

# WasteWise

**Solution to SDG 13: Climate Action**

# Executive Summary

Empowering Communities to Recycle, Donate, and Earn Rewards with AI-driven Simplicity

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## Key Question

How can WasteWise drive user adoption and environmental impact while creating a scalable revenue model from recycling, donation, and resale opportunities in Thailand?



## Situation

Over 27 million tons of waste produced annually in Thailand; **only 30% is recycled.**

Lack of **user-friendly** recycling systems with tangible incentives.

**435,187 tons of e-waste** generated annually, lacking proper disposal and resale options.



## Solution

### AI Categorization

Users scan items to identify whether to recycle, donate, or sell.

### Partnerships

Corporate & retail collaborations to provide incentives and expand networks

### Gamified Rewards

Points system redeemable at partner businesses.



## Impact

**Divert 5 million tons of waste, reduce CO<sub>2</sub> emissions by 1.5 million tons**, and ensure proper plastic and e-waste management while **unlocking a \$600M resale market**, creating new income streams, and supporting corporate ESG tracking. By **encouraging sustainable habits**, rewarding users for recycling, and fostering green business partnerships, it drives both environmental and economic impact.

# Supporting Statistics

Unlocking the Value of Waste Through AI, Incentives, and Smart Recycling



## Recycling Rates

Thailand generates around **27 million tons** of waste annually, but only **30% is recycled**.

Andreas Walderich 2024

## Waste Mismanagement

**87%** of recyclable plastic in Thailand is **improperly disposed** of, leading to severe marine pollution.

World Bank 2021

## Improper E-Waste Disposal

Thailand's e-waste market is growing at **5-7%** annually, but proper disposal is limited.

UNEP 2021

## Recycling Disincentive

Deposit Return Scheme, recycling rates surged from **2 million to 111 million** containers **in just six months**, demonstrating that **monetary incentives** significantly **boost recycling participation**.

The Guardian 2024

## AI Gap in Resale Market

Companies that **implemented AI** in their **sales** processes have seen up to a **30% increase in lead conversion rates**, demonstrating AI's potential to improve sales efficiency.

Forbes 2024

## ESG & Carbon Credit

**Carbon credit markets** are growing at **30%** annually, yet most businesses lack data on their waste impact.

World Bank 2023

A wide-angle photograph of a large industrial building with a distinctive curved glass roof. The interior is filled with bright sunlight streaming through the windows. In the foreground, several workers wearing yellow safety vests and hard hats are engaged in sorting through large piles of shredded material, likely paper or plastic, using hand tools like shovels and rakes. Yellow wheelbarrows are scattered around the floor. The ceiling is supported by a complex steel framework, and the overall atmosphere is one of a busy, modern industrial environment.

# — Implementation —

# Customer Journey

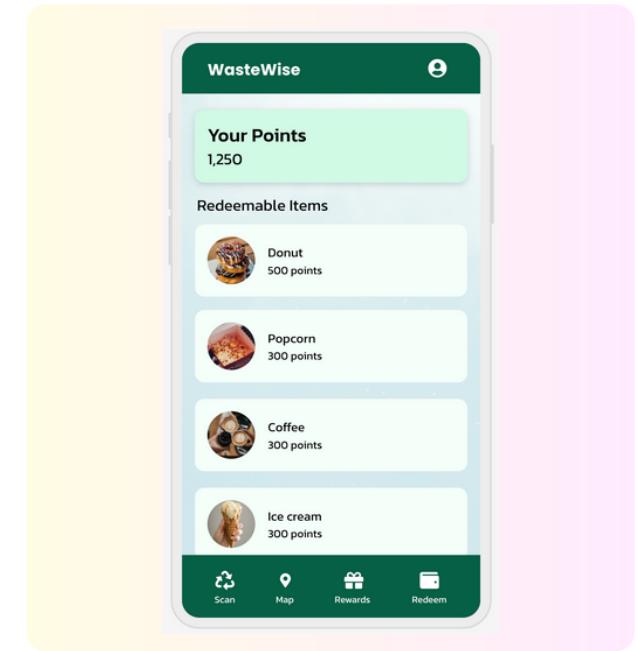
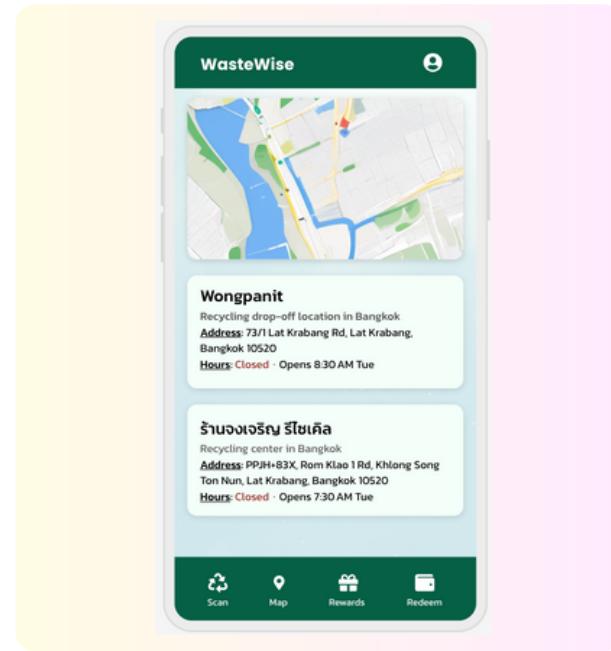
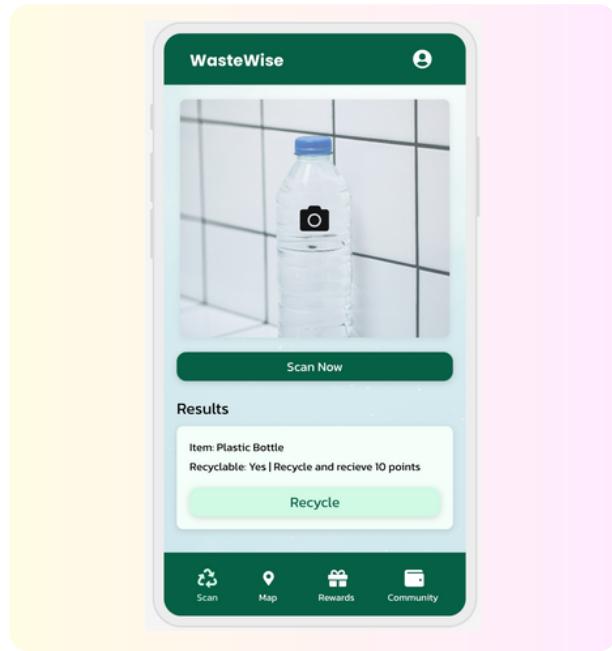
Transforming Waste Management Through AI and Rewards

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## AI-Powered Scanning

## Drop-Off Locations

## Gamified Rewards



Executive Summary

Analysis

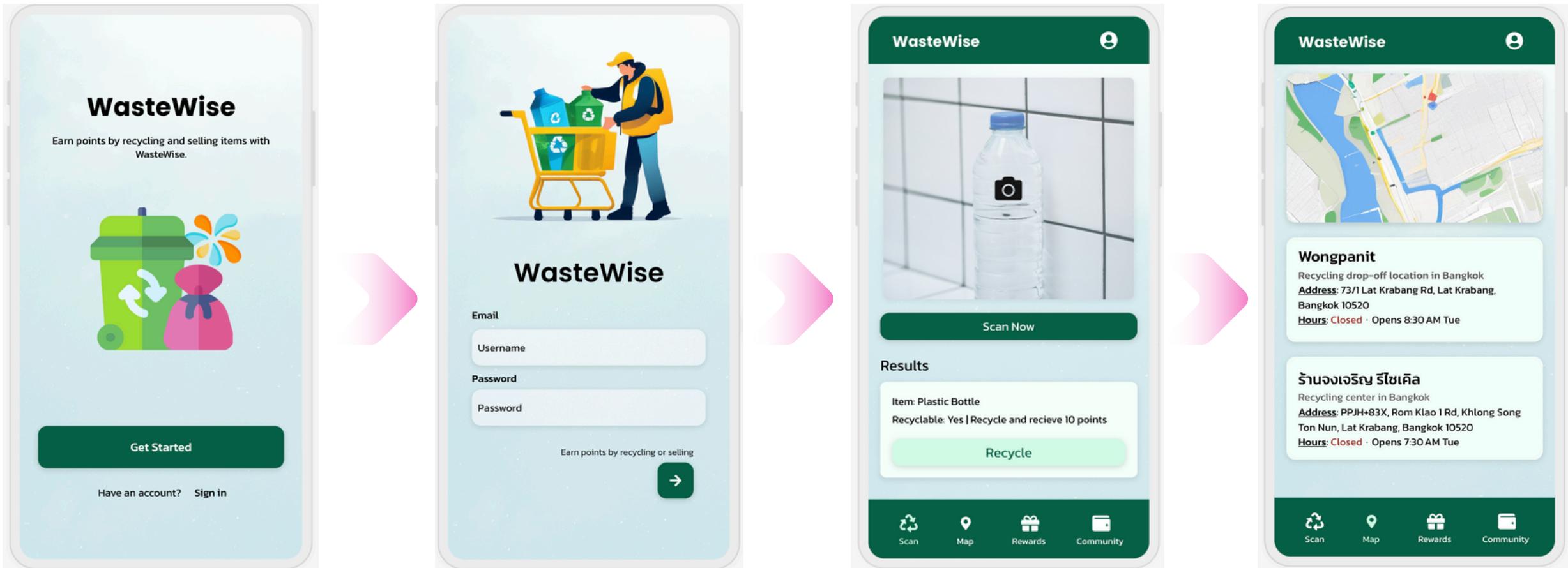
**Solution**

Market

# Prototype: WasteWise Feature

A feature allowing users to scan items, recycle, earn points redeemable for discounts at partner stores.

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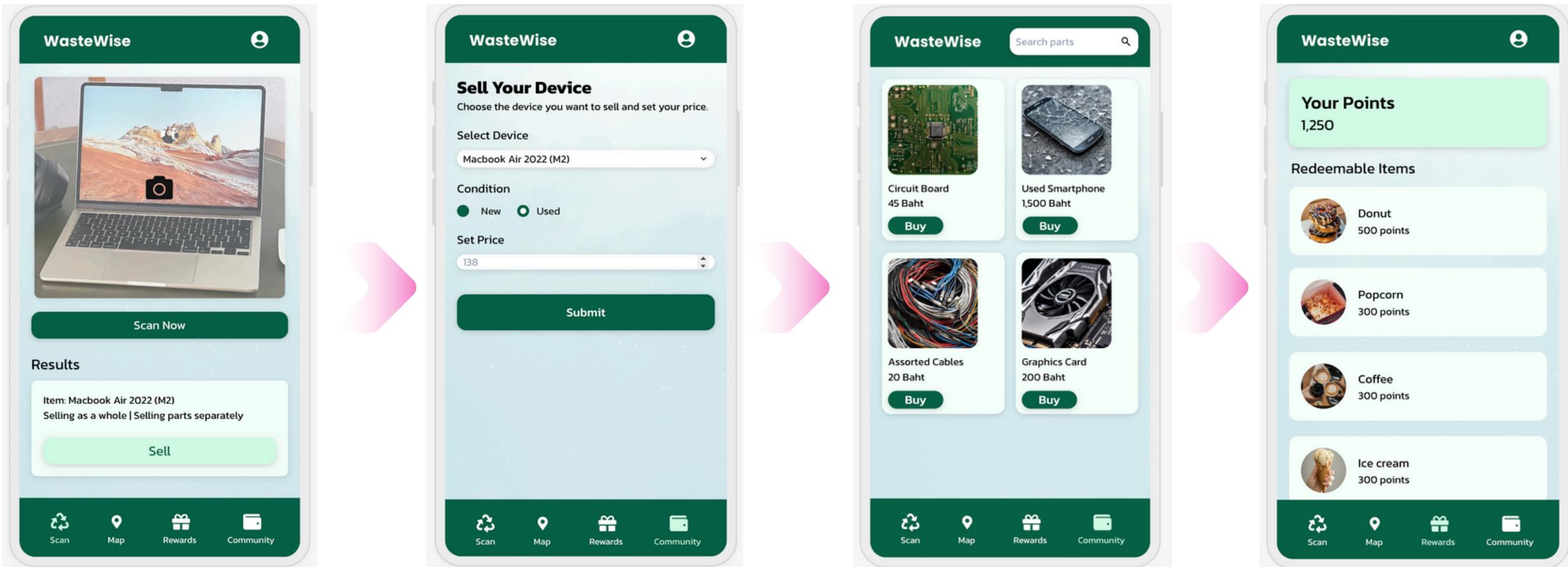
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# Prototype: WasteWise Feature

A feature allowing users to scan items, recycle, earn points redeemable for discounts at partner stores.

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A wide-angle photograph of a large industrial facility. The ceiling is a prominent feature, consisting of a series of curved, translucent panels that allow natural light to illuminate the interior. The walls are made of dark metal framing, and there are several large windows along the sides. In the foreground, a group of workers wearing yellow safety vests and hard hats are working in a large, open area filled with piles of shredded material, likely paper or plastic. They are using various tools and equipment to sort through the waste. The overall atmosphere is one of a busy, modern industrial environment.

# Technical

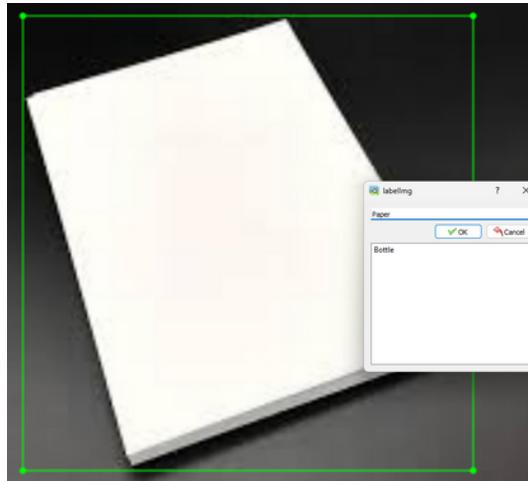
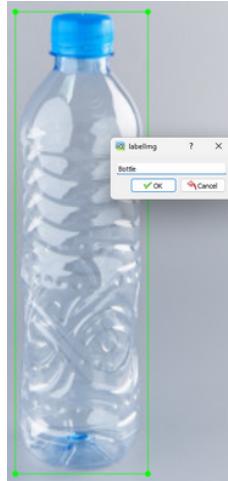
# Object Detection Algorithm

Detect and classify waste items from images



**Model**: YOLOv8  
(You Only Look Once version 8)

The main model for separating plastic and paper uses a dataset trained with two classes: 0 Bottle, 1 Paper



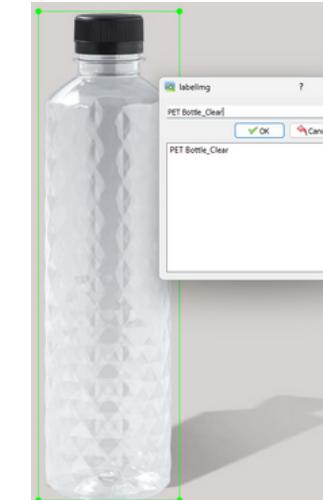
**Pre-trained model**: Use a YOLOv8 model trained on waste categories such as plastic and paper

**Training dataset labeled using LabelImg**



LabelImg

The model for classifying plastic bottle types is trained with a dataset containing three classes: 0 PET Bottle\_Clear, 1 PET Bottle\_Colored, 2 HDPE Bottle

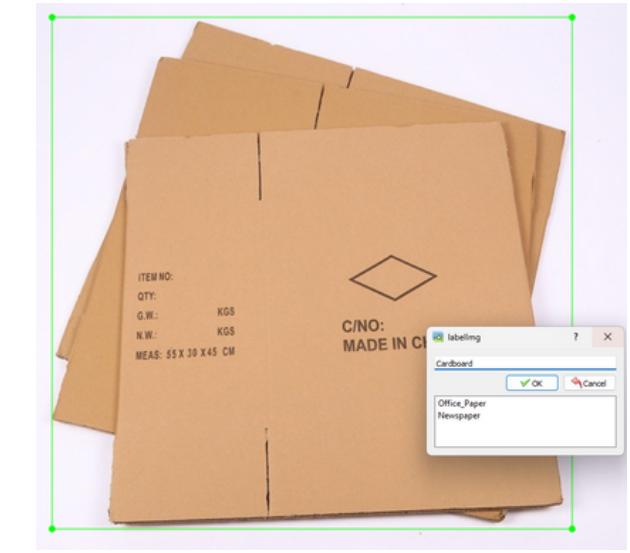


# Object Detection Algorithm

Detect and classify waste items from images

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The model for classifying paper types is trained with a dataset containing three classes: 0 Office\_Paper, 1 Newspaper, 2 Cardboard



Executive Summary

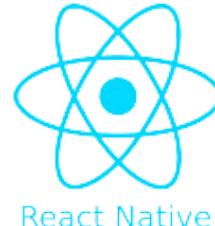
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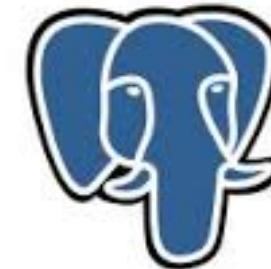
- **Frontend:**

- Mobile App: React Native



- **Database Management System:**

- PostgreSQL



- **Backend:**

- **NestJS**



**Nest JS**

# — Business Model —



## TAM

The TAM for waste recycling in Thailand is estimated at **8,250 million THB annually in 2025**. This represents the total value of recyclable materials from the 27 million tons of waste produced annually in Thailand. This revised estimate assumes an average value of **600 THB per ton of recyclable material** and accounts for a **10% annual growth rate** in the recycling sector since 2023.

## SAM

The SAM focuses on the segment of the market that can be reached through urban areas and digital engagement initiatives. Approximately **1% of the total waste** is realistically accessible through your app's gamified rewards system and AI-assisted recycling features. This adjustment gives a SAM of around **82.5 million THB annually**, reflecting increased engagement potential due to marketing efforts and partnerships.

## SOM

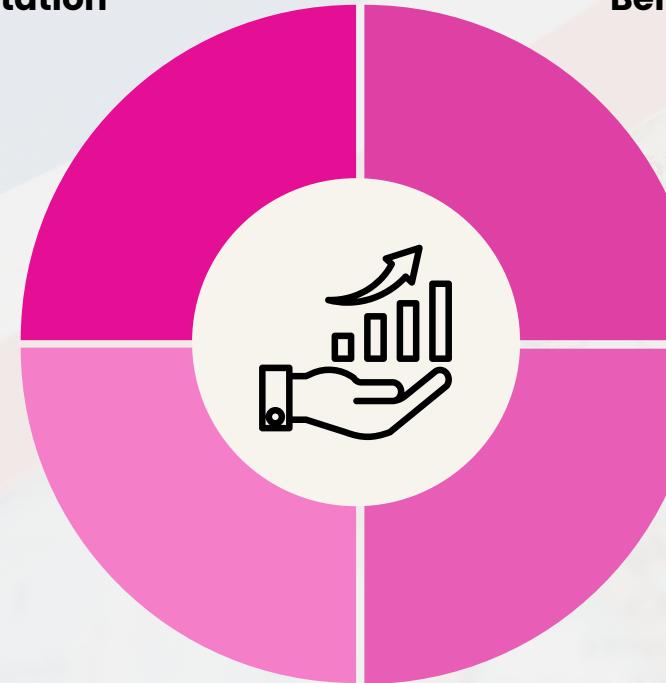
The SOM indicates the realistic portion of the SAM that your startup could capture in the early stages. We aim for **2-5% penetration into this market**, providing a **SOM ranging from 1.65 million to 4.125 million THB annually**. As a startup, we can start at **2% penetration**, allowing for gradual growth as brand recognition and customer trust increase through marketing efforts and partnerships with eco-friendly brands and recyclers.

## Geographic Segmentation

Region: Urban areas in Thailand with dense populations (e.g., Bangkok, Chiang Mai).  
Access: Locations with waste management challenges and recycling centers nearby.

## Psychographic Segmentation

Lifestyle: Eco-conscious individuals who prioritize sustainability.  
Values: Care deeply about reducing waste, CO2 emissions, and contributing to a circular economy.  
Personality: Early adopters of new technology and reward-driven behavior.



## Behavioral Segmentation

Habits: Individuals who actively seek eco-friendly solutions and recycling options.  
Usage: Tech-savvy users comfortable with using mobile apps for daily tasks.  
Motivations: People who value rewards and points systems

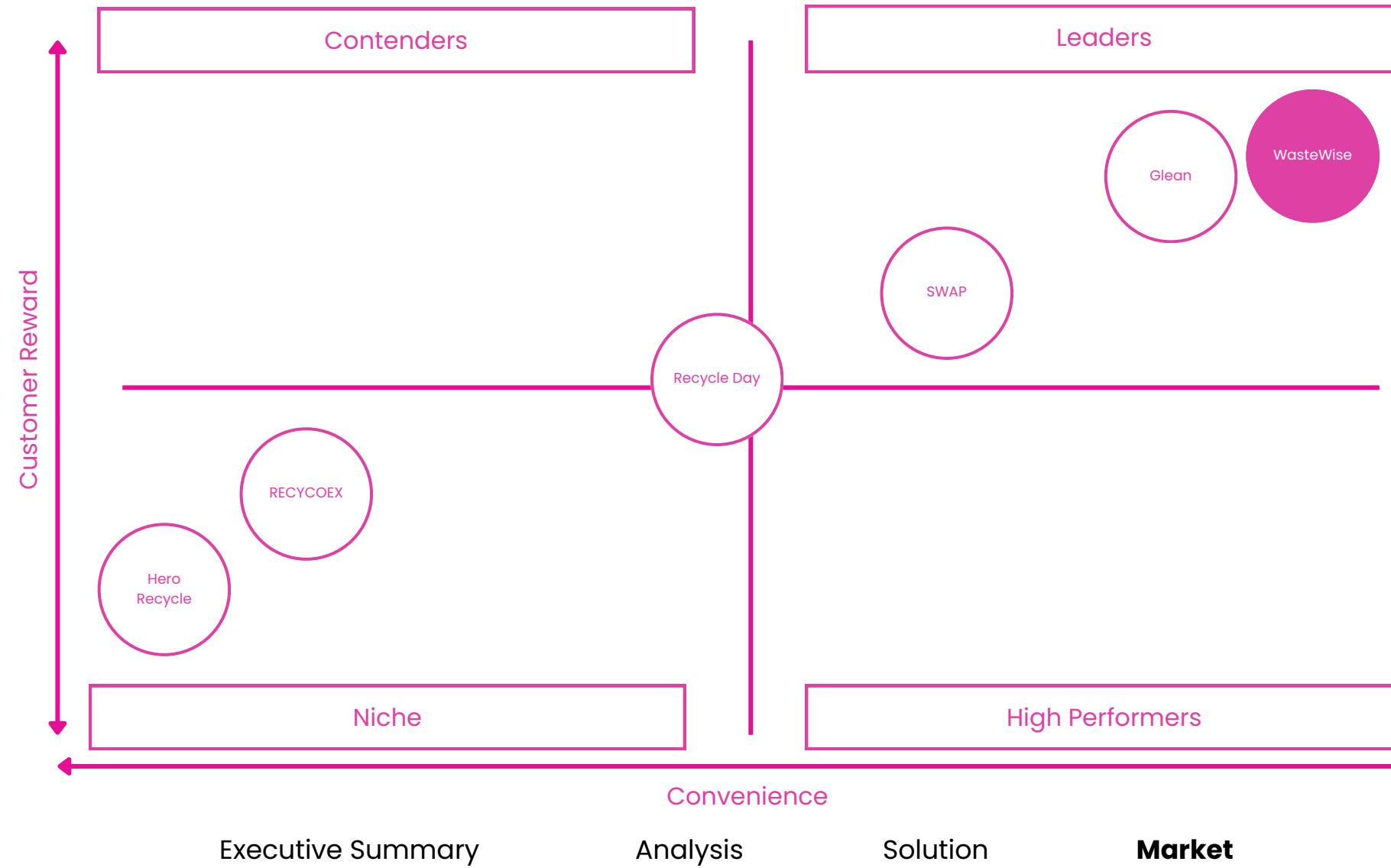
## Demographic Segmentation

Age: 18–45 years old (Gen Z, Millennials, and young professionals).  
Income: Middle to upper-middle-class individuals who can afford sustainable practices.  
Education: Higher education levels, environmentally aware consumers.

# Cometitive Analysis

WasteWise vs. Competitors: Strengths and Market Positioning

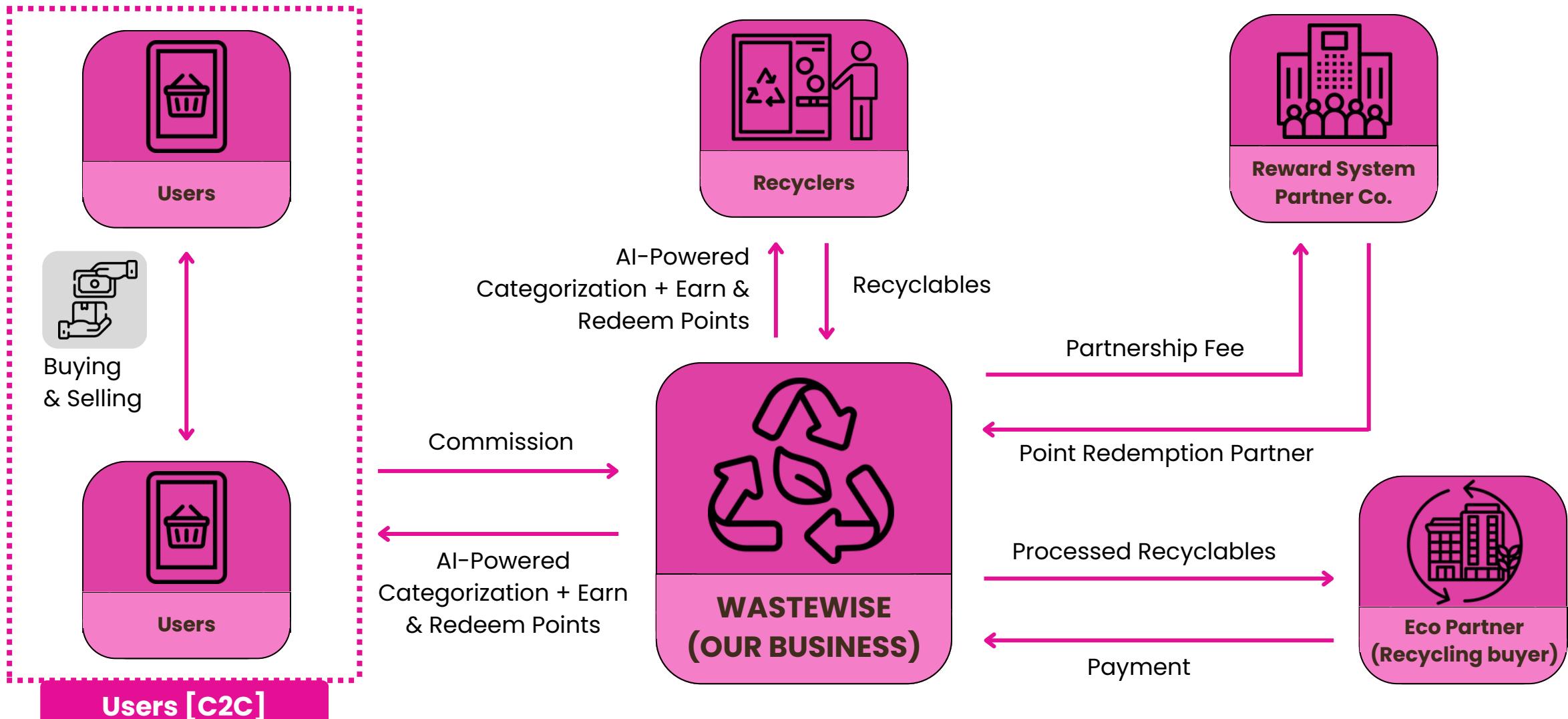
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# Business Revenue Model (B2B2C)

How a company generates income and sustains profitability

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# Financial: Business Model

Revenue and cost structure for the whole project and profitability in 2030

| [WasteWise]<br>Financial Projection<br>[THB] | 2026                  | 2027                  | 2028                  | 2029                  | 2030                  |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>Revenue</b>                               |                       |                       |                       |                       |                       |
| Commissions                                  | ฿ 1,620,000.00        | ฿ 1,830,600.00        | ฿ 2,068,740.00        | ฿ 2,337,660.00        | ฿ 2,641,410.00        |
| Trash Selling                                | ฿ 756,000.00          | ฿ 854,280.00          | ฿ 965,160.00          | ฿ 1,090,740.00        | ฿ 1,232,700.00        |
| <b>Total Revenue</b>                         | <b>฿ 2,376,000.00</b> | <b>฿ 2,684,880.00</b> | <b>฿ 3,033,900.00</b> | <b>฿ 3,428,400.00</b> | <b>฿ 3,874,110.00</b> |
| Variable Costs(COGS)                         | ฿ 398,372.00          | ฿ 450,161.00          | ฿ 508,610.00          | ฿ 574,777.00          | ฿ 649,565.00          |
| <b>Gross Profit</b>                          | <b>฿ 1,977,628.00</b> | <b>฿ 2,234,719.00</b> | <b>฿ 2,525,290.00</b> | <b>฿ 2,853,623.00</b> | <b>฿ 3,224,545.00</b> |
| <b>Expense</b>                               |                       |                       |                       |                       |                       |
| App Maintenance                              | ฿ 100,000.00          | ฿ 100,000.00          | ฿ 100,000.00          | ฿ 100,000.00          | ฿ 100,000.00          |
| AI Maintenance                               | ฿ 96,000.00           | ฿ 96,000.00           | ฿ 96,000.00           | ฿ 96,000.00           | ฿ 96,000.00           |
| Wages (increased 10%/yr)                     | ฿ 1,092,000.00        | ฿ 1,201,200.00        | ฿ 1,321,320.00        | ฿ 1,453,452.00        | ฿ 1,598,797.20        |
| Rent   | ฿ 150,000.00          | ฿ 150,000.00          | ฿ 162,500.00          | ฿ 162,500.00          | ฿ 162,500.00          |
| Marketing Costs (increased 10%/yr)           | ฿ 312,000.00          | ฿ 343,200.00          | ฿ 377,520.00          | ฿ 415,272.00          | ฿ 456,799.20          |
| Depreciation on RVMS                         | ฿ 100,000.00          | ฿ 100,000.00          | ฿ 150,000.00          | ฿ 150,000.00          | ฿ 150,000.00          |
| <b>Total Expenses</b>                        | <b>฿ 1,850,000.00</b> | <b>฿ 1,990,400.00</b> | <b>฿ 2,207,340.00</b> | <b>฿ 2,377,224.00</b> | <b>฿ 2,564,096.40</b> |
| <b>Earning Before Interest &amp; Taxes</b>   | <b>฿ 127,628.00</b>   | <b>฿ 244,319.00</b>   | <b>฿ 317,950.00</b>   | <b>฿ 476,399.00</b>   | <b>฿ 660,448.60</b>   |
| Income Taxes                                 | ฿ 25,525.60           | ฿ 48,863.80           | ฿ 63,590.00           | ฿ 95,279.80           | ฿ 132,089.72          |
| <b>Net Earning</b>                           | <b>฿ 102,102.40</b>   | <b>฿ 195,455.20</b>   | <b>฿ 254,360.00</b>   | <b>฿ 381,119.20</b>   | <b>฿ 528,358.88</b>   |

| Initial Investment        | 2025             |
|---------------------------|------------------|
| App Development           | 650,000          |
| Data Base                 | 1,000,000        |
| AI Training               | 630,000          |
| Equipment (10 machines)   | 1,000,000        |
| <b>Initial Investment</b> | <b>3,280,000</b> |

- Reverse Vending Machine Investment 10 Yr. Straight-Line Depreciation. Initially, with 10 machines in the first 2 years, and purchase 5 more at the beginning of the third year.
- The Revenue comes from 15% commission and trash selling

# Impact on SDG 13 (Climate Action)

WasteWise vs. Competitors: Strengths and Market Positioning

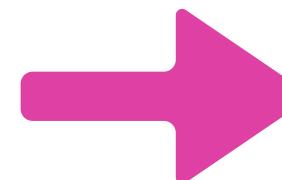
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## Before WasteWise

- High waste-related CO<sub>2</sub> emissions (3.6M tons/year)
- 435K tons of e-waste annually
- Low recycling rates & lack of consumer engagement

## After WasteWise

- AI-powered waste sorting : Lower landfill emissions
- E-waste resale : Saves 500K+ tons of CO<sub>2</sub> yearly
- Gamified incentives : 30-50% boost in recycling rates
- Corporate carbon credits : Supports ESG goals



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# Our members



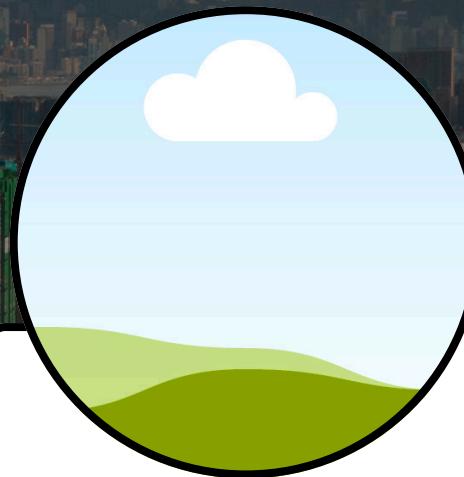
**Phimnara  
Ketkaew**



**Pamika  
Chantin**



**Papangkorn  
Wongsuwan**



**Nattapon  
Boondang**