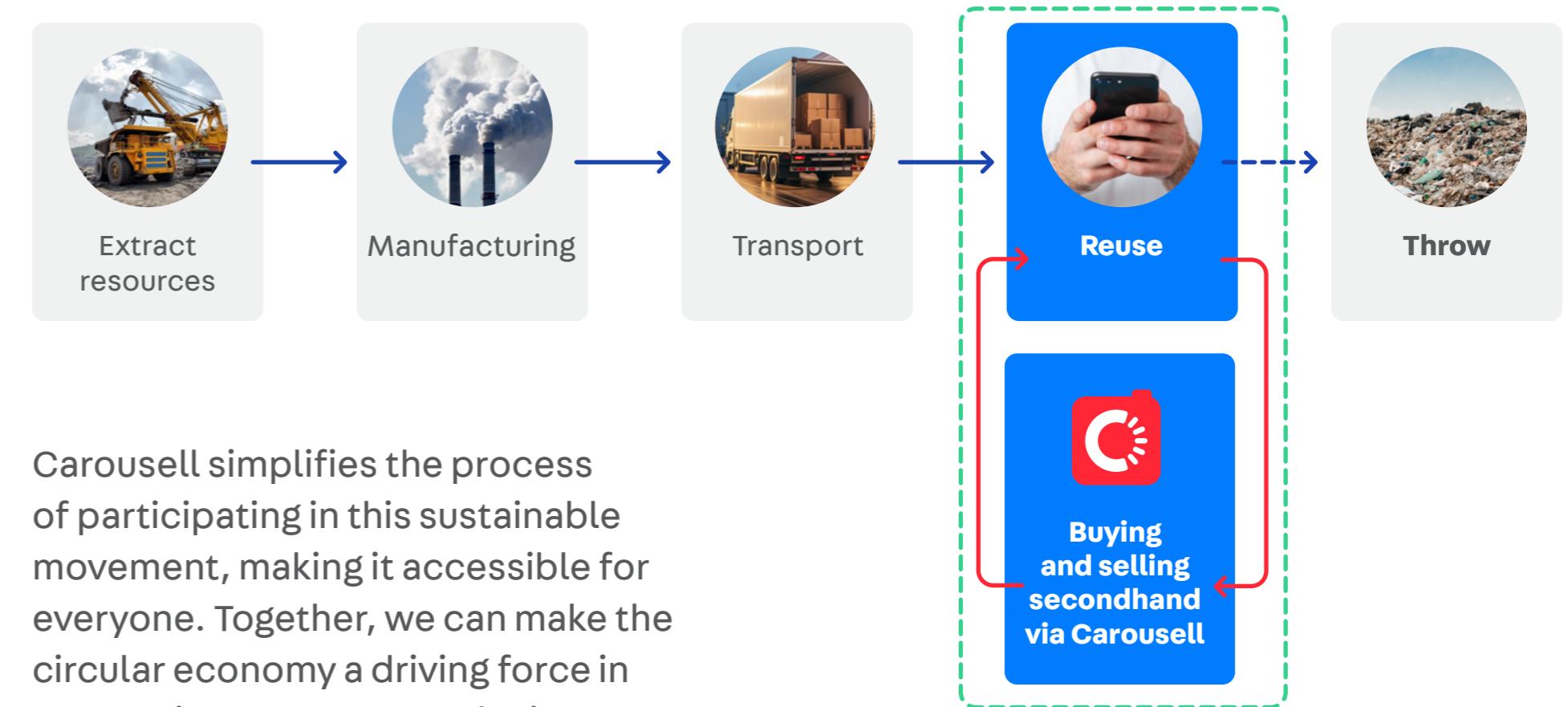
## Life cycle of a product in a linear economy



We want to break this reckless cycle of overconsuming resources to produce new items that are fleetingly used before ending up in landfills. It starts with embracing the circular economy. When you buy and sell secondhand items, you give a new lease of life to still-useable products, effectively extending their life cycle. This conscious choice eliminates the need for buying similar brand new items to a substantial extent, reducing the demand for new production. This, in turn, alleviates the environmental impact associated with manufacturing, transportation and packaging of these new products.

Choosing secondhand is not merely a lifestyle choice; it's a conscientious step towards safeguarding our planet's resources and ecosystem. By opting for secondhand, you not only fulfill your needs, but also significantly reduce your carbon footprint.

## Life cycle of a product in a circular economy



Carousell simplifies the process of participating in this sustainable movement, making it accessible for everyone. Together, we can make the circular economy a driving force in conserving resources, reducing waste and leaving behind a healthier planet for future generations.



# Over a decade of making secondhand the first choice

Sustainability has been at the core of our business model from the beginning. Each year, the Carousell Group facilitates tens of millions of secondhand transactions across our family of brands in the Greater Southeast Asia region. We actively promote responsible consumption and the principles of the circular economy, emphasising the continuous use of items through reuse, recycling, and upcycling. Our aim is to empower our users to make environmentally conscious choices, generating a positive impact on the planet. Through buying and selling secondhand items, our users contribute to the United Nations Sustainable Development Goal (SDG) 12, which advocates Responsible Consumption and Production, bringing us closer to a more sustainable future.

## Our marketplaces are synonymous with secondhand and have a strong regional presence in Greater Southeast Asia region

As of December 2022





II

**By facilitating secondhand transactions, we hold a central role in advancing the circular economy alongside our users in the Greater Southeast Asia region. As a leading enabler of the circular economy in our region, we have a responsibility to lead by example and measure the potential positive impact of choosing secondhand products over new ones in a trustworthy and transparent way. The robustness of our chosen methodology underscores our strong commitment to sustainability, and forms the bedrock of our sustainability endeavours.** II

Gaurav Bhasin  
Chief Strategy Officer  
Carousell Group





# Scope of the report

Our inaugural Circular Economy Impact Report quantifies the Avoided Emissions (proportion of carbon emissions that were potentially saved) due to our users purchasing secondhand items on our Group's marketplaces, in place of a new item, in 2022. **Carousell Group partnered with Vaayu, a European climate tech company** empowering brands and businesses within the retail ecosystem to track and cut their carbon and environmental impact in real-time. By leveraging proprietary AI and machine learning technology, along with its Life Cycle Assessment (LCA) Database of 600,000+ product data points, Vaayu calculates impact across 16 environmental impact categories and has collaborated with more than 60 global brands to date. Their carbon footprinting methodology is certified by TÜV Rheinland in line with the leading GHG Protocol Corporate Standard.

This section describes the overall scope of this report, providing details on the inclusions, as well as the exclusions that fall outside the scope of this year's impact report. **Throughout the modelling and analysis, a conservative approach was used wherever possible to avoid overrepresenting the emissions-saving potential of our Group's marketplaces.**

- 1 As part of the current scope of our debut Circular Economy Impact Report quantification, only transactions facilitated in 2022 from Carousell (Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, Taiwan), Laku6 (Indonesia and Singapore) and REFASH (Singapore) have been included. Whereas, transactions from our Group's other brands Chợ Tốt (Vietnam), Mudah.my (Malaysia) and OneShift (Singapore) have not yet been calculated.
- 2 In this inaugural report, we focused only on calculating the climate impact for four major goods categories: Fashion & Luxury, Electronics, Furniture & Home Living and Hobbies & Toys (comprising 20 subcategories out of the total 54 subcategories<sup>2</sup>).
- 3 The scope for this analysis was for secondhand transactions only, hence transactions involving items with the 'new' condition tag were also intentionally excluded.

As a consequence of the above, our inaugural report encompasses approximately 31% of the total GMV (Gross Merchandise Value) transacted on our Group's marketplaces in 2022. This report signifies the initial phase of our quantification journey, and we are dedicated to progressively incorporating all remaining categories and integrating our other Group brands Mudah.my, Chợ Tốt and OneShift within the scope in the coming years.

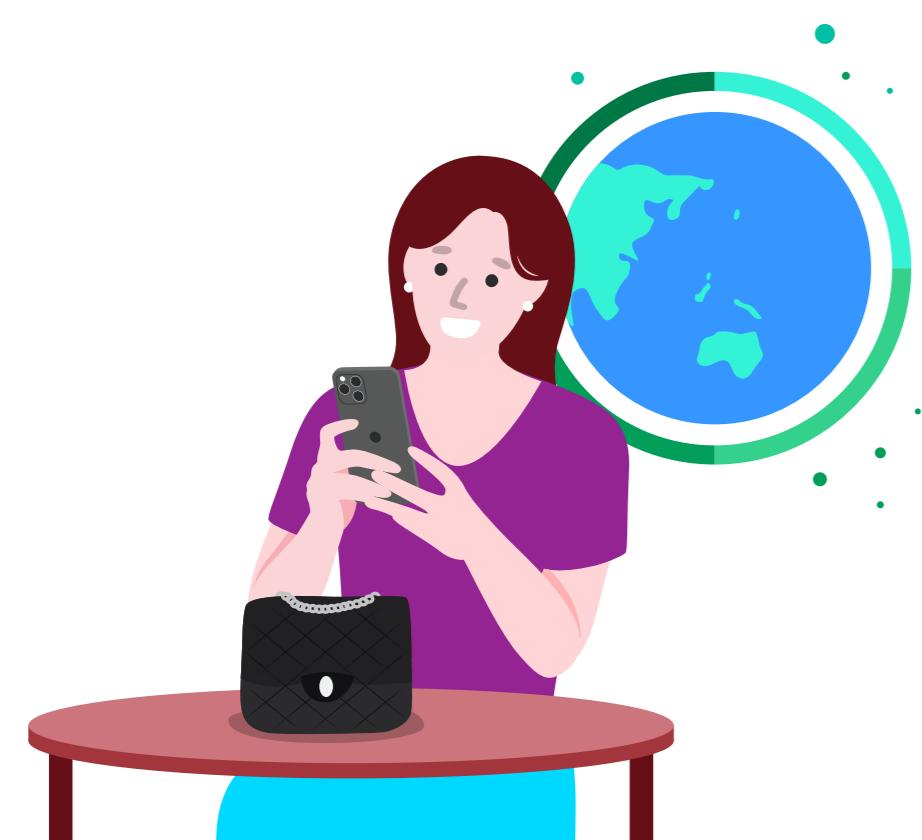
<sup>2</sup> See Annex 2 for more details on the sub-categories included in the calculations



# Carousell's community impact in 2022

**116,577 tonnes of CO<sub>2</sub>e**

**Total Avoided Impact by Carousell Group's users  
by choosing secondhand over new in four goods  
categories in 2022**



This Avoided Impact refers to the proportion of carbon emissions that were potentially saved due to our users purchasing secondhand items specifically in **four major goods categories only** (Fashion & Luxury, Electronics, Furniture & Home Living and Hobbies & Toys) on Carousell Group's marketplaces (Carousell, Laku6 and REFASH) instead of buying new. Chợ Tốt, Mudah.my and OneShift were excluded in calculations from this report.

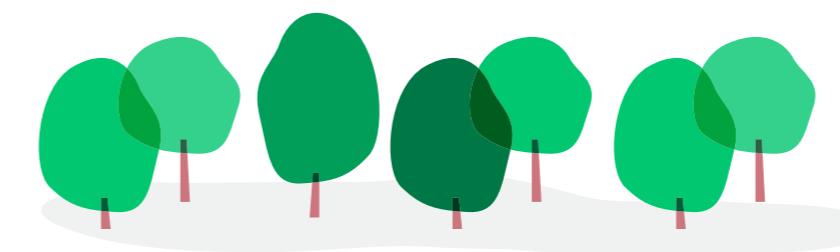
**Equivalent to:**

Powering  
**2.5 million light bulbs**  
for a year<sup>3</sup>



**5.3 million trees**

which is approximately  
76% of total trees in Singapore  
absorbing CO<sub>2</sub> per year<sup>4</sup>

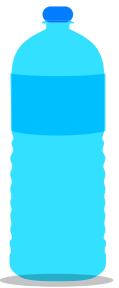


<sup>3</sup> Assumed 10 watt LED bulb

<sup>4</sup> Assumed average CO<sub>2</sub> absorbed by one mature tree to be 22 kilograms per year

The production of

**179 million plastic bottles,**



which represents approximately  
38% of Singapore's annual plastic  
bottle consumption<sup>5</sup>



Charging the mobile  
phones<sup>6</sup> of the entire  
population of

**Singapore 3,164 times**

**Hong Kong 2,545 times**

**Taiwan 797 times**

**Malaysia 554 times**

**Philippines 162 times**

**Indonesia 69 times**

<sup>5</sup> Assumed only manufacturing climate impact of PET bottles and not the total environmental impact

<sup>6</sup> Assumed electricity required to charge one smartphone to be 0.012 kWh



# Almost **56%** of purchases on the Carousell marketplace **displaced** the purchase of a new item

On average across our markets, **55%** of our surveyed users reported an **increase** in buying and selling of **secondhand** items in 2022 as compared to 2021

The Displacement Rate quantifies whether the purchase of a secondhand product on Carousell was an additional purchase or if it substituted the purchase of a new product. This is based on the user behaviour research conducted by Carousell in July-August 2023

Preloved denim jeans  
\$10

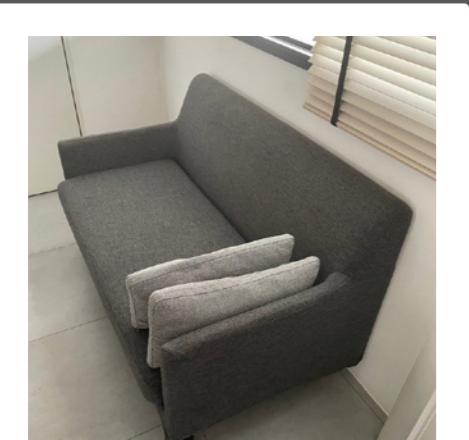
**Buy**





# Impact from every transaction counts!

By buying secondhand items on Carousell marketplaces



Sofa  
**\$100**

Well used



iPhone 14  
**\$780**

Well used

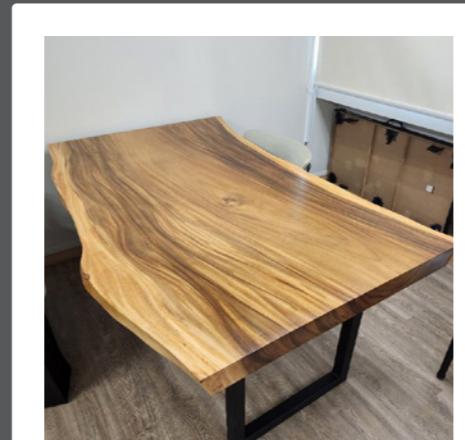


Table  
**\$100**

Lightly used



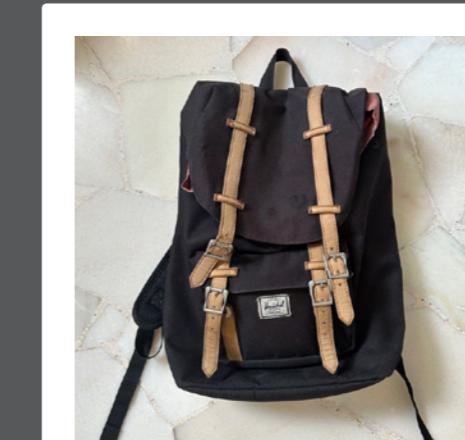
14-in MacBook Pro  
**\$388**

Lightly used



Women's coat  
**\$40**

Lightly used



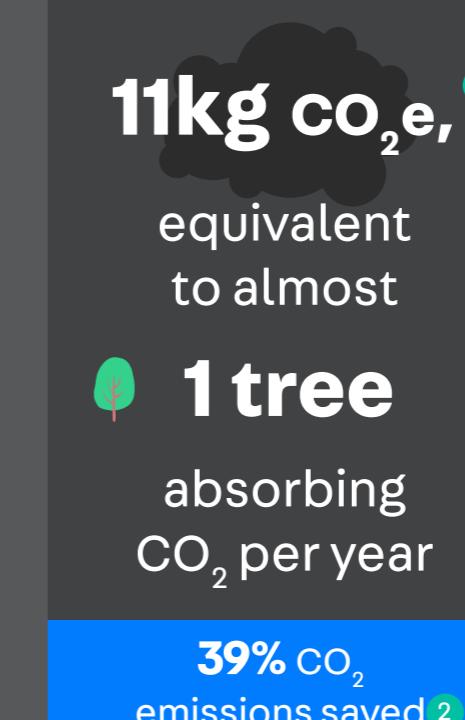
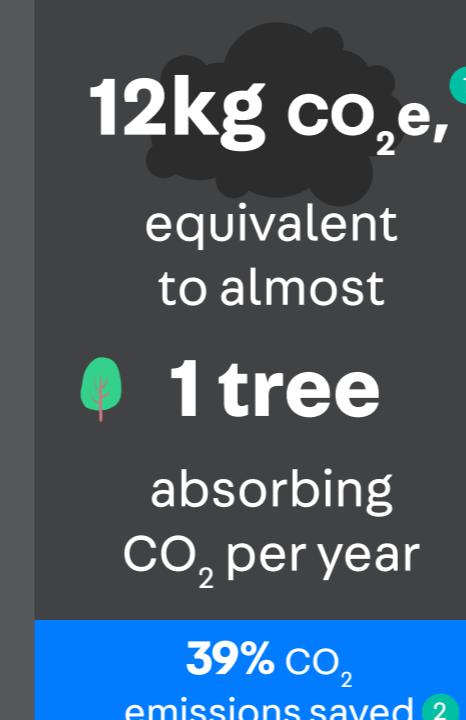
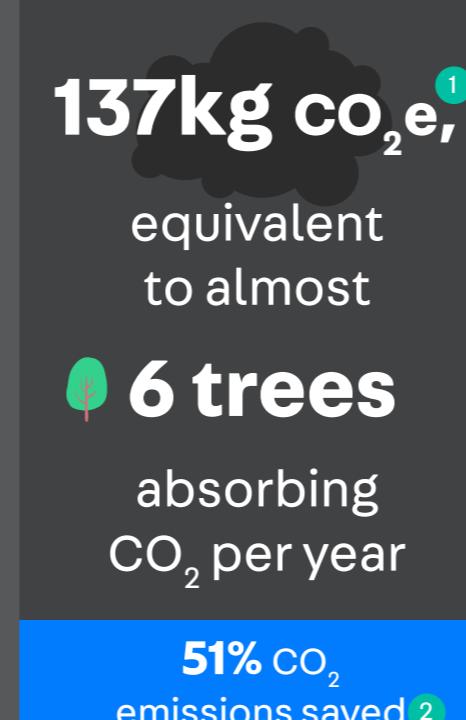
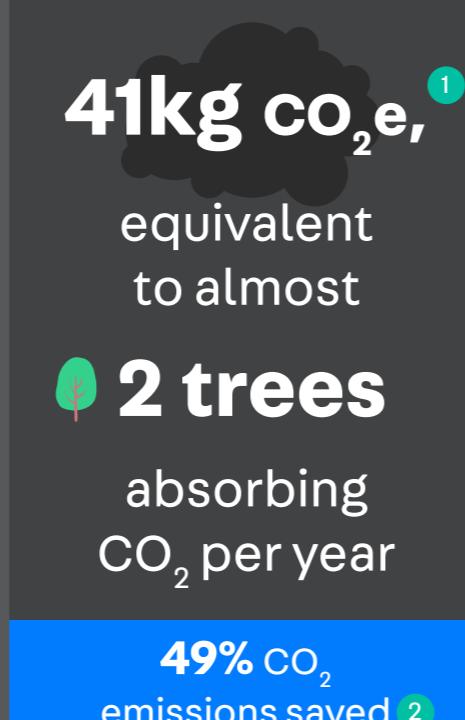
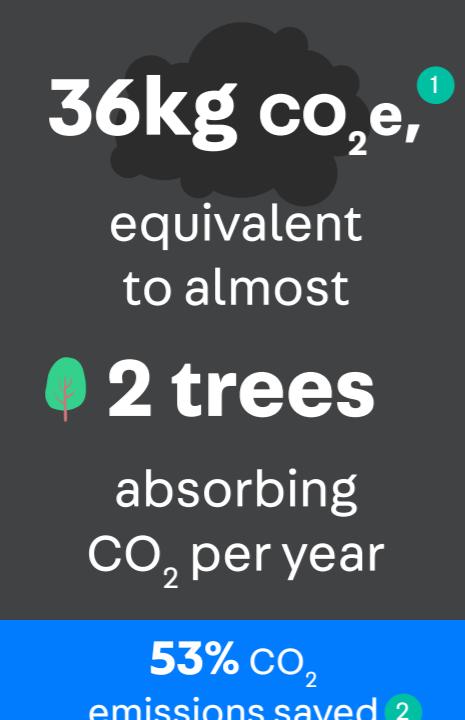
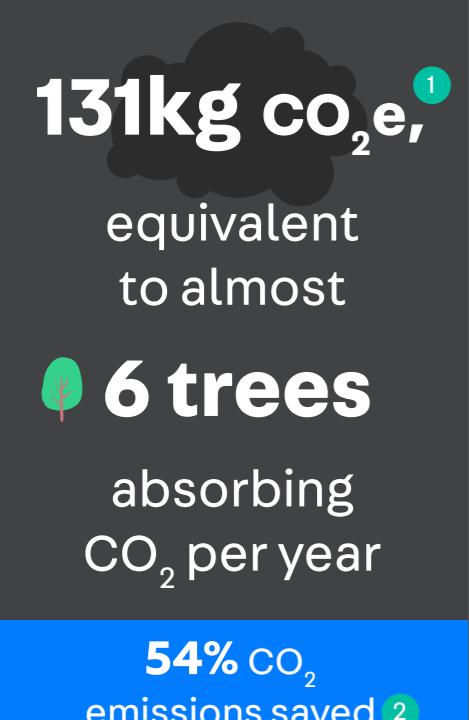
Backpack  
**\$20**

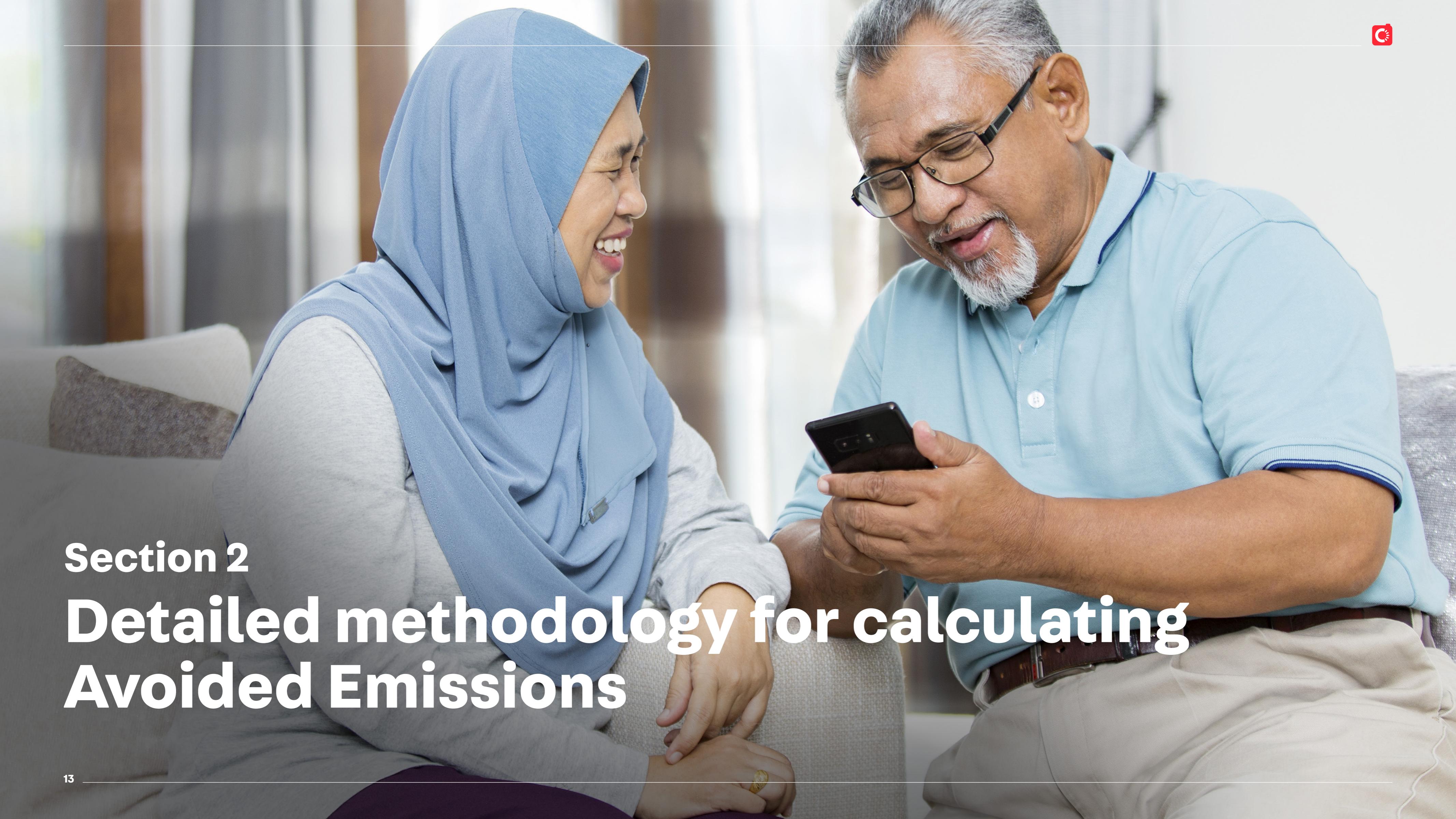
Heavily used

<sup>1</sup> Difference between average climate impact of a new item and average climate impact of a secondhand item purchased on Carousell within the same category. The average climate change impact of a new item was determined using the Life Cycle Assessment (LCA) Modelling Engine (Vaayu's proprietary Engine), by employing a Cradle-to-Consumer system boundary. Furthermore, category Displacement Rate from Carousell's user behaviour research as well as operational footprint per product were used to derive the average climate impact of a secondhand item purchased on Carousell. See Section 2 "Detailed methodology of Avoided Emissions" for more details.

<sup>2</sup> Percentage of carbon emissions saved by buying secondhand item on Carousell vs buying new.

You can save up to





**Section 2**  
**Detailed methodology for calculating**  
**Avoided Emissions**



# Overview

In terms of the methodology, this analysis uses elements from a consequential Life Cycle Assessment (LCA) approach, a globally recognised method for calculating Avoided Emissions.

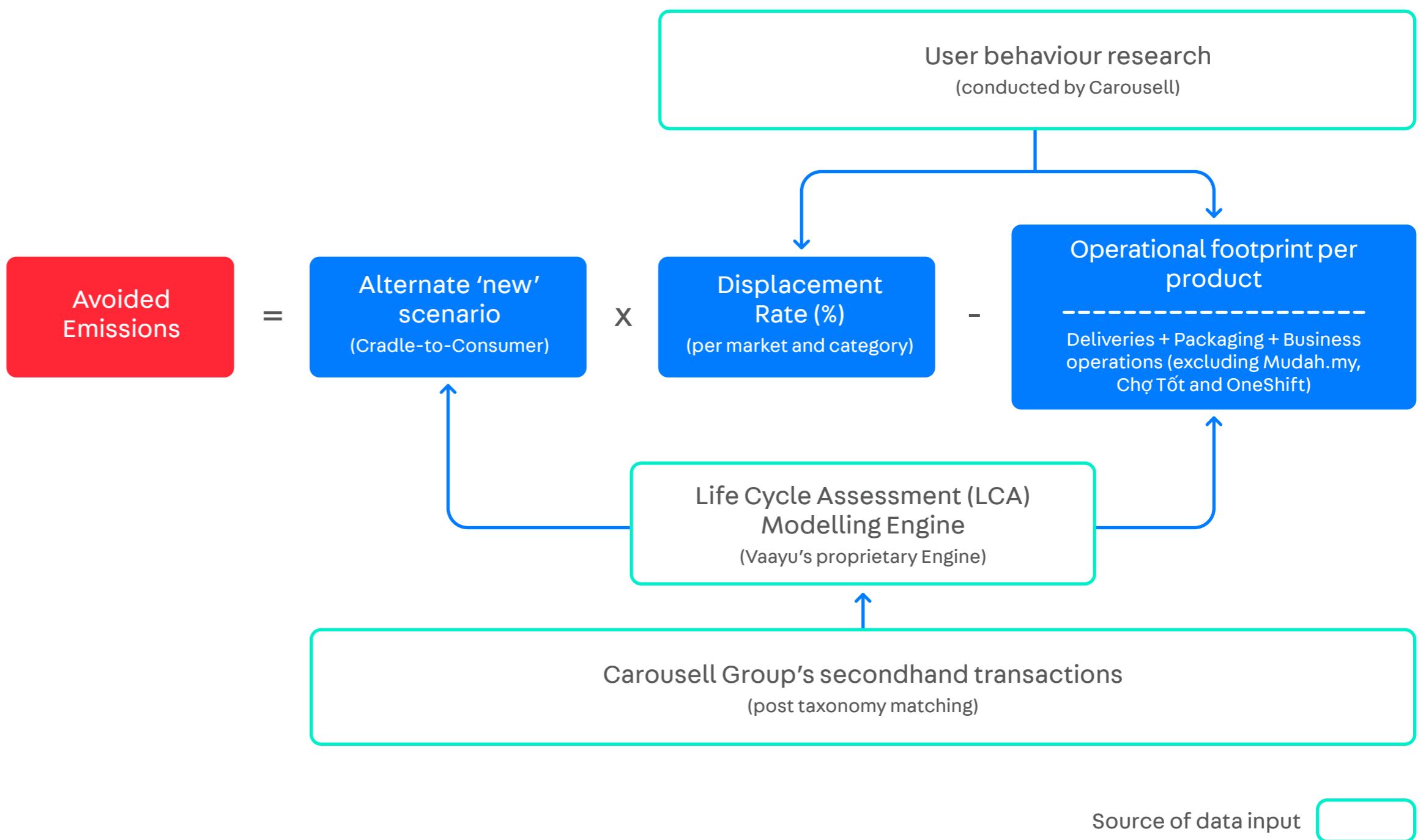
Consequential Life Cycle Assessment (LCA) looks beyond a single product or transaction with the objective of quantifying the impact within a broader system. Further, the methodology chosen aligns with the recommendations provided by the World Resource Institute (WRI) for calculating comparative product emissions<sup>7</sup>.

**Consequential Life Cycle Assessment (LCA)** is a methodology commonly used by sustainability professionals to calculate the overall environmental performance of a product or a service along every stage of its life cycle.

In the scope of this analysis, **Avoided Emissions** refer to the proportion of carbon emissions that are potentially avoided (or saved) due to customers purchasing secondhand products on Carousell Group's marketplaces instead of buying new elsewhere.

<sup>7</sup> Russell, S. (2019, December 3). Estimating and reporting the comparative emissions impacts of products. World Resources Institute

## Calculated Avoided Emissions for tens of millions of secondhand transactions





# User behaviour research

We conducted user behaviour research in July–August 2023 to integrate the usage patterns of Carousell users when they buy and sell secondhand items through our platform. Research was conducted in six markets to assess these patterns, gather primary data to make the calculation of the Avoided Emissions from secondhand item sales more accurate, and to collect information regarding delivery methods and packaging materials used in product fulfillment.

We received responses from 13,998 users in Singapore, Hong Kong, Indonesia, Malaysia, the Philippines and Taiwan. To ensure the representativeness of our sample, we took into account the users' location, the product category they were interested in, the condition of the items they interacted with and their activity on the platform. We targeted buyers who bought in the last 90 days prior to the research and sellers who listed in the last 90 days prior to the research.



**13,998 responses** from Singapore, Hong Kong, Malaysia, Indonesia, Taiwan and the Philippines





As per this methodology, the potential Avoided Emissions of a secondhand product depend on the following 3 pillars:



#### Pillar 1 Alternate 'new' scenario

The emissions generated from the manufacturing and distribution of a comparable new item, which can be avoided to a certain extent when choosing secondhand (Displacement Rate).



#### Pillar 2 The Displacement Rate

Displacement Rate helps to quantify the level of substitutability of the secondhand product with new. It determines the extent to which a secondhand product can displace the purchase of a new product.



#### Pillar 3 Operational footprint per product

Emissions from deliveries, packaging and relevant business operations, which are created due to the purchase of a secondhand item on Carousell.



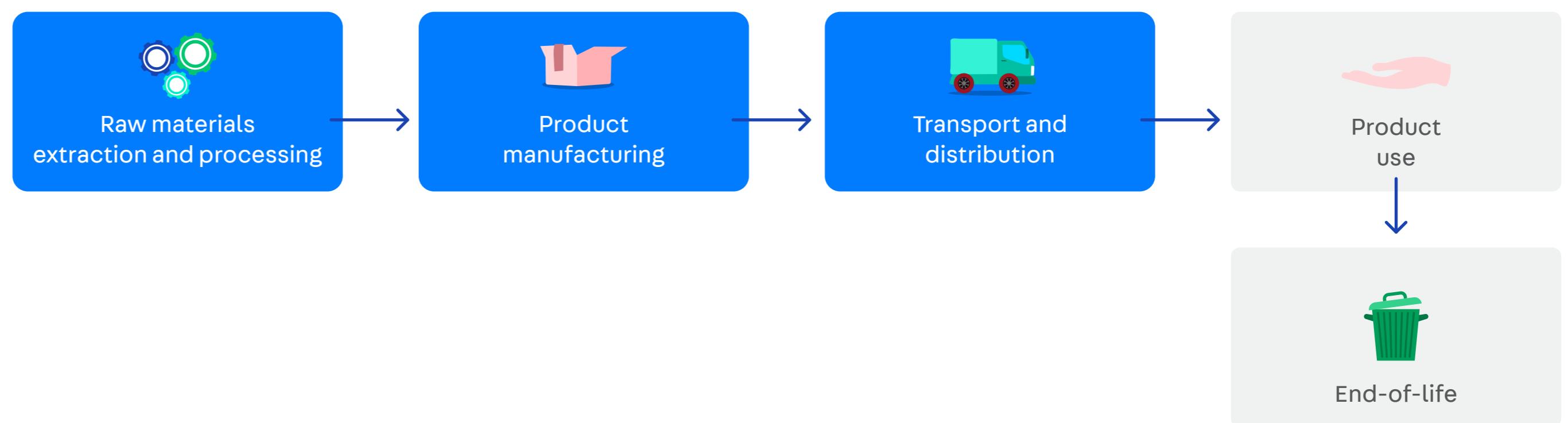
## Pillar 1

# Alternate 'new' scenario

To calculate the Avoided Emissions of buying a secondhand item on Carousell instead of new, the first step is to establish the baseline emissions associated with the production and delivery of a comparable new item known as alternate 'new' scenario. When you buy a new item, it involves the extraction of raw materials, manufacturing processes and distribution until it reaches the consumer. All of these processes contribute to greenhouse gas emissions.

To compute this alternative 'new' scenario, we calculated the Cradle-to-Consumer impact of the products, encompassing emissions from manufacturing to the delivery of these new items, as depicted in the figure. The emissions from product use and End-of-Life were excluded from the assessment, since in the comparative analysis needed to calculate for Avoided Emissions, the assumed equal impact from the use of new and secondhand products cancel each other out.

## Cradle-to-consumer impact of a product



By leveraging proprietary AI and machine learning technology, Vaayu calculates impact such as carbon emissions, water and waste across product, packaging and logistics. For this analysis, the product carbon emissions were calculated using Vaayu's Life Cycle Assessment (LCA) Modelling Engine by mapping to an equivalent product within Vaayu's product taxonomy, going into as much detail per transaction as possible. Where a product category was in scope, but had no suitable mapping with the Vaayu taxonomy, a proxy or average emissions value was used. The mapped product carbon emissions were subsequently applied to all transactions within the Carousell product category.



## Pillar 2

# Displacement Rate

The Displacement Rate is a metric that quantifies whether the purchase of a secondhand product on Carousell was an additional purchase or if it substituted the purchase of a new, first-hand product. This substitution ratio fundamentally dictates the extent to which carbon emissions stemming from the production and distribution of a new product are mitigated through a secondhand purchase.

### Importance of Displacement Rate

In practice, it is important to recognise that there is not always a direct one-to-one substitution between a new product and a secondhand one. Purchasing a reused product may not entirely replace the production of a new item, and this can be attributed to several factors:

#### 1 — Supplementary purchases

Secondhand products may serve as additional purchases rather than direct substitutes for new items.

#### 2 — Usage patterns

Users may exhibit varying usage patterns between new and secondhand products. New items might be used more regularly, while secondhand items could be used less.

#### 3 — Lifespan differences

Secondhand products may have a shorter lifespan compared to new ones, either due to reduced physical durability or because they align with shorter-lived fashion trends. This influences how long an owner intends to keep and use the product, known as emotional durability.





## Calculation of Displacement Rate

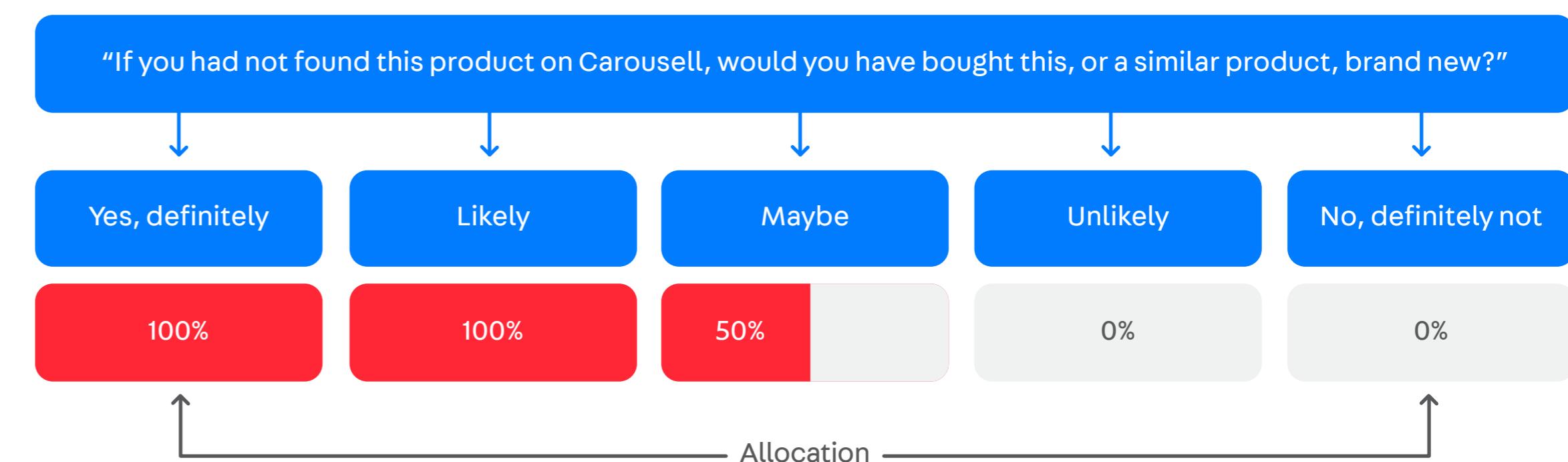
While it contributes to resource conservation and reduced carbon emissions, the extent to which a secondhand item displaces the production of a new item depends on user behaviour and product characteristics. To capture the above uncertainties, Vaayu calculated a Displacement Rate for each product category based on the user behaviour research. Specifically, 7,299 Carousell buyers (out of a total of 13,998 users) were asked the following question about their recent purchase specific to a product category:

"If you had not found this product on Carousell, would you have bought this, or a similar product, brand new?"

The equation to calculate this factor from the responses is as follows:

$$\text{Displacement Rate (\%)} = \frac{\text{Displaced purchases}}{\text{Total responses}}$$

To estimate the **displaced purchase (numerator)** for a particular product category, we gave buyers the following response options, as shown below:



- 1 — 'Yes, definitely' and 'Likely' options:** These were responses where it was reasonably certain that these products lead to the displacement of a new product.
- 2 — 'Maybe' option:** These were responses where the displacement of a new product depends on different factors, adding a certain level of variability to the Displacement Rate calculation.
- 3 — Impulse buyers:** As an additional control question, users were asked what their motivation was for buying the product. Those who answered "I was just browsing Carousell and I liked this product" were classified as impulse buyers. Their purchases were considered not to displace a new purchase and, as such, were excluded from the calculation of the Displacement Rate.

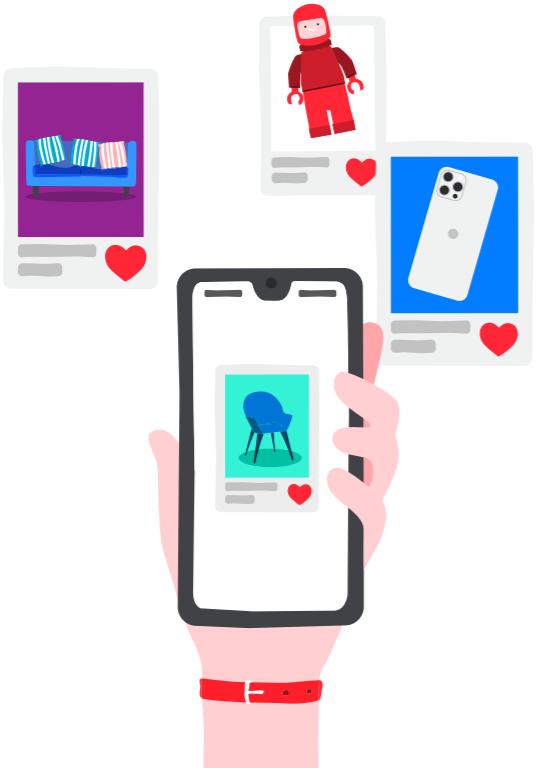


The Average Displacement Rate calculated across the categories of Carousell was about **56%**

On average,

**56%**

of Carousell Group's transactions displaced the purchase of a new product



**44%**

of Carousell transactions might not have displaced the purchase of a new product



This Displacement Rate is in line with the ranges given in the available literature: A study conducted on secondhand shopping behaviour<sup>8</sup> suggested a 56% Displacement Rate for online shopping, twice the average figure for items bought through offline channels (24–29%).

The resulting dataset of Displacement Rate and the transactional footprints at product category level were fed into Vaayu's Life Cycle Assessment (LCA) Modelling Engine to provide insights into the climate impact of shopping secondhand in Carousell marketplaces.

<sup>8</sup> Stevenson et al., 2013. Study into consumer secondhand shopping behaviour to identify the reuse displacement effect





### Pillar 3

## Operational footprint per product

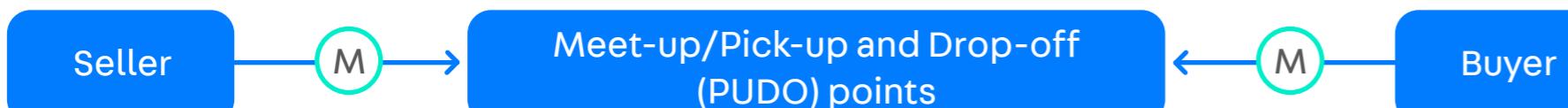
We also recognise that when consumers choose to buy secondhand products from Carousell, there are emissions associated with shipping, transportation and packaging generated in the transaction. To comprehensively account for this in our impact quantification, we calculated the direct and indirect emissions attributable to Carousell, including deliveries, packaging and business operations, for each transaction. This approach enables us to provide a more comprehensive estimation of the comparative impact when opting for secondhand over new products.

### 1 Deliveries

Carousell is primarily a C2C marketplace where the majority of the transactions happen directly between our buyers and sellers. The primary delivery modes used by Carousell users include in-person meet-ups, Pick-Up and Drop-Off (PUDO) points and courier deliveries.



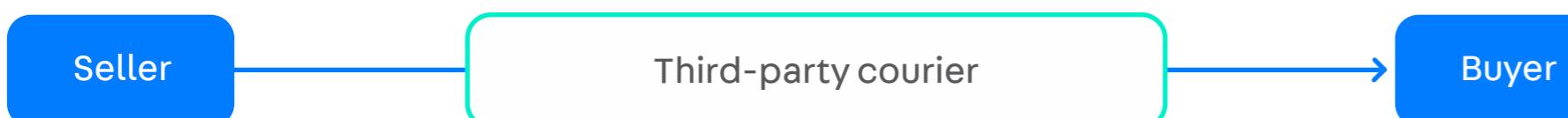
#### In-person meet-up and Pick-Up and Drop-Off



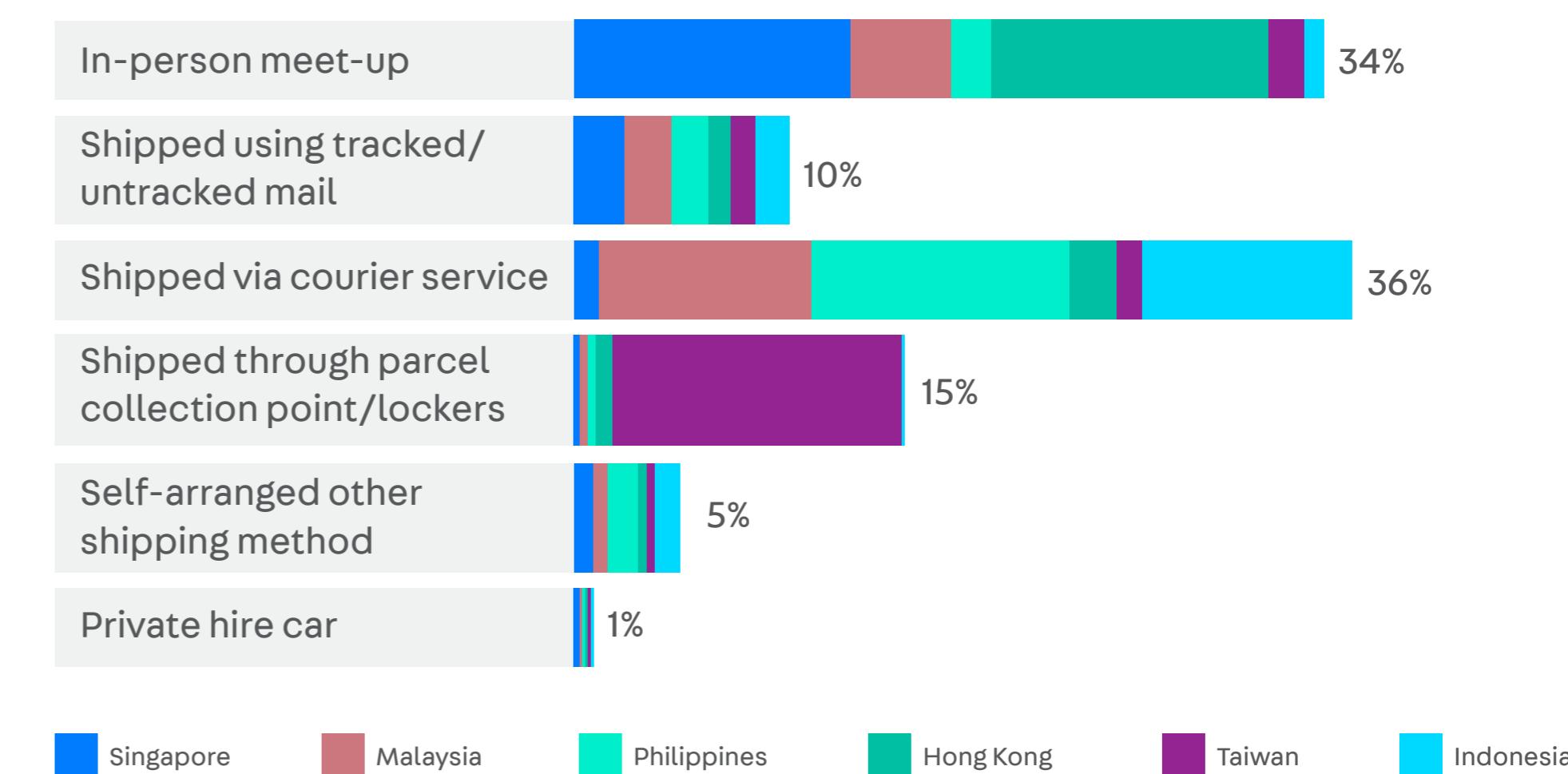
M — Mode of transport used



#### Courier deliveries



In our user behaviour research, we asked our buyers about how they acquired the secondhand item and our sellers about how they delivered the item. The results varied across our key markets: In-person meet-ups are the preferred choice in Hong Kong and Singapore (~75% in both markets), shipping via courier is more common in multi-city markets like Indonesia, Malaysia and the Philippines, and shipping through Pick-Up and Drop-Off (PUDO) points is the most common method in Taiwan (75%).



The emissions from deliveries were computed using these results and Carousell's transaction data, utilizing Vaayu's Logistics Calculation Engine. Further, we also asked our buyers and sellers about the mode of transport used to reach the delivery/pick-up point: Personal car, public transport, scooter, bicycle, walking, etc. Based on these results, emissions were calculated using the fuel-based calculation method, where fuel usage is derived from the total distance travelled.



## 2 Packaging

In our user behavior research, one of the questions pertained to the packaging our users utilised and its condition (whether it was new or reused). Close to **60%** of the surveyed users used either **“no packaging” or “reused packaging”**.

For each transaction, the packaging type and the size were estimated on a per product category basis using Carousell’s transaction data. Emissions related to packaging were subsequently computed using Vaayu’s Packaging Emissions Calculation Engine, drawing insights from the user behavior research regarding the utilization of new and reused packaging in each transaction.

## 3 Impact of CarouTeam Carbon Footprint, at product level

Carousell’s own Carbon Footprint is calculated based on the GHG Protocol Corporate Standard. It includes a full inventory of Scope 2 emissions and Scope 3 (Business operations) emissions<sup>9</sup>. Scope 1 emissions are not applicable to Carousell’s business. The carbon emissions from relevant Scope 2 and 3 emissions categories were integrated into the Avoided Emissions analysis. The average emissions created by the delivery and packaging of secondhand items in the four goods categories as well as the emissions from business operations were integrated in this analysis, as they facilitated the sale of the secondhand item.

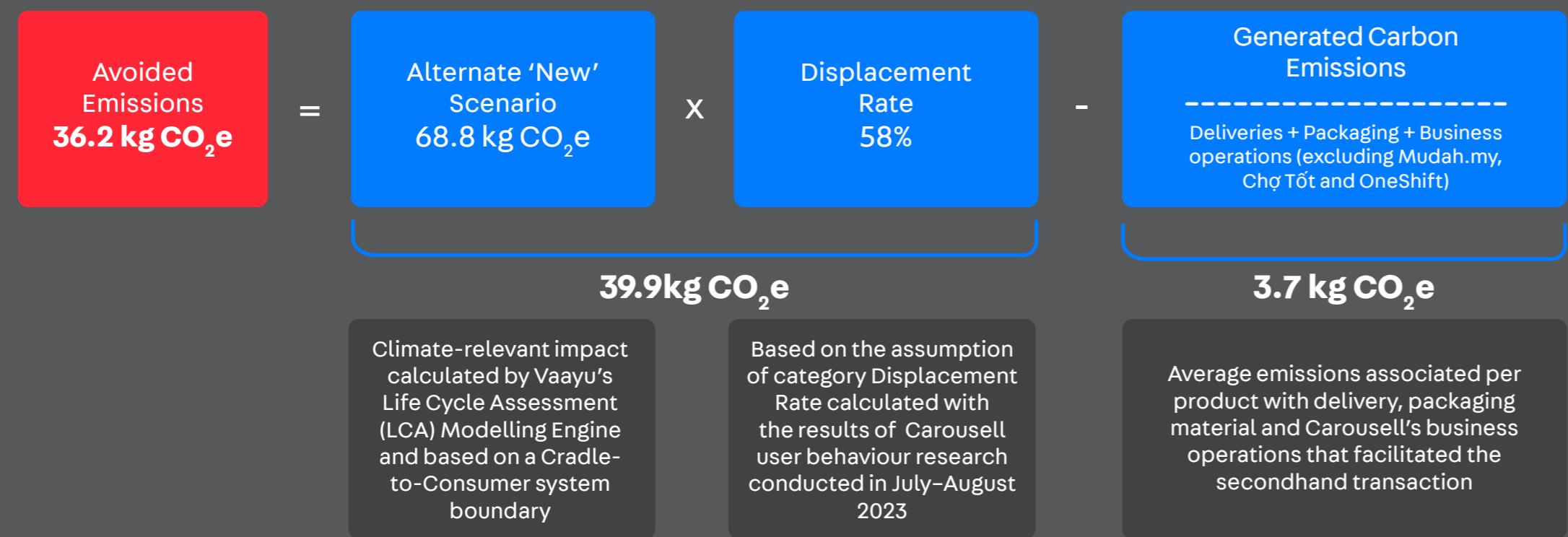
<sup>9</sup> See Annex 1 CarouTeam Carbon Footprint for more details



# See how the calculations were done

The Avoided Emissions were calculated by factoring in the 3 pillars – Alternate ‘new’ scenario, Displacement Rate, along with both direct and indirect emissions attributed to the Carousell Group (Deliveries, packaging and business operations), thus facilitating a more comprehensive assessment of the comparative environmental impact of opting for secondhand item over new.

For example, here’s how the Avoided Emissions were calculated when someone bought a secondhand iPhone 14 on Carousell, in 2022:



We applied a similar methodology to all product categories and transactions within the scope, quantifying the average Avoided Emissions per product category. Ultimately, the summation of the impact across these product categories led to the estimation of the total Avoided Impact that our users created when purchasing secondhand items on Carousell Group’s marketplaces, as an alternative to new items in 2022.





# Section 3 Annex



## Annex 1

# CarouTeam Carbon Footprint (CCF)

We acknowledge the pressing nature of the climate crisis, and we take pride in the fact that Carousell Group's fundamental business model plays a pivotal role in mitigating climate impact. As we strive to further amplify the positive climate impact of choosing secondhand over new, we are equally committed to addressing our own carbon emissions stemming from our business operations. In this vein, we are undertaking the task of measuring our own Carbon Footprint to identify key categories contributing to the overall footprint. The calculation is guided by the GHG Protocol Corporate Accounting and Reporting Standards, based on Carousell's direct and indirect emissions from energy use and supply chain activities.

### Organisational boundary

For the purpose of this report, the operational control approach was chosen to define the boundary, which resulted in Carousell Group accounting for 100% of emissions from operations over which it or one of its subsidiaries has operational control.

### Scope

The assessment for 2022 is geared towards providing a thorough inventory for Scope 1 and 2, along with an extensive overview of Scope 3 (business operations) and a partial overview of Scope 3 (deliveries and packaging). There was a particular emphasis on secondhand transactions within four major goods categories (Fashion & Luxury, Electronics, Furniture & Home Living and Hobbies & Toys). We aim to continue to refine our calculation methodologies in the years to come, and to enlarge the scope of assessment.

#### 1 No Scope 1 emissions

No direct emissions produced from our business activities

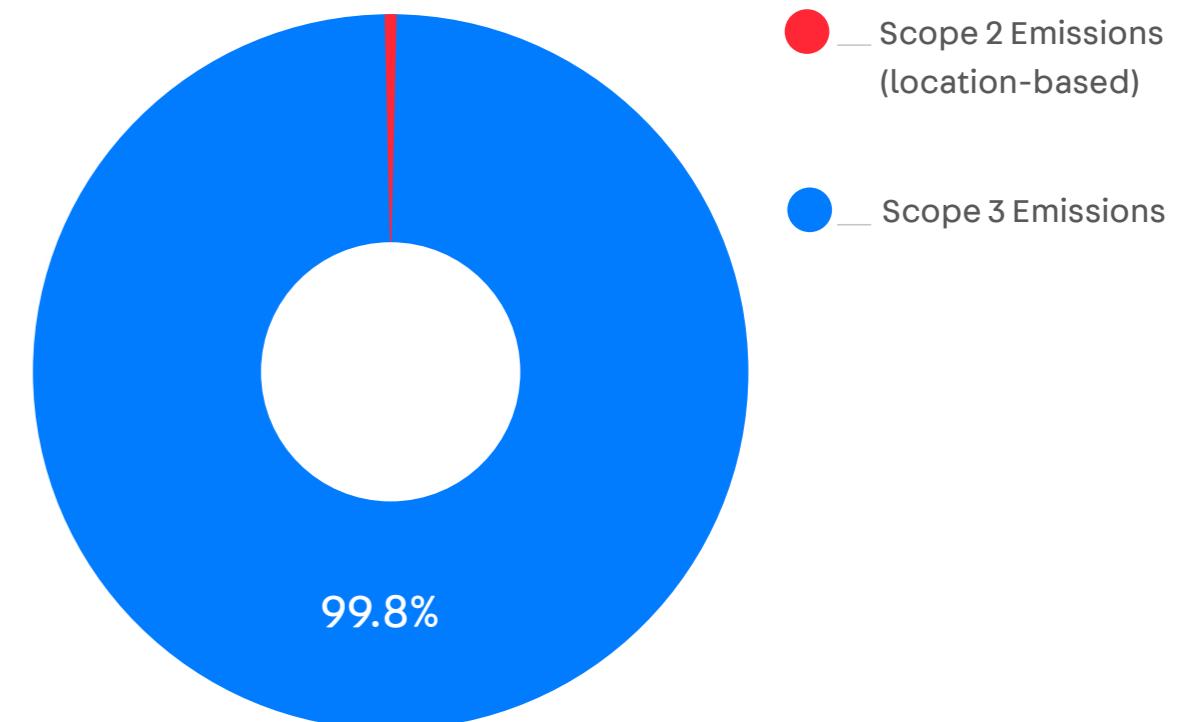
#### 2 Scope 2 emissions from all indirect emissions

Attributed to electricity and heating usage in all regional offices

#### 3 Scope 3 emissions from all indirect emissions along our value chain, including:

- Purchased goods and services
- Fuel and energy-related activities
- Upstream transportation and distribution
- Business travel
- Employee commuting
- Downstream transportation and distribution

### 2022 Emissions by Scope



This pie chart shows the breakdown of our greenhouse gas emissions, with no Scope 1 emissions incurred and Scope 2 making up 0.2% of the total emissions. As with many companies, our Scope 3 emissions far outweigh our Scope 1 and Scope 2 emissions. The majority (99.8%) of Carousell Group's emissions come from indirect emissions along the value chain (Scope 3). Specifically, as an online marketplace, the majority of our value chain emissions can be attributed to the delivery and packaging of products.



### Detailed breakdown of Scope 1, 2 and 3 emissions

GHG Protocol Emission Categories	tonnes of CO <sub>2</sub> e
<b>Scope 1</b>	<b>0</b>
<b>Scope 2 (location-based)</b>	<b>140</b>
<b>Scope 3</b>	<b>61,320</b>
3.1 Purchased goods and services	27,822
3.3. Energy-related activities not in Scopes 1 and 2 (Transmission and distribution losses)	45
3.4. Upstream transportation and distribution	58
3.6 Business travel	253
3.7 Employee commute	237
3.9 Downstream transportation and distribution	32,905

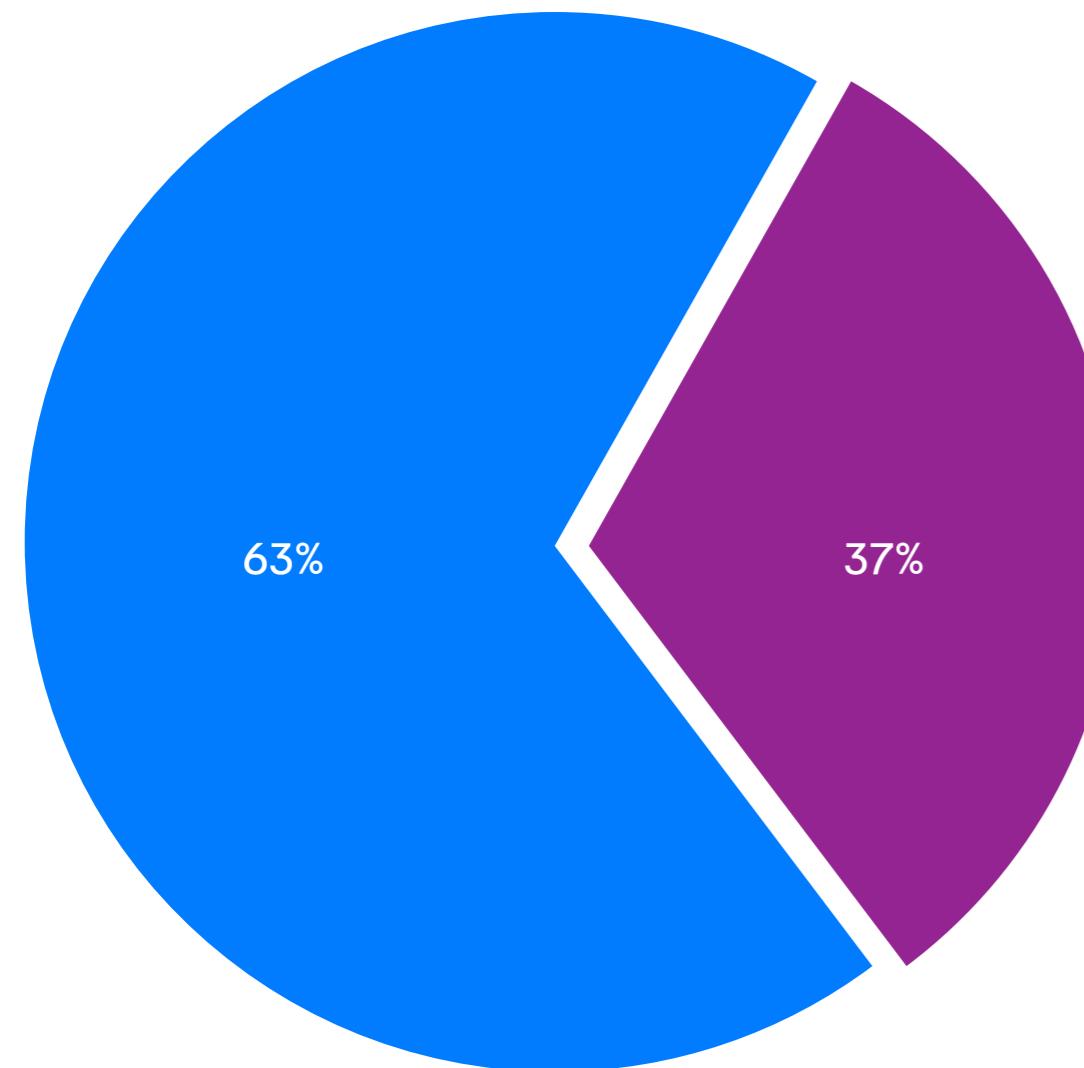
#### Within Scope 3 emissions:

- 1 The major contributor to Scope 3 emissions was downstream transportation and distribution, accounting for 53% of the total
- 2 Purchased goods and services constituted another significant contributor, making up 45% of Scope 3 emissions



## Annex 2

# Overview of selected sub-categories



● Sub-categories not included in the calculations, in 2022

● Sub-categories included in the calculations, in 2022

### Sub-categories included in the Avoided Emissions calculations in 2022, are as follows:

- |                        |                                  |
|------------------------|----------------------------------|
| Women's Fashion        | Mobile Phones, Tablets & Gadgets |
| Men's Fashion          | Furniture & Home Living          |
| Muslim Fashion         | Hobbies & Toys                   |
| Babies & Kids          | Music & Media                    |
| Luxury                 | Design & Craft                   |
| Beauty & Personal Care | Sports                           |
| Health & Beauty        | Books & Stationery               |
| Health & Nutrition     | Toys & Collectibles              |
| Electronics            | Antiques                         |
| Computers & Tech       | Gardening                        |



## Annex 3

# Displacement Rate questionnaire in user behaviour research

**Excerpt of relevant questions from the user behaviour research for the calculation of Displacement Rate:**

**1 If you had not found this product on Carousell, would you have bought this, or a similar product, brand new?**

- a. Yes, definitely
- b. Likely
- c. Maybe, I'm not sure
- d. Unlikely
- e. No, definitely not

**2 Why are you not sure?**

- a. It depends on the price
- b. It depends on the model/size
- c. I don't really need this product enough to buy it brand new
- d. I was just browsing on Carousell, I'm not sure to buy it brand new
- e. It depends on other factors, please specify: \_\_\_\_\_

**3 Imagine that you could buy this product brand new, for almost the same price as second-hand, would you buy it?**

- a. Yes, definitely
- b. Likely
- c. Maybe, I'm not sure
- d. Unlikely
- e. No, definitely not

**4 Imagine that your preferred model/size is available, would you buy it brand new?**

- a. Yes, definitely
- b. Likely
- c. Maybe, I'm not sure
- d. Unlikely
- e. No, definitely not

**5 Please select the main reason you purchased this product secondhand on Carousell instead of buying it brand new?**

- a. This was a unique item which was difficult to find anywhere else
- b. I had no intent to buy a brand new item/I liked this product while I was casually browsing
- c. I prefer buying secondhand products out of principle
- d. I prefer buying secondhand products because it's cheaper than brand new
- e. I am looking for a specific model which is not available new
- f. I found the quality of secondhand item as good as brand new



# Glossary of terms

## Avoided Emissions

Avoided Emissions are emission reductions that occur outside of a product's life cycle or value chain, but as a result of the use of that product

## Carbon dioxide equivalent (CO<sub>2</sub>e)

The number of metric tons of CO<sub>2</sub> emissions with the same global warming potential as one metric ton of greenhouse gas

## CarouTeam Carbon Footprint (CCF)

CCF refers to the organisational GHG emissions inventory of a business, encompassing the climate impact of an organisation's activities decisions including all indirect emissions as well as the more obvious direct emissions

## Climate impact

Also known as global warming potential or carbon footprint, climate impact is a key aspect of environmental assessment and sustainability analysis. It involves quantifying the greenhouse gas emissions associated with a product, process, or activity and assessing their contribution to global warming over a specific time horizon, typically expressed in terms of carbon dioxide equivalents (CO<sub>2</sub>e)

## Consequential Life Cycle Assessment (LCA)

Life Cycle Assessment is a methodology commonly used by sustainability professionals to calculate the overall environmental performance of a product or a service along every stage of its life. Traditional (attributional) Life Cycle Assessment methods track the performance of a single product (e.g. a T-shirt) over time based on past data, whereas consequential Life Cycle Assessment better estimates the impact of decisions within a system, like buying secondhand instead of new. This is because it includes external market factors that can significantly influence the result, like changing customer behaviour or average use

## Cradle-to-Consumer

Cradle-to-Consumer refers to the carbon emissions of a product from the moment it is produced to the moment it is delivered to the customer

## Displacement Rate

A ratio determining the substitutability of pre-owned products with new ones

## End-of-Life

The life cycle stage of the product when it has completed its useful life

**Greenhouse gases (GHG)**

Gases present in the atmosphere which trap heat, contributing to global warming and climate change

**GHG Protocol**

A comprehensive and widely used global standardised framework for measuring and managing greenhouse gas (GHG) emissions.

**GHG Protocol Corporate Accounting and Reporting Standard**

The GHG Protocol Corporate Accounting and Reporting Standard offers best-practice guidance on the calculation of emissions from an organisation (referred to as the ‘reporting company’), based on the reporting company’s supply chain activities. These emissions are typically divided into Scope 1, 2 and 3 emissions

**Operational control**

As per the GHG Protocol, operational control is defined as the scenario where a business or one of its subsidiaries has the full authority to introduce and implement its own operating policies

**Scope 1 emissions**

Forming part of the GHG Protocol Corporate Accounting and

Reporting Standard, Scope 1 emissions are those emissions that are owned or controlled by a company

**Scope 2 emissions**

Forming part of the GHG Protocol Corporate Accounting and Reporting Standard, Scope 2 emissions are those emissions that are caused indirectly by a company through the purchase and use of energy

**Scope 3 emissions**

Forming part of the GHG Protocol Corporate Accounting and Reporting Standard, Scope 3 emissions are emissions that are a consequence of the activities of a company but occur from sources not owned or controlled by it

**Vaayu’s Life Cycle Assessment (LCA) Modelling Engine**

Vaayu’s proprietary automated modelling system, modified specifically for Carousell’s use case to compute complex Life Cycle Assessments. The Life Cycle Assessment (LCA) Modelling Engine uses a quantification of Displacement Rate to determine the calculation of the Avoided Emissions

**Vaayu’s Product Life Cycle Assessment (LCA) Database**

Vaayu’s Product Life Cycle Assessment (LCA) Database consists of over 600,000 datapoints



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