



Organisers:



ASEAN FOUNDATION



# PROMOTING RESPONSIBLE CONSUMPTION AND WASTE MANAGEMENT IN ASEAN

*Objective: To advance the 3Rs (Reduce, Reuse, Recycle) through technology, data insights, and community-driven donation systems that foster sustainable consumption and production.*

UN SDG-ADDRESS:

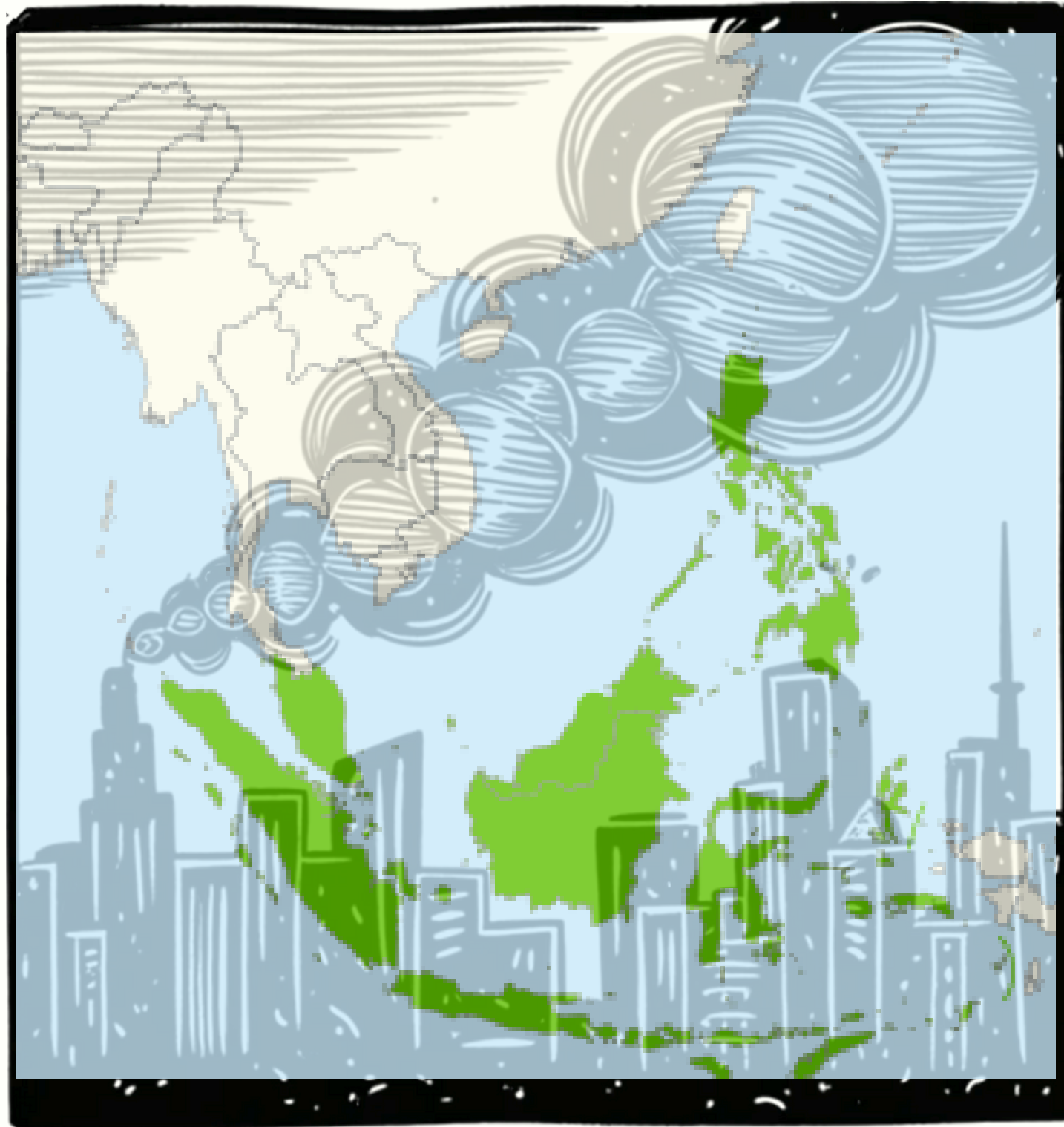


**TEAM:** DATANALY

**MEMBERS:** INN MANITA & KIM SOKLIN



# WASTE IN ASEAN IS INCREASING AT AN ALARMING RATE



Population growth, industrialization & rapid urbanization

**612** million (in 2013) **>>** **685** million (in 2024)

Municipal Solid Waste (MSW) is currently a major concern

Southeast Asia alone accounted for

**150**

million tons in 2016

By 2030, this figure is projected to

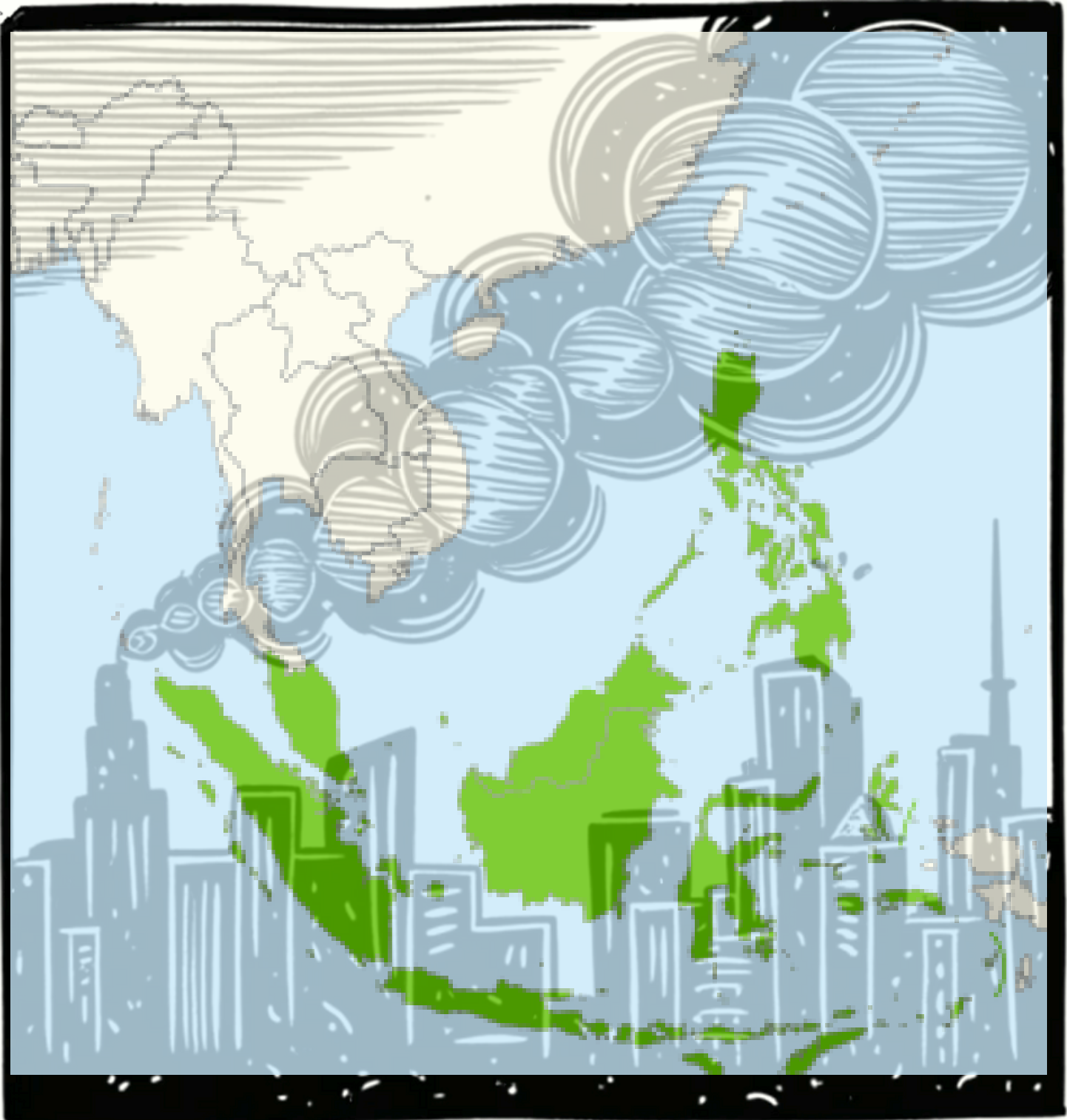
**150 x 2**

(double) million tons

**BY 2050**

if current patterns continue, we will **need three Earths' worth of resources** to sustain our lifestyles.

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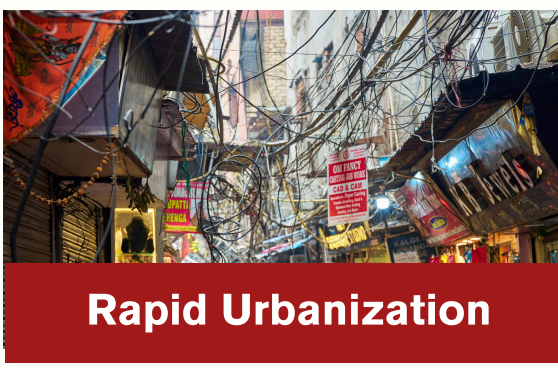
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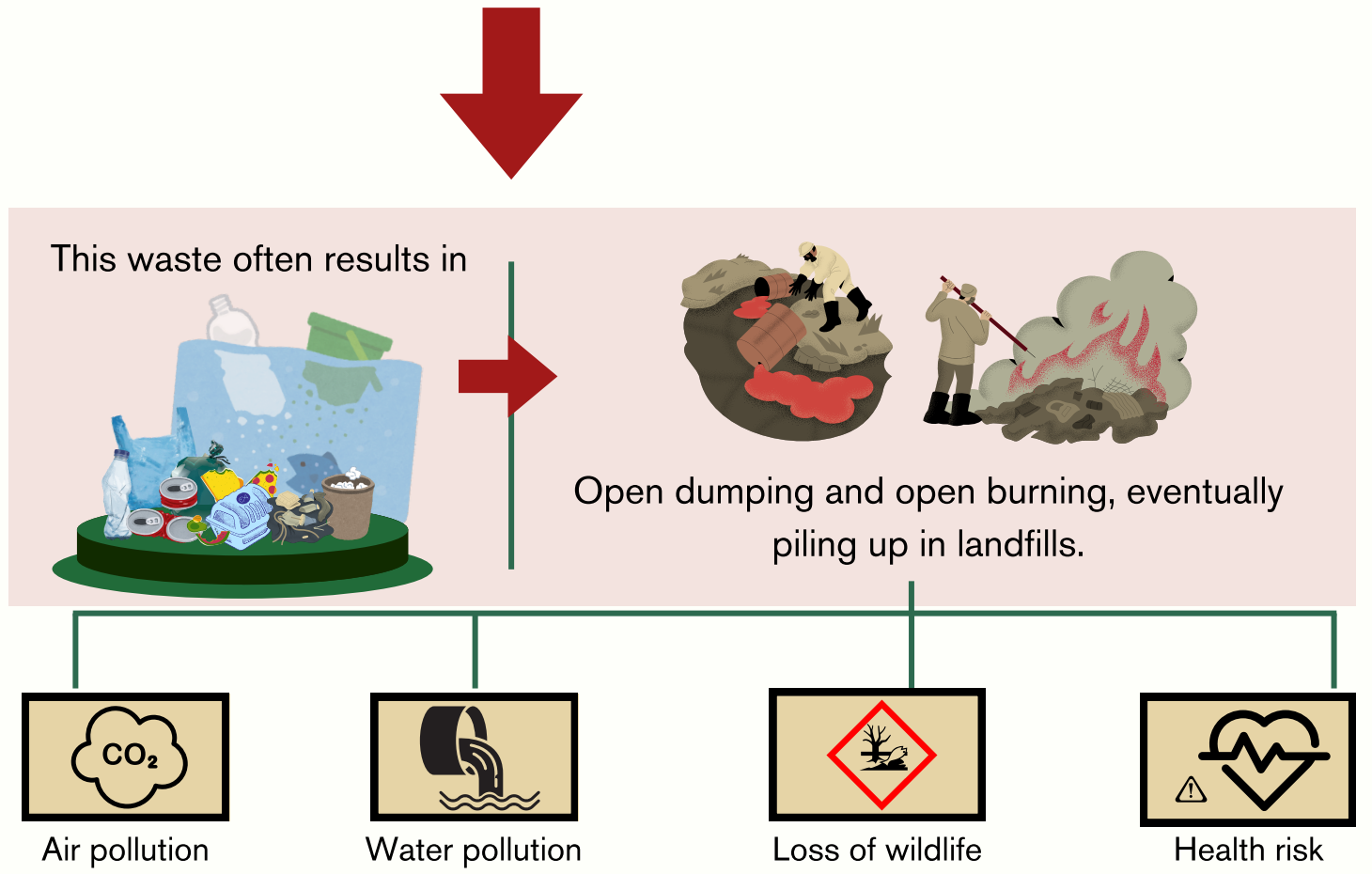
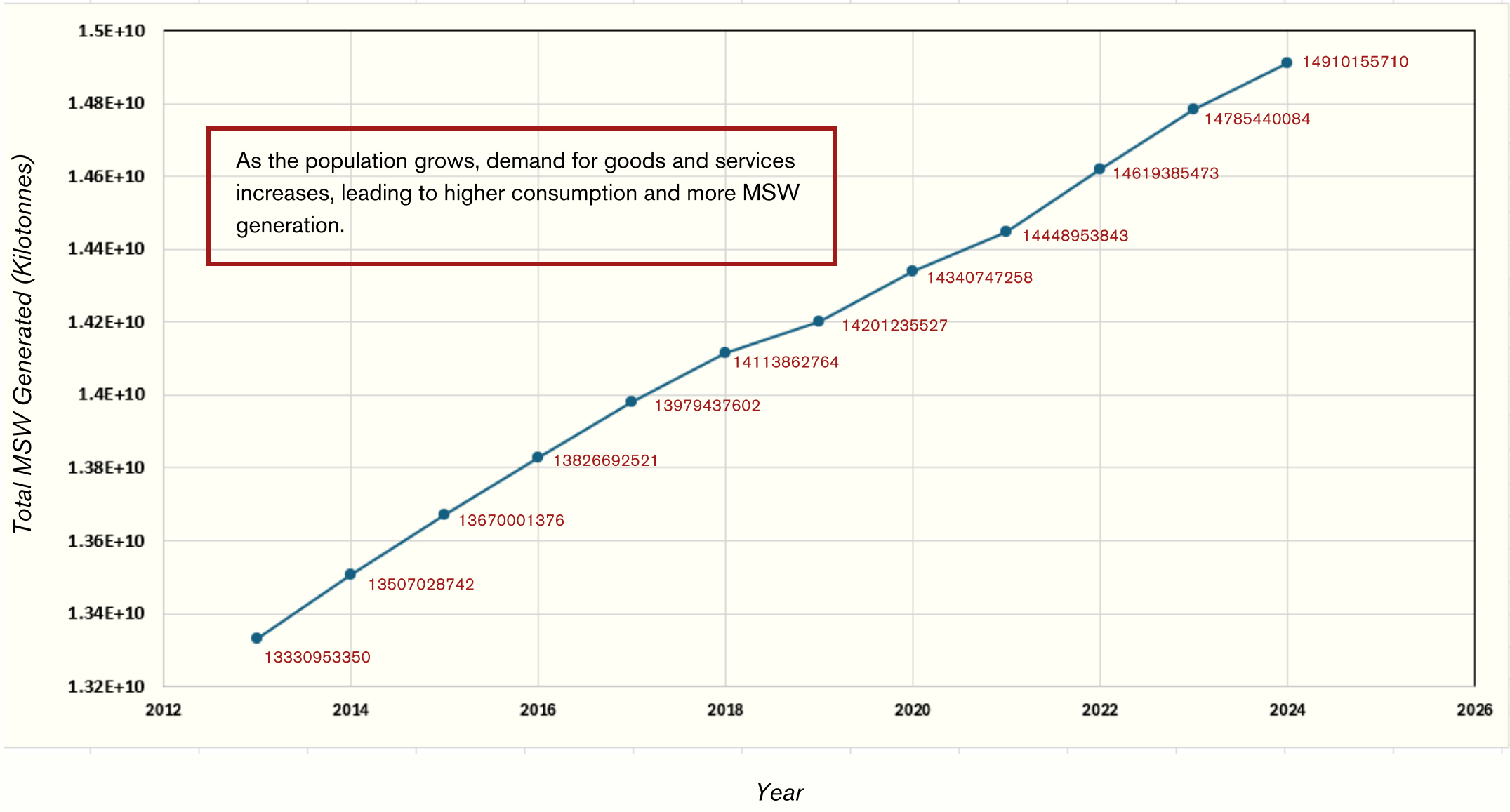
**BY 2050** if current patterns continue, we will **need three Earths' worth of resources** to sustain our lifestyles.

## PROBLEM - MUNICIPAL SOLID WASTE GROWTH

In ASEAN, most usable waste comes from Municipal Solid Waste (MSW), especially recyclables. Every year, millions of usable items are discarded from

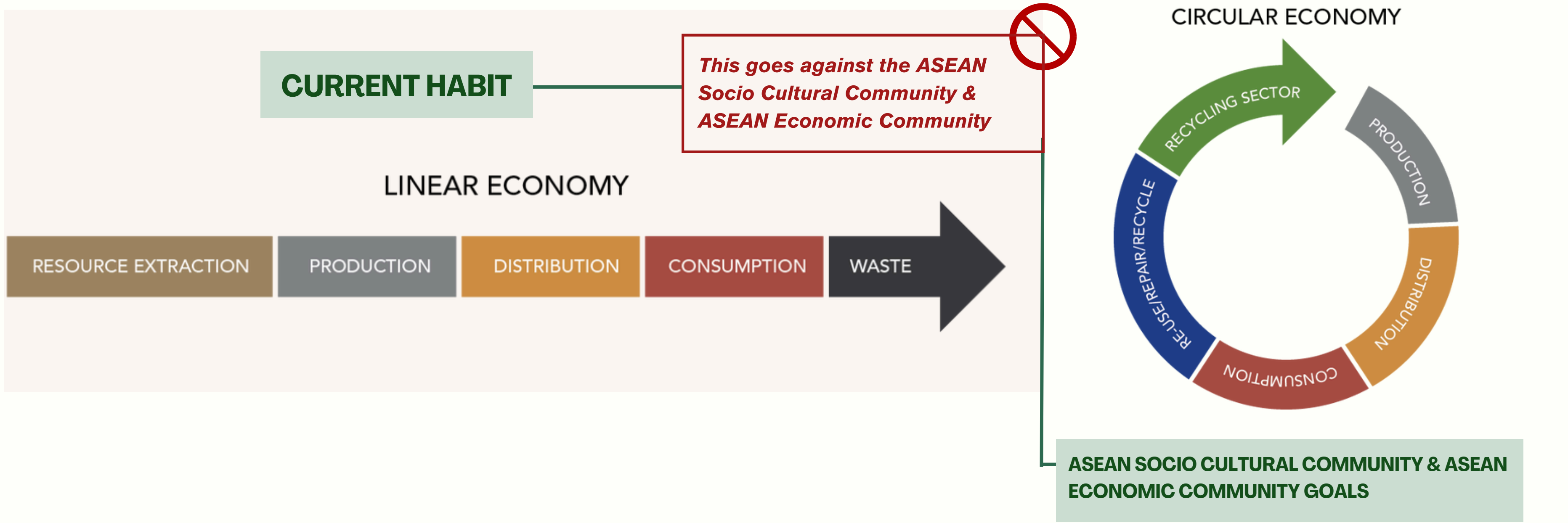


### CORRELATION BETWEEN POPULATION GROWTH AND MSW GENERATION



Source: Waste Management in ASEAN Countries: Summary Report

## CHALLENGES TO ACHIEVE CIRCULAR ECONOMY



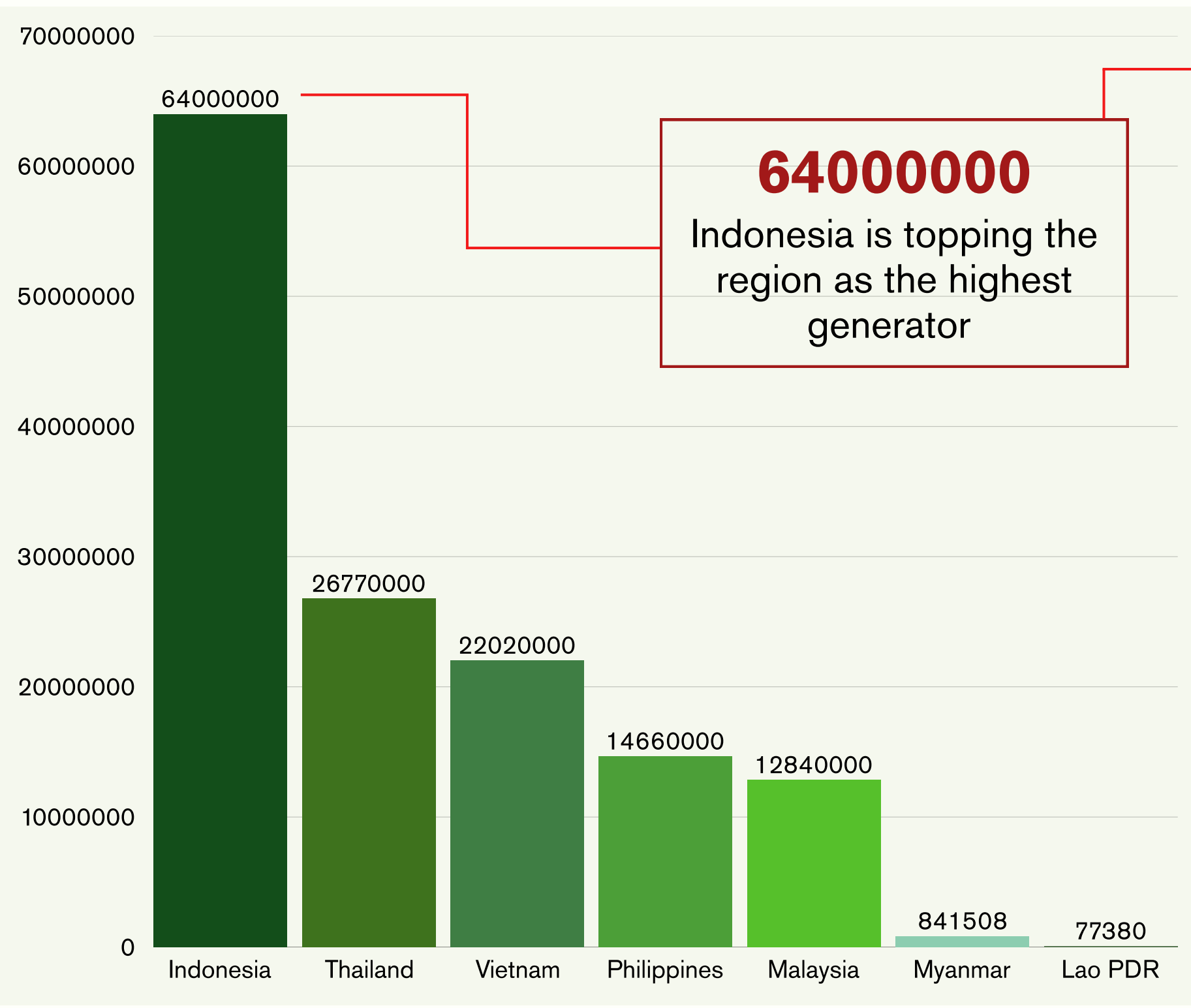
To achieve these goals, we must shift from linear to circular solutions.

- ASEAN Socio Cultural Community:
- Promote Environmental Awareness
  - Enhance Quality of Life
  - Encourage Community Participation

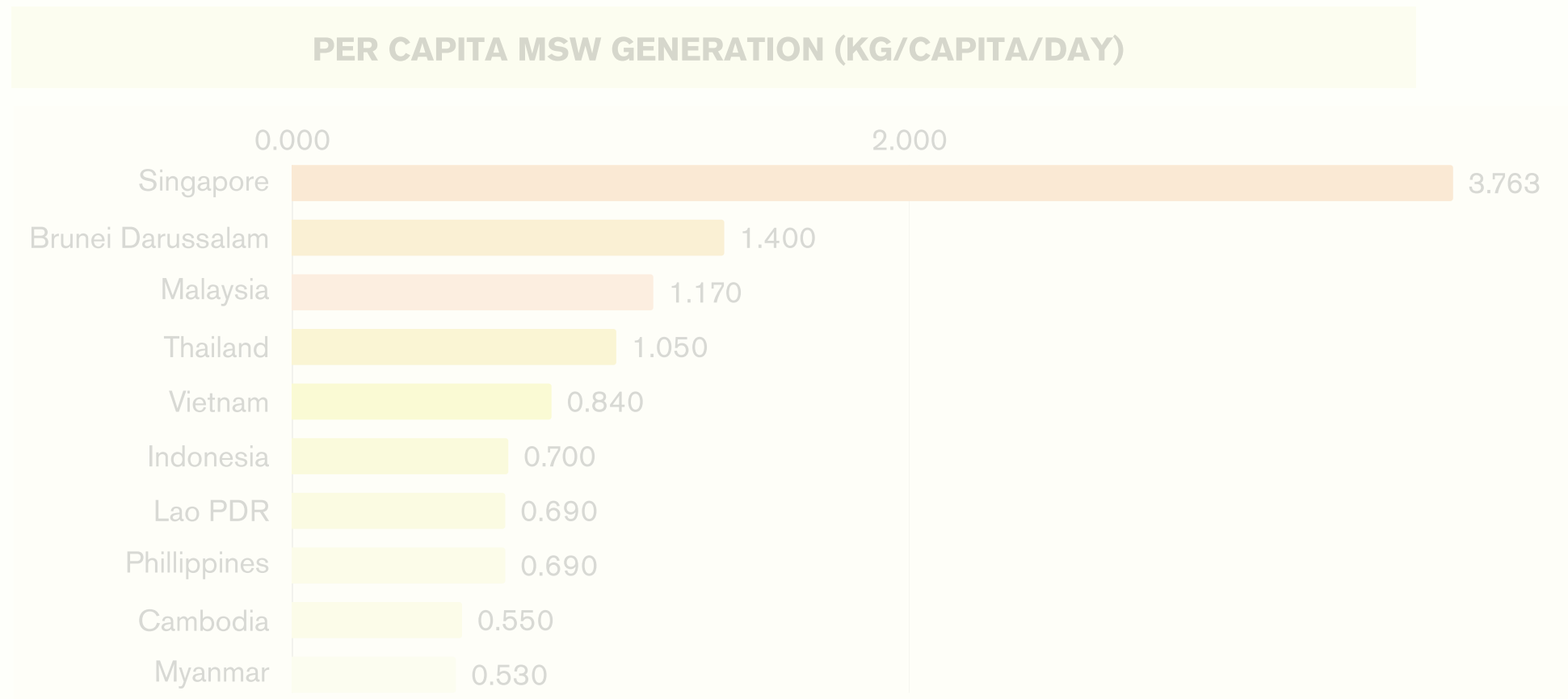
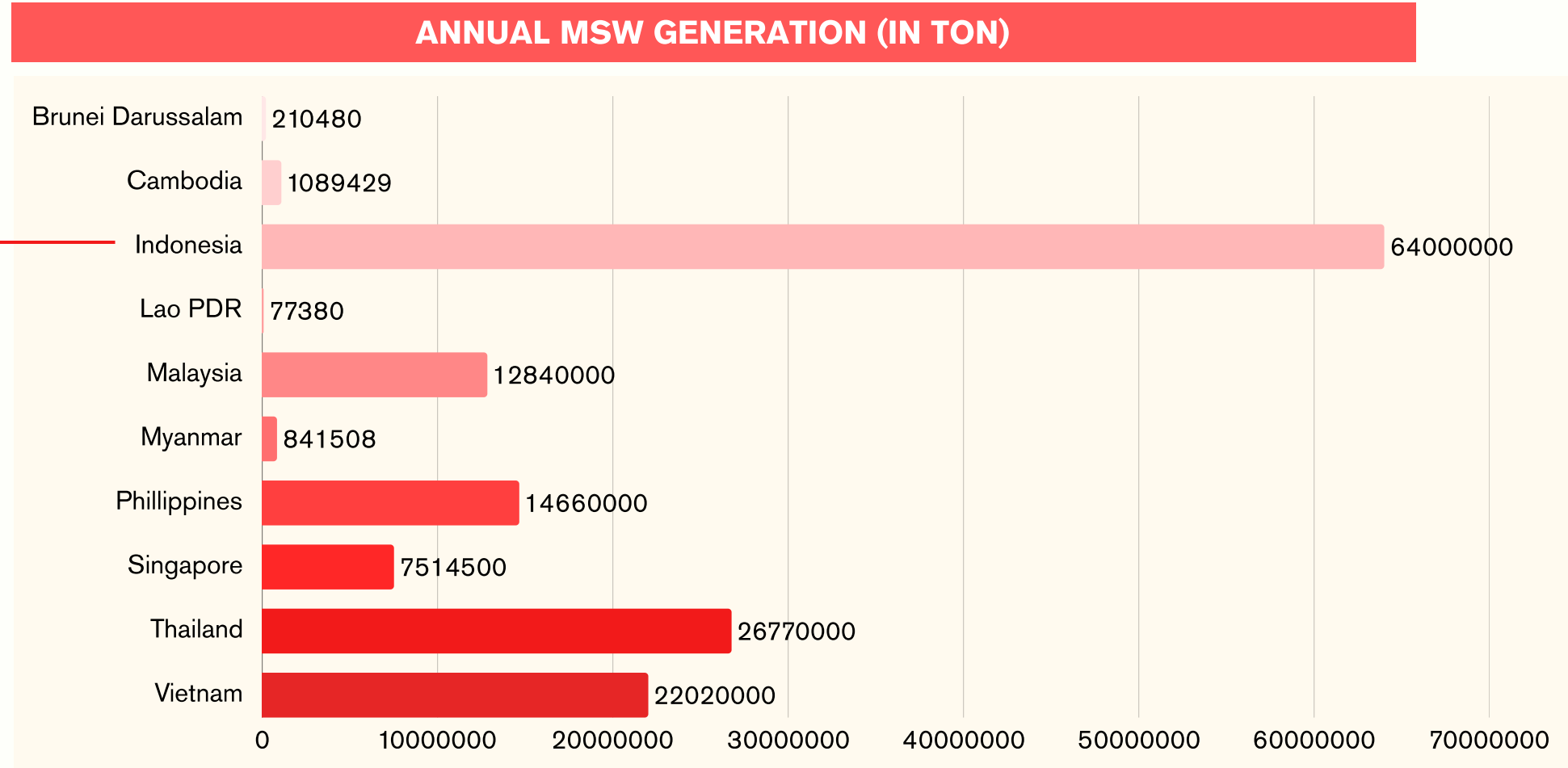
- ASEAN Economic Community goals:
- Facilitate Economic Growth
  - Encourage Regional Cooperation
  - Support Sustainable Development

# DIFFERENCES IN MSW WASTE GENERATION AMONG ASEAN COUNTRIES

**ASEAN COUNTRIES BY MSW GENERATION, FROM HIGHEST TO LOWEST (TONNES)**



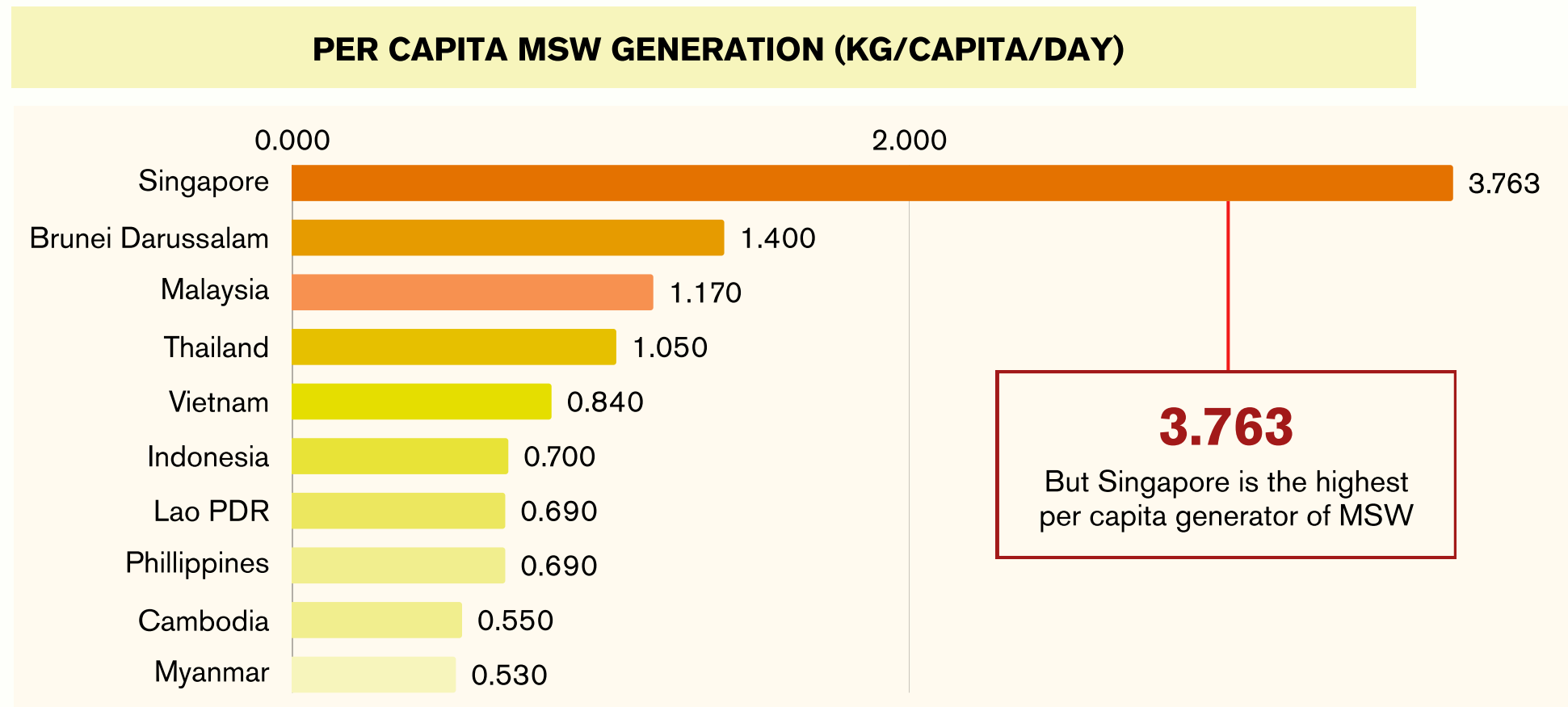
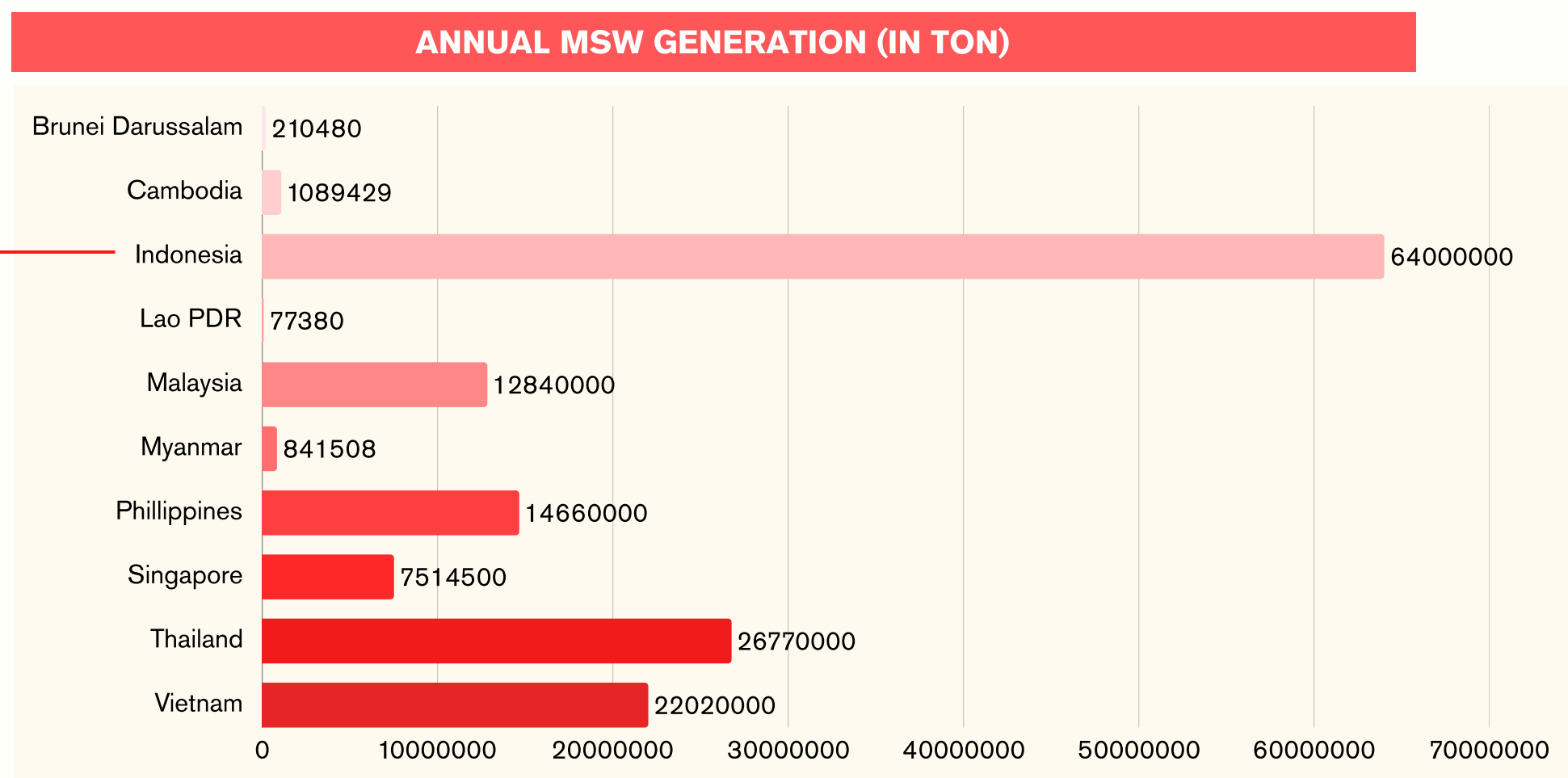
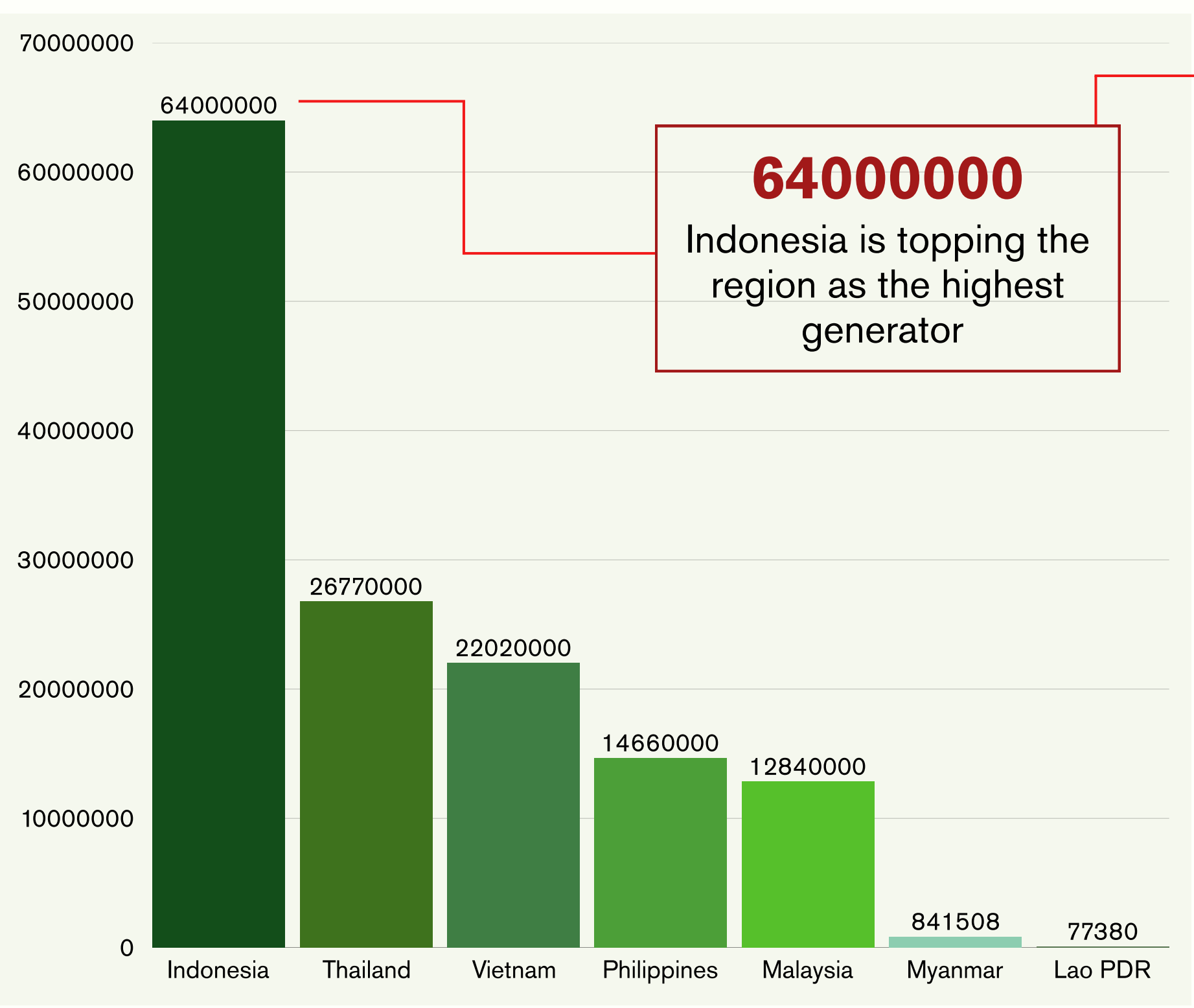
**64000000**  
Indonesia is topping the region as the highest generator



Source: Waste Management in ASEAN Countries: Summary Report

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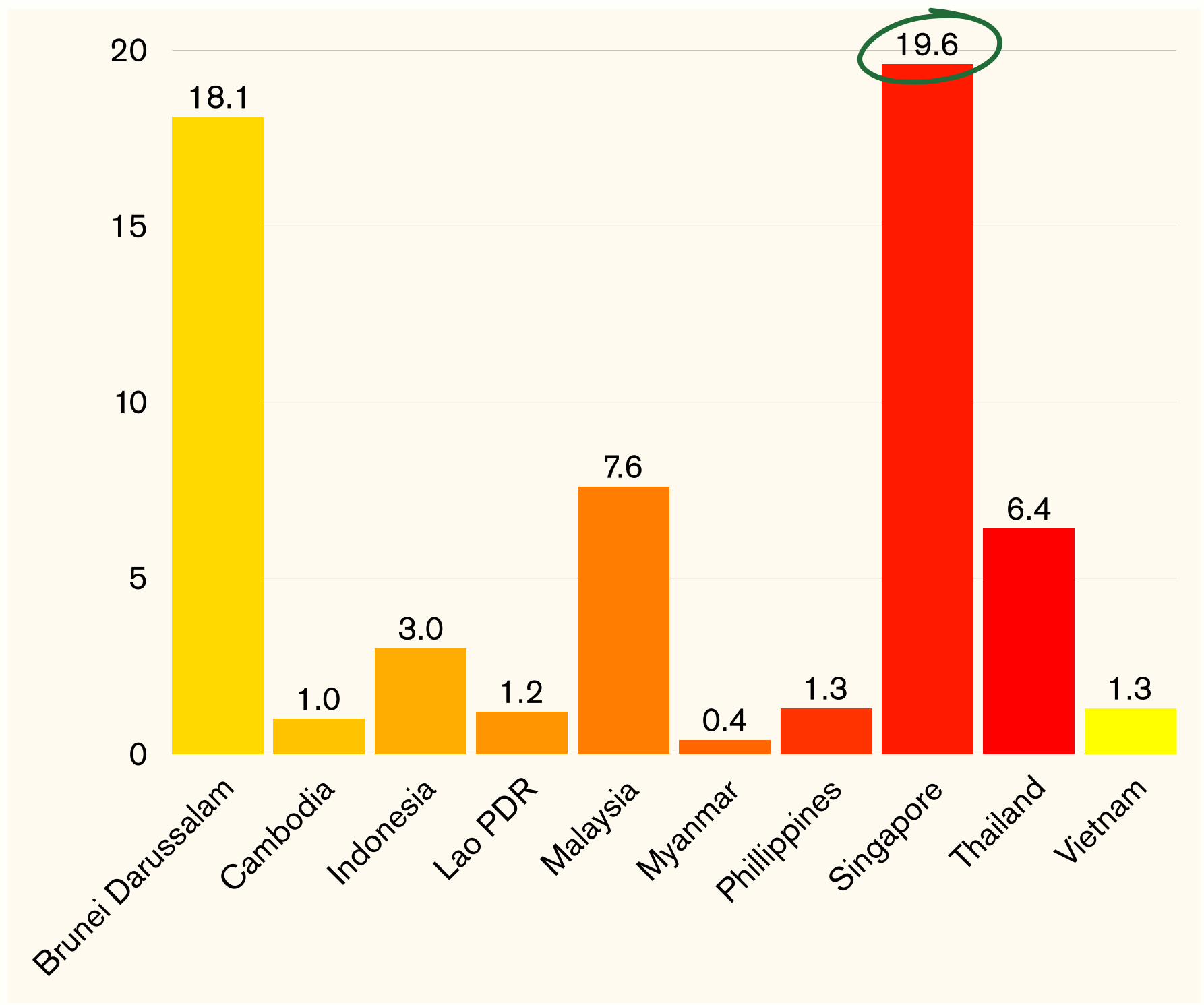
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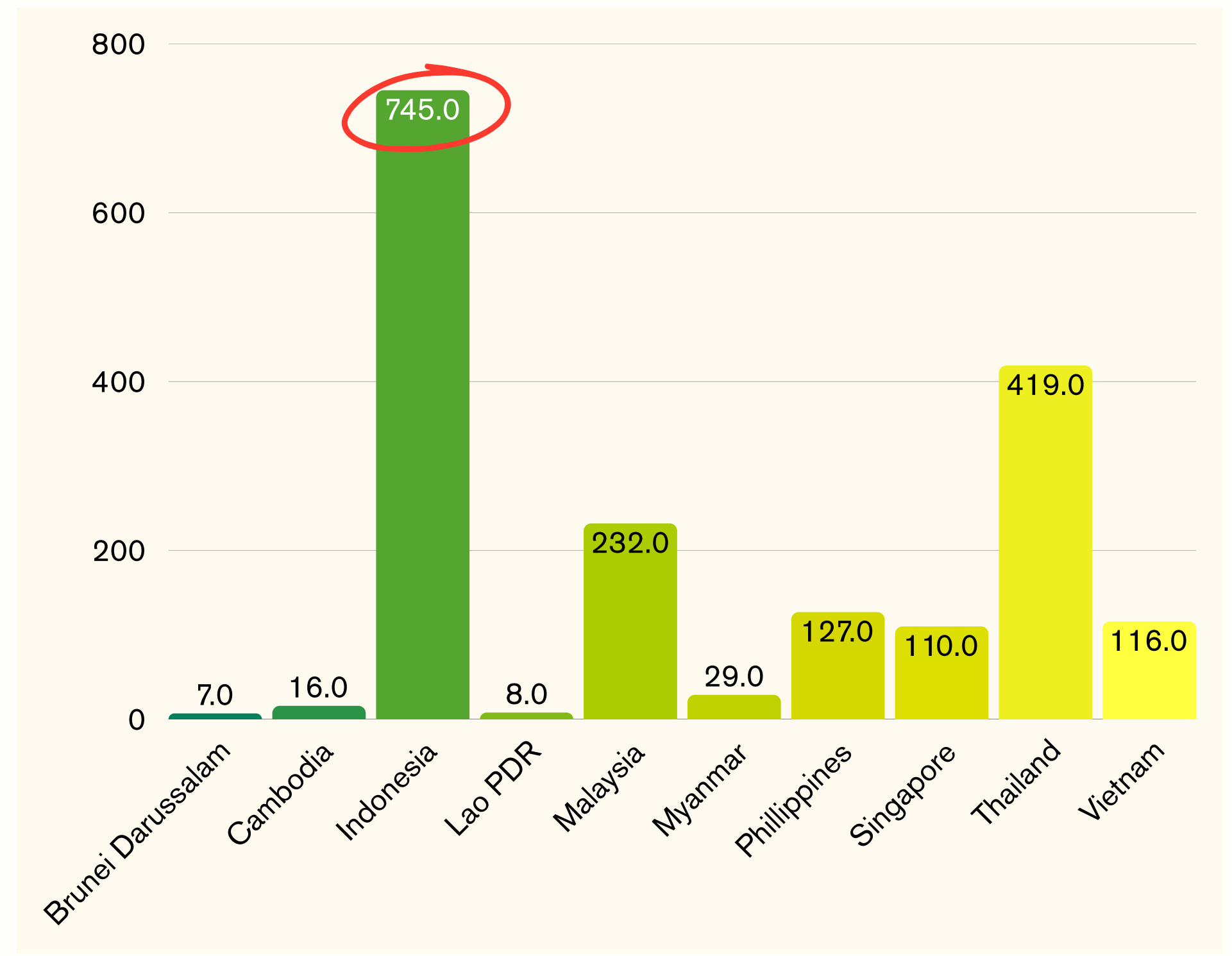
# E-WASTE IS ALSO A CONCERN

Even in terms of e-waste, Singapore leads in per capita generation, but Indonesia produces the highest total amount annually.

**PER INHABITANT GENERATION (IN KG/INH)**



**AMOUNT OF E-WASTE GENERATED ANNUALLY (IN METRIC KILOTONS)**

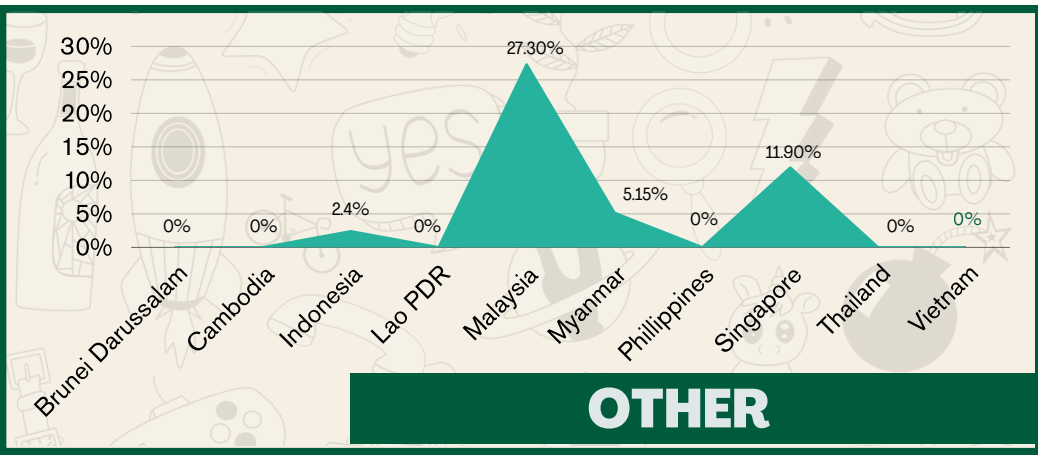
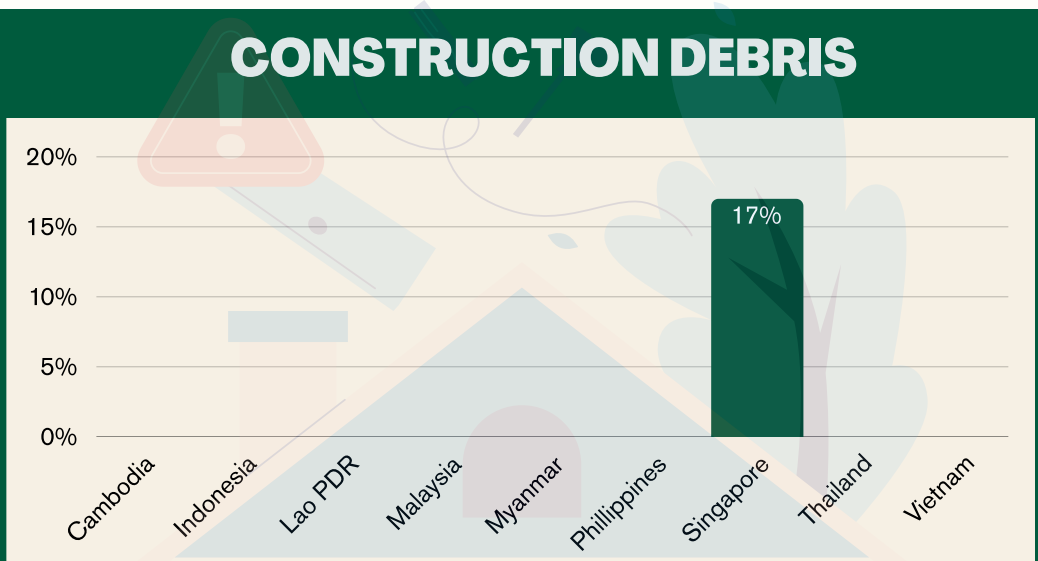
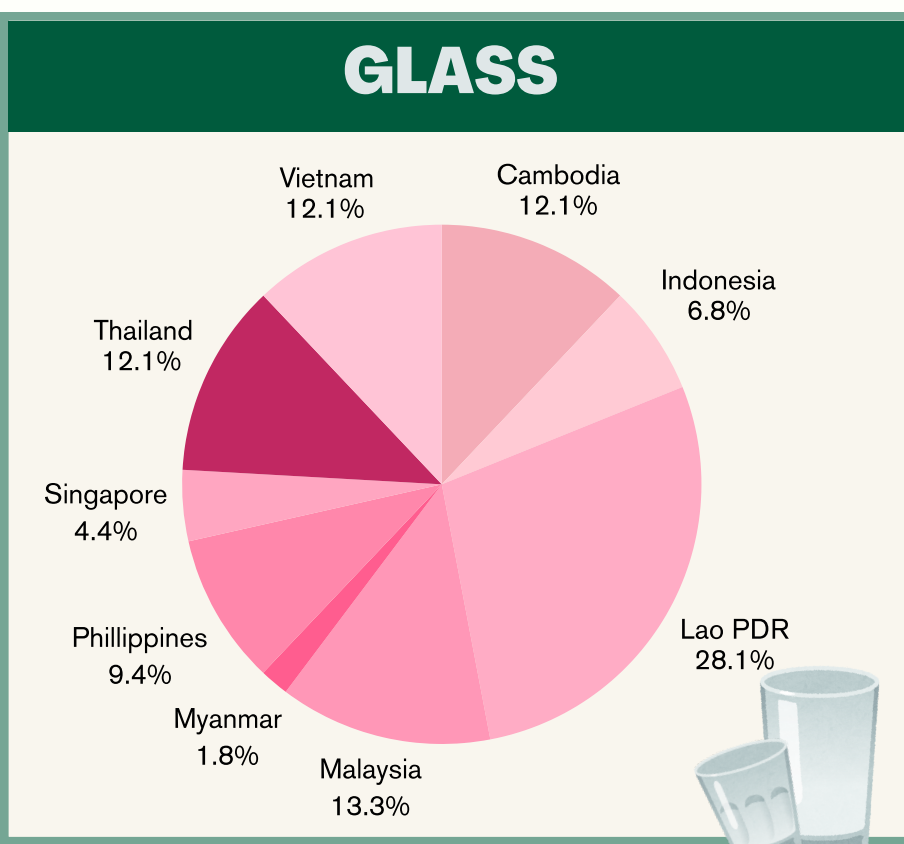
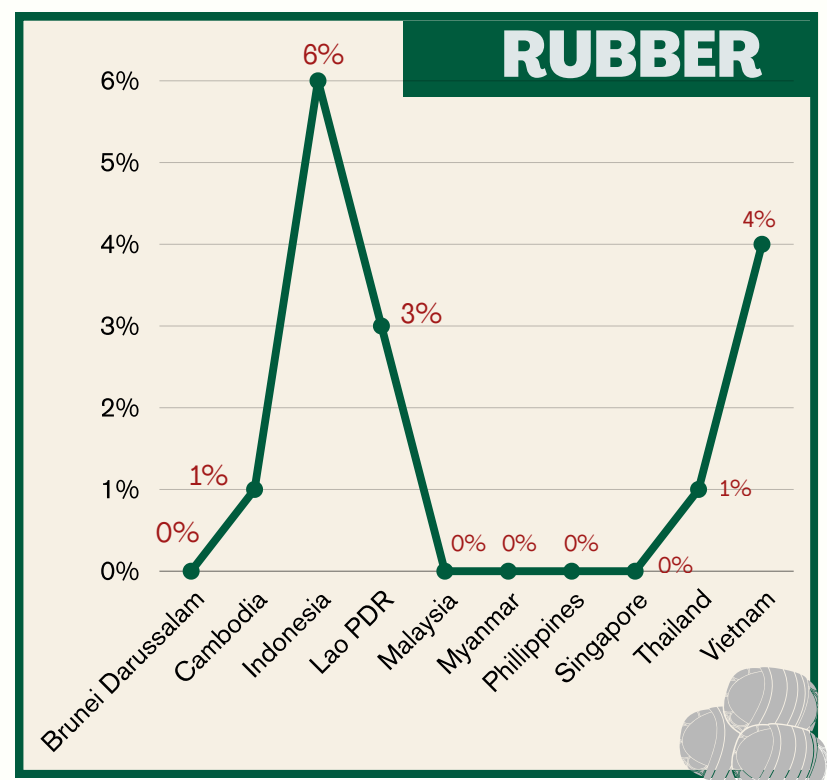
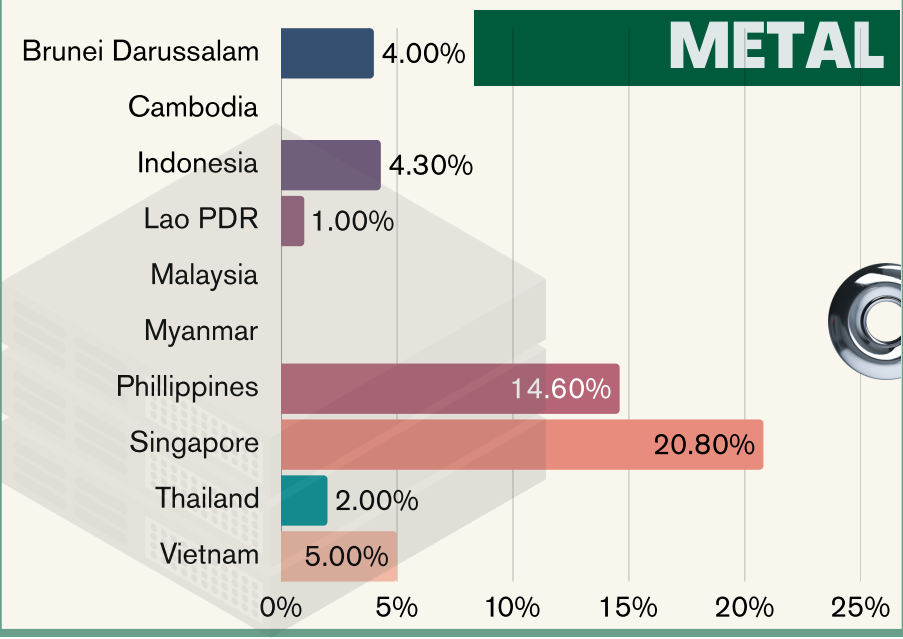
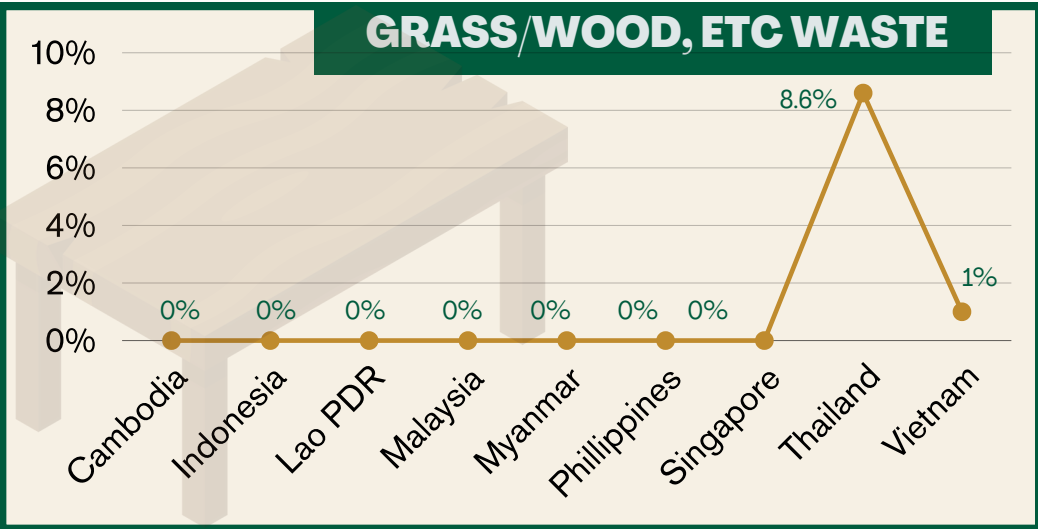
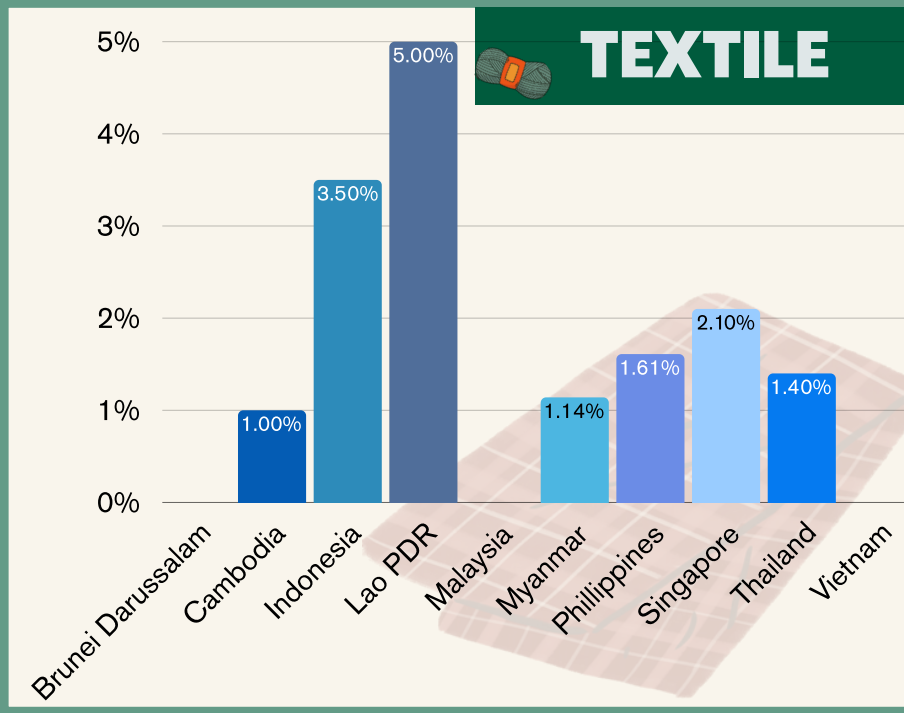
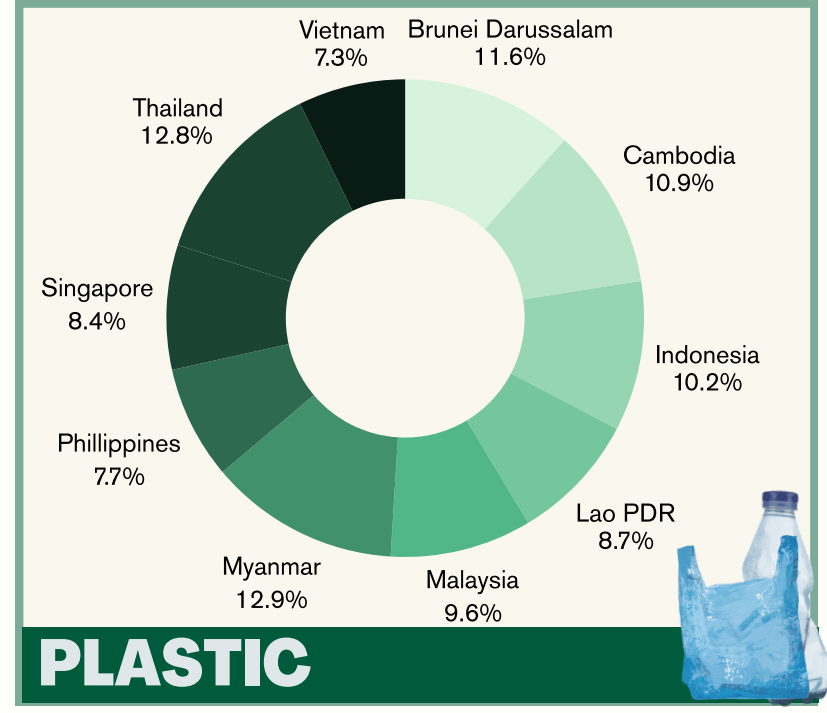
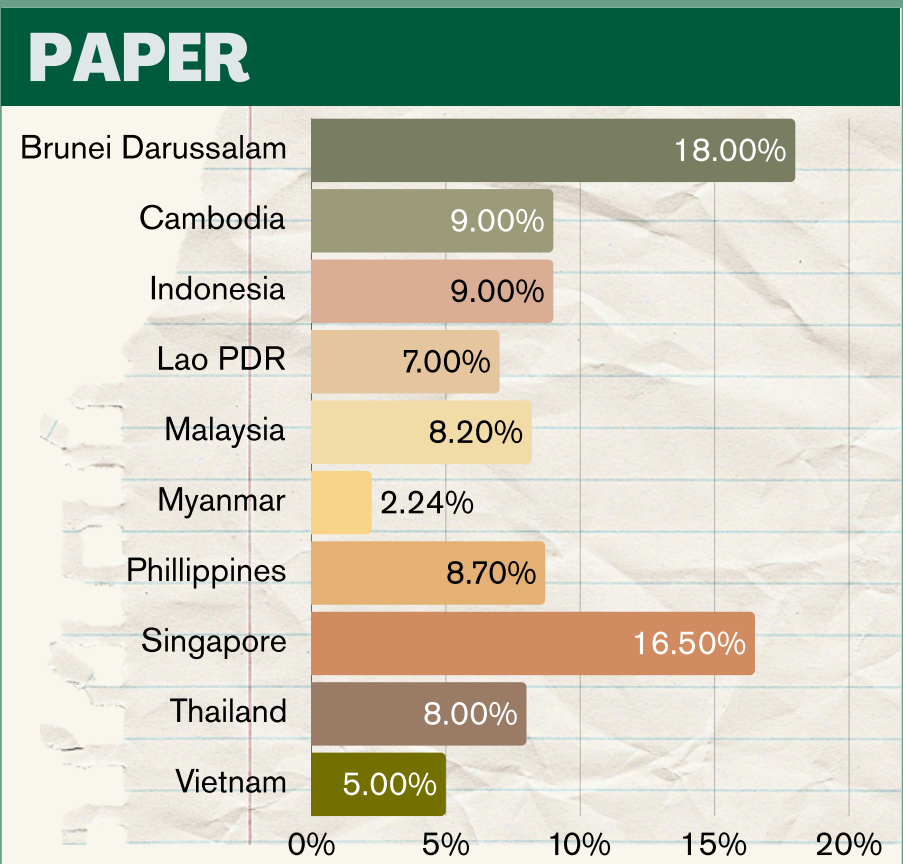


Source: Waste Management in ASEAN Countries: Summary Report



This comparison shows that **total population matters**. Even small amounts of waste generated daily can add up to a significant pile over time.

# LET'S TAKE A LOOK AT COMPOSITION OF USABLE MSW IN ASEAN COUNTRIES



Source: Waste Management in ASEAN Countries: Summary Report



# ASSESSMENT OF WASTE MANAGEMENT TECHNOLOGIES IN ASEAN: FOCUS ON EMERGING WASTE STREAMS

**AVERAGE RECYCLING RATE**  
**50%**

**APPOX. AVERAGE SOURCE SEGREGATION RATE**  
**55%**

**APPROX. AVERAGE URBAN COLLECTION RATE**  
**79.6%**

Recycling and Treatment Availability in ASEAN Countries (Updated)

Country	Recycling - Plastic	Recycling - E-waste	Treatment - Plastic	Treatment - E-waste
Brunei Darussalam	0	1	0	0
Cambodia	0	0	0	0
Indonesia	1	1	1	1
Lao PDR	0	0	0	0
Malaysia	1	1	1	1
Myanmar	1	0	0	0
Philippines	1	1	1	1
Singapore	1	1	1	1
Thailand	1	1	1	1
Vietnam	1	1	1	1

Many ASEAN countries lack effective recycling systems for emerging waste streams, highlighting urgent opportunities for improvement.



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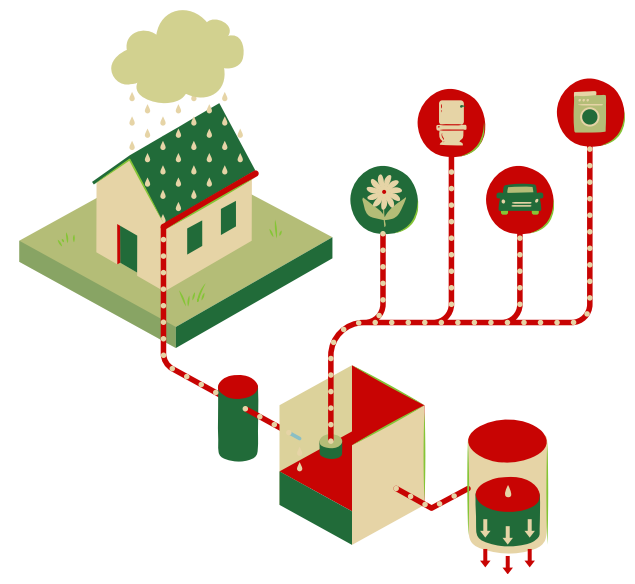
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## ROOT CAUSE - INEFFICIENT WASTE MANAGEMENT SYSTEMS



Waste collection systems: manual, irregular, and data-poor



Incomplete or outdated municipal waste data hinders planning.

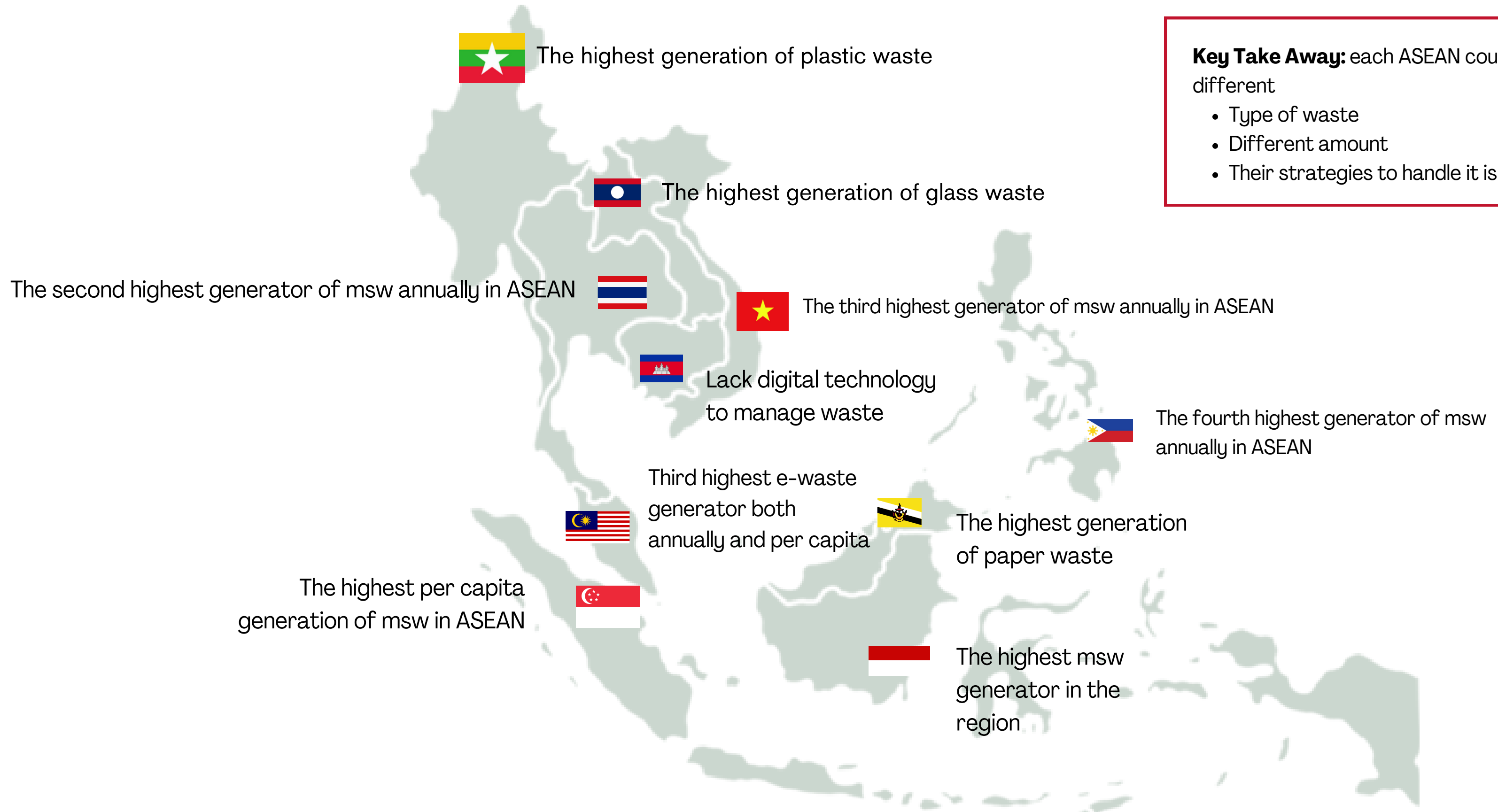


Low recycling participation due to lack of digital platforms linking producers and recycle

**BY 2050**

Solid waste in ASEAN cities **could double**, raising pollution and threatening health and economic productivity

# PROBLEM - KEY TAKEAWAY



**Key Take Away:** each ASEAN countries generate different

- Type of waste
- Different amount
- Their strategies to handle it is also different

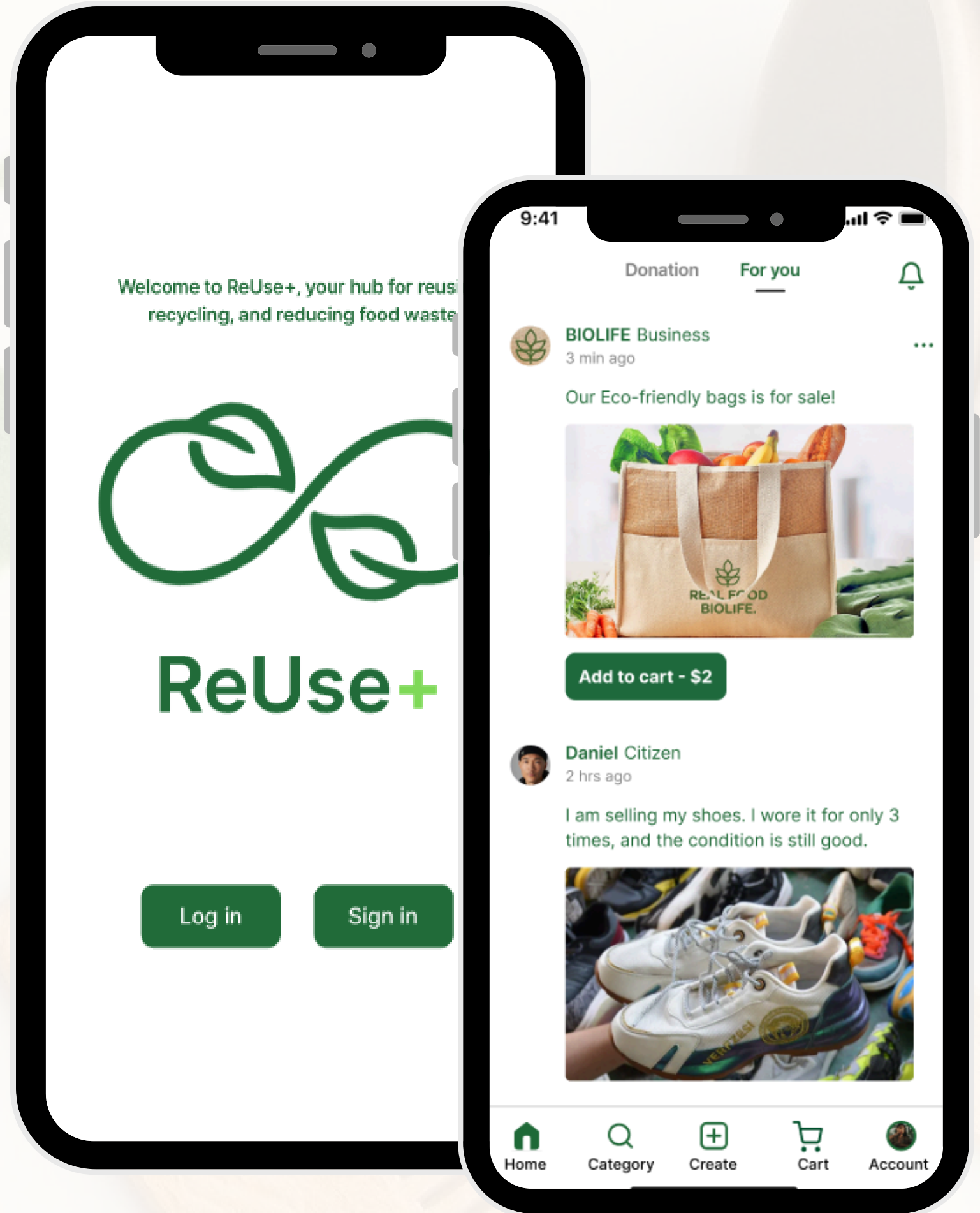


**SO, IS THERE ANY  
SOLUTION TO MITIGATE  
THIS PROBLEM?**

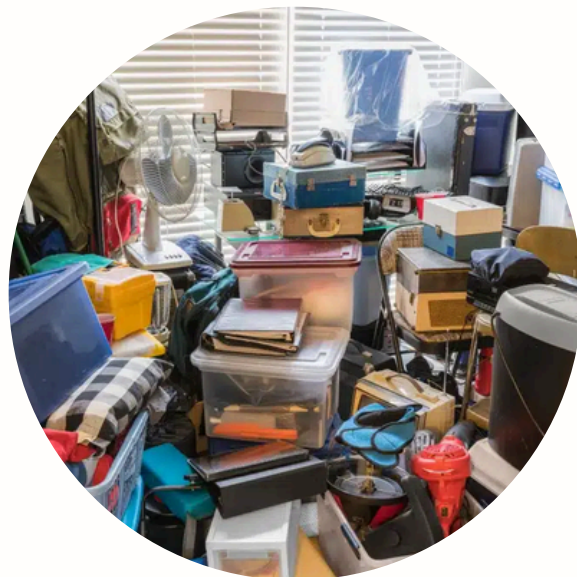


# ReUse+

**A Unified Platform for Circular Economy and Sustainable Waste Management in ASEAN**



# SOLUTION



**SECOND HAND OR OBSOLETE ITEMS**



**ECO-FRIENDLY PRODUCTS SUPPLIES**



**SPACE FOR  
SHARE, DONATE, BUY, AND SELL**

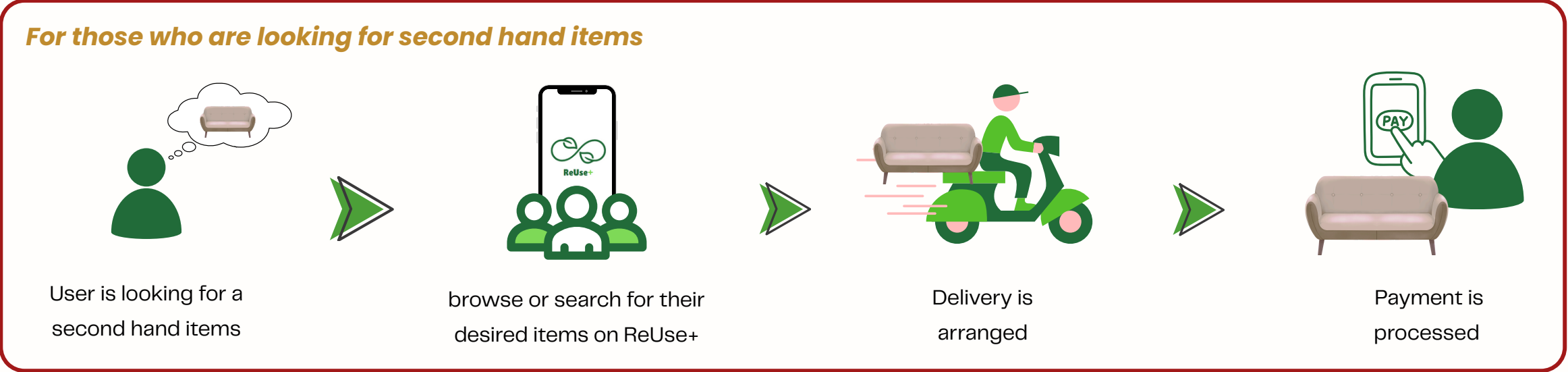


**UNDERSERVED COMMUNITY**

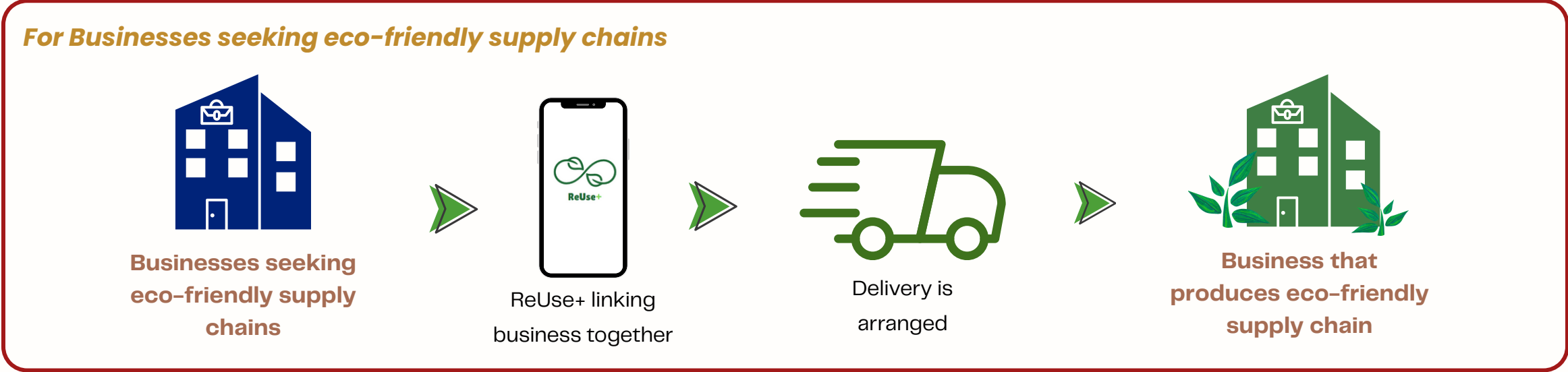


**ECO-FRIENDLY BUSINESS**

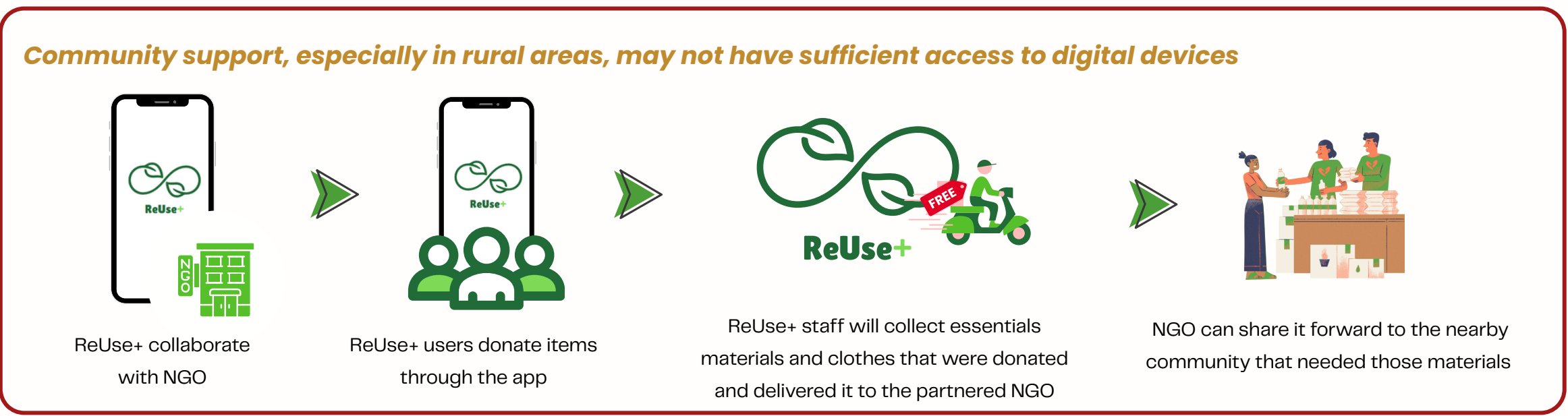
# HOW DOES REUSE+ WORK?



**C2C**



**B2B**

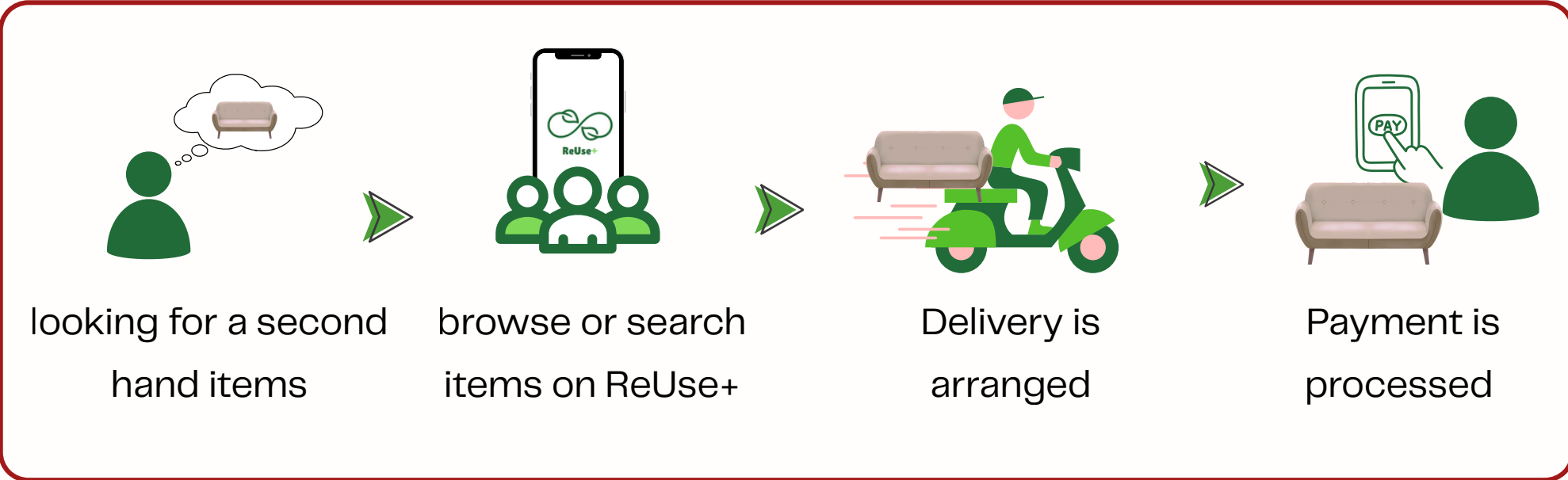


**Community**

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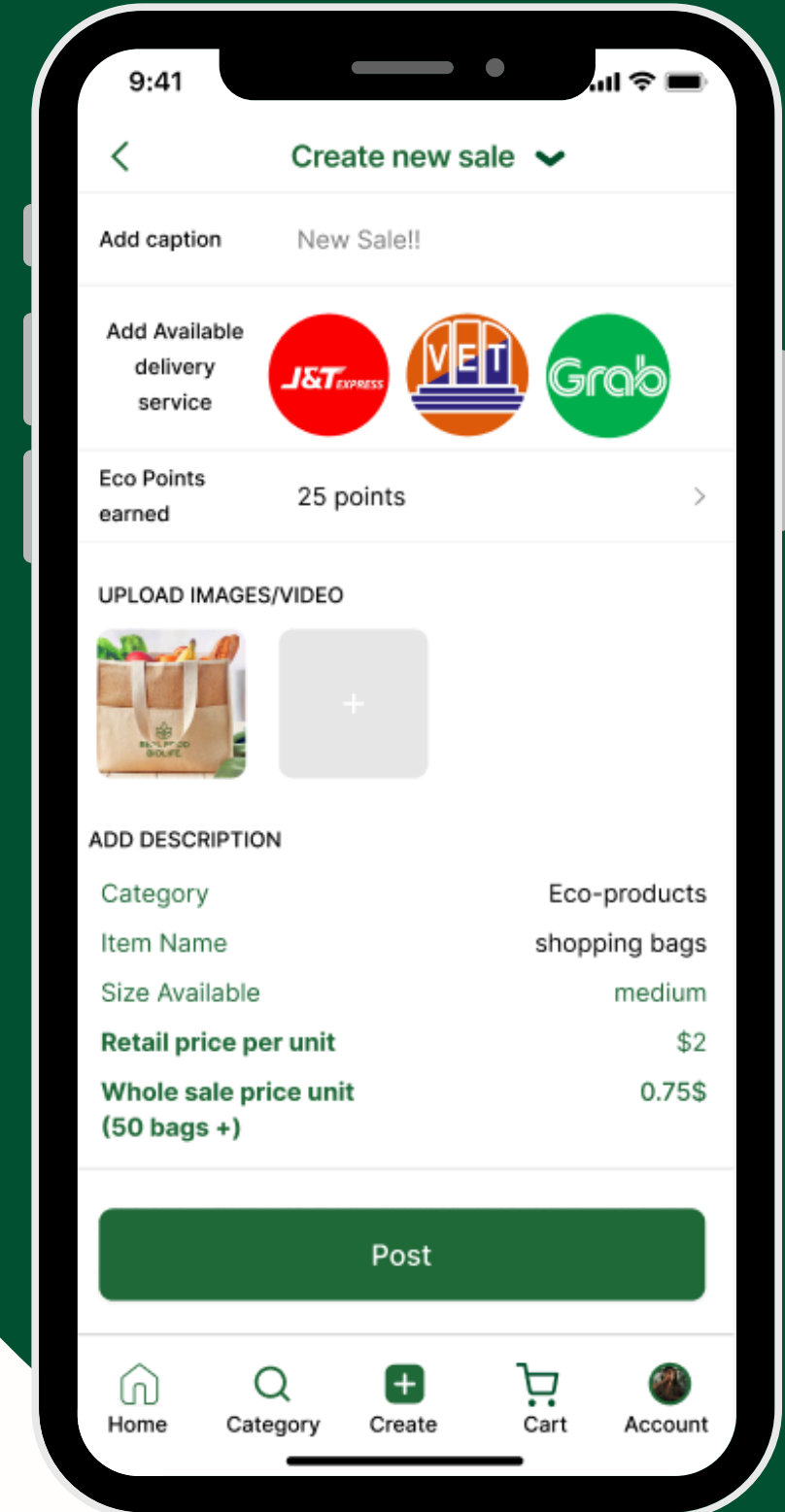
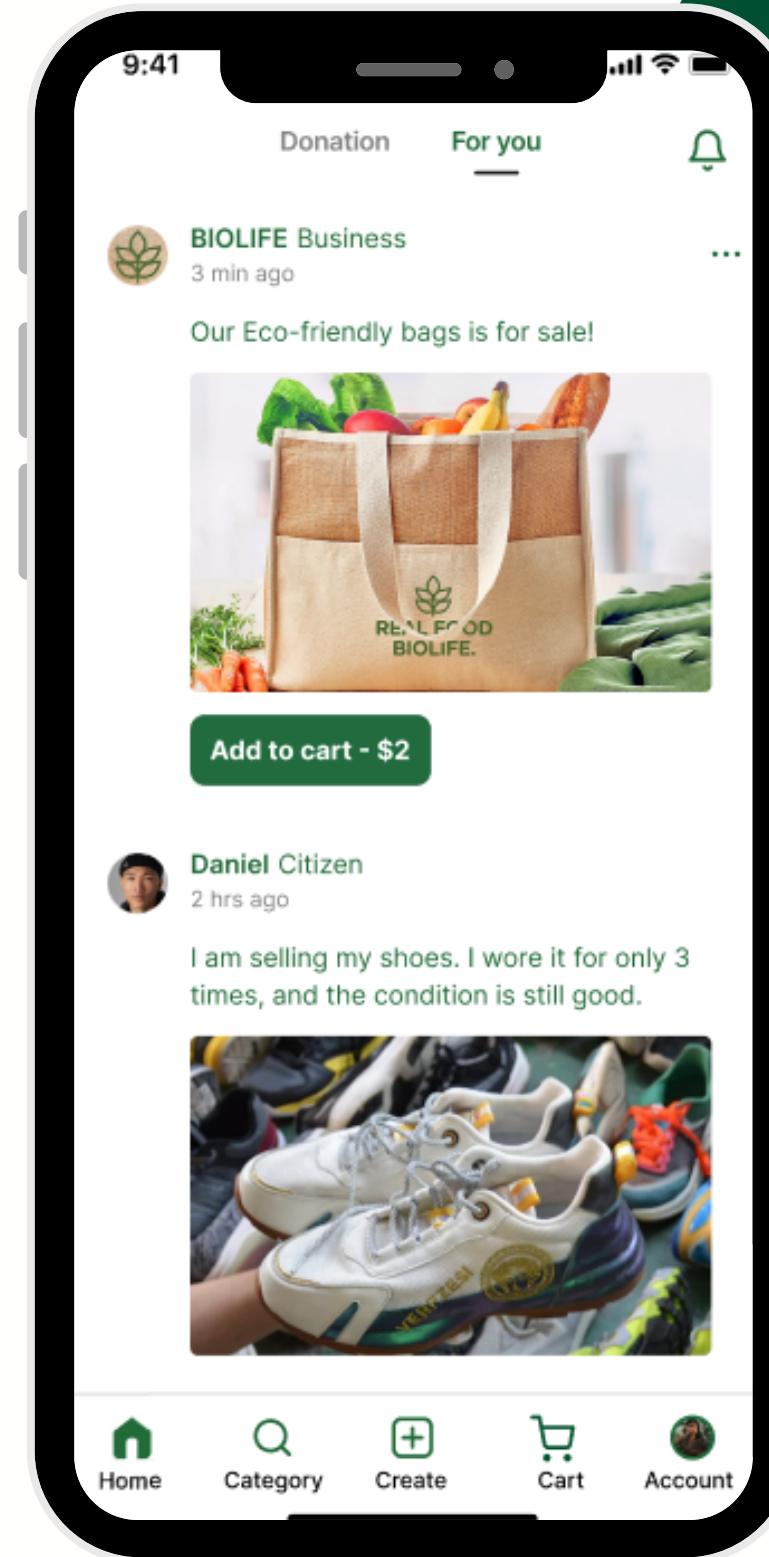
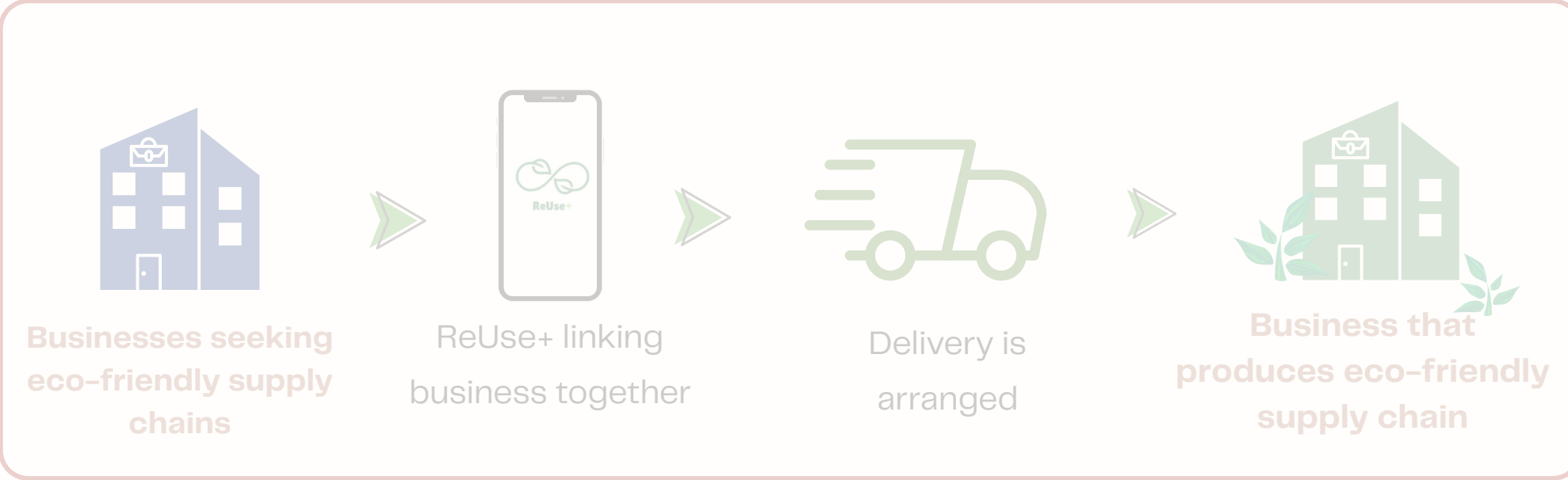
## C2C (Customer to Customer)

### Buying and selling second hand items



## B2B (Business to Business)

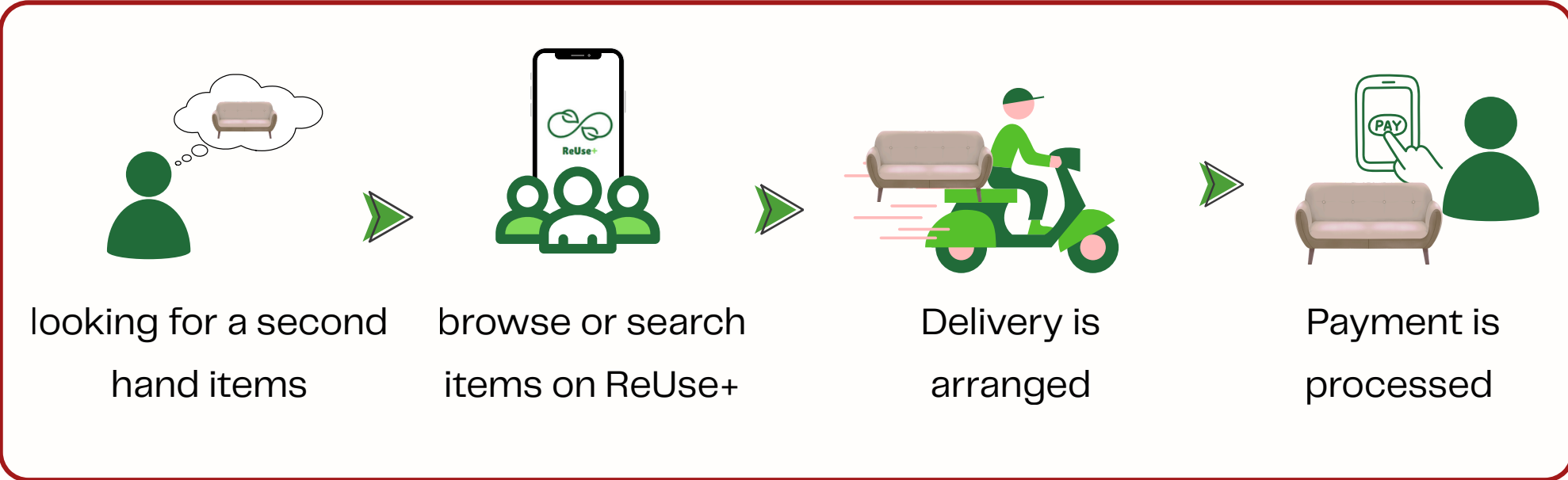
### Connecting eco-friendly business and suppliers



# HOW DOES REUSE+ WORK?

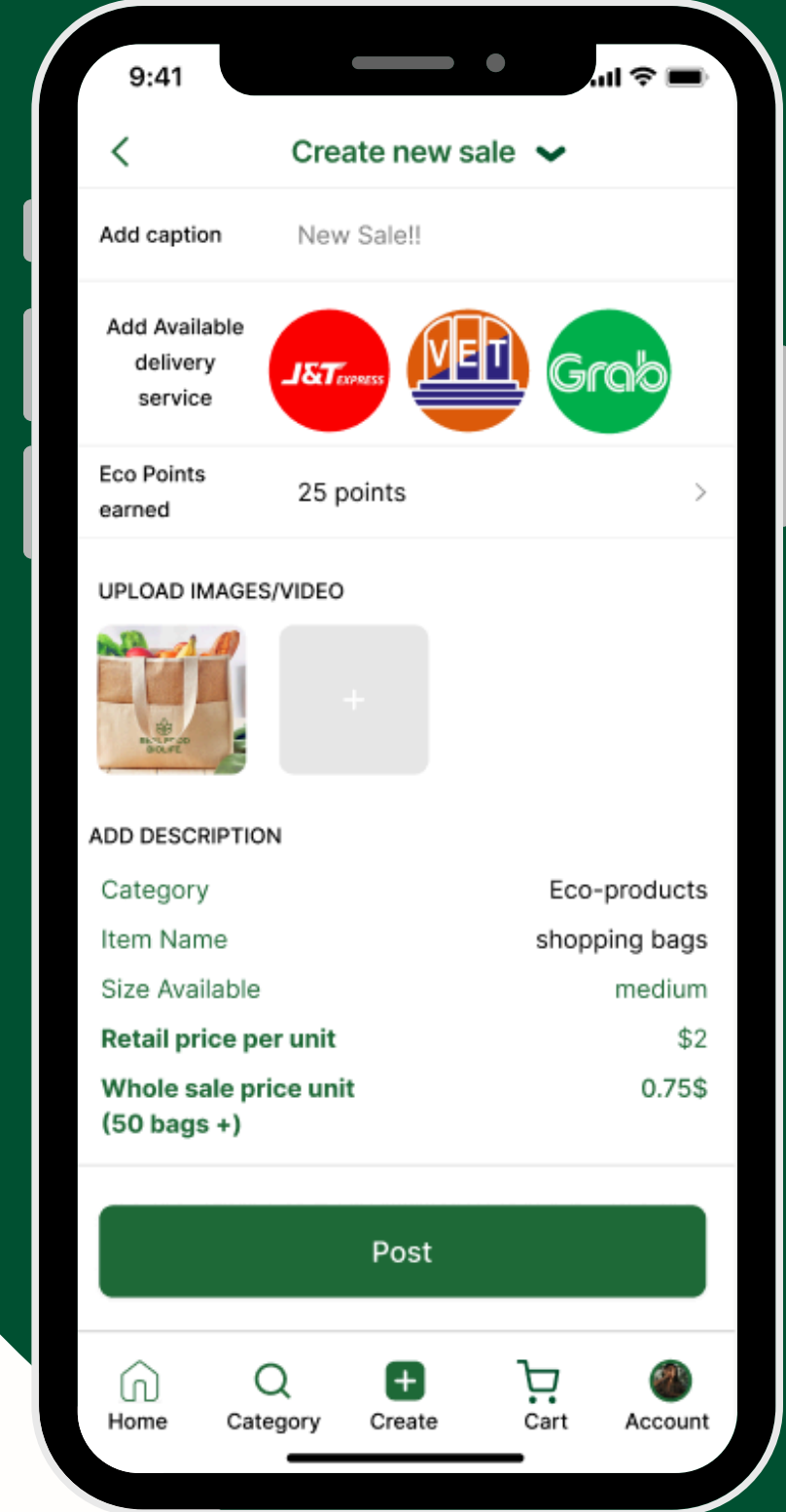
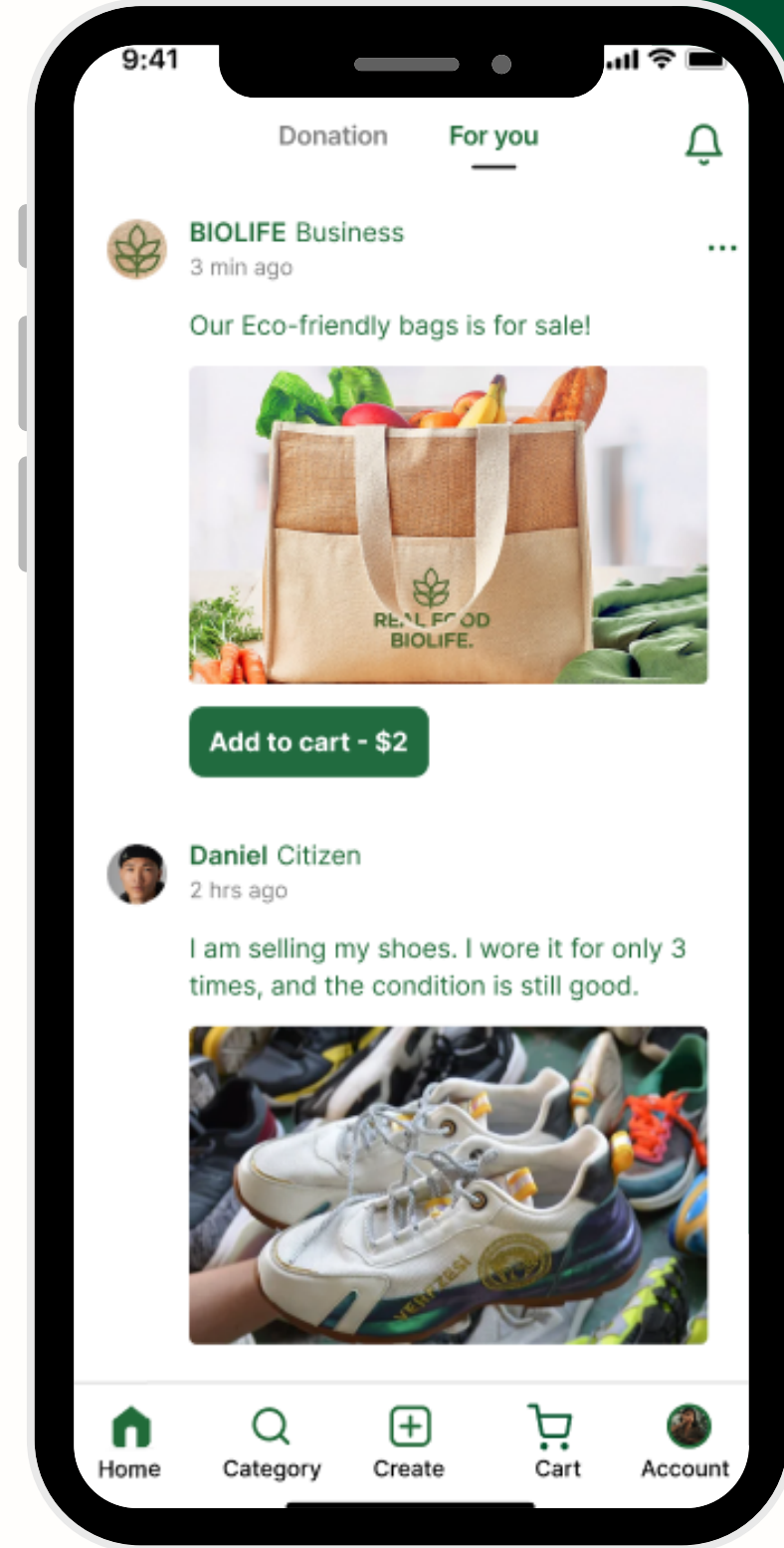
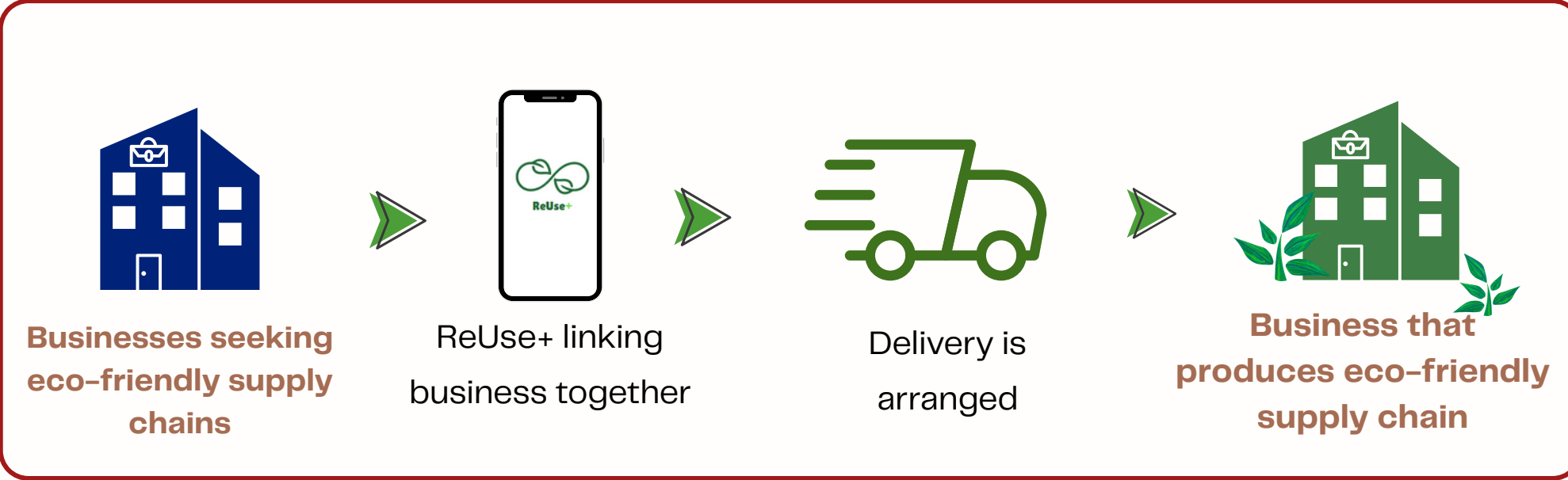
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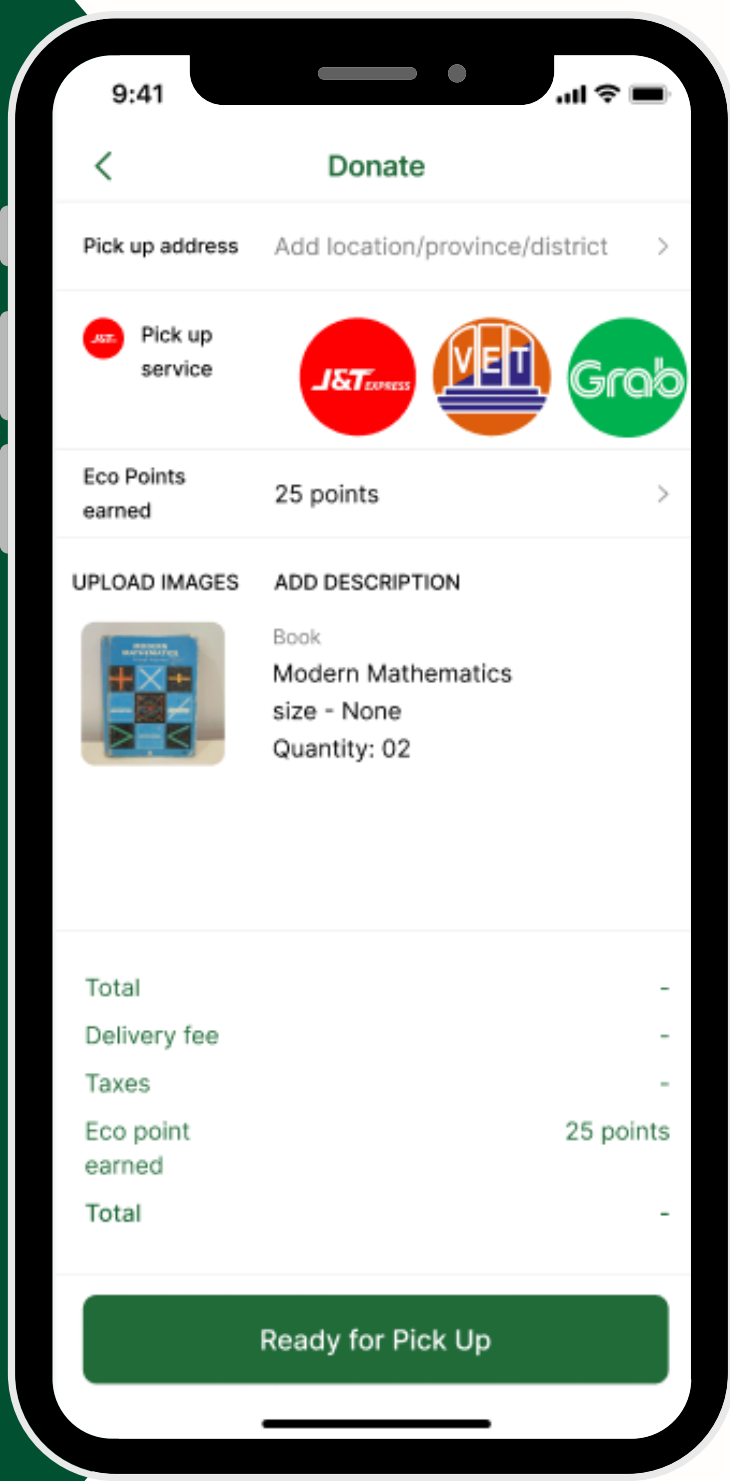
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# HOW DOES REUSE+ WORK?

*(Continue)*

## Community

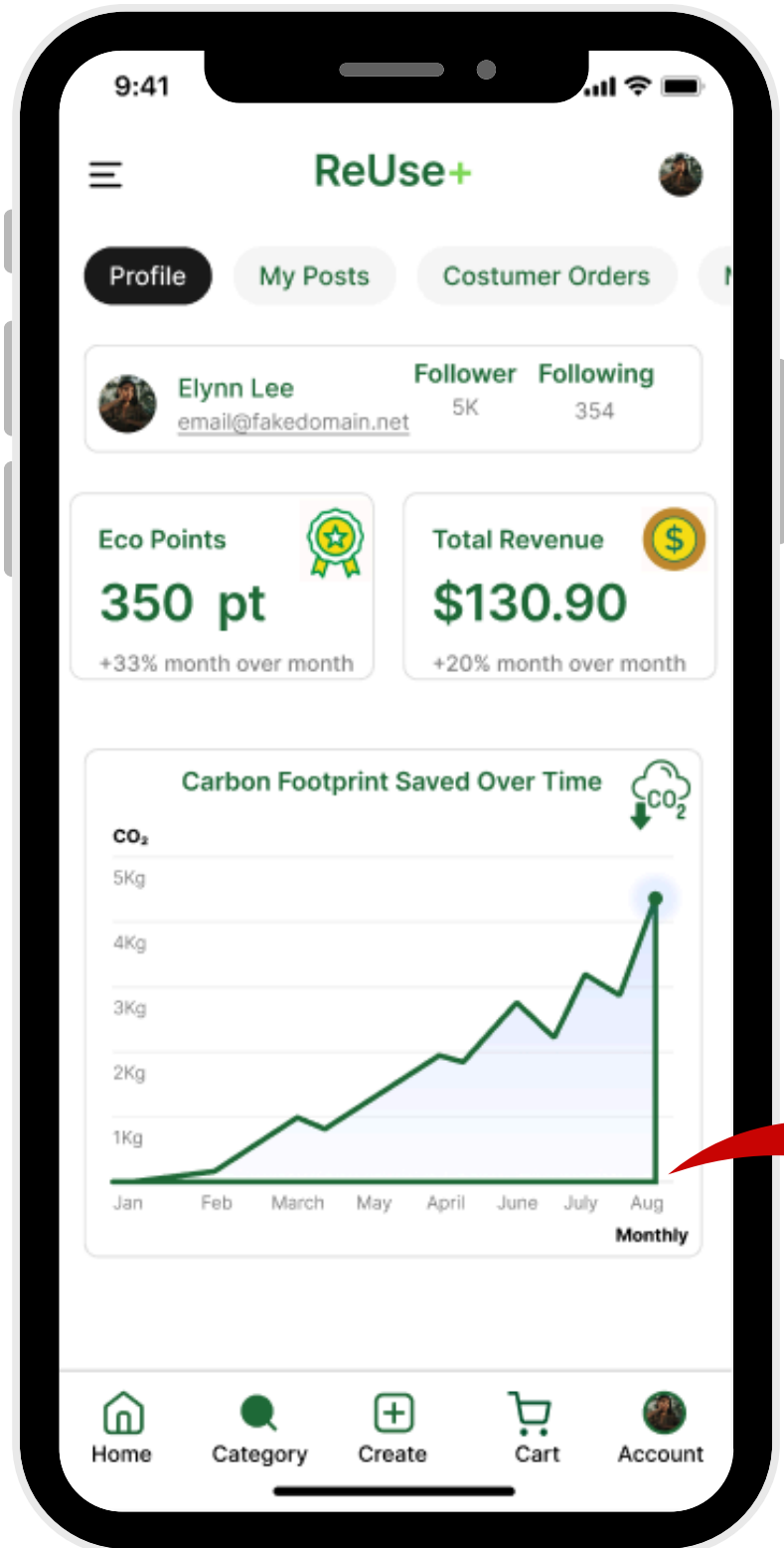
*Community support, especially in rural areas, may not have sufficient access to digital devices*



**ReUse+ integrates a donation policy for items that cannot be sold or reused, ensuring proper waste management and promoting responsible giving.**

# To keep user engage, ReUse+ offer **Eco points** where users can use to trade for various benefits

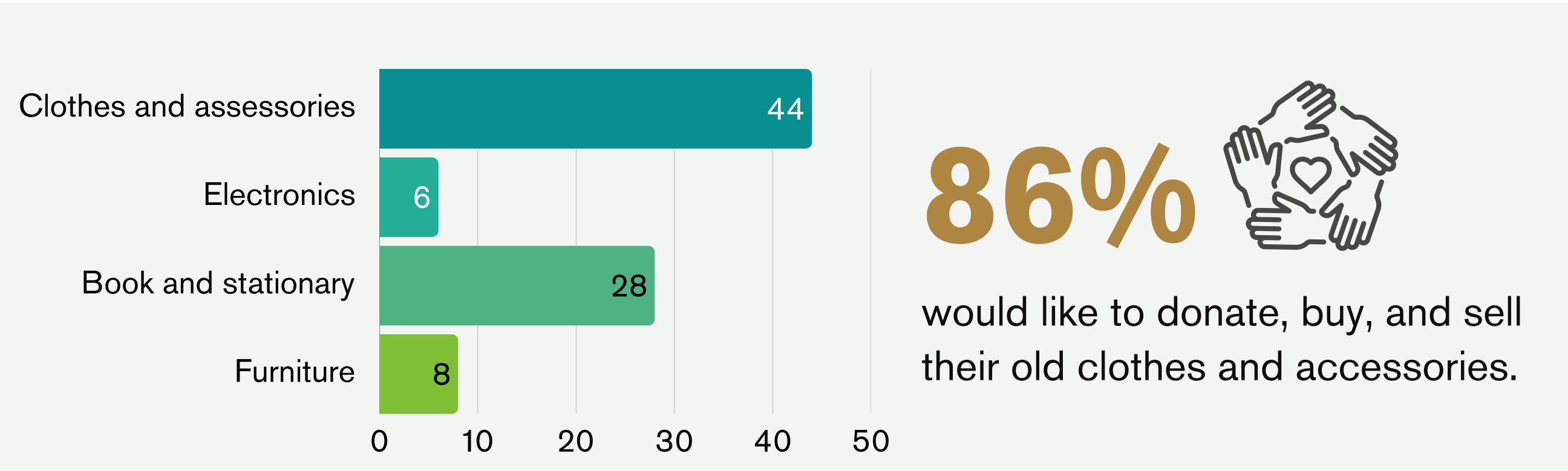
## How does Eco Points work?



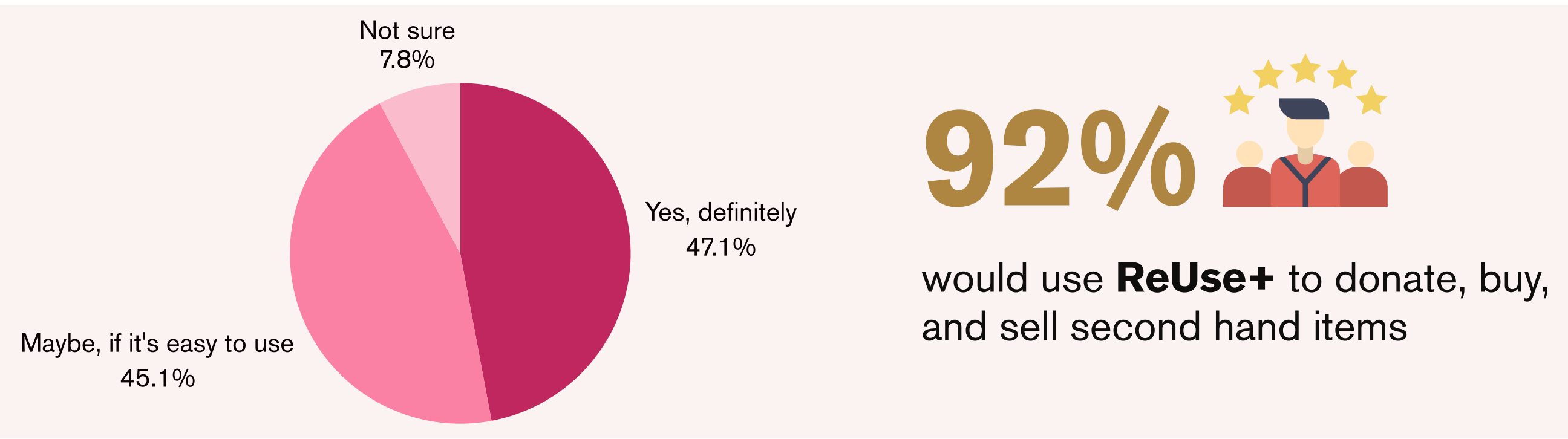
**1 KG OF CO<sub>2</sub> SAVED = 10 ECO-POINTS**

# COSTUMER VALIDATION

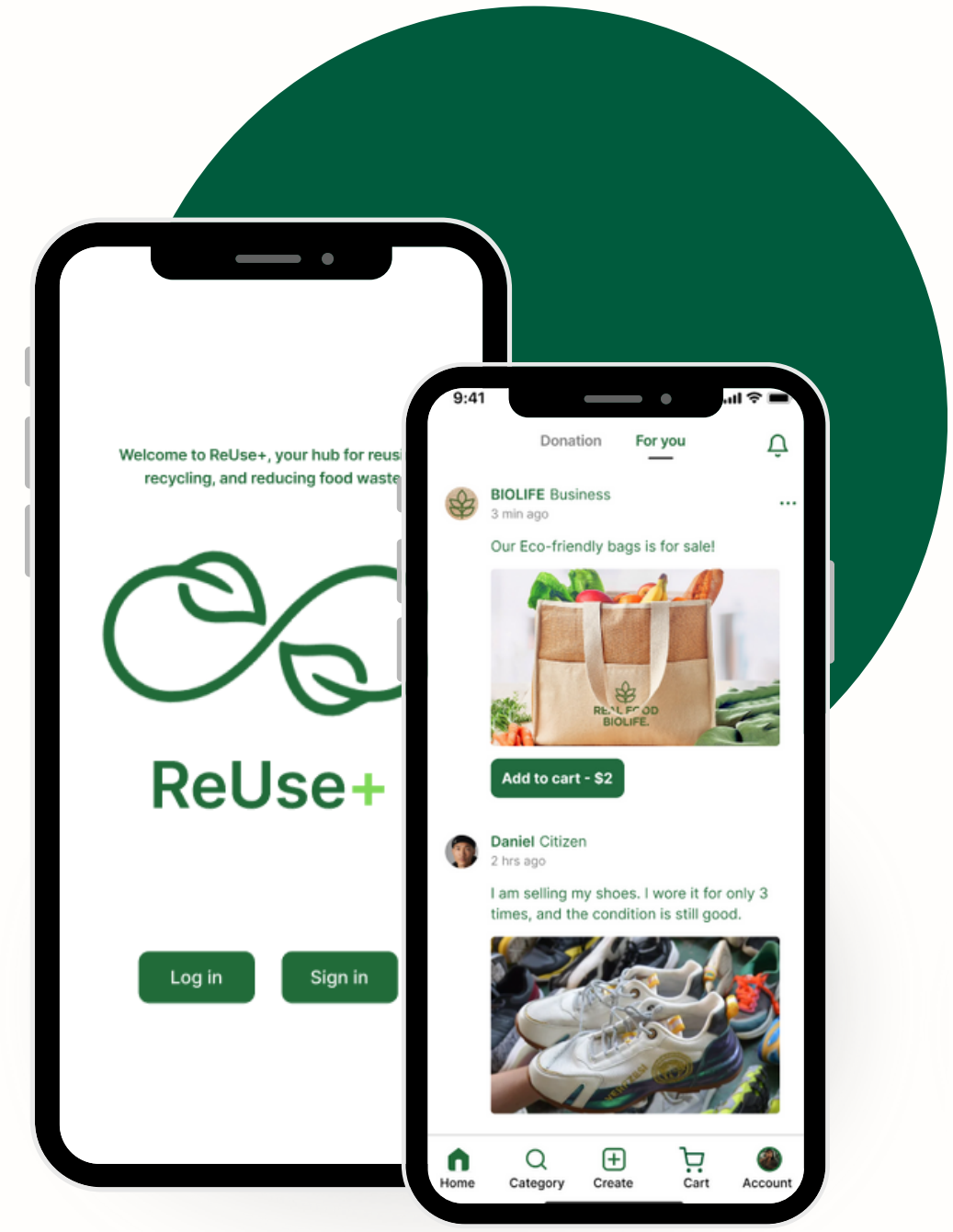
We conducted a survey of more than **50 people** between the ages of 18 and 24 on their **interest in using ReUse+**



**86%**   
 would like to donate, buy, and sell their old clothes and accessories.



**92%**   
 would use **ReUse+** to donate, buy, and sell second hand items





**BUT IS THAT EVERYTHING  
REUSE+ CAN OFFER?**

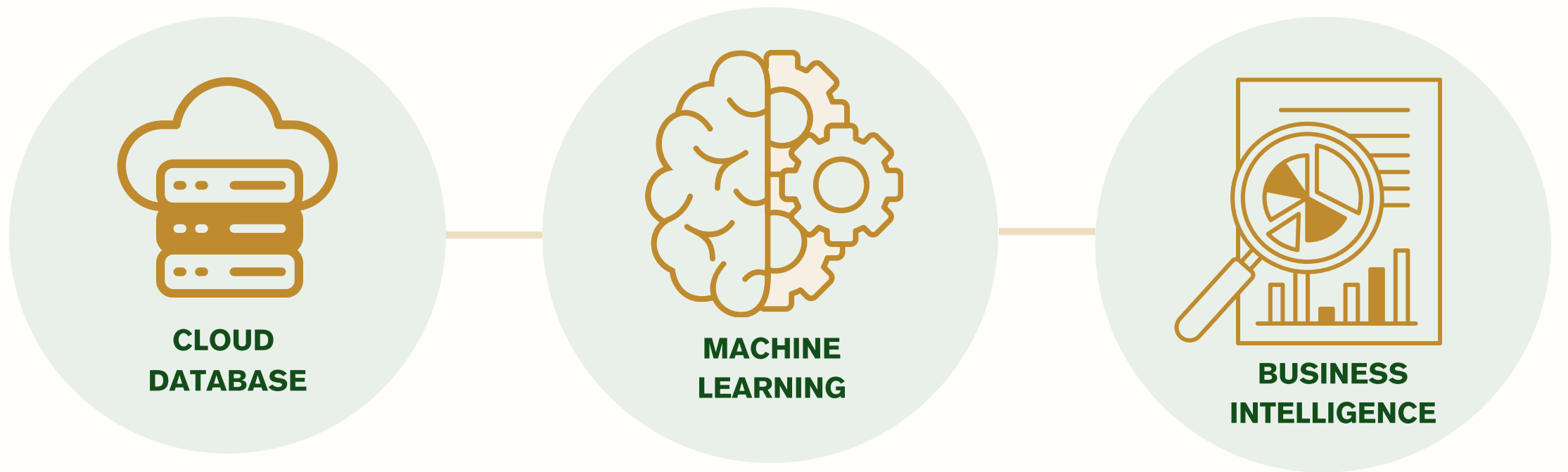
# TURNING USER ACTIVITY INTO A CLEAN & INFORMATIVE DATASET AND DASHBOARD



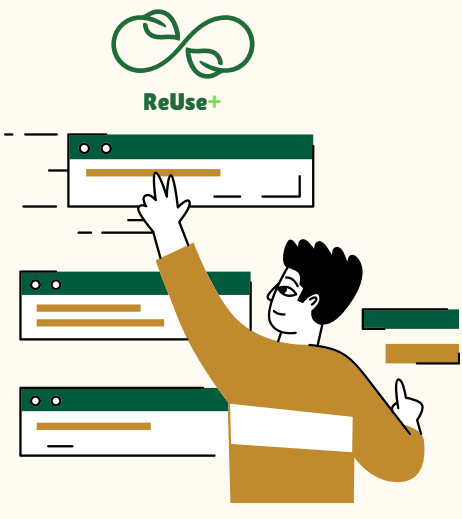
Open Data for everyone

## ReUse+ uses:

1. **Cloud Database** to securely store data,
2. **Machine Learning** to clean datasets for future analysis
3. **Business Intelligence** to create a public dashboard.




# FLOW OF HOW THIS WORK



**1**

**Users interact with the platform**

People donate, sell or manage reusable items on ReUse+


**2**

**Data is securely recorded in a cloud database**, keeping personal information safely

Database - SAP Hana Cloud




Finally, the clean dataset is ready for future and further analysts to use



**4**




Data is automatically cleaned with machine learning algorithms tidy up the information, fixing mistakes creating an accurate, ready-to-use datasets.



**3**



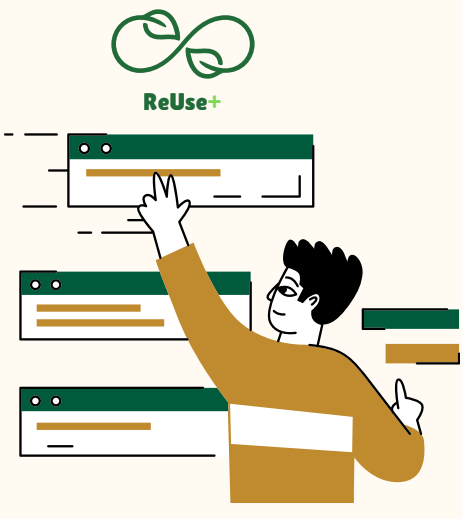
**5**



Policy maker, students and data analyst may submit a request to access the dataset

Public trends are displayed with business intelligence dashboard (No private user data is revealed)


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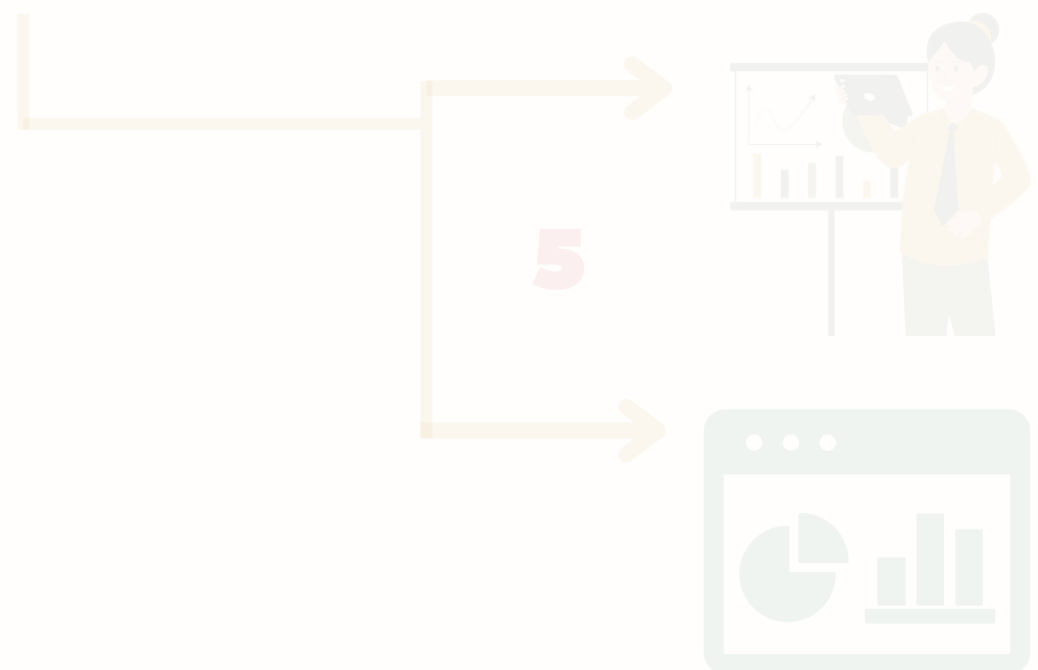


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INCONSISTENCY AND ACCURACY

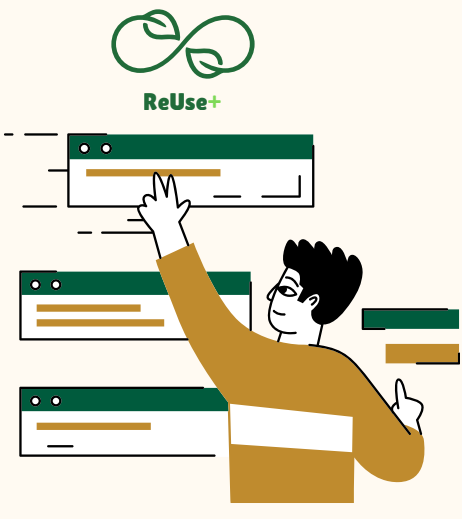


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INCONSISTENCY AND ACCURACY

Duplicate data

Missing values

**4**



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(No private user data is revealed)

**5**



# WHAT LEADS US TO BELIEVE THIS SOLUTION IS FEASIBLE?



**Thrifting in Southeast Asia has evolved from a money-saving habit into a sustainable lifestyle embraced by the younger generation**

**91%** prefer digital platform as their main interacting, trading and shopping channel.

**42%** shop online at least once or twice a month.

Southeast Asia is a significant contributor to the global eco-packaging market, which is valued at

**USD 108.66 billion**

driven by regularity initiatives & shifting consumer preferences



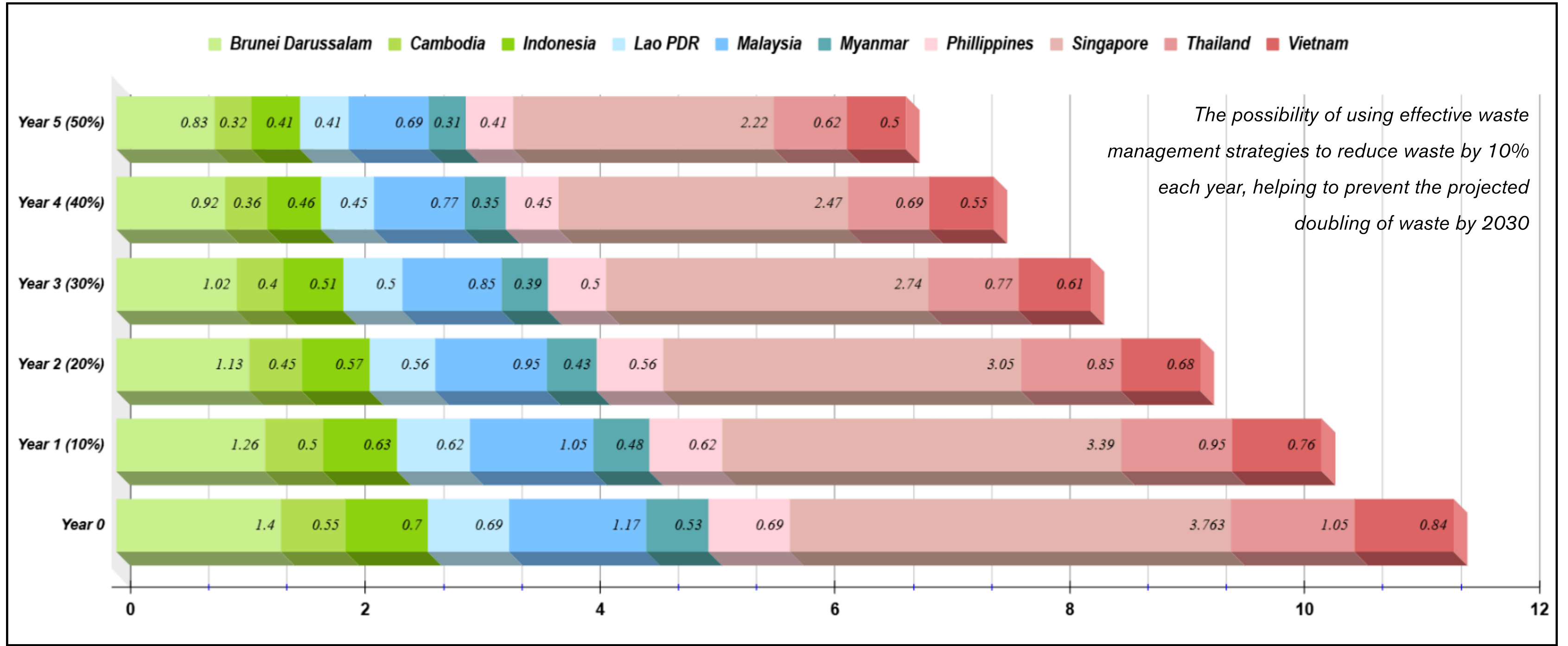
Address MSW data gaps in ASEAN and provide reliable datasets for future analysis.

# WHAT-IF ANALYSIS

Projected Per Capita MSW Reduction in ASEAN (5-Year Forecast)

If ASEAN countries successfully reduce their per capita MSW generation by 10% each year, the region could experience significant environmental and operational benefits by Year 5.

Waste reduction decreases as the year increase



*The possibility of using effective waste management strategies to reduce waste by 10% each year, helping to prevent the projected doubling of waste by 2030*

Values are calculated using the formula  $MSW_n = MSW_0 \times (1 - r)^n$  and rounded to 2 decimal places

Start with Per Capita MSW Generation (kg/capita/day) data

# ALIGNING WITH SDG 12: DRIVING ASEAN'S BLUEPRINT FORWARD

✓  
**SDG 12.5**  
 ReUse+ promote reuse of items like clothes, electronics and furniture, helping reduce waste that ends up in landfill

✓  
**SDG 12.6**  
 ReUse+ educate users through tips, resources, and eco-impact tracking, encouraging more responsible daily habit

✓  
**SDG 12.8**  
 ReUse+ connects businesses with sellers or producers who turned waste into reusable goods, making sustainable sourcing easier.



**ASEAN**  
 SOCIO-CULTURAL COMMUNITY  
 BLUEPRINT 2025

**SUSTAINABLE ENVIRONMENT**  
 ReUse+ contributes to reducing waste and promoting recycling, aligning with the ASCC's goal of achieving a sustainable environment

**SOCIAL DEVELOPMENT**  
 By facilitating access to eco-friendly products and promoting sustainable consumption, ReUse+ supports the ASCC's objective of enhancing social development.



**ASEAN**  
 ECONOMIC COMMUNITY  
 BLUEPRINT 2025

**SUPPORT FOR SMEs:**  
 ReUse+ provides a platform for small and medium-sized enterprises (SMEs) to reach consumers interested in sustainable products, aligning with the AEC's emphasis on supporting SMEs.

**SUSTAINABLE ECONOMIC DEVELOPMENT**  
 By promoting the reuse and recycling of products, ReUse+ contributes to sustainable economic practices, in line with the AEC's objectives.

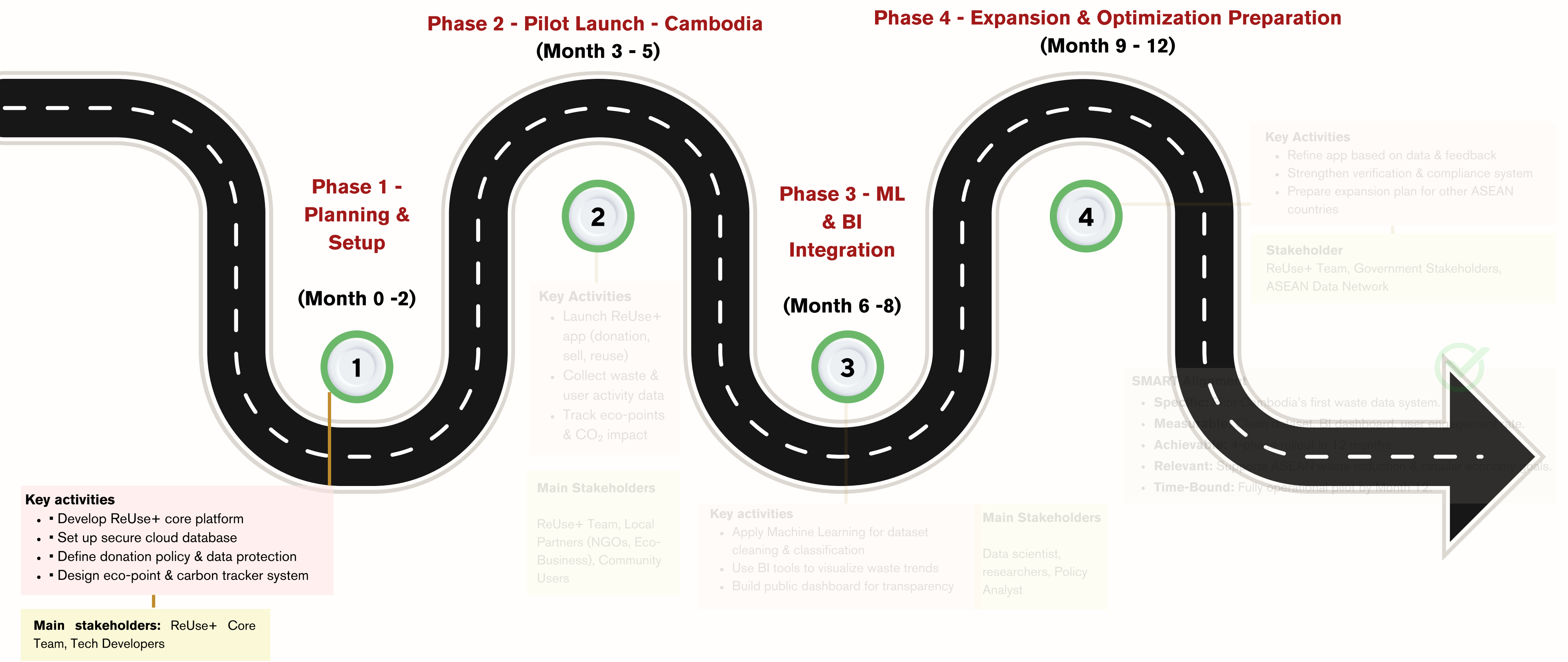
# STAKEHOLDERS





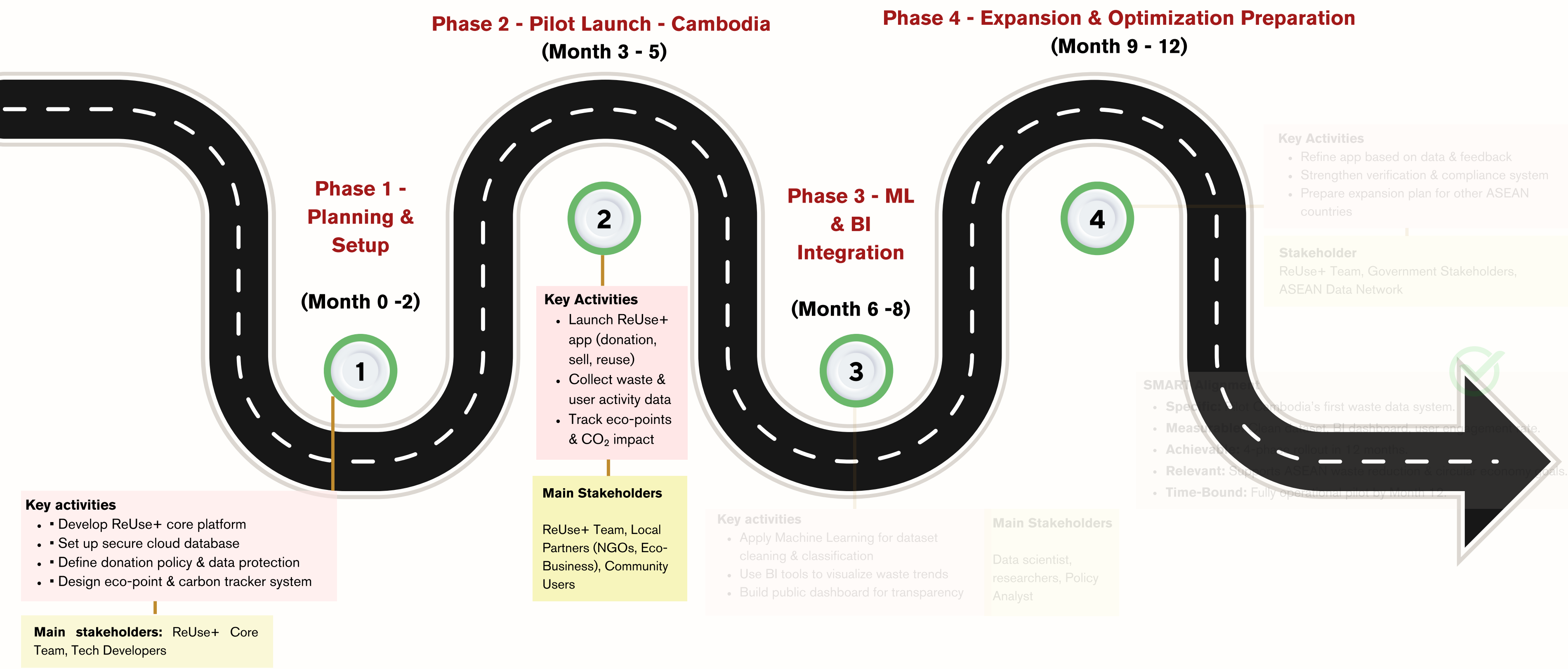
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SMART (Specific, Measurable, Action, Relevant, Time)  
 (Implementation of the solution - timeline, relevant stakeholder involves) – Months 0 - 12



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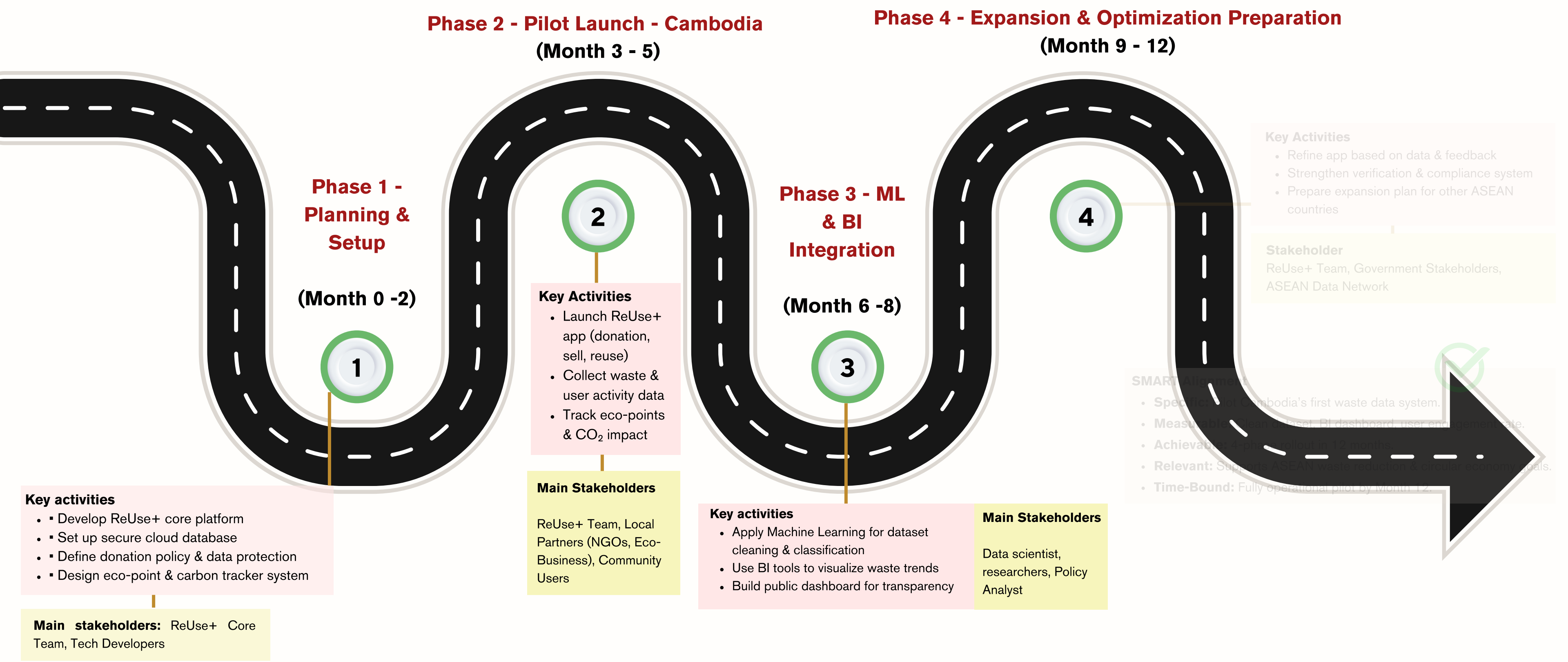
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 (Implementation of the solution - timeline, relevant stakeholder involves) – Months 0 - 12





# REUSE+ IMPLEMENTATION ROADMAP - SMART APPROACH

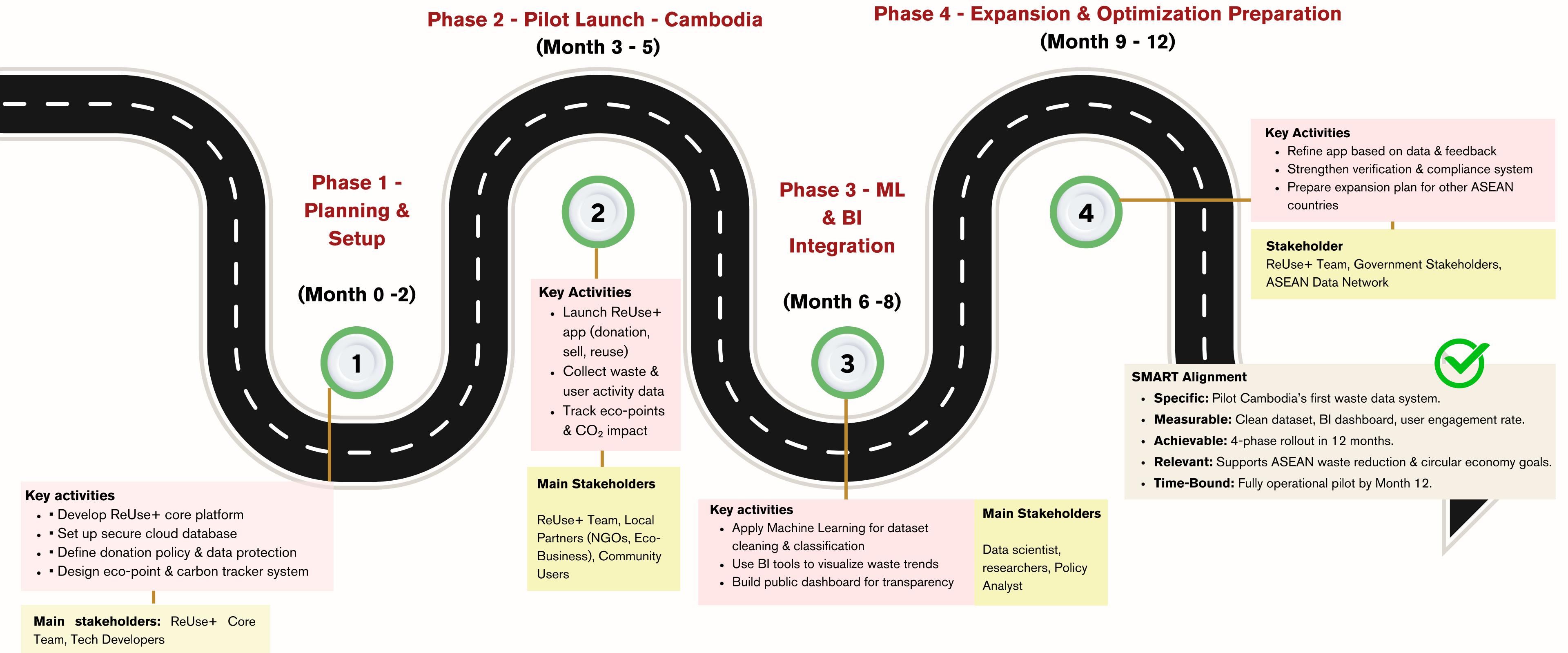
SMART (Specific, Measurable, Action, Relevant, Time)  
 (Implementation of the solution - timeline, relevant stakeholder involves) – Months 0 - 12





# REUSE+ IMPLEMENTATION ROADMAP - SMART APPROACH

SMART (Specific, Measurable, Action, Relevant, Time)  
 (Implementation of the solution - timeline, relevant stakeholder involves) – Months 0 - 12





**Reuse today. Restore tomorrow!**



**THANK YOU!**

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# **APPENDIX**

# SYSTEM HOW ECO-POINT WORK

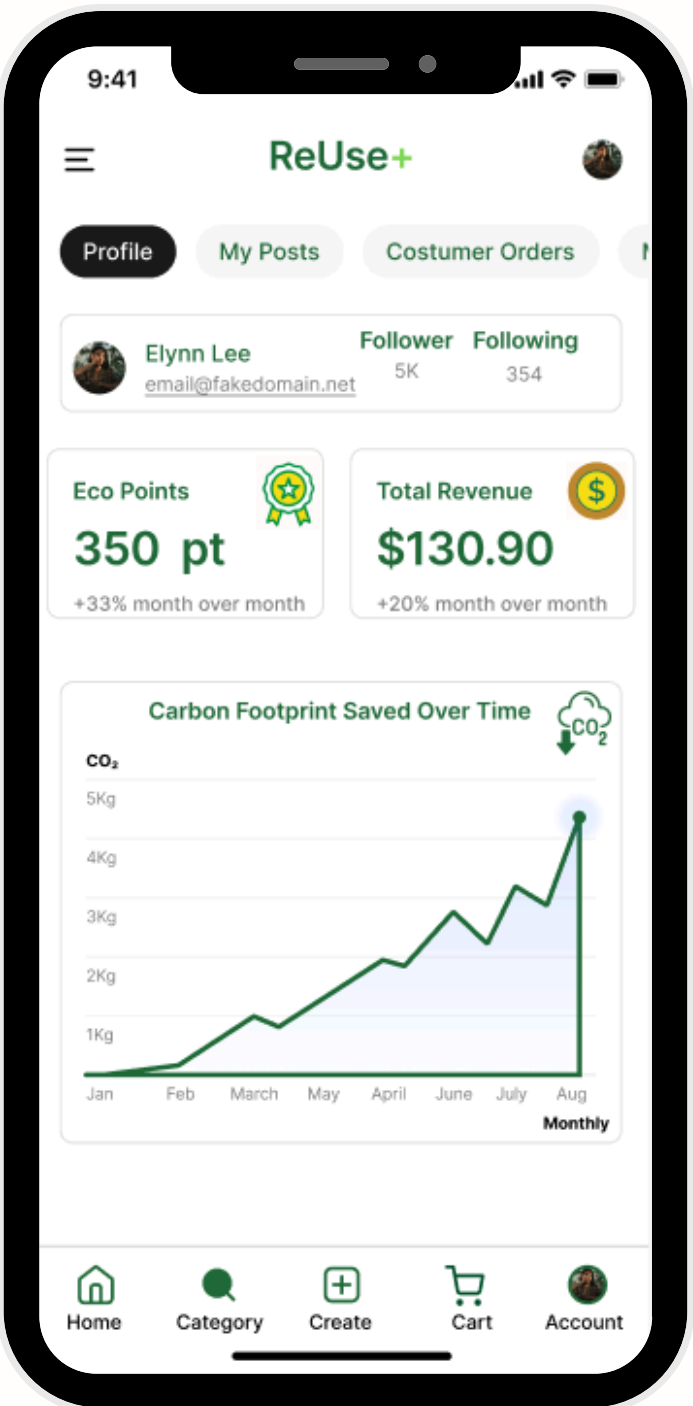
*Estimate the Carbon Savings of different items and Eco-point conversion*

**CO<sub>2</sub> saved per item (kgCO<sub>2</sub>) = Weight (kg) x CO<sub>2</sub> avoided per kg (kgCO<sub>2</sub>/kg)**

Items	Main Material	Typical weight (kg) min / mid / max	CO <sub>2</sub> avoided per kg (kg CO <sub>2</sub> / kg) min / mid / max (assumed)	CO <sub>2</sub> saved per item (kgCO <sub>2</sub> )	Eco-point conversion (0.1 kg CO <sub>2</sub> saved = 1 eco-points )
Books (paperback)	Paper	0.45 / 0.90 / 1.36	<b>0.6 / 1.00 / 1.50</b>	<b>0.90 kg CO<sub>2</sub></b>	<b>9 points/book</b>
Clothes (single garment, cotton)	Cotton textiles	0.14 / 0.20 / 0.30	<b>3.5 / 6.0 / 10.0</b>	<b>1.20 kg CO<sub>2</sub></b>	<b>12 points/clothe</b>
Electronic device (smartphone → laptop range)	Aluminum, Metal, steel	0.20 / 1.35 / 2.50	<b>8.0 / 12.0 / 20.0</b>	<b>16.20 kg CO<sub>2</sub></b>	<b>160 points/device</b>
Household plastic item (small)	Plastic	0.05 / 0.275 / 0.50	<b>1.0 / 2.0 / 3.0</b>	<b>0.55 kg CO<sub>2</sub></b>	<b>5 points/item</b>
Furniture (glass component e.g., tabletop)	Glass	2.0 / 6.0 / 20.0	<b>0.3 / 0.6 / 1.0</b>	<b>3.60 kg CO<sub>2</sub></b>	<b>35 point/item</b>

*Life Cycle Assessment (LCA)*

# DASHBOARD SAMPLE FOR PUBLIC VIEW



**INDIVIDUAL IMPACT DASHBOARD**



**CITY, COUNTRY, AND ASEAN IMPACT DASHBOARD**

### REUSABLE ITEM TRENDS

### Carbon Footprint Saved Over Time

Month	CO <sub>2</sub> Saved (Kg)
Jan	0
Feb	10
March	15
May	25
April	22
June	30
July	35
Aug	45

*Displays different categories of reusable waste (Glass, Metal, Cloth, Plastic, Books, etc.).*

*Tracks collective CO<sub>2</sub> savings from all users within a specific region (city, country, or ASEAN level).*

*Shows CO<sub>2</sub> saved (in kilograms) by waste type to visualize which materials contribute most to sustainability.*

*Highlights progress and impact on environment over months or years.*

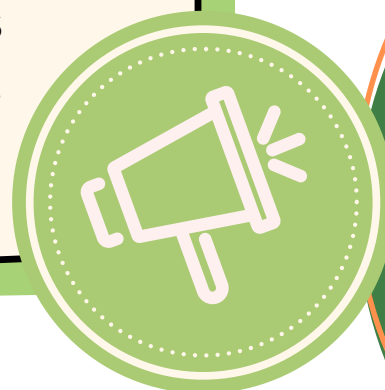
*Open data for public usages*

# REVENUE MODEL

1

## Advertising & Post Boosting

- Green businesses, eco-brands, or sustainable SMEs pay to promote their products.
- Individuals can boost listings for second-hand items.



4

## Partnership Revenue

Collaborations with NGOs, local government, and logistic companies (e.g. shared projects, CSR funding).



2

## Eco-Verified Subscription

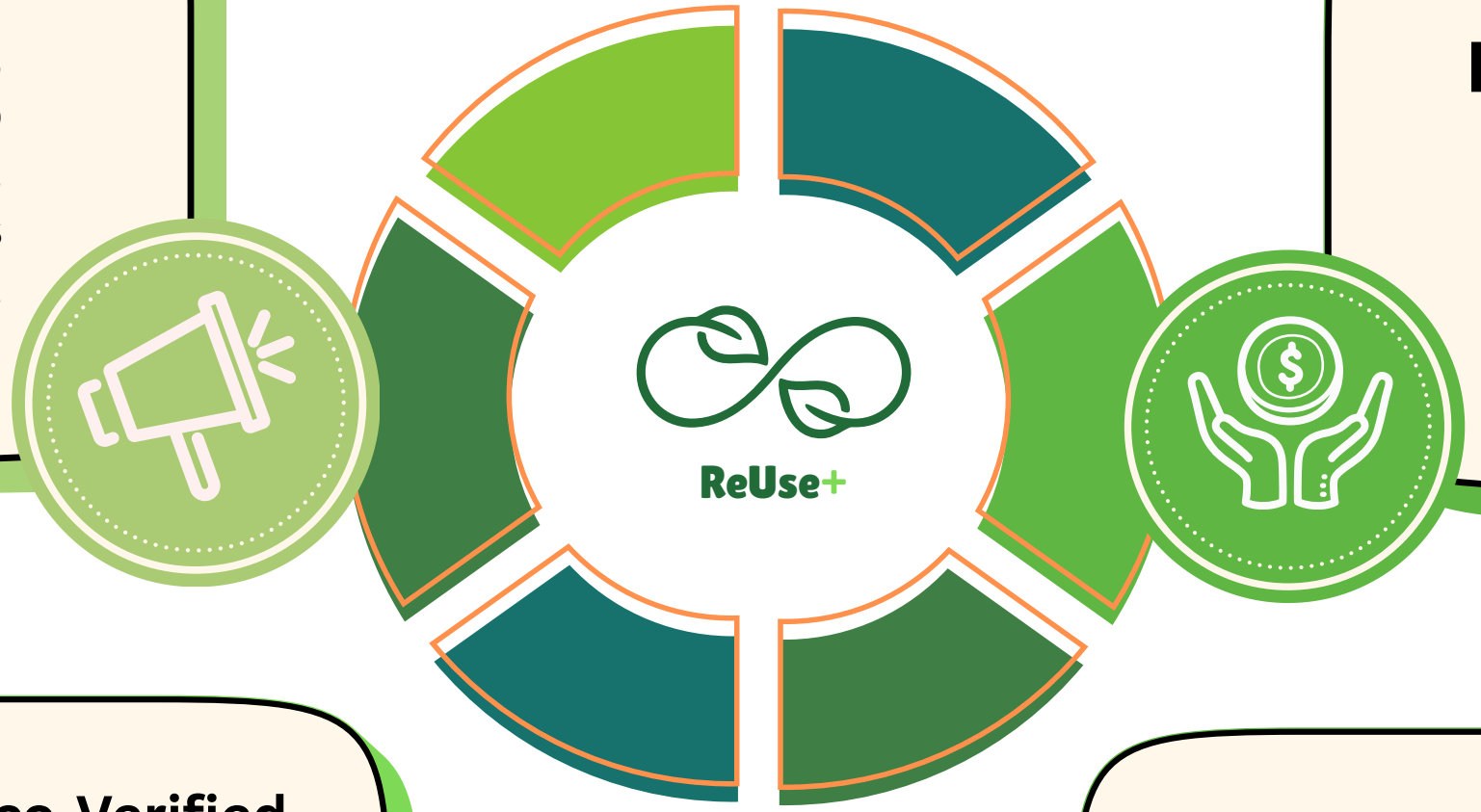
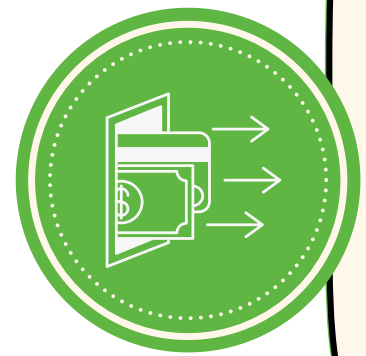
Businesses can pay a small monthly subscription or one-time fee for a “Verified Eco” badge → boosts trust and visibility.



3

## Transaction Fee (B2B)

Small commission on sales between eco-suppliers and businesses using the app.



# DONATION AND PRODUCT SELLING POLICY

*Our platform only accepts items that are clean and ready for donation.*

*We do not accept:*

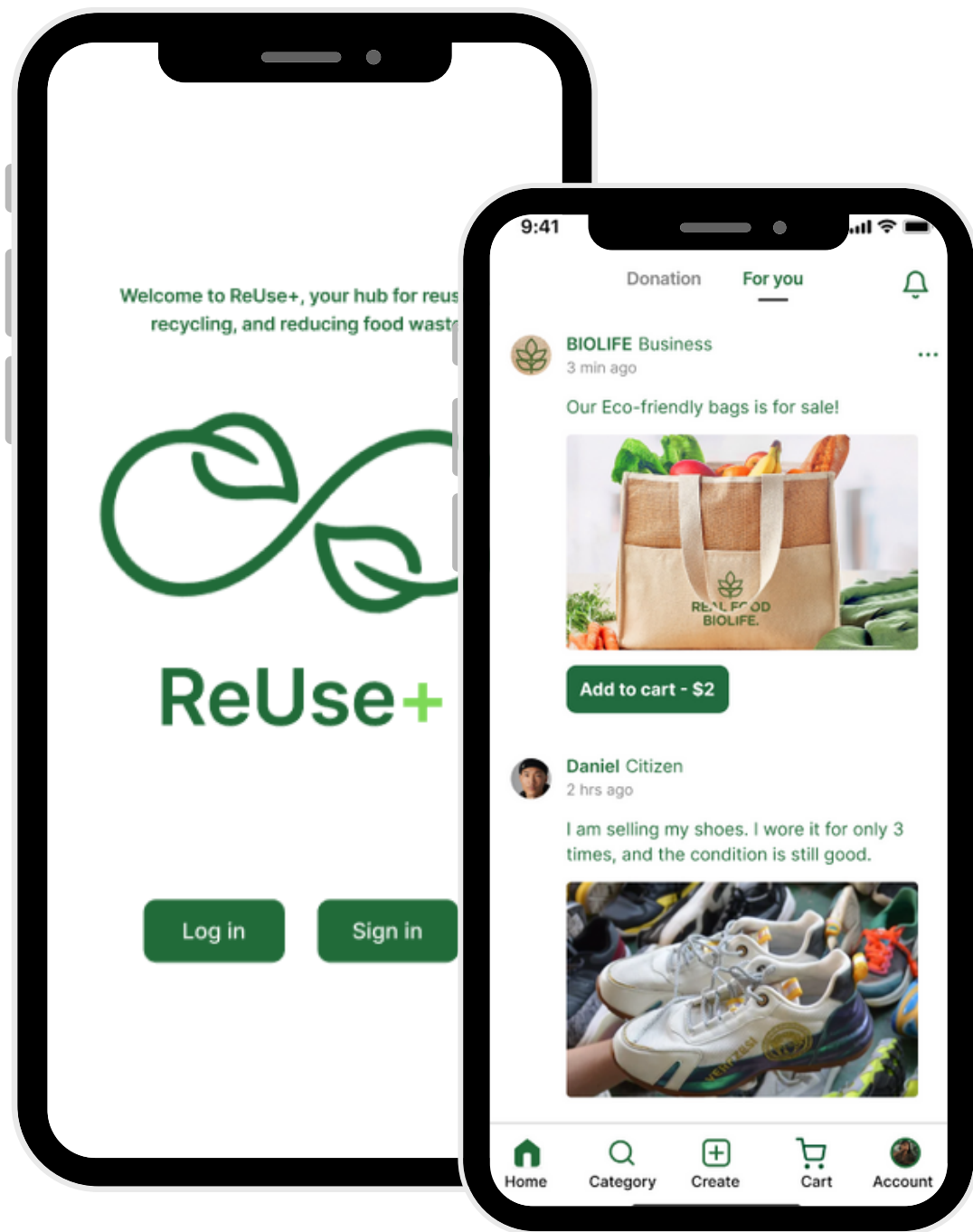
1. **Used boxes filled with food or other perishable items.**
2. **Damaged or unsanitary items that cannot be reused.**
3. **Hazardous or dangerous e-waste, including items like batteries, electronics with toxic materials, or anything that poses a safety risk.**

*To ensure that all donated items are in good condition and suitable for others to use:*

1. **Users must upload their product picture/video.**
2. **ReUse+ uses image recognition and category tagging to automatically detect if the items are reusable and acceptable under the policy or not.**
3. **If users fail to comply with the term and condition, their account can be restricted and face the risk of getting ban.**



# SCALABILITY



*Test in Phnom Penh City*

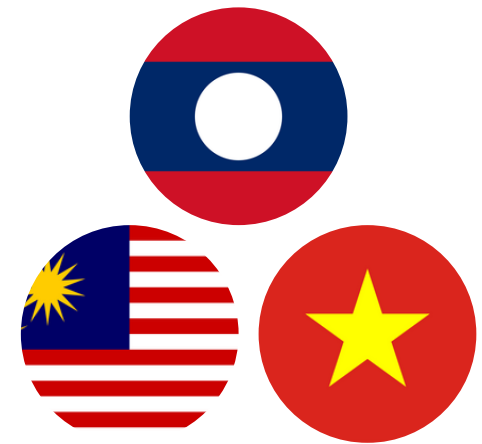


*launch in Cambodia*



*1<sup>st</sup> year*

*launch in neighboring countries*



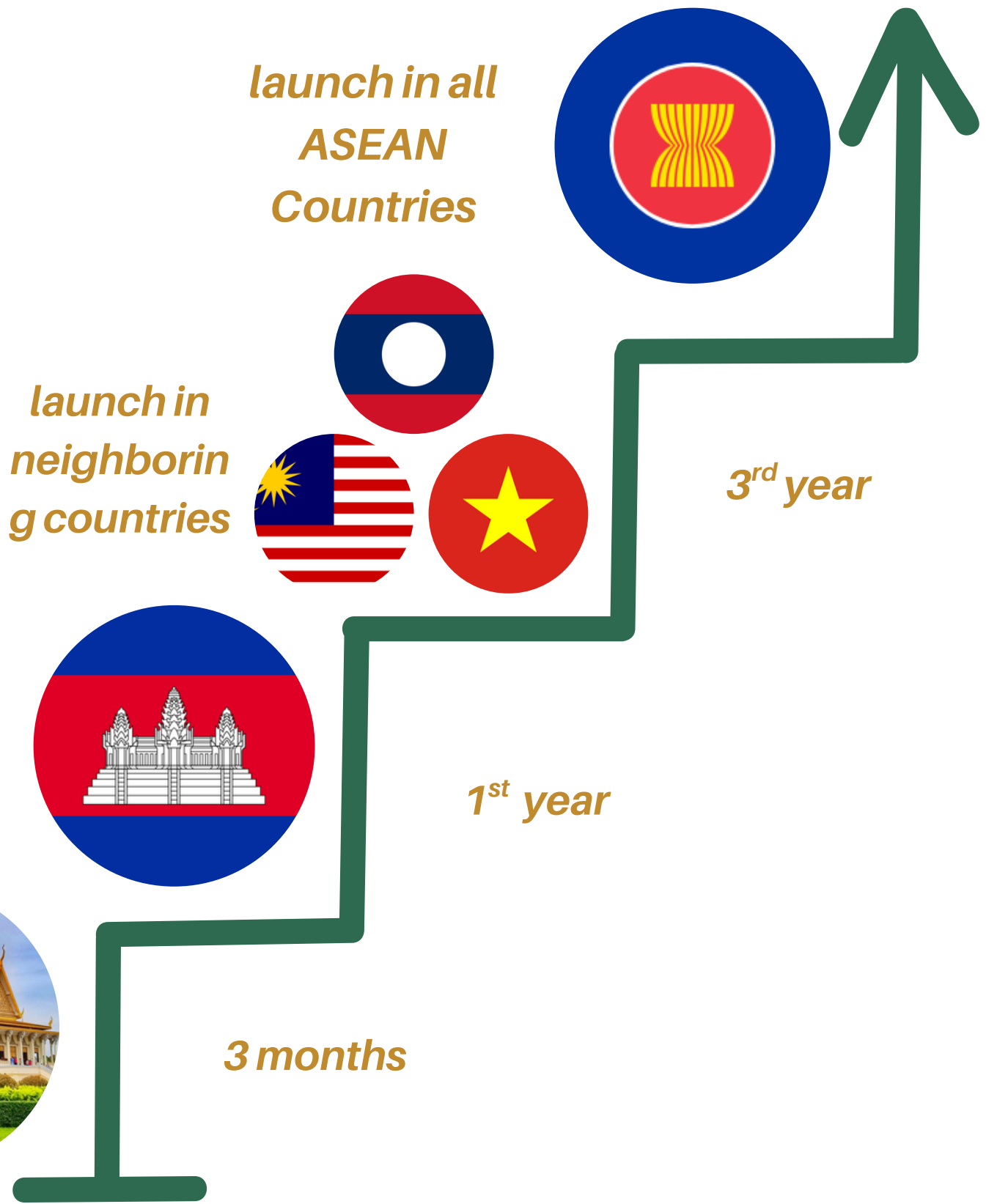
*launch in all ASEAN Countries*



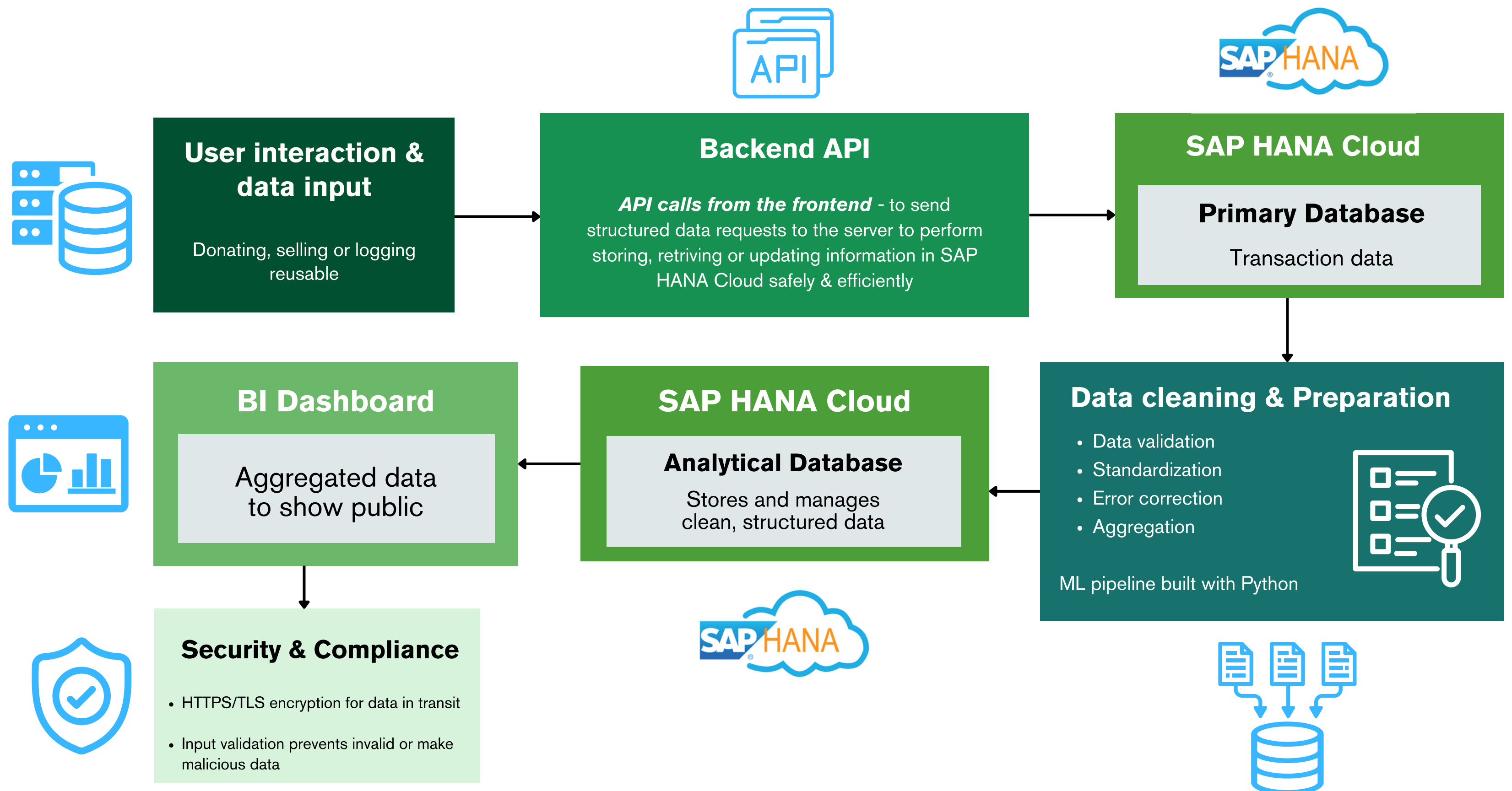
*5<sup>th</sup> year*

*3<sup>rd</sup> year*

*3 months*

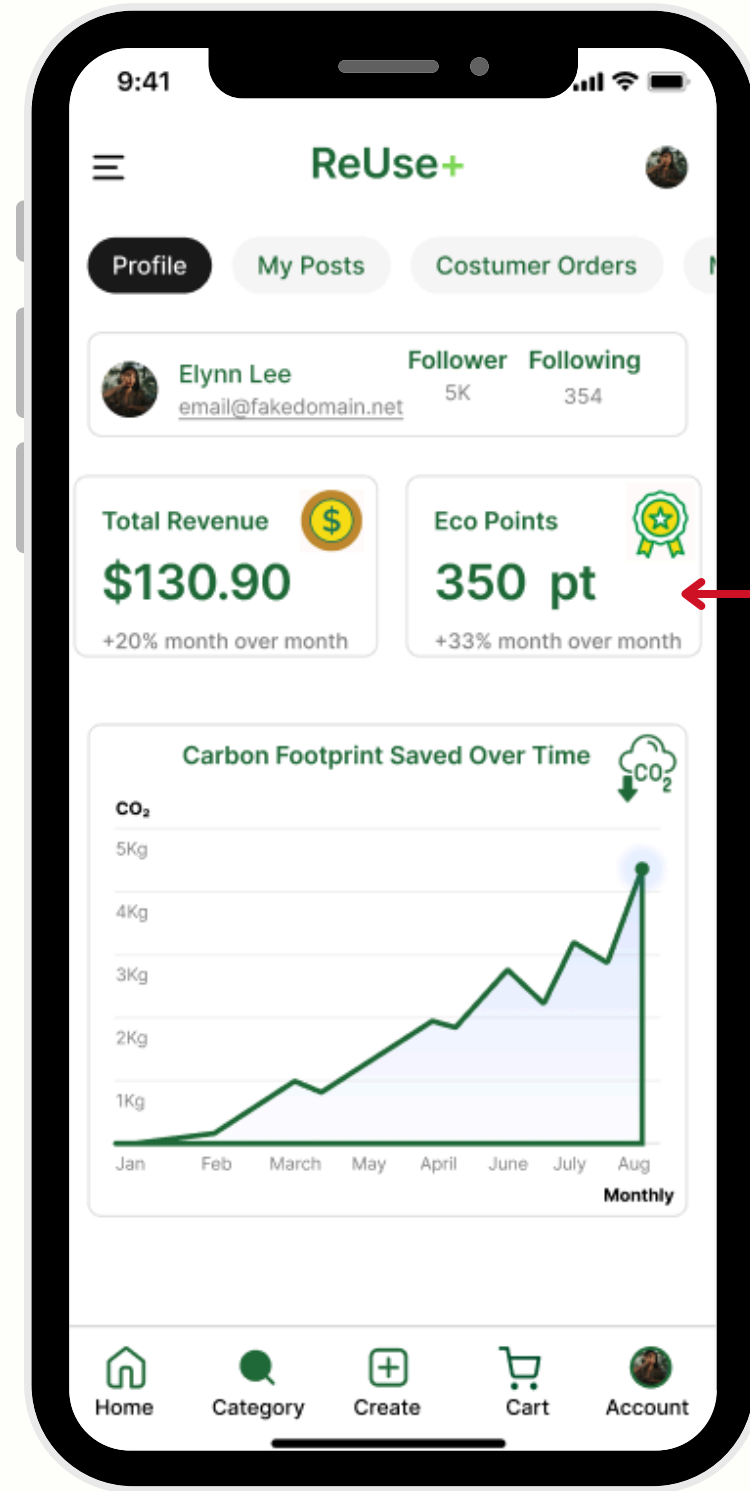
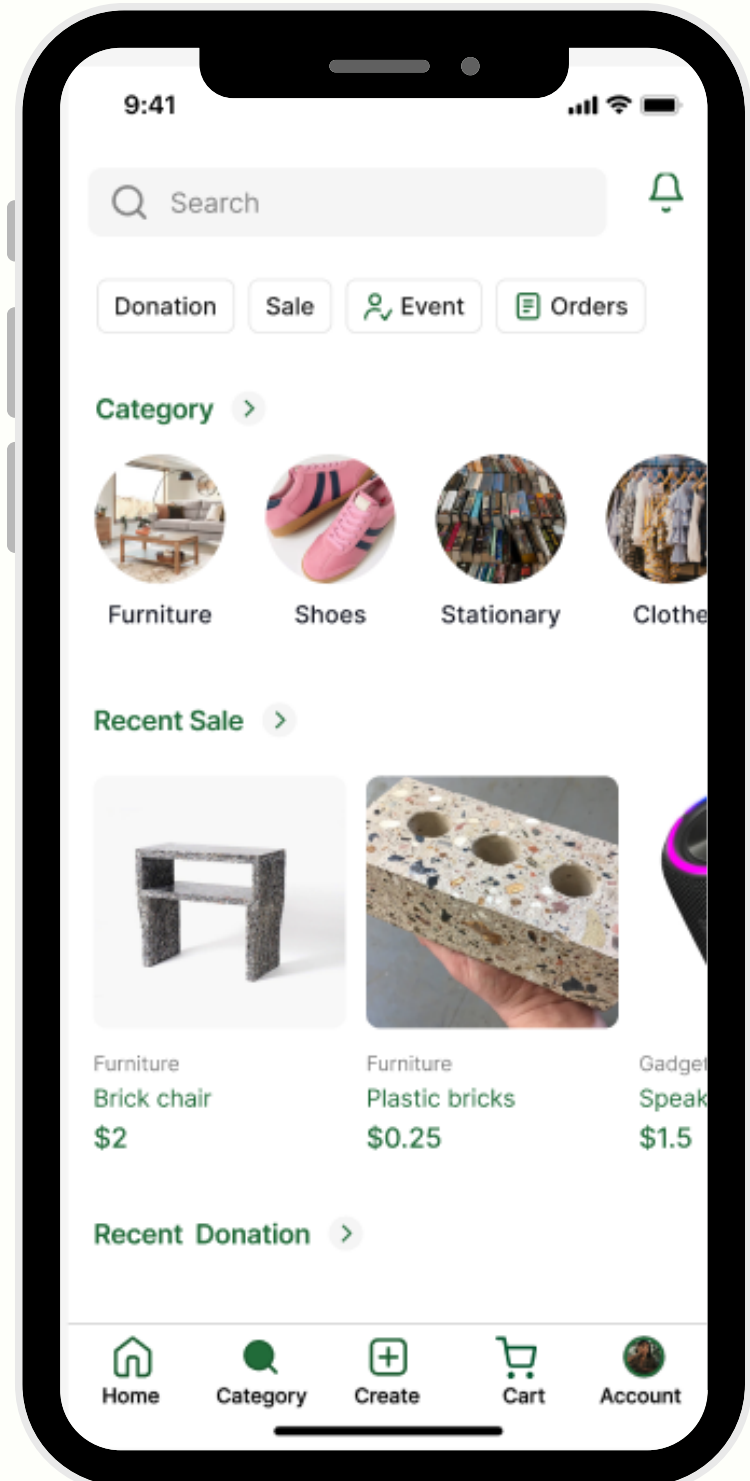
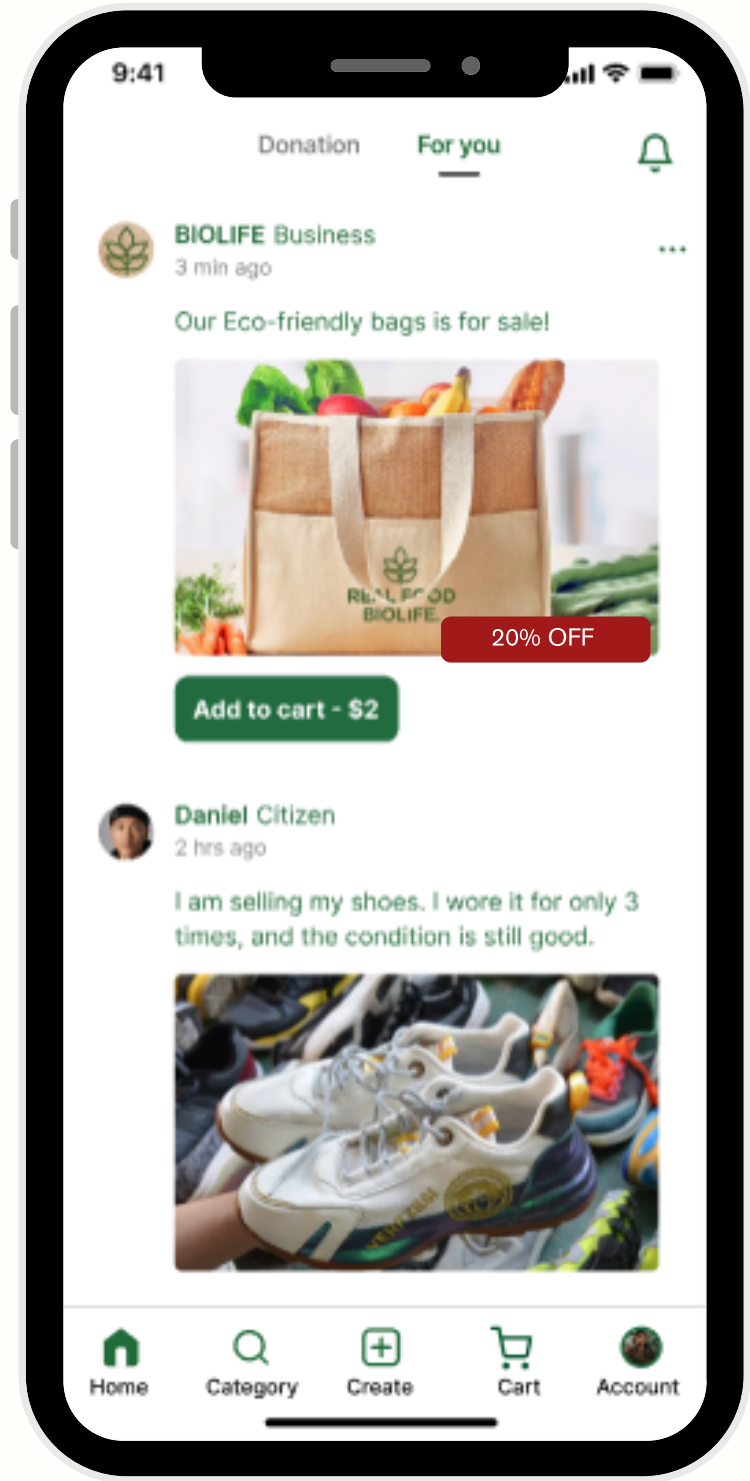


# TECHNICAL EXPLANATION OF REUSE+ CLEAN DATASET AND INSIGHT SYSTEM WORK



Green businesses or any organization willing to offer discounts between 5% and 100% will **receive extra visibility** when users search or explore.

## REGARDING THE ECO-POINTS AWARD



For example: if users earn **350pt** they will receive **33% discount**

They can apply their 33% balance toward the 20% offer from the green business, leaving them with 15% remaining, which they can use toward any other business that offers a discount within that range.

TARGET USERS

Youth



University sustainability clubs, high school eco-groups, and environmental volunteers

NGO



Organisations that support environmental and humanitarian.

Eco-Suppliers



Business that produces eco-friendly supply chain

Local Businesses



Businesses seeking eco-friendly supply chains

VALUE PROPOSITION



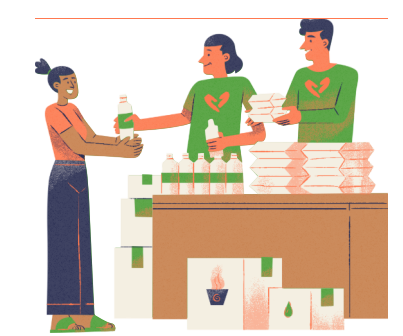
Cleaner ASEAN Cities: Reduce landfill pressure by promoting reuse, resale, and donations.



Affordability Access to affordable second-hand products.



Eco-friendly living: Marketplace for sustainable goods.




















Equity Donations redistributed to vulnerable community via NGOs.



Engagement Eco-points and impact tracking to encourage behavior change.

# COMPETITOR ANALYSIS

Platform	Purpose	Sustainability Focus	Incentives / Rewards	Community Support & Access
	Circular economy app for donating, buying, selling reused items			
	General local buying/selling of new & used goods			
	Global auction and resale of new/used items			
	Giving away free items locally			
	Online second-hand clothing store			

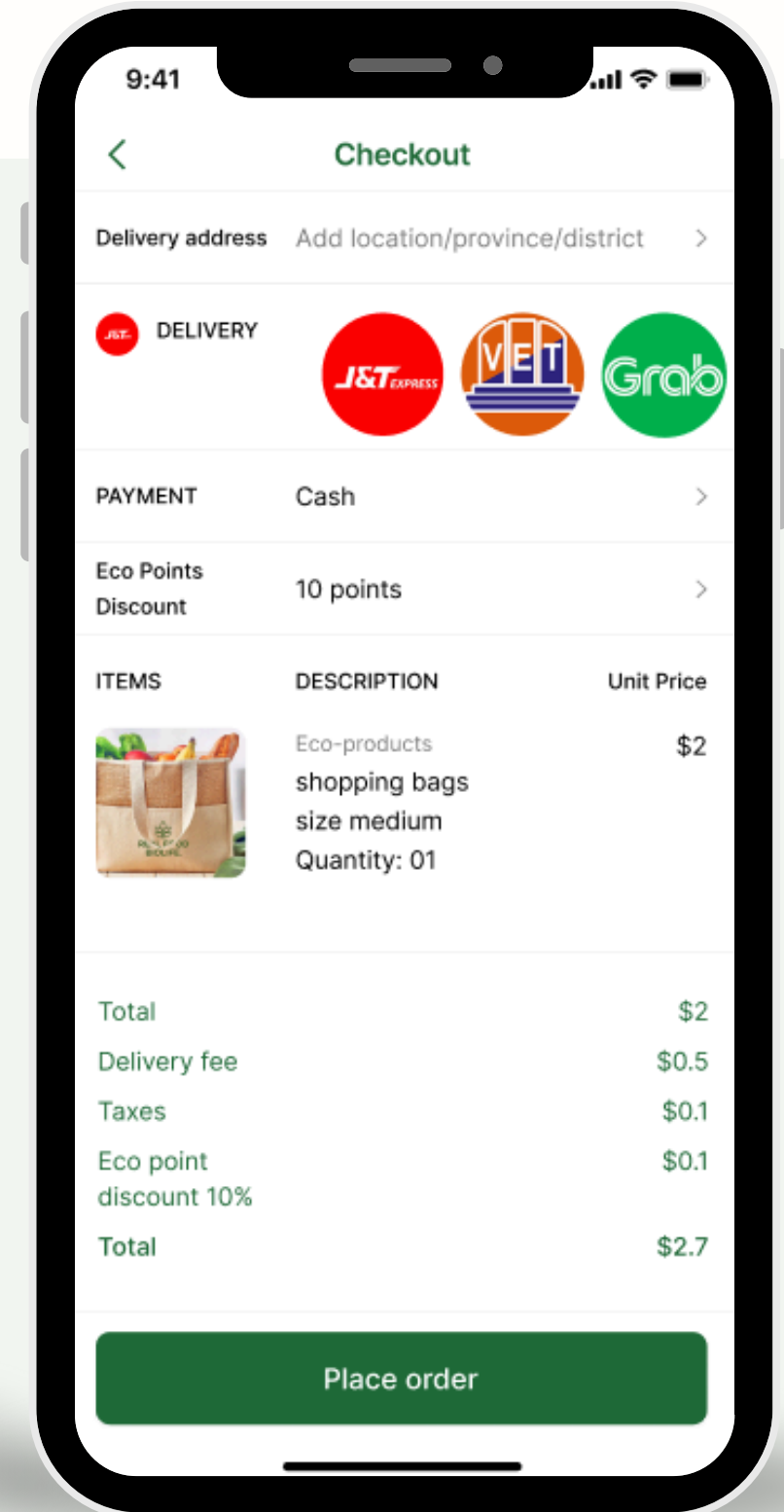
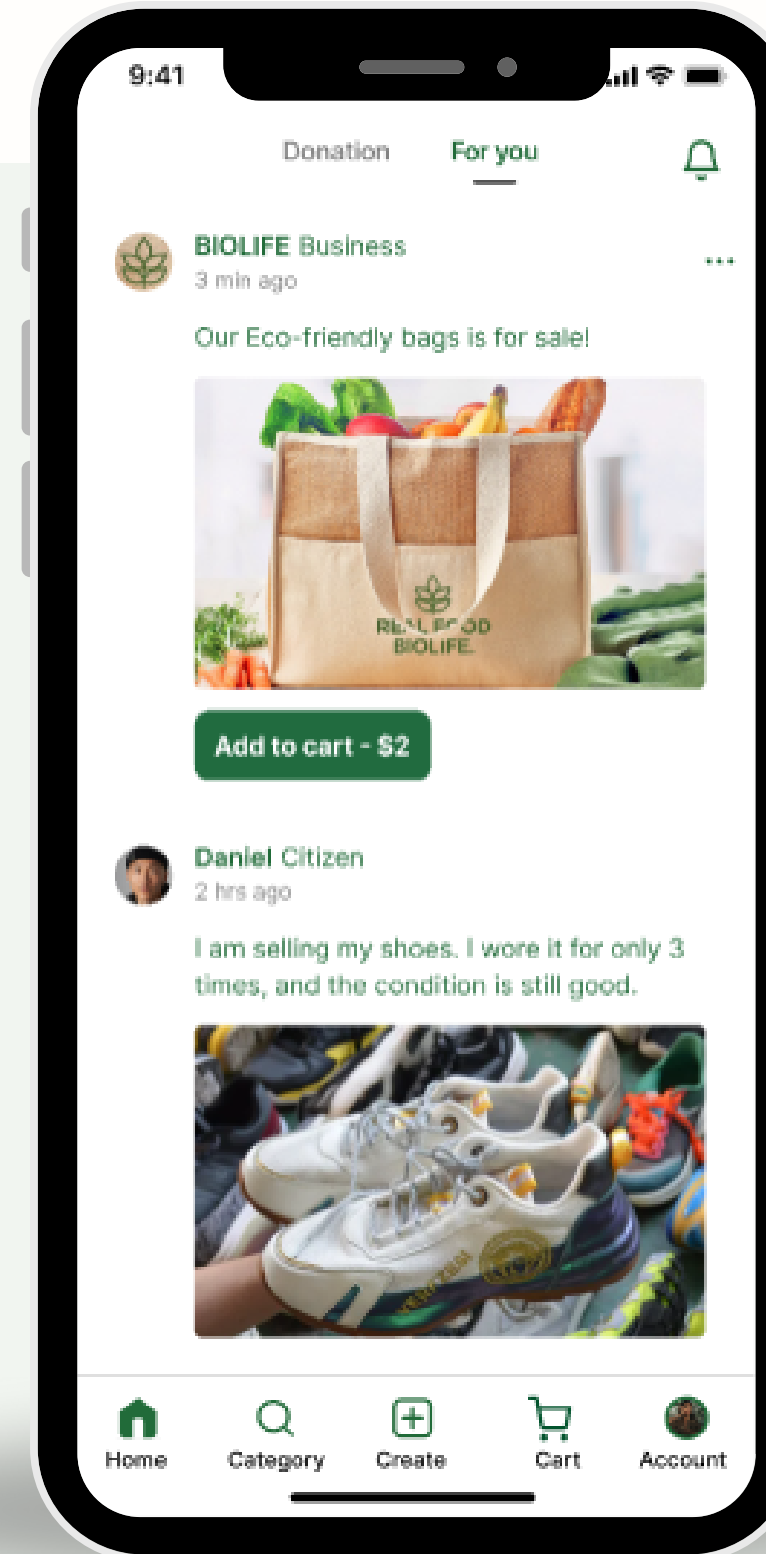
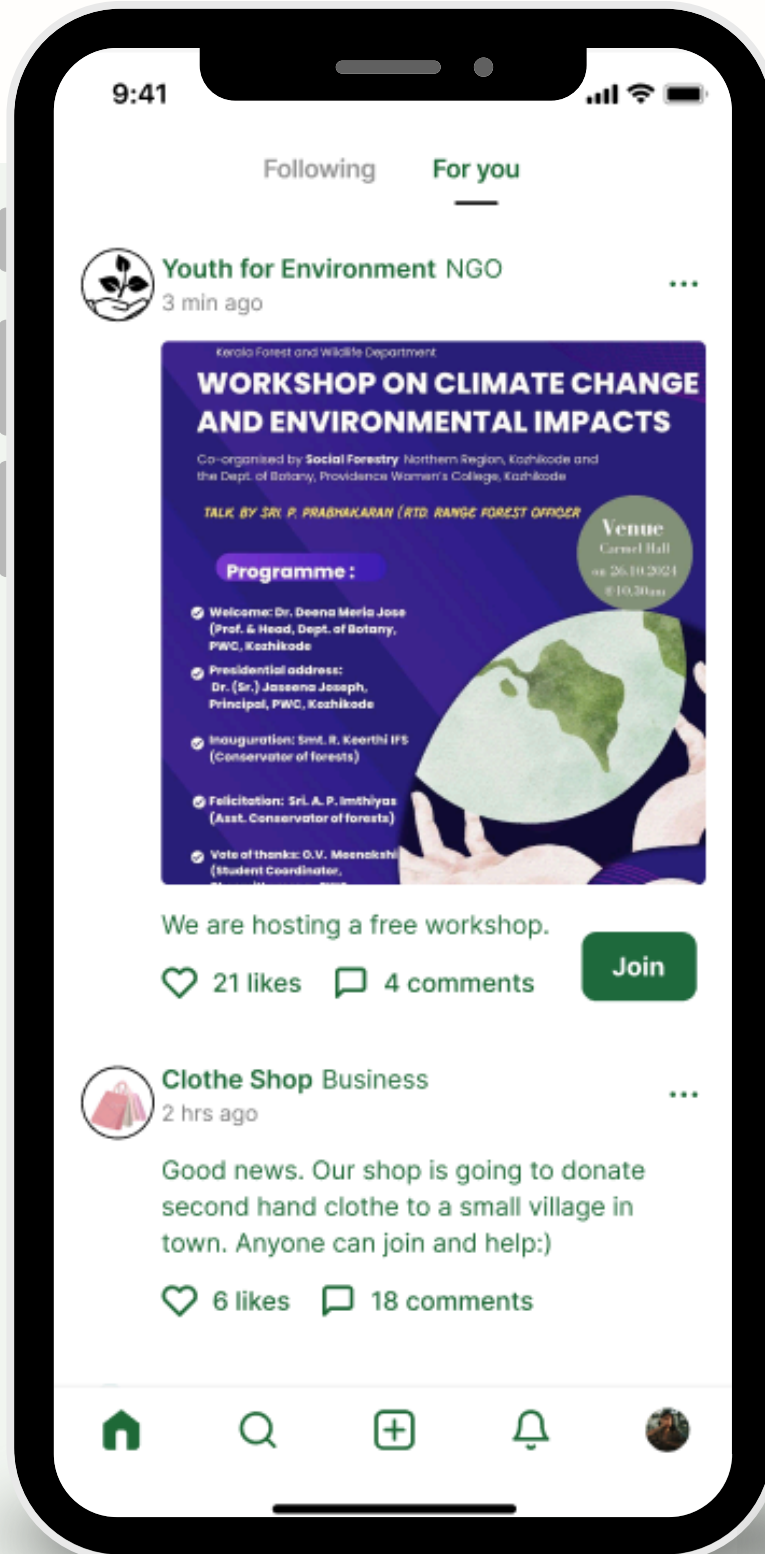
# MAIN FUNCTION

(Core prototype features)

Events & sale page

Donation page

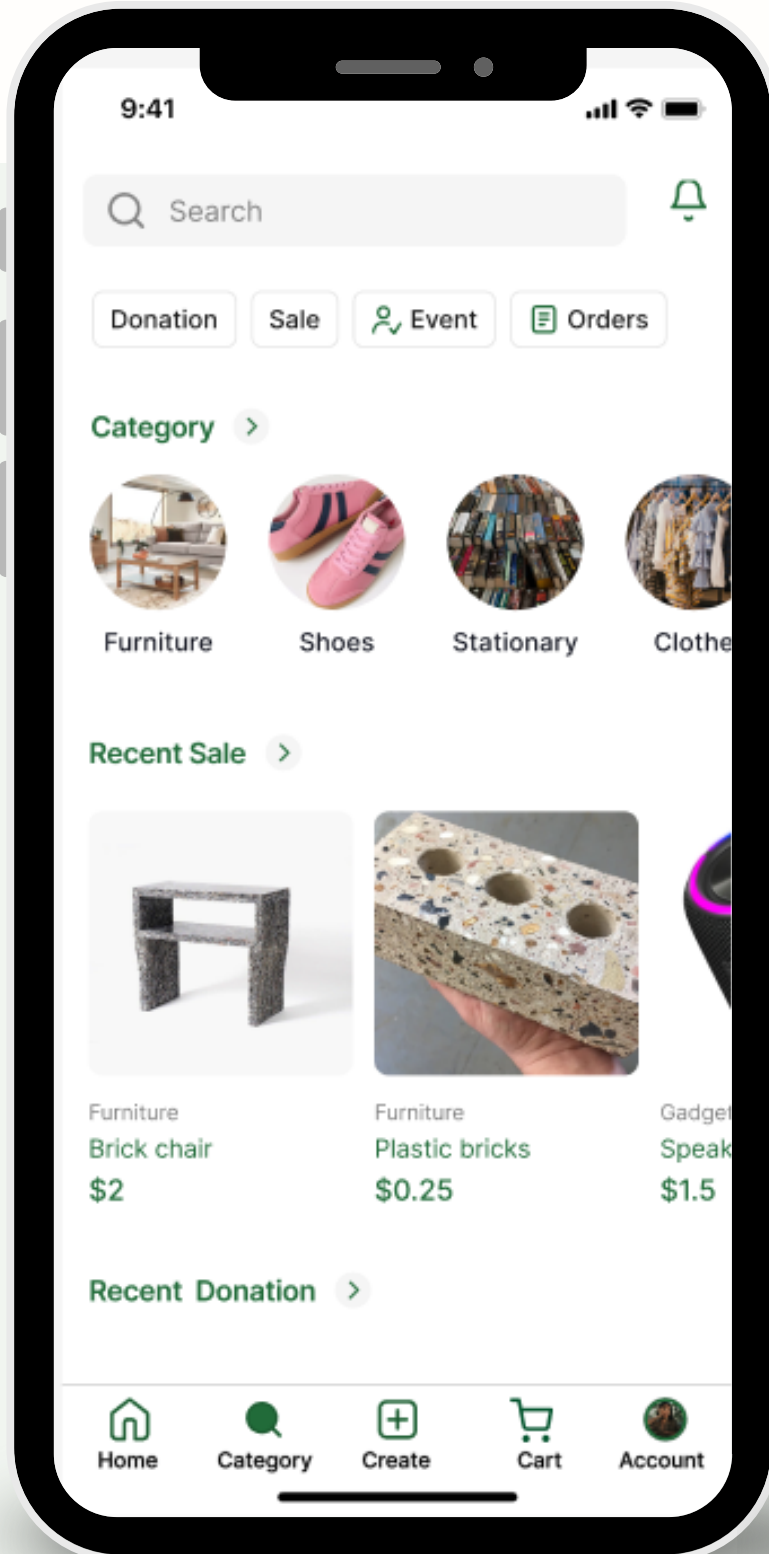
Quick Buy and Payment



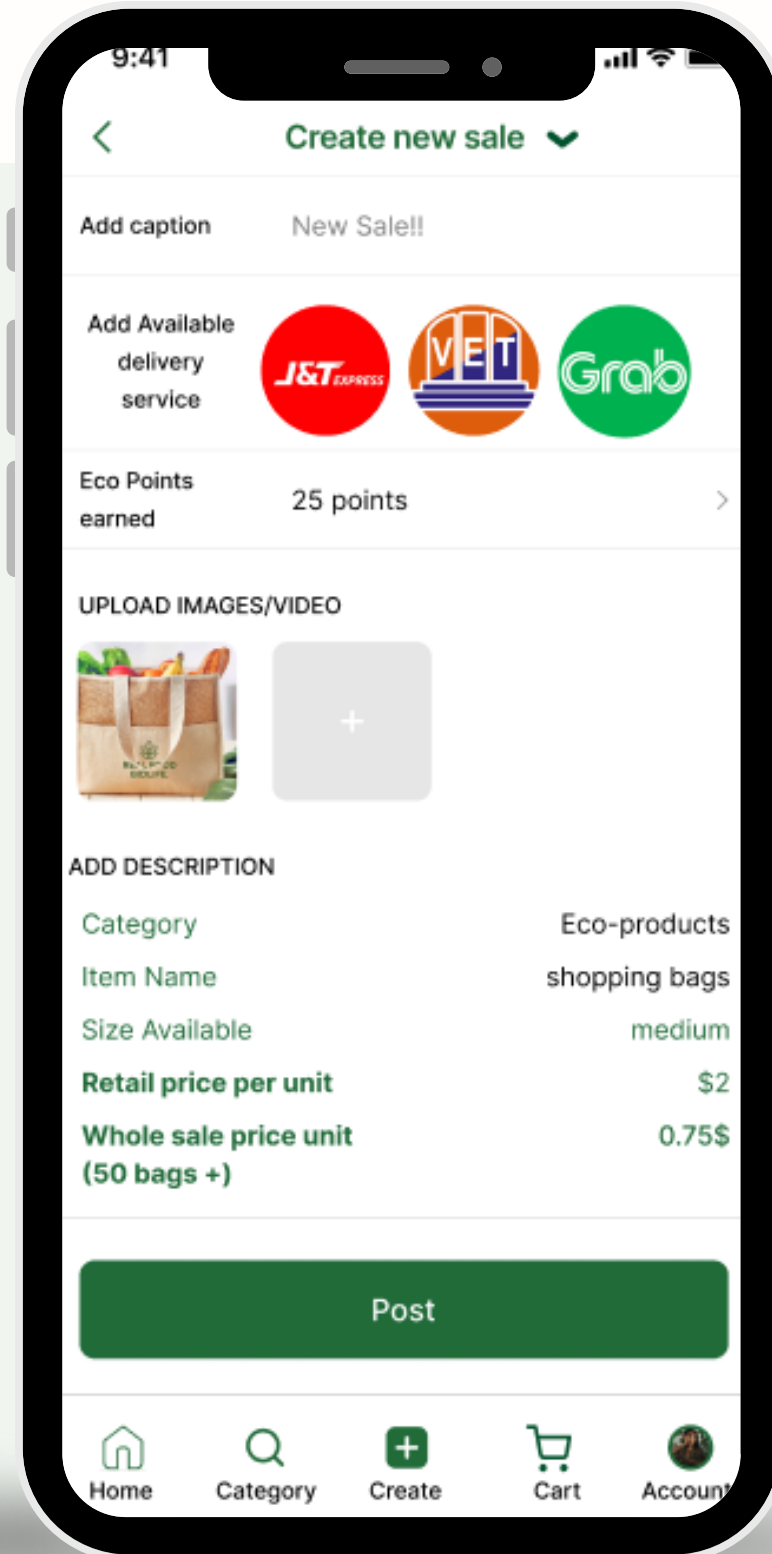
# MAIN FUNCTION

(Core prototype features)

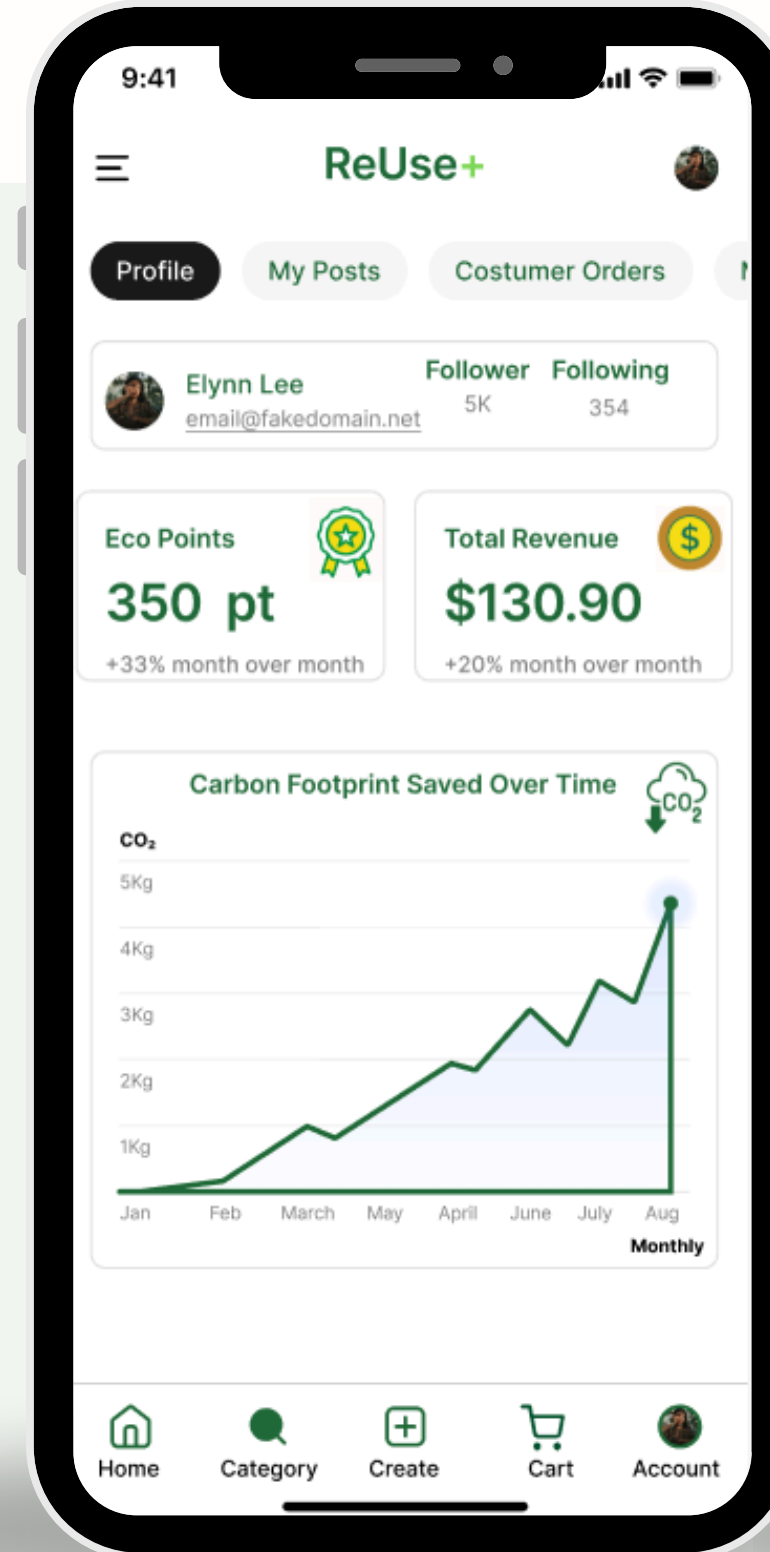
### Search



### Create new sale



### Carbon Impact Dashboard



# RECYCLING RATE

appendix 12

**ONLY**



**PERCENT OF  
RECYCLING  
RATE**

Brunei Darussalam	15%
Cambodia	<50%
Indonesia	<50%
Lao PDR	<50%
Malaysia	50% - 60% (Metal, Paper, Plastic); Others (<50%)
Myanmar	70% (Plastic, Paper, Metal)
Philippines	20%-33% (Paper) 30%-70% (Aluminum) 20% - 58% (Other Metals) 23% - 42% (Plastic) 28% - 60% (Glass)
Singapore	50% - 60% (Paper, Horticulture) >90% (Fe, CandD, Used Slag) >80% (Scrap Tire) >80% (Wood) >50% (Others) Overall (60%)
Thailand	>90% (Metal) 50% - 60% (Paper, Construction) <50% (Others)
Vietnam	>90% (Metal) >70% (Plastic, E-waste) 50% (Paper) <50% (Others)

## Country VS. Source Segregation

**<50%**

**Brunei Darussalam**

**Cambodia**

**Indonesia**

**Lao PDR**

**Vietnam**

**50%**

**Malaysia**

**Myanmar**

**Thailand**

**50% - 70%** **Philippines**

**70%** **Singapore**

## Country VS. Collection Rate (Urban)

**Brunei Darussalam**

**90%**

**Cambodia**

**80%**

**Indonesia**

**56% - 75%**

**Lao PDR**

**40% - 70%**

**Malaysia**

**> 70%**

**Myanmar**

**Philippines**

**40% - 90%**

**Singapore**

**> 90 %**

**Thailand**

**> 80%**

**Vietnam**

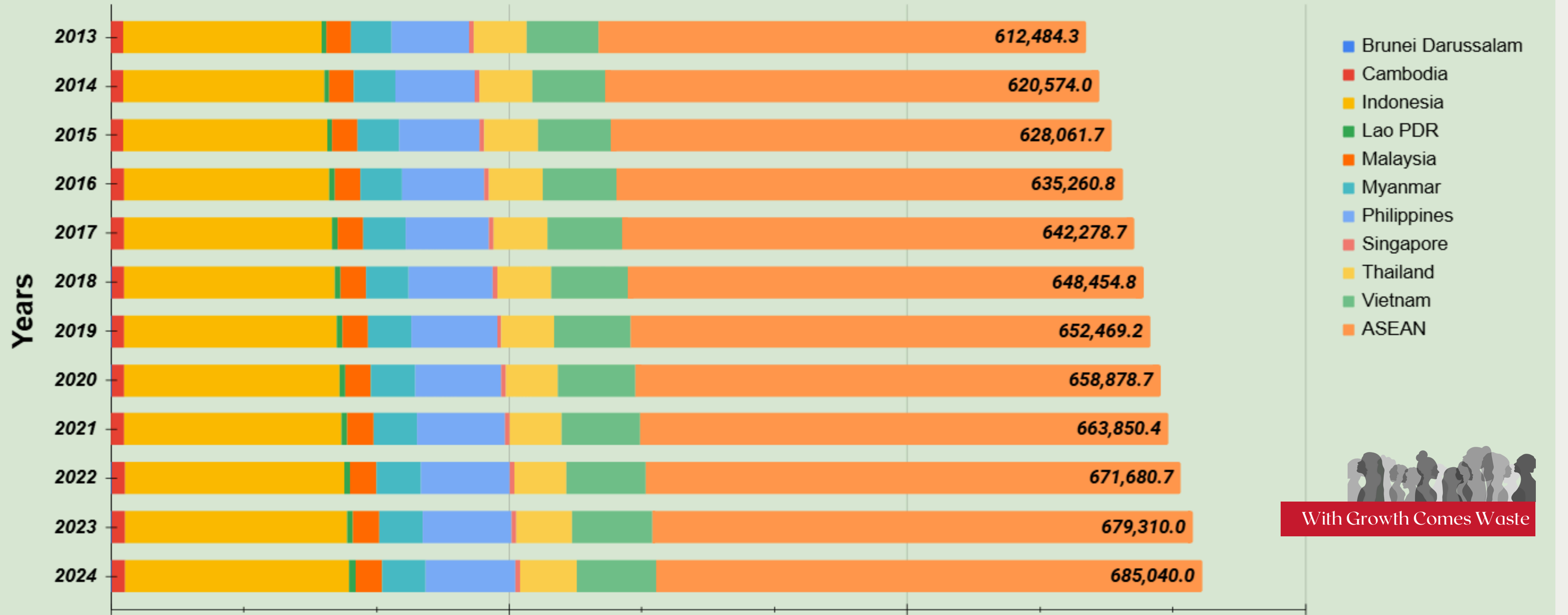
**80 % - 82%**

# NUMBER OF POPULATION IN ASEAN FROM 2013 - 2024

ASEAN's population grew from 612 million in 2013 to 685 million in 2024

appendix 14

ASEAN Total Population from 2013 - 2024



Source: ASEAN Statistical YEAR BOOK & Total population of the ASEAN countries from 2020 to 2030



## How we calculate the What-If Analysis of Per Capita MSW Generation in ASEAN Countries Over 5 Years

Country	Per Capita MSW Generation (kg/capita/day) Year 0	New Per capita msw generation Year 1 - 10% Reduction"	New Per capita msw generation Year 2 - 20% Reduction"	New Per capita msw generation Year 3 - 30% Reduction"	New Per capita msw generatio Year 4 - 40% Reduction	New Per capita msw generi Year 5 - 50% Reduction"
Brunei Darussalam	1.4	1.26	1.13	1.02	0.92	0.83
Cambodia	0.55	0.5	0.45	0.4	0.36	0.32
Indonesia	0.7	0.63	0.57	0.51	0.46	0.41
Lao PDR	0.69	0.62	0.56	0.5	0.45	0.41
Malaysia	1.17	1.05	0.95	0.85	0.77	0.69
Myanmar	0.53	0.48	0.43	0.39	0.35	0.31
Phillippines	0.69	0.62	0.56	0.5	0.45	0.41
Singapore	3.763	3.39	3.05	2.74	2.47	2.22
Thailand	1.05	0.95	0.85	0.77	0.69	0.62
Vietnam	0.84	0.76	0.68	0.61	0.55	0.5

Using this formula:

New Per Capita MSW Generation =  $MSW_n = MSW_0 \times (1 - r)^n$  and rounded to 2 decimal places