



WASTE

A Sustainable
Supply Chain for
a Greener ASEAN

TO VALUE

University of Information Technology
Team Nexus



ASEAN
DATA SCIENCE
EXPLORERS



About Us



Linn Khant Kyaw

Team Leader

4th year student

Software Engineering

 b8_linkhantkyaw@uit.edu.mm



Yoon Yamone Oo

Team member

4th year student

Software Engineering

 yoonyamoneoo@uit.edu.mm

Do you recycle?

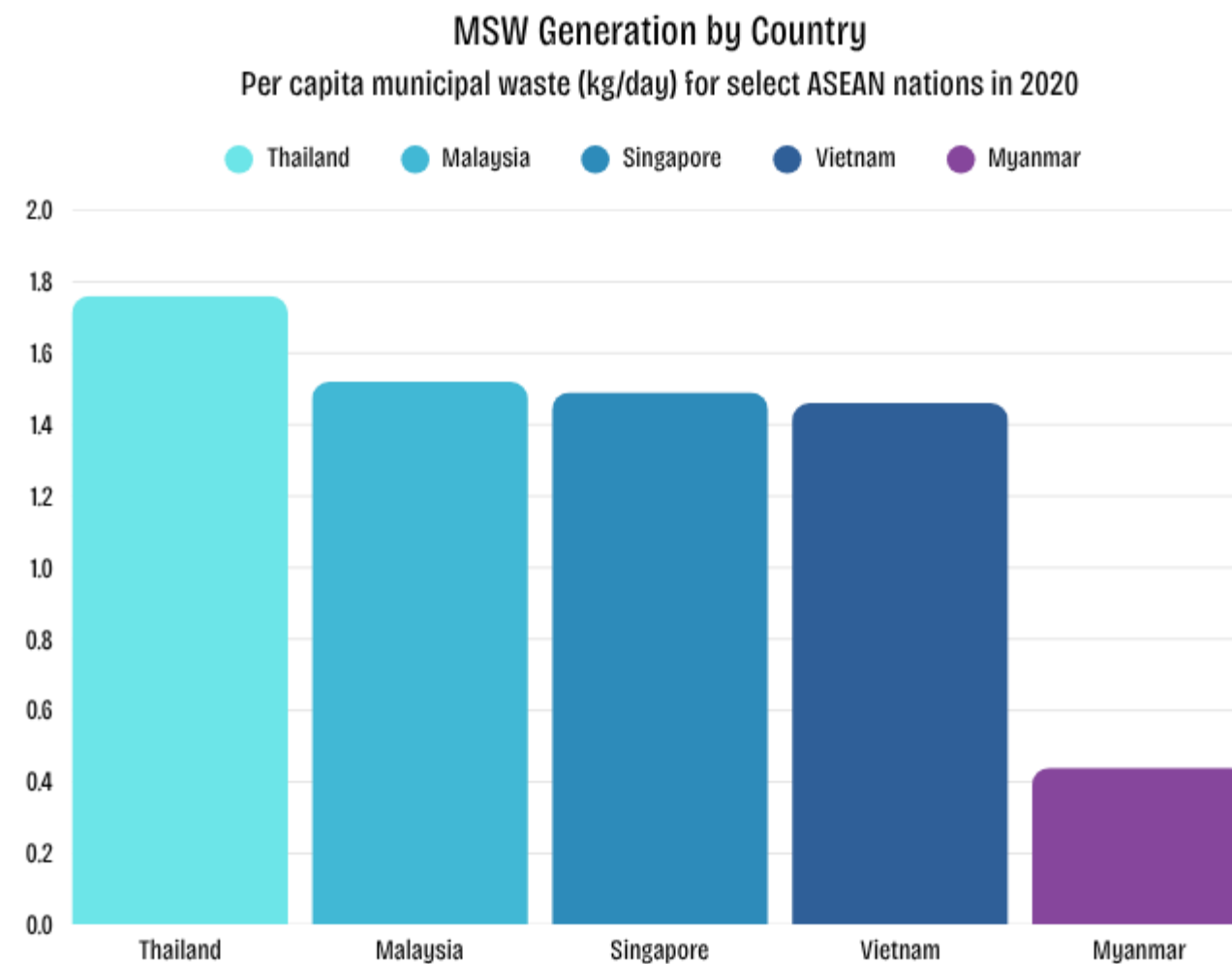
Problem analysis

Problem

Solution

Impact

Implementation



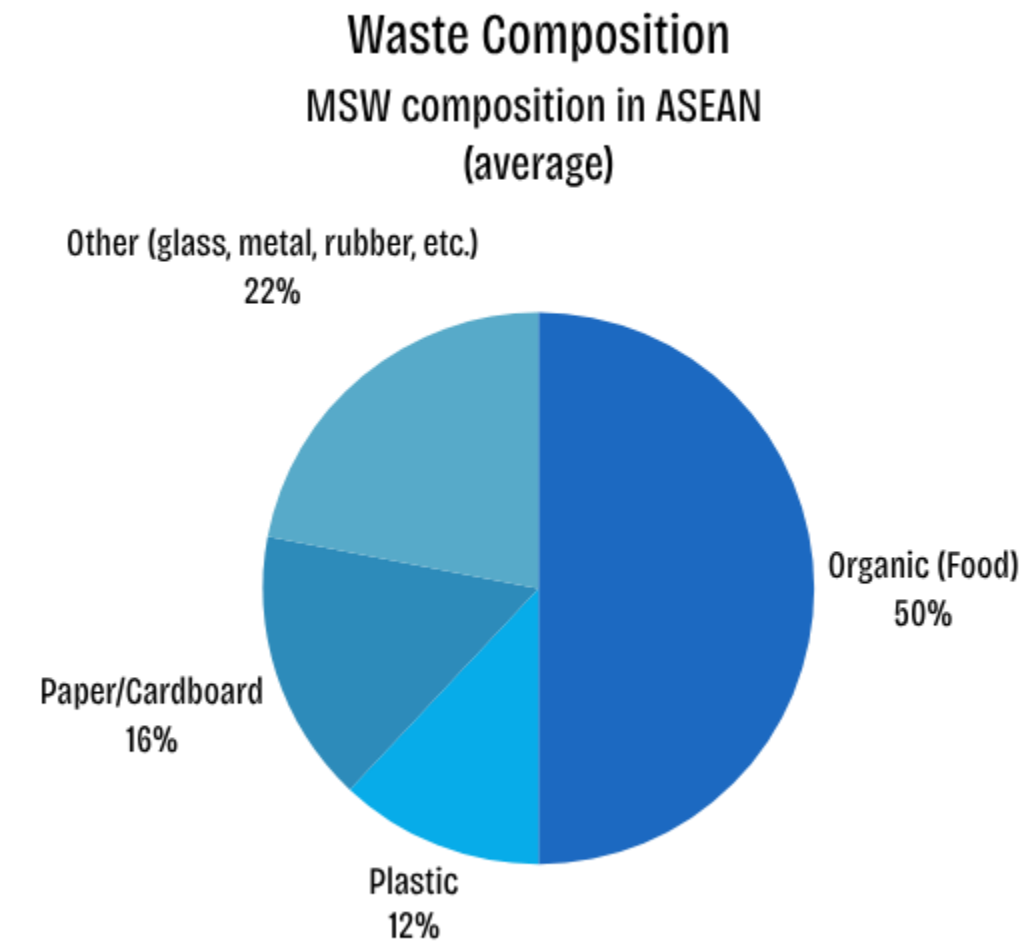
Dataset: What a Waste 2.0 (World Bank) – “Trends in Solid Waste Management”

URL: <https://tinyurl.com/3n9486f2>

Average MSW generation: 1.14 kg per capita/day

Total ASEAN MSW ≈ 170–180 million tons/year

Only ~20% is recycled sustainably.

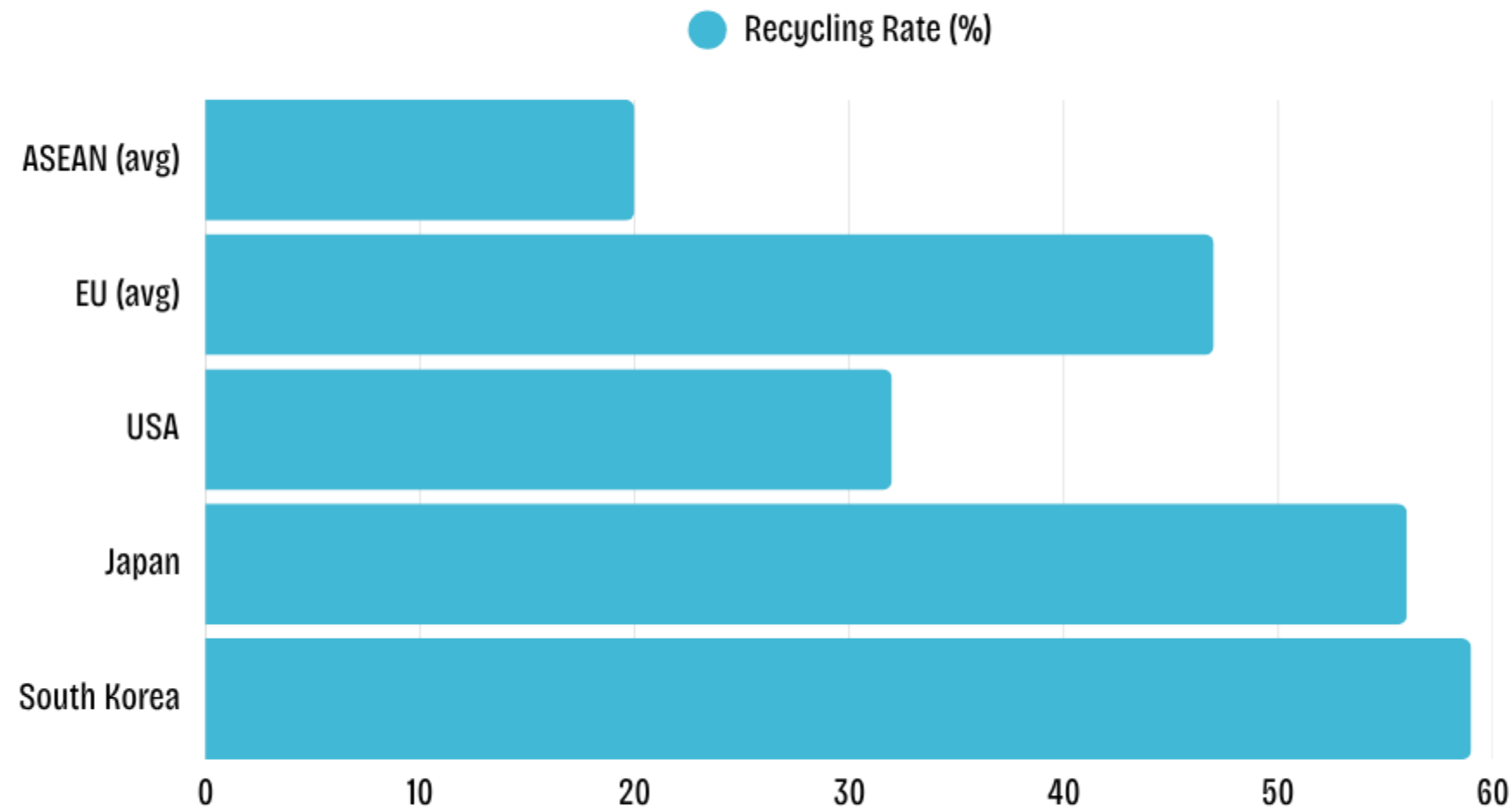


Dataset: What a Waste 2.0 (World Bank) – “Trends in Solid Waste Management”

URL: <https://tinyurl.com/3myss5ru>

- This large-scale generation with
- Weak recycling systems
- Poses serious environmental and economic challenges.

ASEAN vs Developed Countries MSW & Recycling Comparison



Dataset: Eurostat “Municipal waste statistics” (EU average ~50% in 2021)

URL: <https://tinyurl.com/mppwwcsk>

Region/Country	Avg MSW per capita (kg/day)	Total MSW (Mt/year)
ASEAN (avg)	1.14	~170–180 Mt
EU (avg)	1.33	~225 Mt
USA	2.24	~292 Mt
Japan	1.10	~43 Mt
South Korea	1.10	~54 Mt

Dataset: US EPA “Facts and Figures about Materials, Waste and Recycling” (national MSW recycling; latest series)

URL: <https://tinyurl.com/bdd4efb9>

ASEAN generates less per capita waste than USA or EU, but:

● Recycles far less (20% vs 47–59%)

Developed countries have **infrastructure, incentives, and circular economy markets** to support high recovery rates.

ASEAN’s **low recycling rate** despite **high total volume = huge missed opportunity**

The Gap Between Waste and Worth



■ Problem

- ASEAN loses \$80B–\$120B in recyclable value yearly.
- ~20% of MSW is sustainably recycled or treated
- Waste-to-resource pathways are fragmented, underutilized, and opaque.

■ Solution



■ Impact



The Waste Crisis in ASEAN: A Mounting Challenge

40% - 45%
is processed in controlled
waste management
facilities, but often without
material recovery or
emissions treatment.
(based on available data
from 2025)

\$80 billion to \$120 billion
worth of recyclable materials is
lost annually due to inefficient
waste management practices
(based on available data from
2022)

1,719,770.00 MtCO₂e
greenhouse gas emissions
per year from waste
(based on available data
from 2023)

Report: UNEP "Waste Management in ASEAN Countries: Summary Report"

URL: <https://tinyurl.com/4n94stt8>

Global stat basis: Ellen MacArthur Foundation (EMF), "New Plastics Economy"

URL: <https://tinyurl.com/45shn749>

Dataset: EDGAR v8.0 – Waste sector emissions (country level)

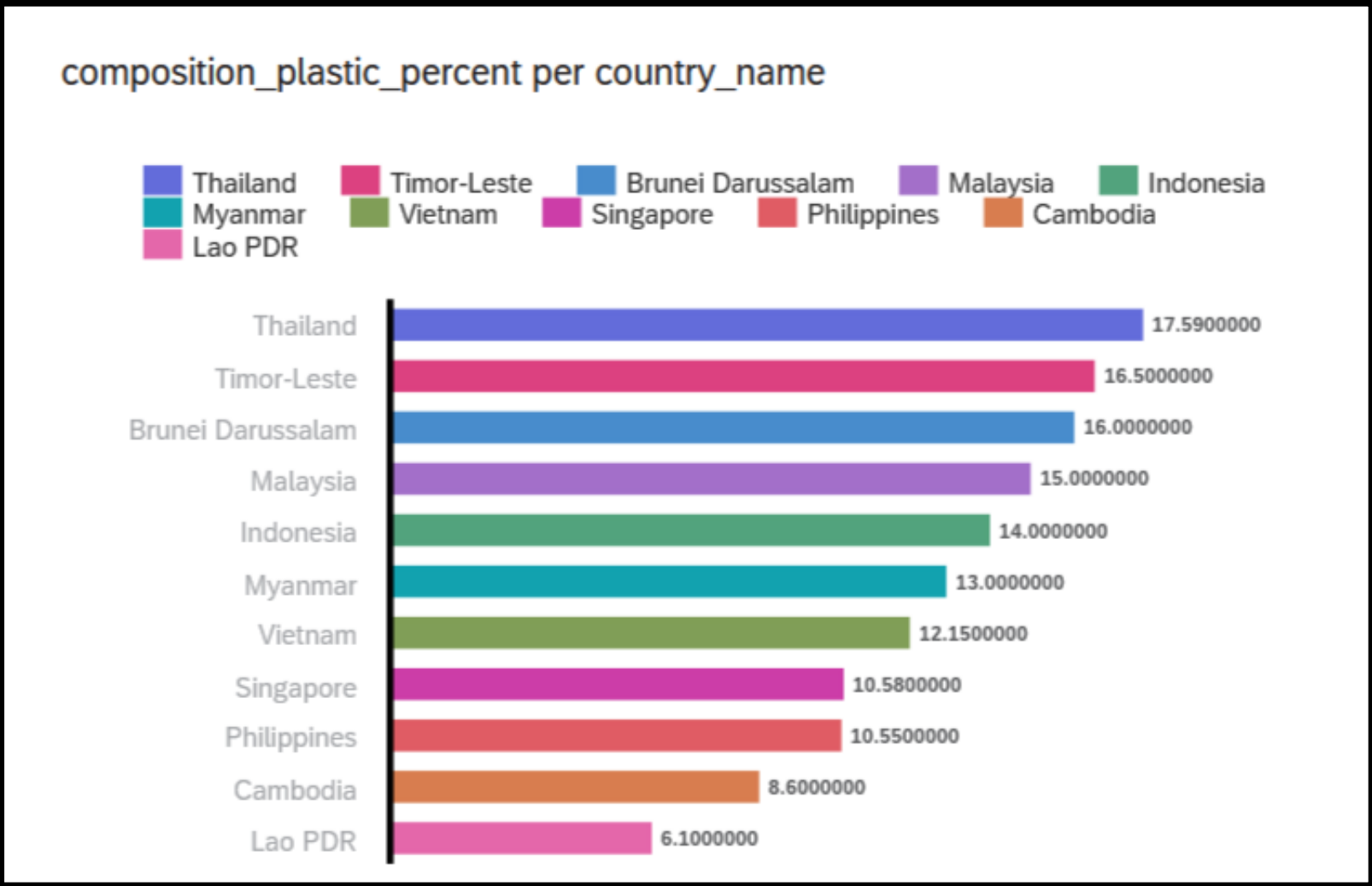
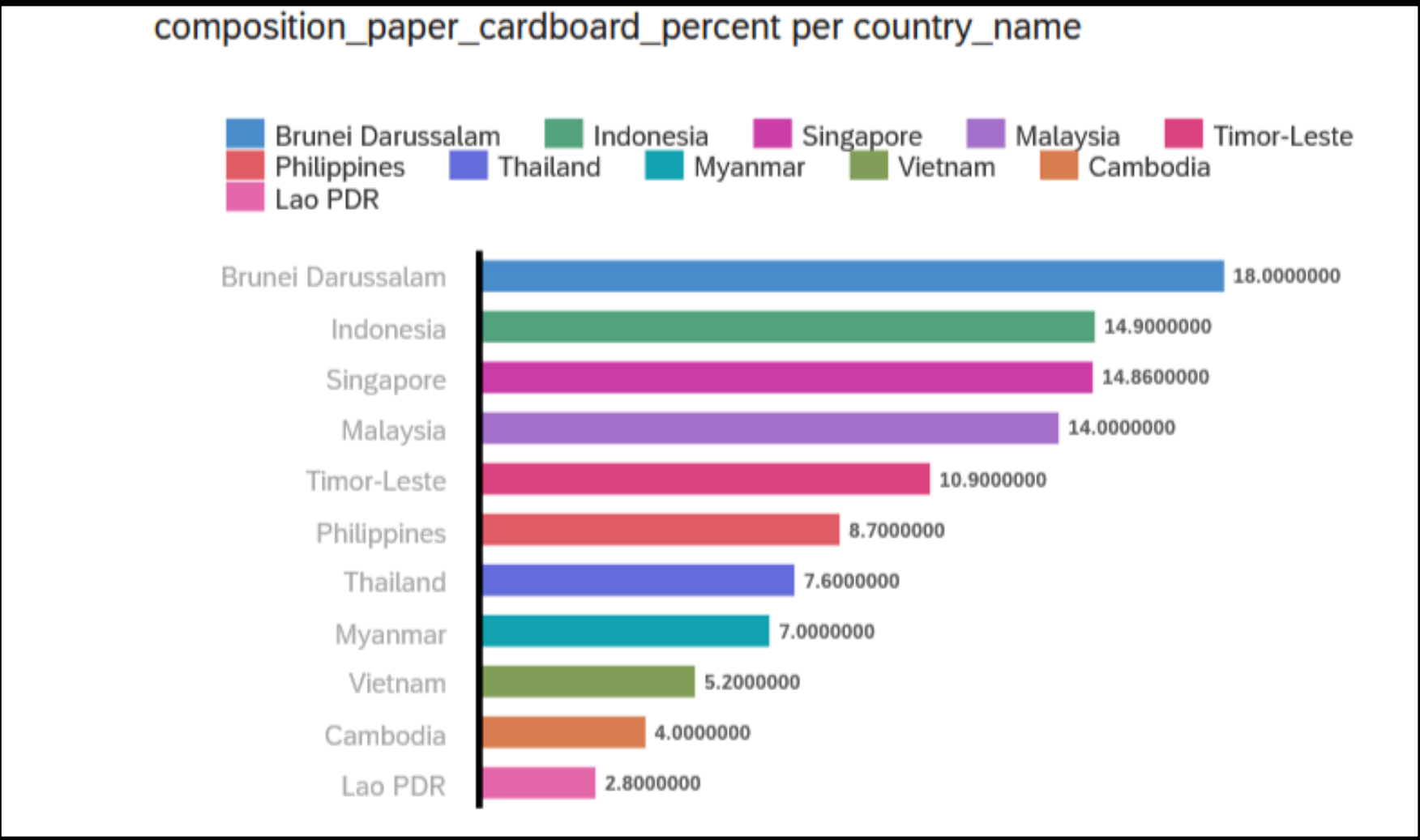
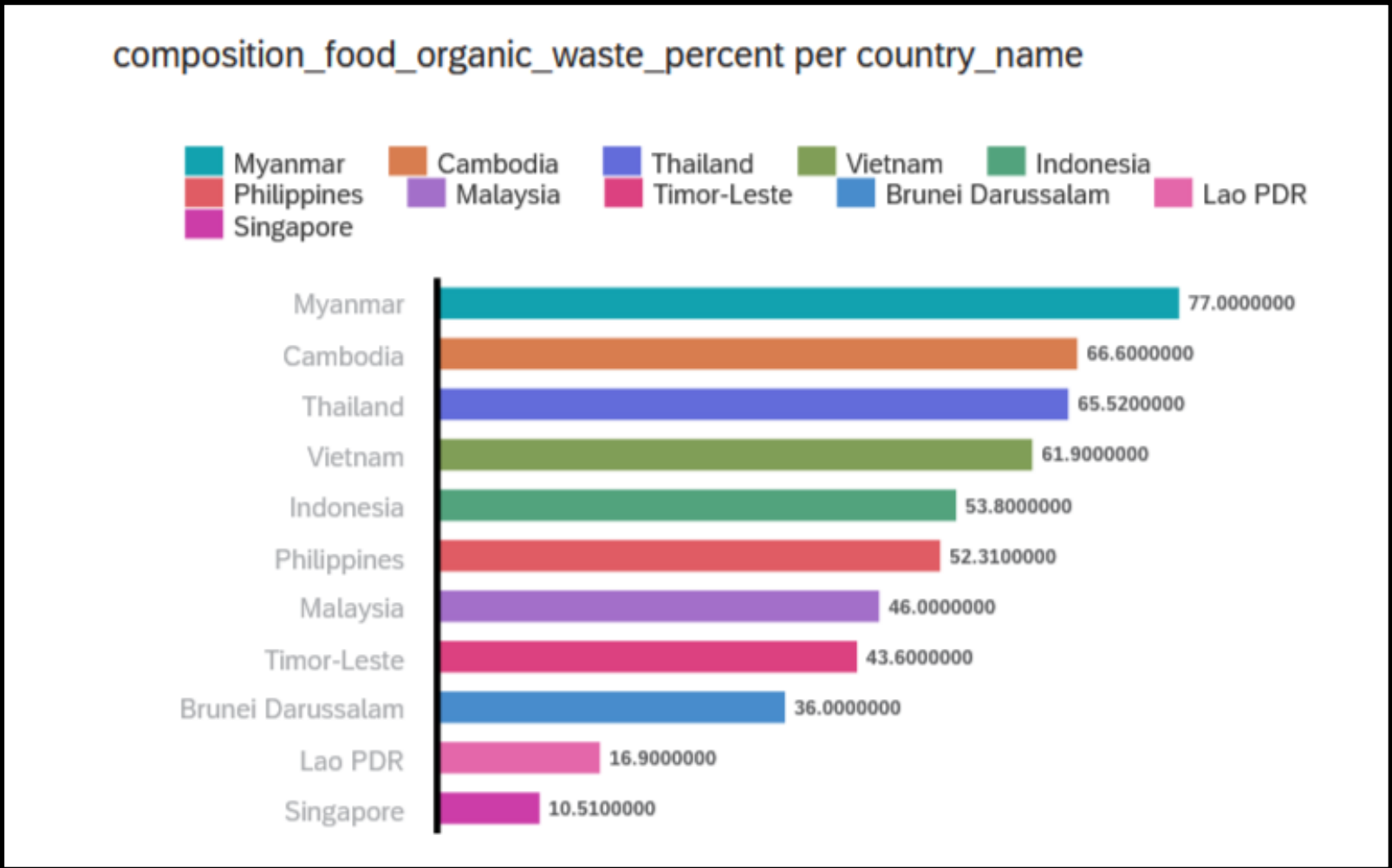
URL: <https://tinyurl.com/5edkcf3k>

Waste Composition Across ASEAN Countries

Dominant Waste Streams

Plastics, food, and paper/cardboard form the bulk of ASEAN's waste due to high consumption and inadequate recycling. Limited infrastructure leads to landfilling or burning of these materials despite their recyclability.

Dataset/report: UNEP ASEAN Summary Report (Fig. 8; country breakdowns)
<https://tinyurl.com/5e6chpfj>



Waste Composition Across ASEAN Countries

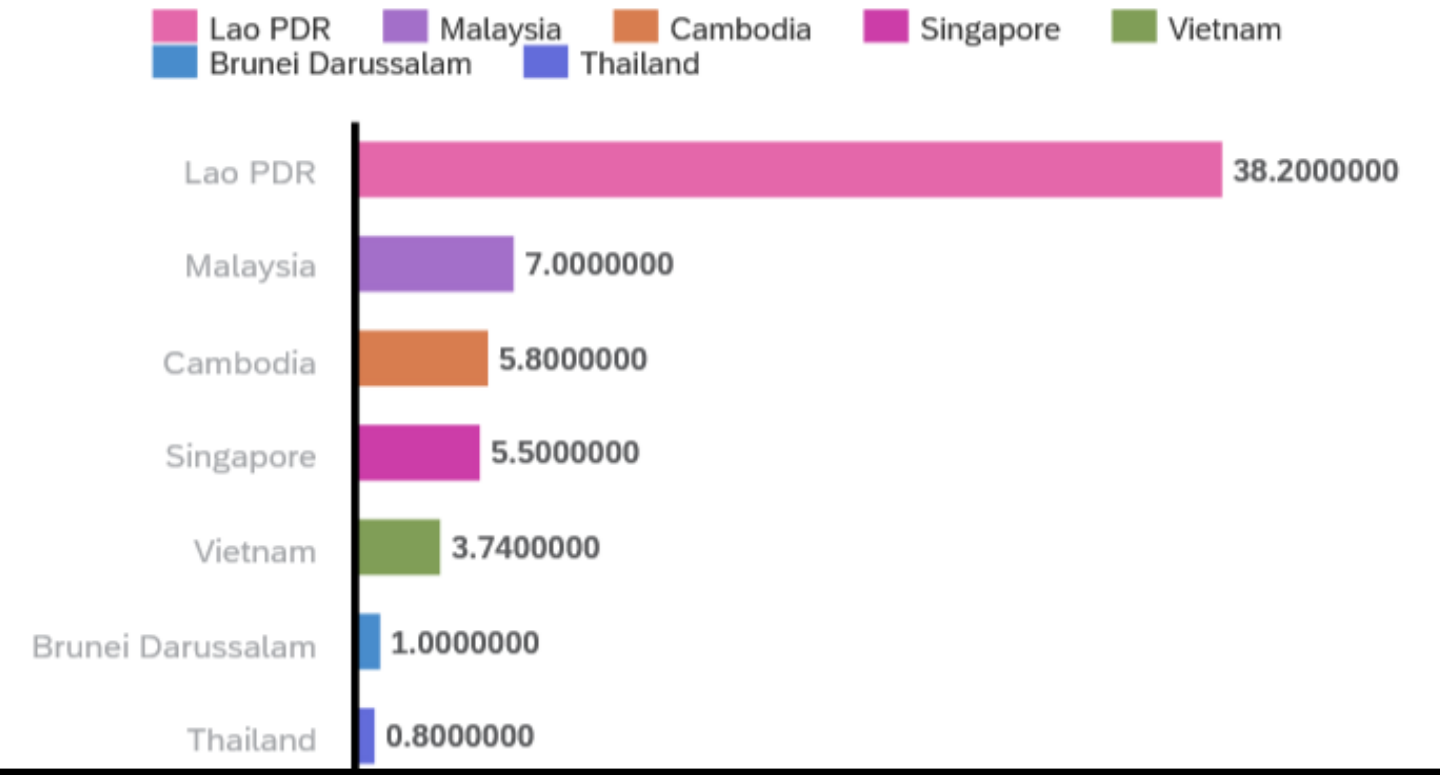
Underutilized Resources

Wood, metal, and glass waste often go unrecycled but hold economic potential. Better sorting and processing could transform them into valuable materials, supporting a circular economy.

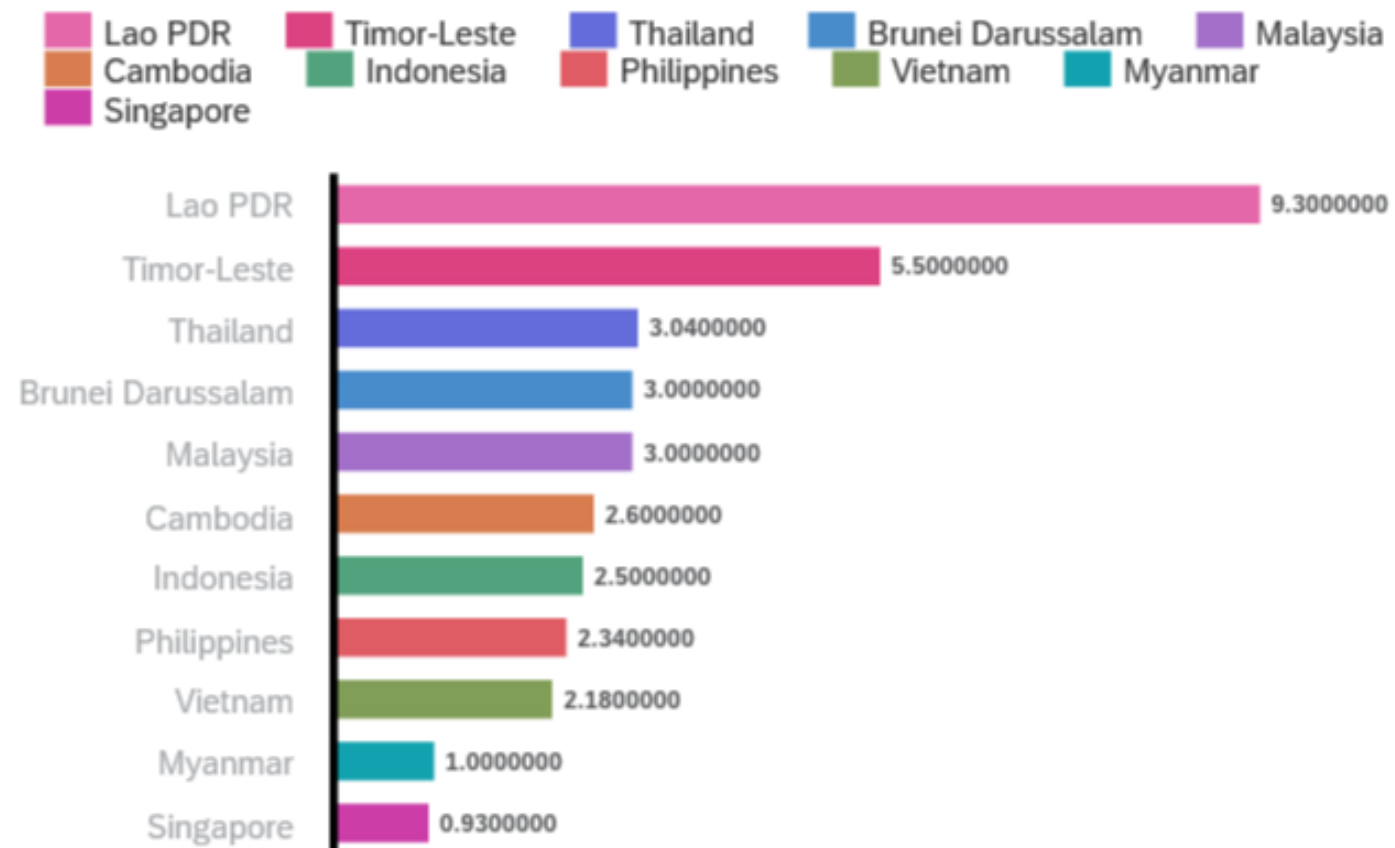
Dataset/report: UNEP ASEAN Summary Report (Fig. 8; country breakdowns)

<https://tinyurl.com/5e6chpfj>

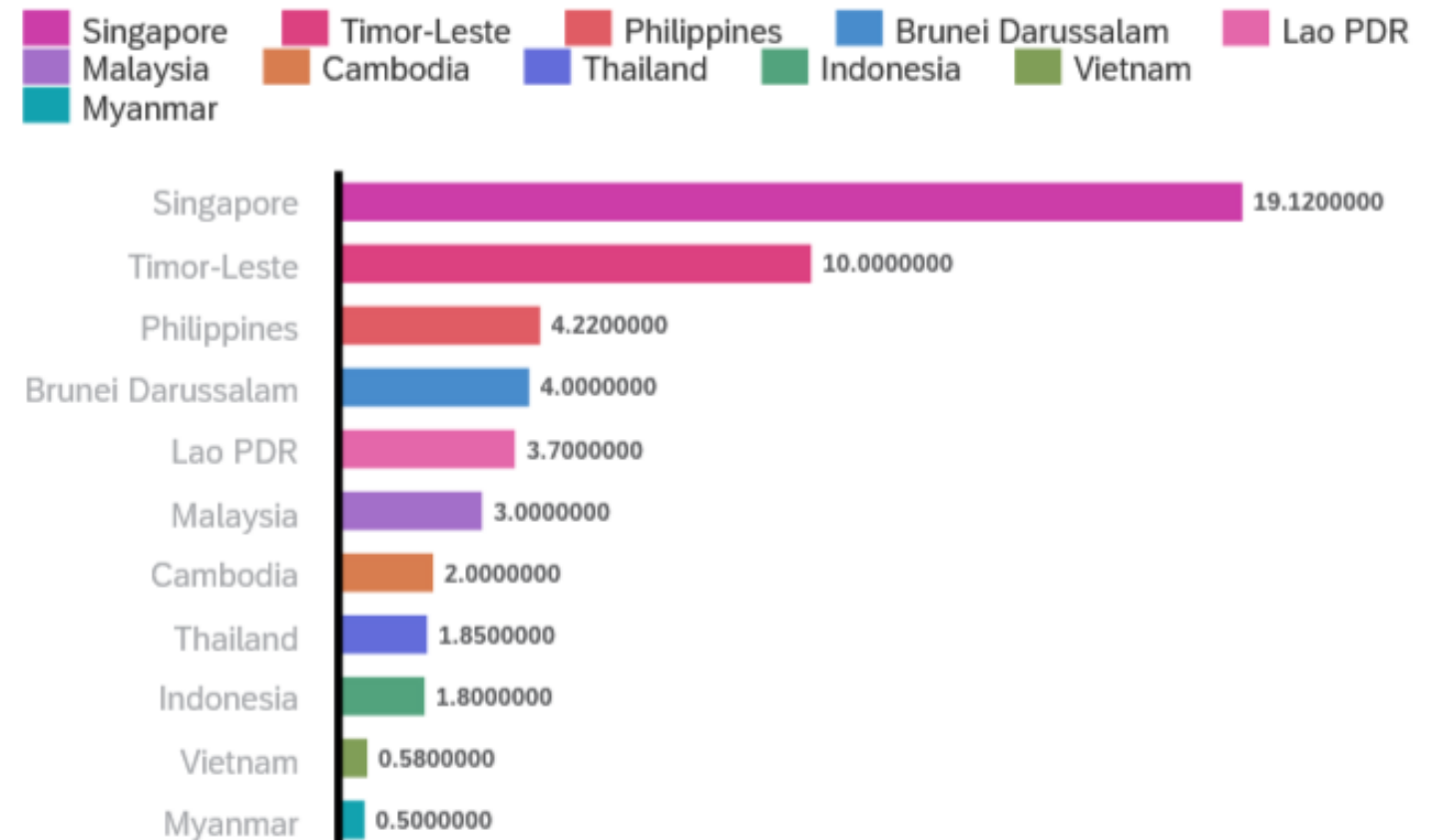
composition_wood_percent per country_name



composition_glass_percent per country_name



composition_metal_percent per country_name



Total Municipal Solid Waste (MSW) Generation by ASEAN Countries

in Million

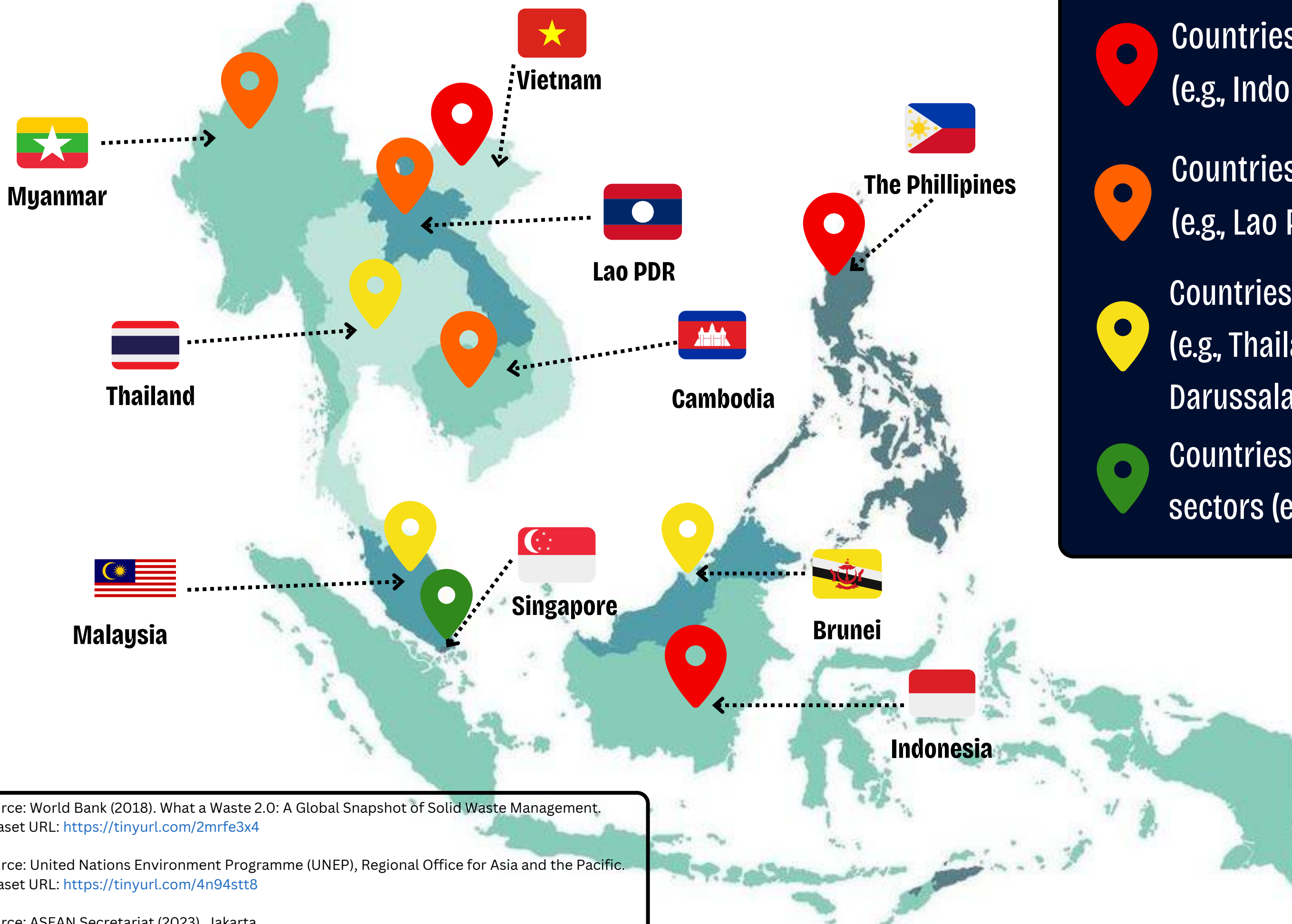
Brunei Darussalam	0.2162532
Cambodia	1.0890000
Indonesia	65.2000000
Lao PDR	0.3519000
Malaysia	12.9826850
Myanmar	4.6773065
Philippines	14.6319229
Singapore	1.8700000
Thailand	26.8533660
Timor-Leste	0.0638750
Vietnam	9.5703000

"Indonesia's waste = 65M tons/year – where does it all go?"

Dataset: What a Waste 2.0 (country totals; Indonesia ~64–65 Mt/y, etc.)

URL: <https://tinyurl.com/ya4xvyp5>

<https://tinyurl.com/568p29x8>



Legend:

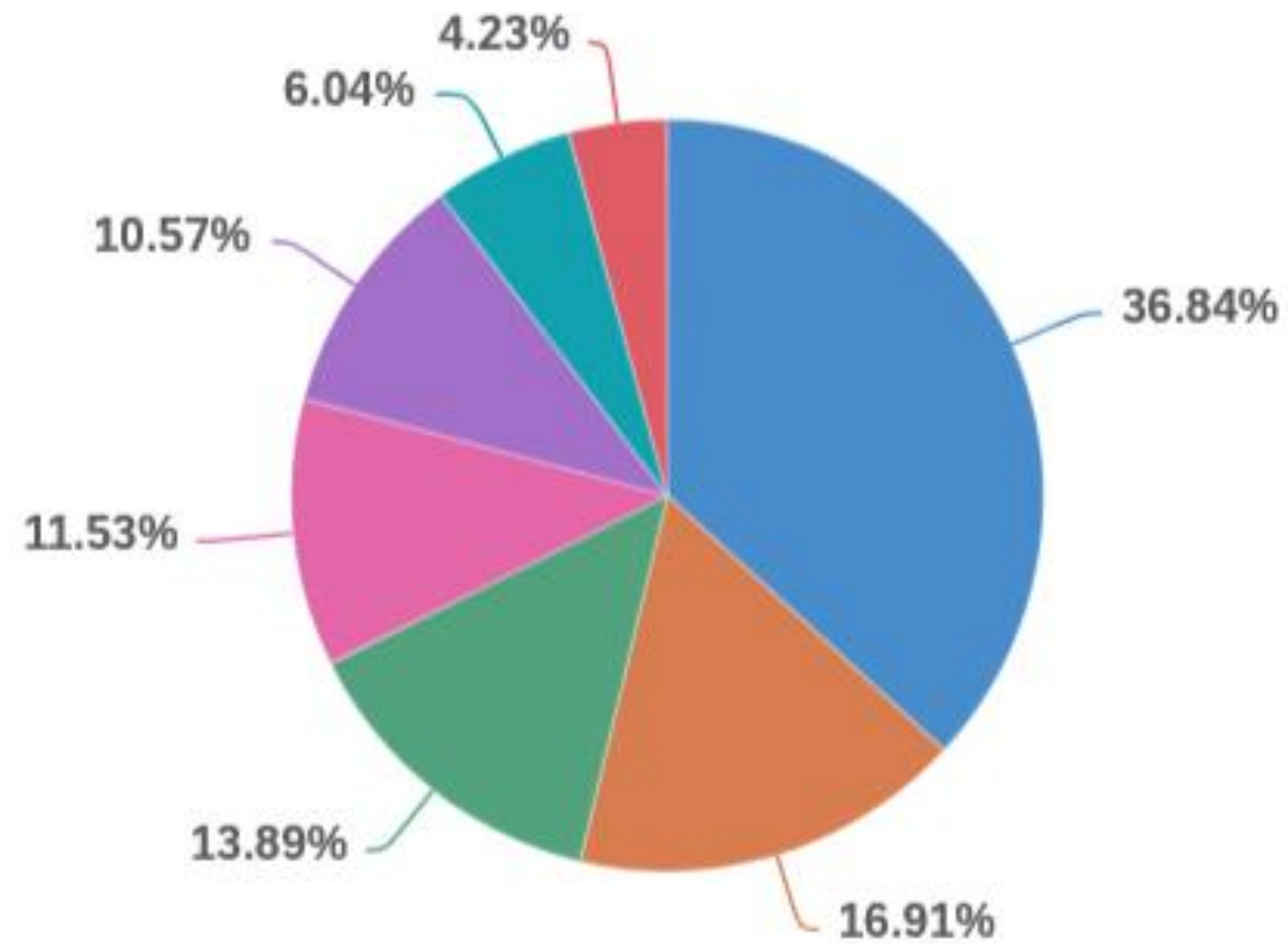
- Countries with high waste generation (e.g., Indonesia, Vietnam, The Philippines)
- Countries with low recycling rates (e.g., Lao PDR, Myanmar, Cambodia)
- Countries with Emerging Transition (e.g., Thailand, Malaysia, Brunei Darussalam)
- Countries with growing green innovation sectors (e.g., Singapore)

- Source: World Bank (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management. Dataset URL: <https://tinyurl.com/2mefe3x4>
- Source: United Nations Environment Programme (UNEP), Regional Office for Asia and the Pacific. Dataset URL: <https://tinyurl.com/4n94stt8>
- Source: ASEAN Secretariat (2023), Jakarta. Dataset URL: <https://tinyurl.com/s2meahu6>

Regional Waste Opportunity Map

The chart shows recycling rates across ASEAN nations, with Singapore leading at **36.84%**, while Indonesia and Lao PDR report the lowest rates at **4.23%** and **6.04%**, highlighting regional disparities in waste management.

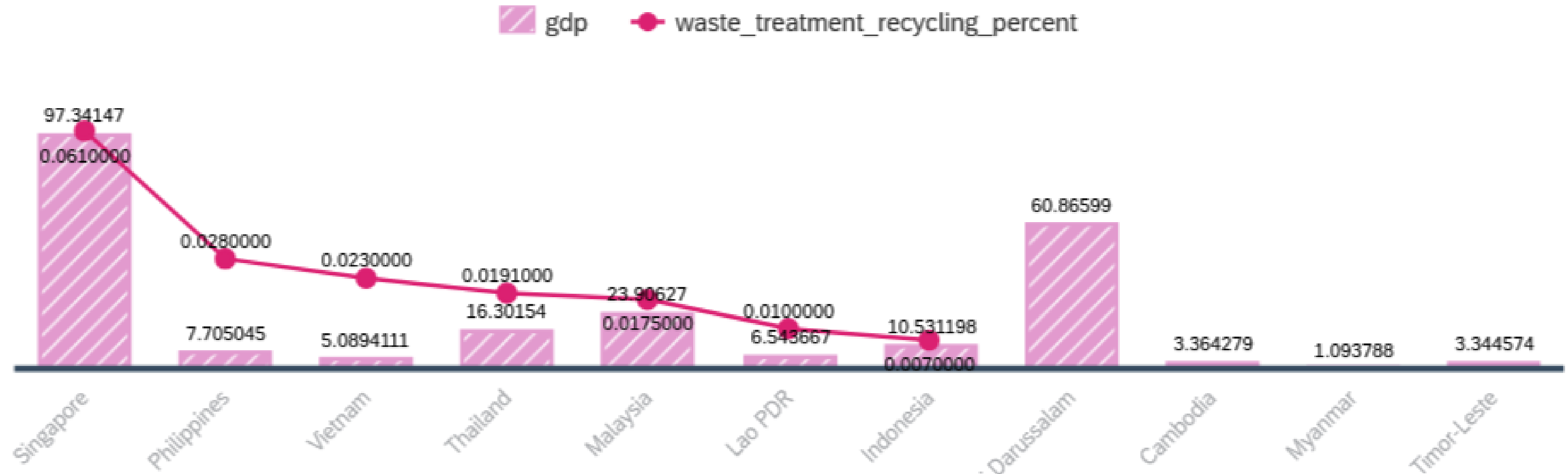
Recycling Rates Across ASEAN Countries



Regional base: UNEP ASEAN Summary Report
<https://tinyurl.com/4n94stt8>

Relation Between GDP and Recycling

in Thousand



- This diagram shows the link between GDP (in thousands) and recycling rates in ASEAN countries.
- Singapore, has the highest GDP, also has a relatively highest recycling rate,
- Other countries show low GDP and low recycling activity.
- Some countries lack recycling data.

Dataset: World Bank, WDI – NY.GDP.MKTP.CD
URLs: <https://tinyurl.com/522k8p6x>
API docs: <https://tinyurl.com/42vxy3wz>

The Solution ASEAN Has Been Waiting For

Problem analysis

Problem

Solution

Impact

Implementation

NEXUS

Waste-to-Value

An AI-Powered Circular Economy Platform

Problem

- ASEAN loses \$80B–\$120B in recyclable value yearly.
- Less than 45% of waste is processed sustainably.
- Waste-to-resource pathways are fragmented, underutilized, and opaque.

Solution

An AI + blockchain-powered digital platform that:

- Matches waste with upcyclers
- Optimizes supply chain logistics
- Tracks impact in real-time using SAP dashboards

Impact



“Turning Waste Into Value – Our Mission”



Objectives

Reduce Landfill Waste

Enable suppliers to sell recyclable materials instead of dumping them.

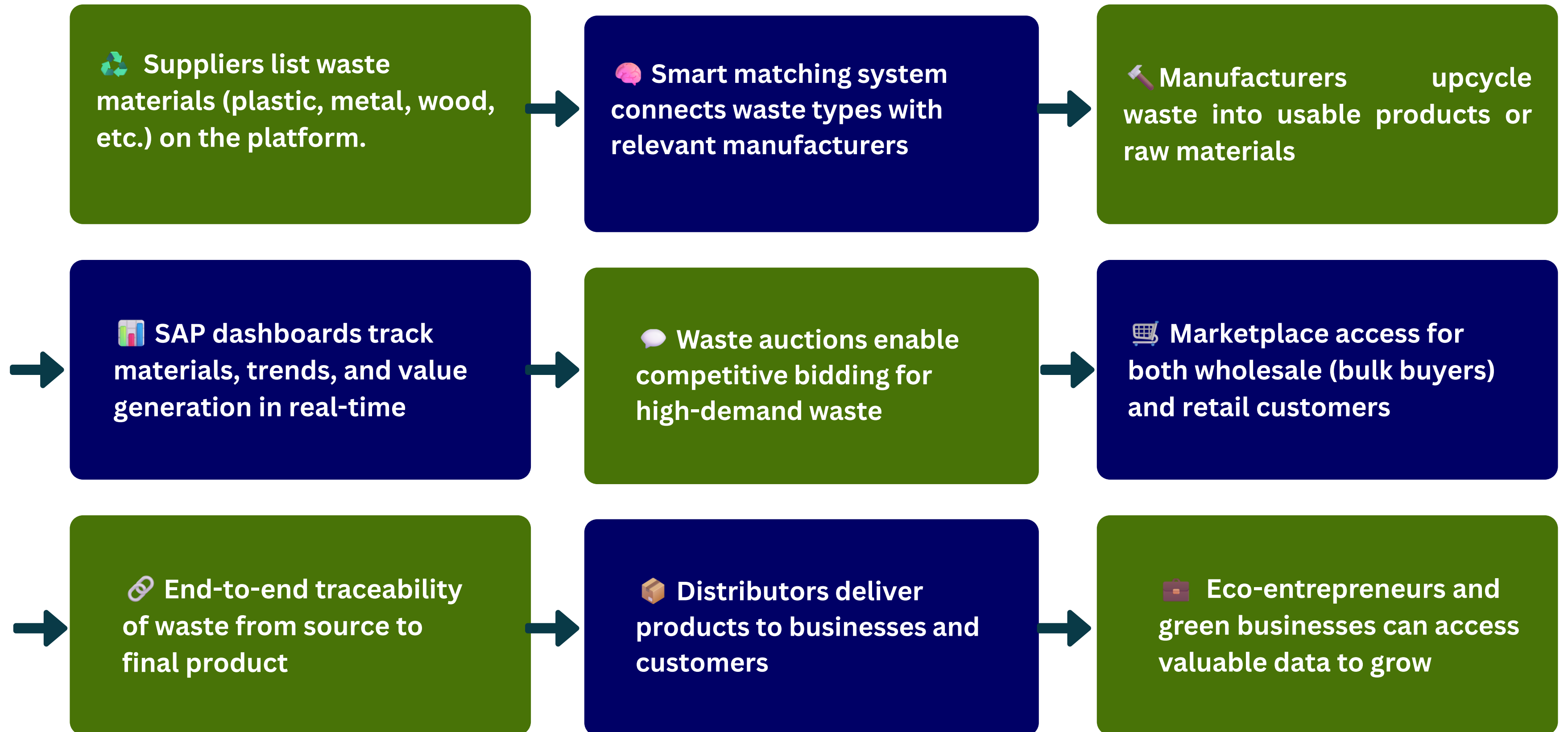
Promote Recycling Supply Chains

Connect manufacturers with waste sources to produce reusable low-cost products.

Empower Green Business via Data

Use analytics to optimize operations, forecast supply/demand, and measure environmental impact.

How the Waste-To-Value Platform Works





Home page

How it works

Platform users

Platform Features

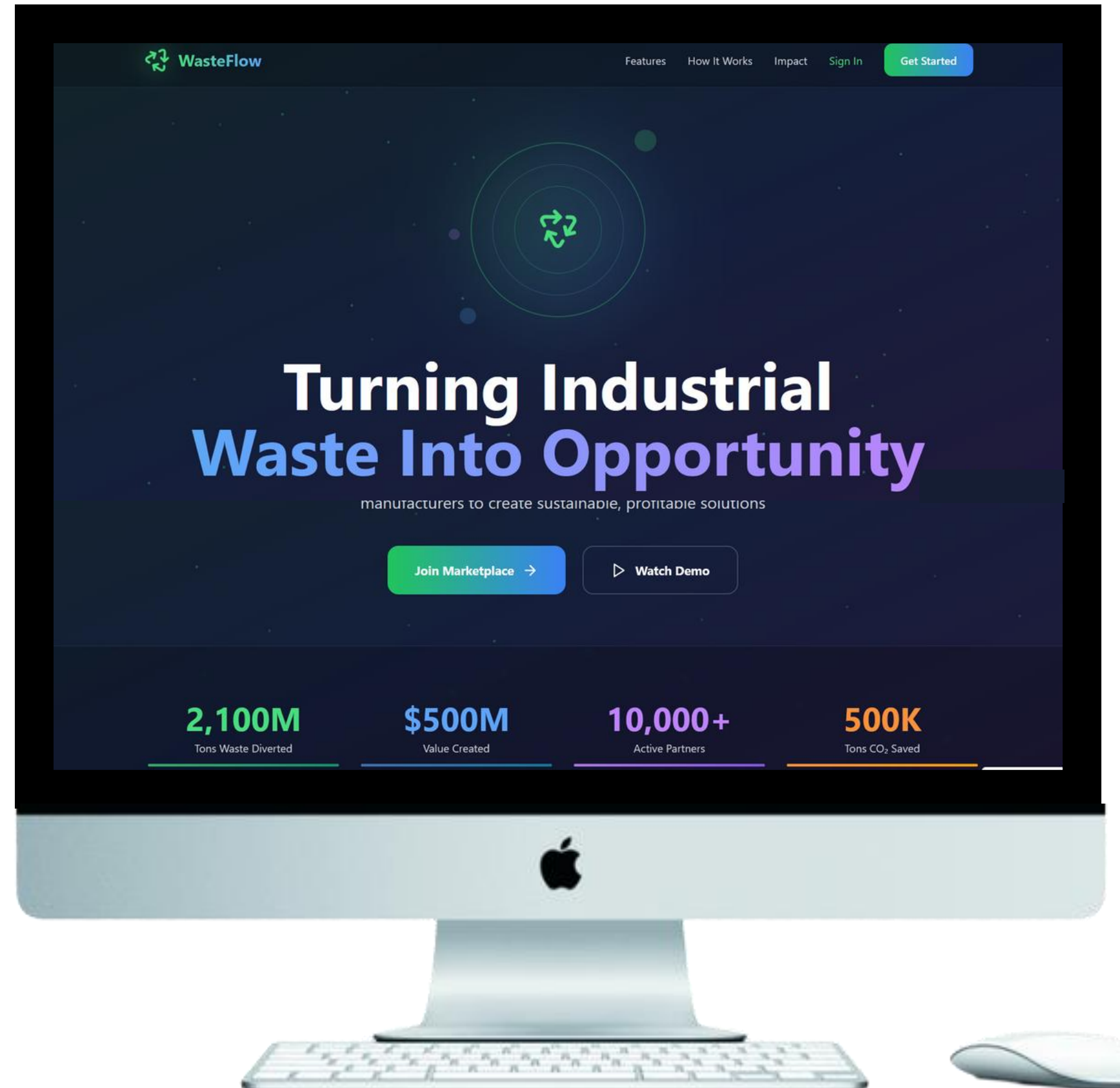
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



Home page



How it works

Platform users

Platform Features

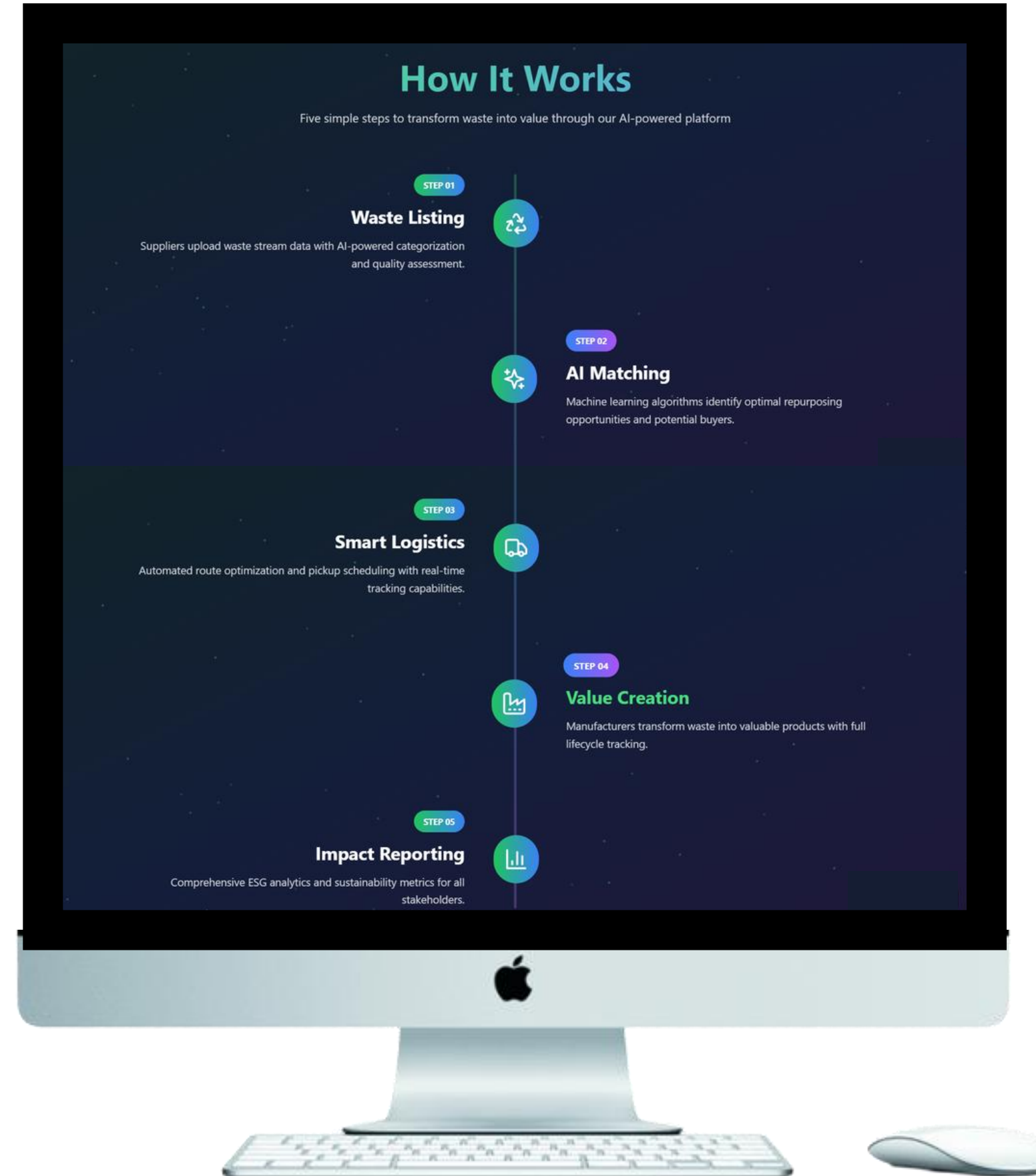
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



How It Works

Five simple steps to transform waste into value through our AI-powered platform

STEP 01

Waste Listing

Suppliers upload waste stream data with AI-powered categorization and quality assessment.



STEP 02

AI Matching

Machine learning algorithms identify optimal repurposing opportunities and potential buyers.



STEP 03

Smart Logistics

Automated route optimization and pickup scheduling with real-time tracking capabilities.



STEP 04

Value Creation

Manufacturers transform waste into valuable products with full lifecycle tracking.



STEP 05

Impact Reporting

Comprehensive ESG analytics and sustainability metrics for all stakeholders.



Home page

How it works



Platform users

Platform Features

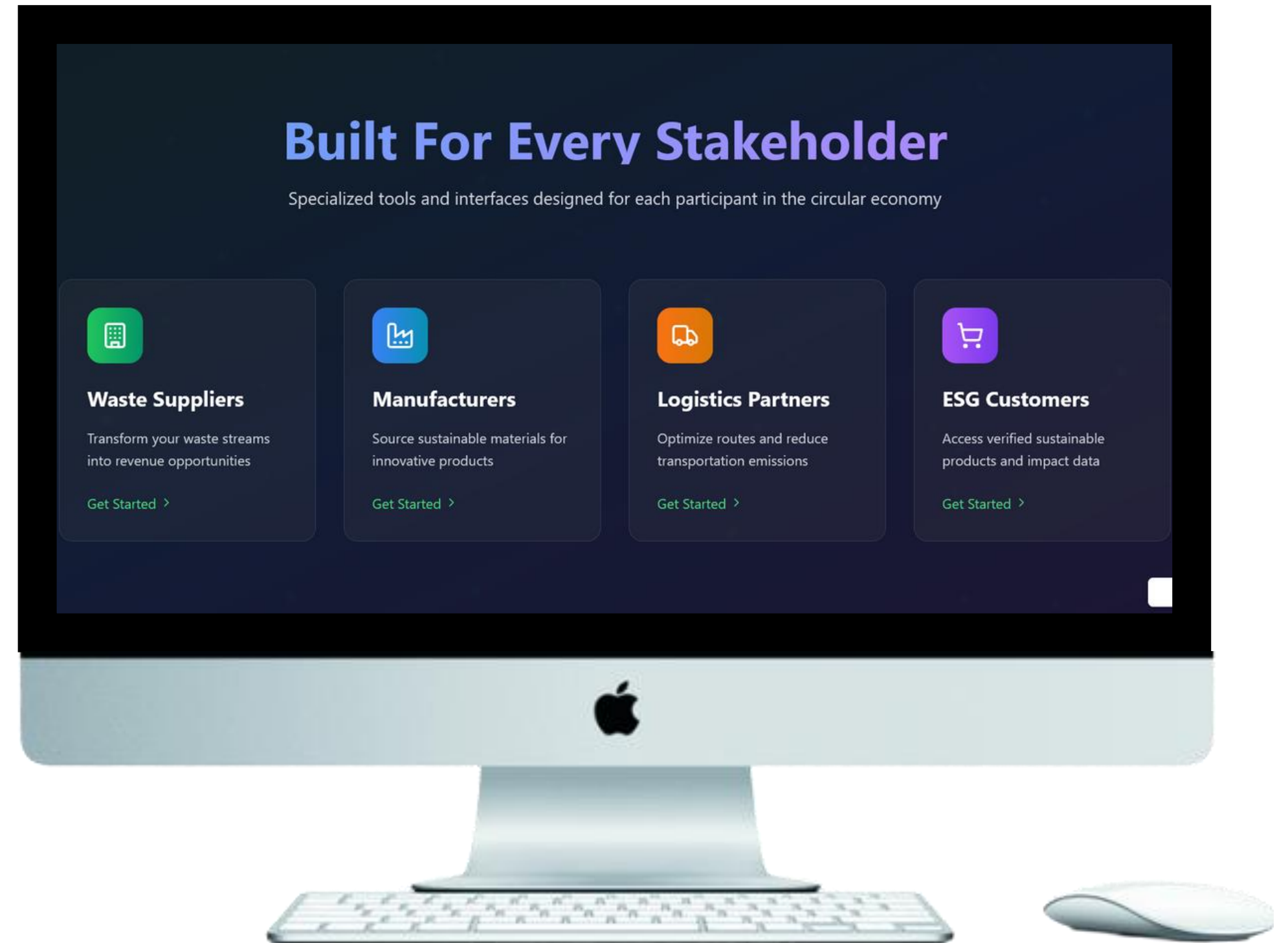
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



Built For Every Stakeholder

Specialized tools and interfaces designed for each participant in the circular economy



Waste Suppliers

Transform your waste streams into revenue opportunities

[Get Started >](#)



Manufacturers

Source sustainable materials for innovative products

[Get Started >](#)



Logistics Partners

Optimize routes and reduce transportation emissions

[Get Started >](#)



ESG Customers

Access verified sustainable products and impact data

[Get Started >](#)

Home page

How it works

Platform users



Platform Features

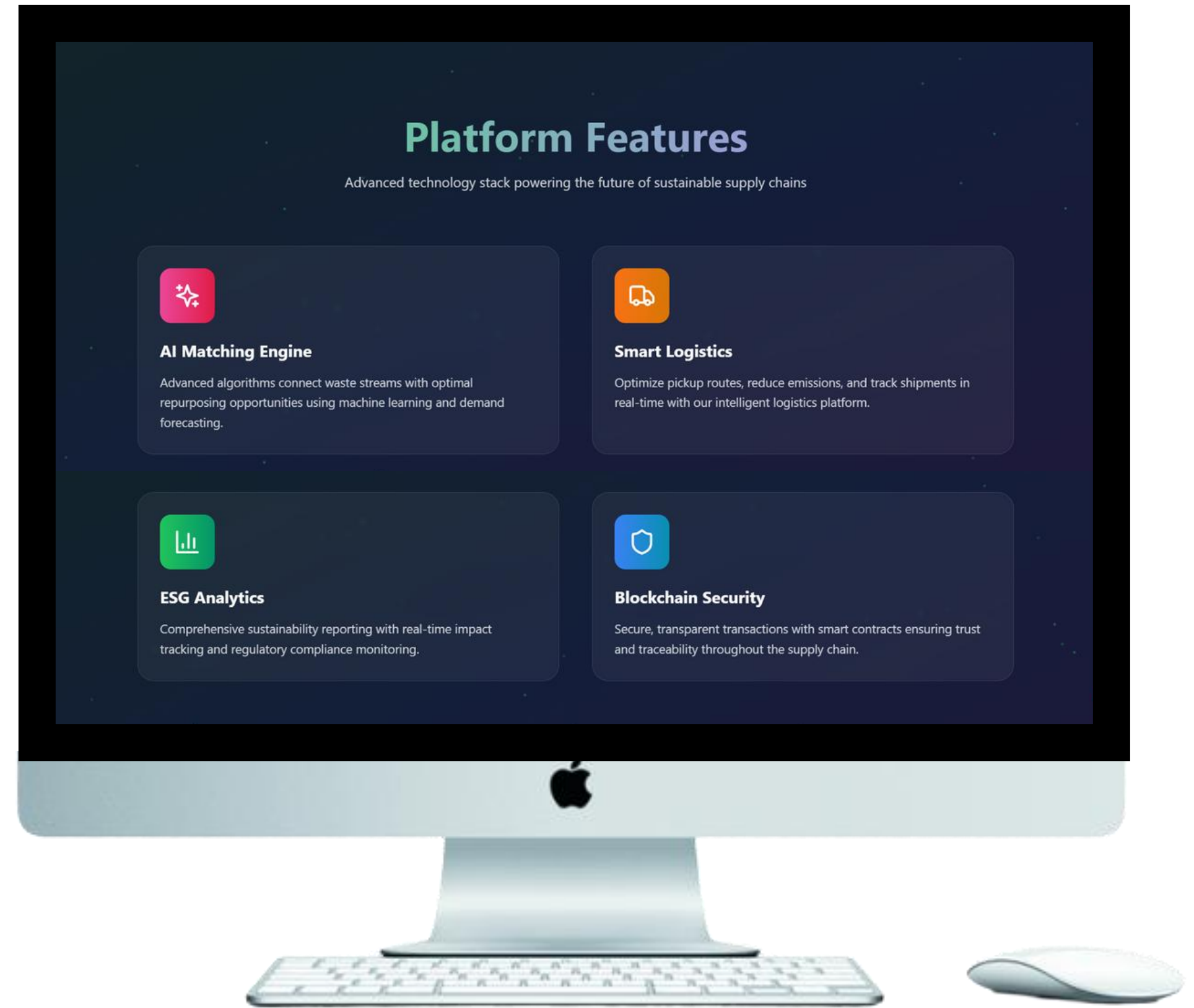
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



Home page

How it works

Platform users

Platform Features

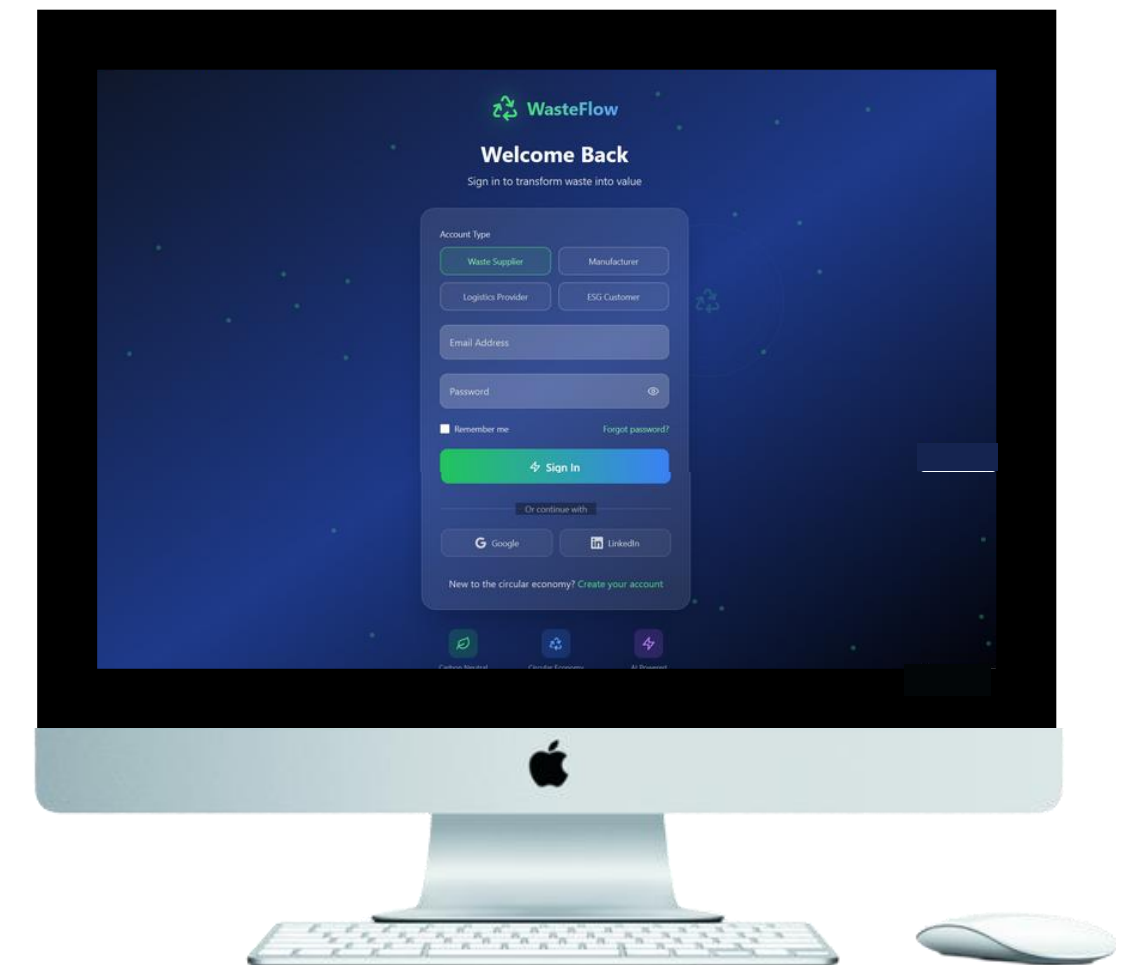
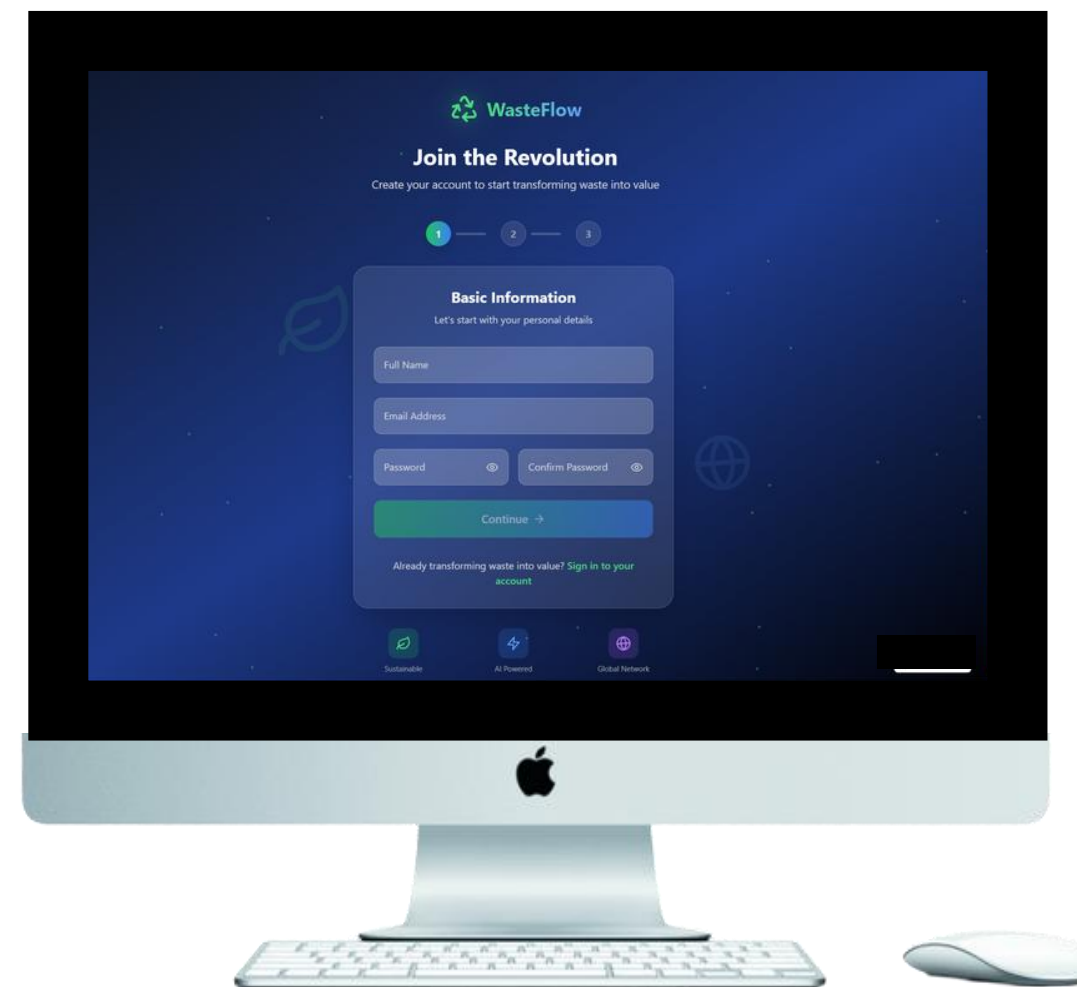
 Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



Home page

How it works

Platform users

Platform Features

Sign up/Log in

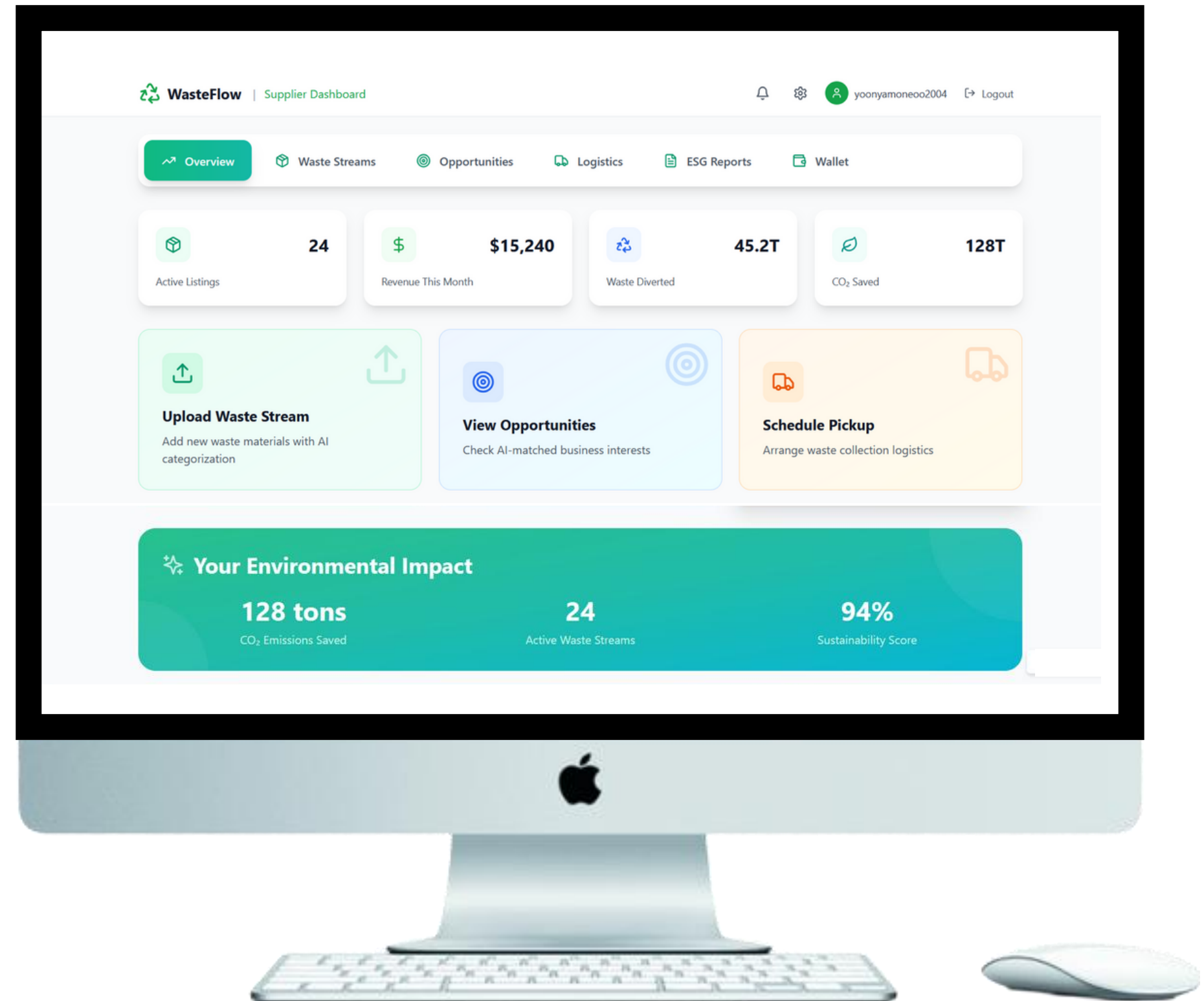


Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

Customer Dashboard



Home page

How it works

Platform users

Platform Features

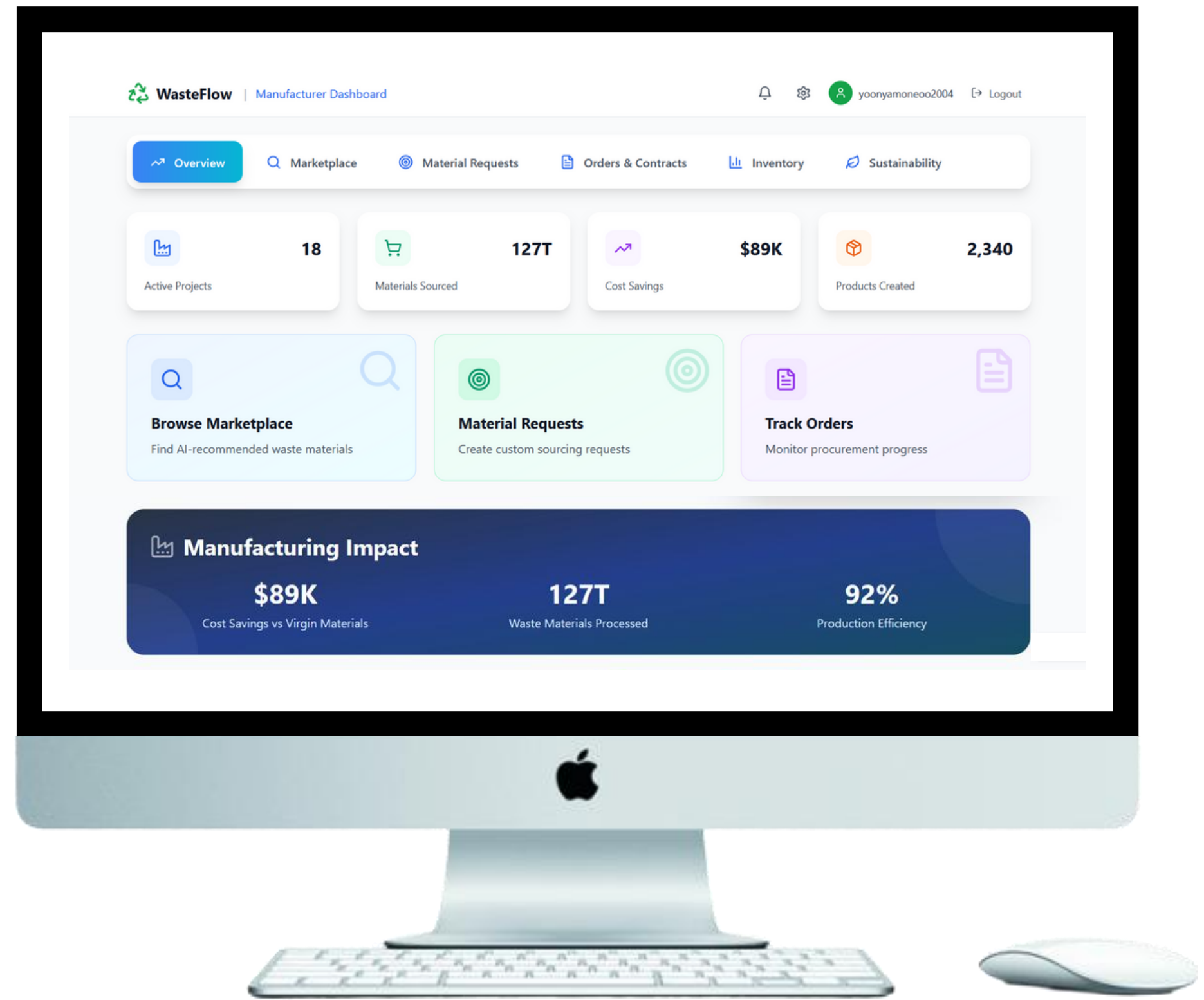
Sign up/Log in

Supplier Dashboard

 **Manufacture Dashboard**

Logistics Dashboard

Customer Dashboard



Home page

How it works

Platform users

Platform Features

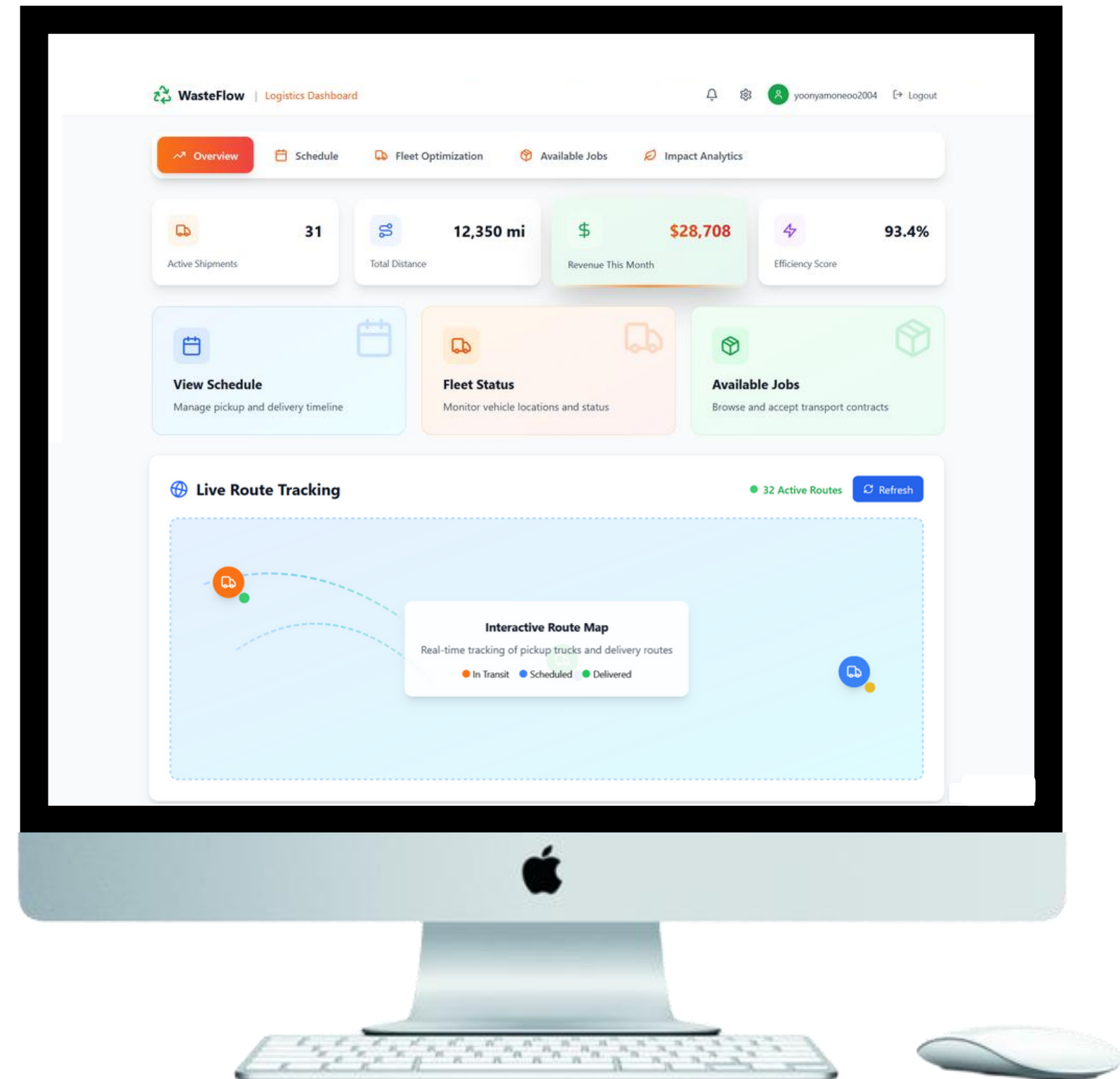
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

 **Logistics Dashboard**

Customer Dashboard



Home page

How it works

Platform users

Platform Features

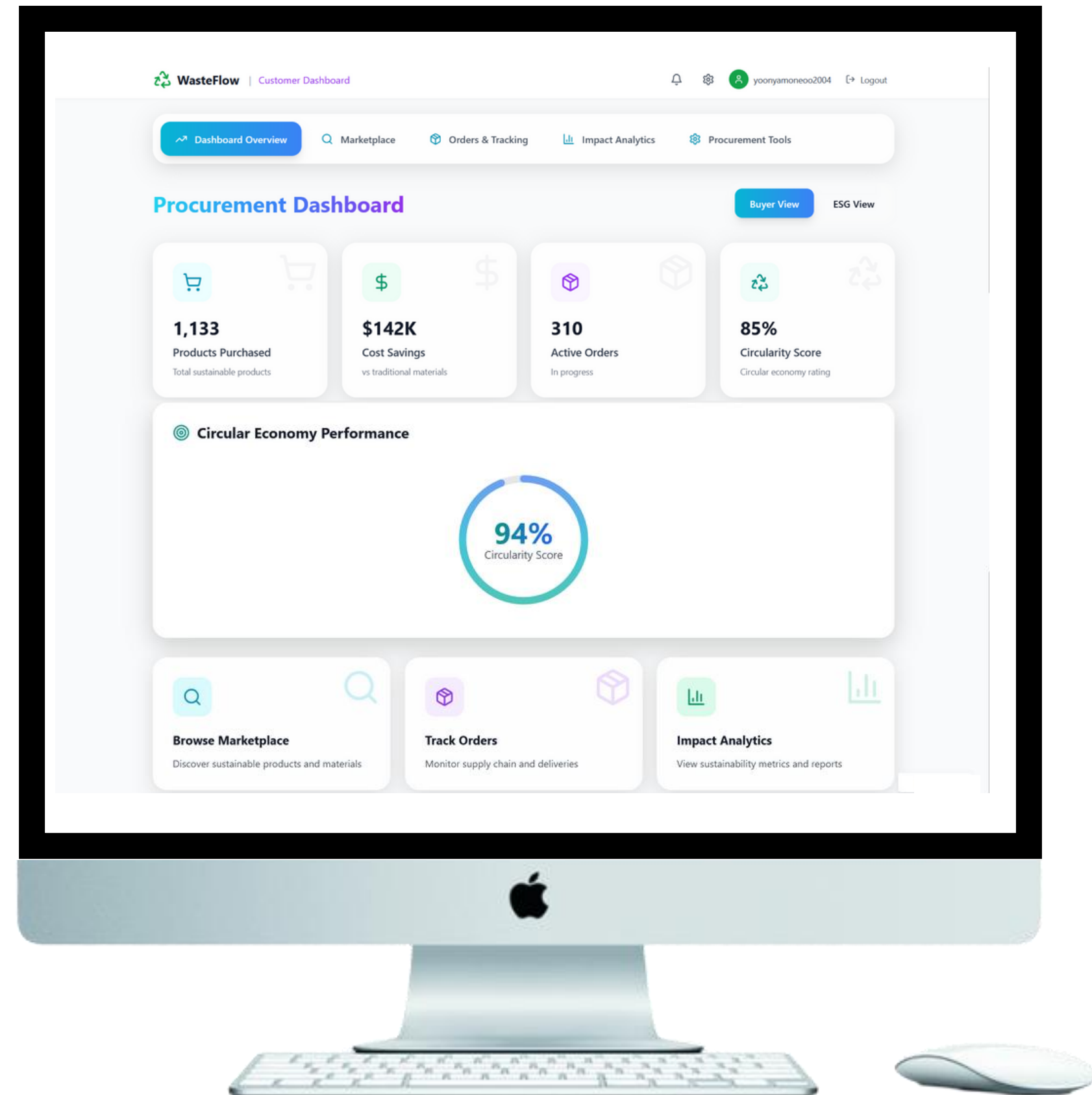
Sign up/Log in

Supplier Dashboard

Manufacture Dashboard

Logistics Dashboard

 Customer Dashboard



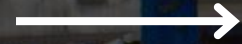
PLATFORM USER CATEGORIES & EXAMPLES



Supplier



PLATFORM USER CATEGORIES & EXAMPLES



**Manufacturers
(Upcyclers/
SMEs, startups)**

PLATFORM USER CATEGORIES & EXAMPLES



Distributors

PLATFORM USER CATEGORIES & EXAMPLES



**Retail
Customers**



Suppliers

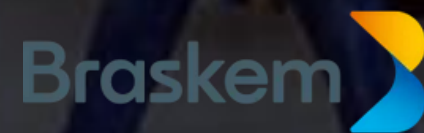
(businesses or organizations that generate plastic, food, paper/cardboard, or industrial waste)

Example organizations in ASEAN



Food processing plants

Plastic manufacturers



ASEAN Federation of Plastic Industries (AFPI)



Logistics warehouses / e-commerce (generate cardboard/plastic)



Hotels / Supermarkets (generate food & packaging waste)



Waste Reusers / Upcyclers / Recyclers

SMEs, startups, or enterprises that turn waste into new products

Example organizations in ASEAN



Recyglo (Myanmar)

plastic & e-waste
recycler



**GA Circular
(Vietnam/Singapore)**

packaging and
materials recovery



Evoware (Indonesia)

turns seaweed into
packaging



Organic compost SMEs

buy food waste for
conversion



Paper

uses
cardboard/paper as
raw material



Distributors & Logistics Providers

Companies that manage the collection, transport, and delivery of repurposed materials across the supply chain.

Example organizations in ASEAN



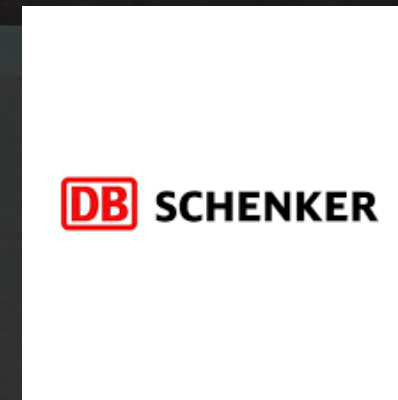
DHL Supply Chain



Kerry Logistics Network



SCG Logistics



DB Schenker



Yusen Logistics



Retail Customers

Businesses and individuals that purchase upcycled or recycled products distributed through the platform for resale or personal use.

Example organizations in ASEAN



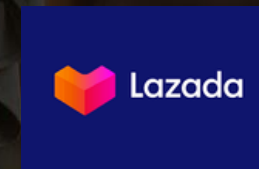
Supermarkets
(e.g. City Mart,
FairPrice, Big C)

Buy compost, eco-packaging, or paper-based goods to resell to consumers.



Eco-conscious retailers
(e.g. The Green Corner,
Ecotopia)

Purchase upcycled products (e.g. bags from plastic, furniture from wood/paper waste).



Online shops
(e.g. Shopee sellers,
Lazada eco stores)

Buy and resell sustainable products to end customers.



Individual buyers
(e.g. farmers buying compost,
crafters buying paper)

Use platform to directly source low-cost recycled goods.

Core Technology Stack: AI, Blockchain & SAP Analytics

1. AI & Machine Learning Layer

Waste-type analysis

Smart matching engine

Supply-demand forecasting

Predictive logistics

planning



2. Blockchain Layer

End-to-end traceability

Smart contracts for secure transactions

ESG compliance logs





3. Data Visualization Layer (SAP Analytics Cloud)

Real-time dashboards

KPI tracking (CO₂ saved, cost reduced)

Auto-generated sustainability reports





4. Marketplace & User Interface

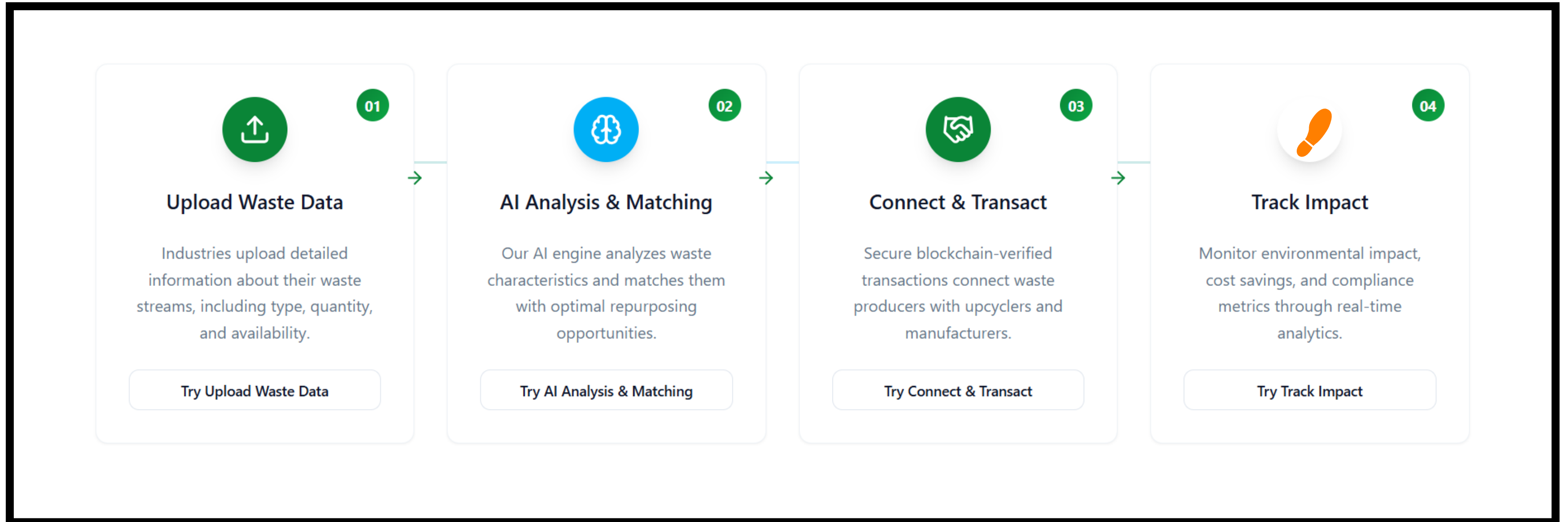
Waste listings & auctions

Manufacturer search/filter

Retail and wholesale customer portal

How It Works

From waste generation to value creation, our platform streamlines the entire circular economy process.



Upload Waste Data

Industries upload detailed information about their waste streams, including type, quantity, and availability.

1

Upload Waste Data

Waste Type: Quantity (tons):

Location:

Description & Properties:

Upload Documentation:

Upload Waste Data

2

Upload Waste Data

Waste Type: Quantity (tons):

Location:

Description & Properties:

Upload Documentation:

Upload Waste Data

3

Upload Complete

Data Successfully Uploaded

Your waste stream data is now being analyzed by our AI engine.


Upload More Data

AI Analysis & Matching

Our AI engine analyzes waste characteristics and matches them with optimal repurposing opportunities.

1

AI Analysis & Matching Results



Analyzing Your Waste Stream

Our AI is processing your 12.5 tons of steel scrap data and finding optimal matches based on material properties, location, and market demand.

2

AI Analysis & Matching Results

Analysis Summary

Material: Steel Scrap (Grade A)	Purity Level: 94.2%	Estimated Value: \$4,875 - \$5,315
------------------------------------	------------------------	---------------------------------------

Top Matches for Your Waste Stream

EcoSteel Manufacturing

Automotive Parts ☆ 95% Match

Specializes in automotive steel components from recycled materials

Location Detroit, MI	Distance 12 miles	Price \$425/ton	Capacity 50 tons/month
-------------------------	----------------------	--------------------	---------------------------

Certifications: ISO 14001 LEED Gold

[Connect & Negotiate](#) [View Details](#)

Urban Metal Works

Construction ☆ 87% Match

3

Urban Metal Works

Construction ☆ 87% Match

Creates architectural steel elements and building materials

Location Chicago, IL	Distance 45 miles	Price \$380/ton	Capacity 75 tons/month
-------------------------	----------------------	--------------------	---------------------------

Certifications: Green Building Council B-Corp

[Connect & Negotiate](#) [View Details](#)

Artistic Creations Co.

Art & Design ☆ 78% Match

Transforms metal waste into sculptures and decorative pieces

Location Milwaukee, WI	Distance 28 miles	Price \$320/ton	Capacity 15 tons/month
---------------------------	----------------------	--------------------	---------------------------

Certifications: Fair Trade Sustainable Arts

[Connect & Negotiate](#) [View Details](#)

Connect & Transact

**Secure blockchain-verified transactions
connect waste producers with upcyclers and
manufacturers.**




1

Connect & Transact

1 2 3 4

Contract Terms

Define the terms for your waste-to-value transaction

 **EcoSteel Manufacturing**
Buyer

Quantity (tons) Price per ton (\$)

Pickup Date Payment Terms

[Review Terms](#)

2

Connect & Transact

1 2 3 4

Contract Review

Verify all terms before blockchain deployment

Material:	Steel Scrap (Grade A)
Quantity:	12.5 tons
Unit Price:	\$425/ton
Total Value:	\$5312.50
Pickup Date:	
Payment Terms:	Net 30

[Edit Terms](#) [Deploy Contract](#)

3

Connect & Transact

1 2 3 4

Deploying Smart Contract

Creating blockchain-secured transaction on Ethereum network...

- Contract validated
- Terms verified
- Deploying to blockchain...

[Complete Deployment](#)

4

Connect & Transact

1 2 3 4

Transaction Secured!

Your smart contract has been deployed successfully

Contract ID:	0x7a9...f4c2
Blockchain:	Ethereum
Status:	Active
Next Step:	Await pickup confirmation

[View Contract](#) [Track Shipment](#)

Track Impact

**Monitor environmental impact, cost savings,
and compliance metrics through real-time
analytics.**



1 Impact Tracking Dashboard

Overview | Environmental | Financial | Compliance

CO₂ Reduced
18.9K
tons this year

Cost Savings
\$95.3K
this year

Waste Diverted
234.8
tons this year

Revenue Generated
\$62.4K
this year

Monthly Progress

Month	CO ₂ Reduced (tons)
Jan	~1.5K
Feb	~2.5K
Mar	~4.5K
Apr	~7.5K
May	~11.5K
Jun	~18.9K

2 Impact Tracking Dashboard

Overview | Environmental | Financial | Compliance

Carbon Footprint Reduction

- Direct Emissions Avoided: **12.4 tons CO₂**
- Transportation Optimization: **3.8 tons CO₂**
- Process Improvements: **2.7 tons CO₂**

Total Impact: 18.9K tons CO₂

Waste Stream Analysis

- Steel Scrap: 67%
- Plastic Waste: 23%
- Other Materials: 10%

Real-Time Impact Dashboard

3 Impact Tracking Dashboard

Overview | Environmental | Financial | Compliance

Financial Performance

- Total Savings: **\$95.3K**
- Revenue Generated: **\$62.4K**

ROI Calculation
287%
Return on Investment

Cost Breakdown

- Waste Disposal Avoided: \$45.2K
- Transportation Savings: \$28.7K
- Material Sales Revenue: \$62.4K
- Processing Optimization: \$21.4K

Real-Time Impact Dashboard

4 Impact Tracking Dashboard

Overview | Environmental | Financial | Compliance

ESG Compliance Score

94

Excellent ESG rating

- Environmental: **A+**
- Social: **A**
- Governance: **A**

Compliance Reports

- Q2 2024 ESG Report (Generated June 30, 2024) [Download](#)
- Carbon Footprint Audit (Generated June 15, 2024) [Download](#)
- Waste Management Report (Generated June 1, 2024) [Download](#)

Real-Time Impact Dashboard

Sustainability & Business Model: Built to Last and Scale

Transaction Fees → % commission on B2B/B2C waste-material sales

Freemium Access Model → Free listing for small suppliers; premium features for businesses

Pricing & Business Model

Monthly Annual

Tier	Price	Target Audience
Free Tier	\$0	Perfect for small suppliers
Business	\$249/month	For growing businesses
Enterprise Custom	Custom	For large organizations

Free Tier
Perfect for small suppliers

- ✓ List up to 5 waste streams
- ✓ Basic AI matching
- ✓ Standard support
- ✓ Basic analytics

Get Started Free

Business
For growing businesses

- ✓ Unlimited waste listings
- ✓ Advanced AI matching & predictions
- ✓ Priority support
- ✓ Real-time analytics dashboard
- ✓ ESG compliance tracking
- ✓ Smart contract automation
- ✓ Custom integrations

Start Business Plan

Enterprise Custom
For large organizations

- ✓ Everything in Business
- ✓ Dedicated account manager
- ✓ Custom AI model training
- ✓ Advanced blockchain features
- ✓ White-label solutions
- ✓ API access
- ✓ Custom reporting

Contact Sales

Revenue Model

Category	Rate
B2B Waste Sales	2.5% commission
B2C Material Sales	3.5% commission
Premium Transactions	1.5% commission

Commission automatically deducted from successful transactions

Product	Price
Policymaker Reports	\$15K/year
NGO Analytics Package	\$8K/year
Industry Benchmarking	\$25K/year

Request Data Package

Pricing & Business Model

Monthly Annual Save 20%

Tier	Price	Target Audience
Free Tier	\$0	Perfect for small suppliers
Business	\$199/month	For growing businesses
Enterprise Custom	Custom	For large organizations

Free Tier
Perfect for small suppliers

- ✓ List up to 5 waste streams
- ✓ Basic AI matching
- ✓ Standard support
- ✓ Basic analytics

Get Started Free

Business
For growing businesses

- ✓ Unlimited waste listings
- ✓ Advanced AI matching & predictions
- ✓ Priority support
- ✓ Real-time analytics dashboard
- ✓ ESG compliance tracking
- ✓ Smart contract automation
- ✓ Custom integrations

Start Business Plan

Enterprise Custom
For large organizations

- ✓ Everything in Business
- ✓ Dedicated account manager
- ✓ Custom AI model training
- ✓ Advanced blockchain features
- ✓ White-label solutions
- ✓ API access
- ✓ Custom reporting

Contact Sales

Revenue Model

Category	Rate
B2B Waste Sales	2.5% commission
B2C Material Sales	3.5% commission
Premium Transactions	1.5% commission

Commission automatically deducted from successful transactions

Product	Price
Policymaker Reports	\$15K/year
NGO Analytics Package	\$8K/year
Industry Benchmarking	\$25K/year

Request Data Package

Sustainability & Business Model: Built to Last and Scale

ESG Report Subscriptions

Monthly/quarterly reports sold to corporates or agencies

Data Insights Licensing

Industry data analytics for policymakers or NGOs

ESG Report Subscriptions

Subscription Plans | Available Reports | Analytics Preview

- Basic ESG Reports** - \$299/monthly
 - Standard ESG metrics
 - Carbon footprint analysis
 - Waste diversion tracking
 - PDF report format
 - Email delivery
- Premium ESG Suite** - \$799/monthly
 - Comprehensive ESG analysis
 - Custom KPI tracking
 - Interactive dashboards
 - Multiple format exports
 - API access
 - Benchmark comparisons
- Enterprise ESG Platform** - \$1,999/monthly
 - Full ESG compliance suite
 - Real-time monitoring
 - Custom report builder
 - White-label options
 - Dedicated support
 - Integration services

Report Frequency: Select reporting frequency

ESG Report Subscriptions

Subscription Plans | Available Reports | Analytics Preview

Corporate Performance

- 94** ESG Score
- 87%** Waste Diverted
- Carbon Reduction: 18.9K tons CO₂
- Cost Savings: \$95.3K
- Revenue Generated: \$62.4K

Agency Insights

- Industry Benchmark**: Above 89% of similar companies
- Regulatory Compliance**: Exceeds all current requirements
- Sustainability Goals**: On track for 2030 targets

[View Full Analysis](#)

ESG Report Subscriptions

Subscription Plans | Available Reports | Analytics Preview

- Q2 2024 Comprehensive ESG Report** - June 30, 2024 | Quarterly | 45 pages | Available | Download
- Carbon Impact Assessment 2024** - June 15, 2024 | Annual | 28 pages | Available | Download
- Waste-to-Value Chain Analysis** - June 1, 2024 | Monthly | 18 pages | Available | Download
- Circular Economy Metrics Dashboard** - Live Data | Real-time | Interactive pages | Premium | Download

Greener. Cheaper. Smarter.

Problem analysis

Problem

Solution

Impact

Implementation

NEXUS

Waste-to-Value

An AI-Powered Circular Economy Platform

Problem

- ASEAN loses \$80B–\$120B in recyclable value yearly.
- Less than 45% of waste is processed sustainably.
- Waste-to-resource pathways are fragmented, underutilized, and opaque.

Solution

- An AI + blockchain-powered digital platform that:
- Matches waste with upcyclers
 - Optimizes supply chain logistics
 - Tracks impact in real-time using SAP dashboards

Impact

- Cuts landfill and GHG emissions
- Creates new low-cost raw material markets
- Empowers businesses to meet SDG and ESG goals

ESG Dashboard & Impact Metrics

Based on 3 main waste types (Plastic, Food, Paper) across ASEAN

Pilot platform could target

Waste Diverted

Value:
21,060 tons

Waste volume repurposed from landfill or open dumping across ASEAN

CO₂ Emissions Saved

Value:
40,014 tons CO₂e

By upcycling plastic, food, and paper waste instead of landfilling

Cost Savings for Suppliers

Value:
USD 2,511,000

From avoided disposal fees and sale of recyclable materials

Recycled Material Value

Value:
USD 2,133,000

Market value of plastic, food compost, and recycled paper resold

Transactions Matched

Value:
42,000 matches

Successful connections between waste suppliers and upcyclers

ESG Compliance Score

Value:
78%

Composite score from traceability, diversion rate, and reporting



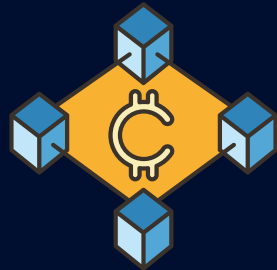
Our platform features Aligning with UN SDGs & ASEAN 2025 Strategic Priorities



AI Waste Matching

SDG 12.5 - Reduce waste generation

ASEAN Socio-Cultural Blueprint:
Circular economy promotion



Blockchain for ESG Compliance

SDG 13.3 - Improve education & awareness

ASEAN Economic Blueprint:
Transparency & traceability



Marketplace & Upcycler Network

SDG 9.4 - Sustainable infrastructure

ASEAN Innovation Goals: Industry 4.0 & resource efficiency



SAP ESG Dashboards

SDG 12.6 - Adopt sustainable practices

ASEAN Green Growth Agenda:
Business sustainability tracking

Platform Feature	UN SDG Target & Indicator	ASEAN 2025 Measure
AI Waste Matching	SDG 12.5 - Reduce waste generation	ASEAN Socio-Cultural Blueprint: Circular economy promotion
Blockchain for ESG Compliance	SDG 13.3 - Improve education & awareness	ASEAN Economic Blueprint: Transparency & traceability
Marketplace & Upcycler Network	SDG 9.4 - Sustainable infrastructure	ASEAN Innovation Goals: Industry 4.0 & resource efficiency
SAP ESG Dashboards	SDG 12.6 - Adopt sustainable practices	ASEAN Green Growth Agenda: Business sustainability tracking

ASEAN 2025 Strategic Alignment – Waste-to-Value Platform

ASCC Blueprint 2025 Alignment	
Characteristic / Element	How Waste-to-Value Platform Supports It
E.2: Sustainable Consumption and Production	Promotes circular economy by transforming waste into marketable resources.
E.3: Environmental Sustainability and Climate Resilience	Reduces landfill use and GHG emissions through digital waste optimization and CO ₂ tracking dashboards.
D.1: Strengthening Human Development	Builds digital literacy and data analytics capacity among youth and SMEs in waste sector.
Impact: Supports ASEAN Vision 2025 goal of a “clean and green ASEAN with sustainable consumption patterns.”	

AEC Blueprint 2025 Alignment	
Strategic Measure / Priority	How Waste-to-Value Platform Supports It
A5: Foster Innovation and Entrepreneurship	Encourages data-driven eco-entrepreneurship and cross-border collaboration among recyclers and startups.
B4: Sustainable Economic Development	Creates a new regional green value chain connecting suppliers, upcyclers, and buyers across ASEAN.
C2: Enhancing Digital Integration	Uses AI, blockchain, and SAP Analytics Cloud to increase supply-chain transparency and cross-border traceability.
D1: Strengthening Micro, Small, and Medium Enterprises (MSMEs)	Empowers SMEs to participate in circular economy markets using accessible digital tools.
Impact: Advances AEC Vision 2025 of a “highly integrated, cohesive, and sustainable ASEAN economy.”	

Sources: ASEAN Secretariat (2015) ASEAN Socio-Cultural Community Blueprint 2025; ASEAN Secretariat (2015) ASEAN Economic Community Blueprint 2025; ASEAN Secretariat (2023) ASEAN Investment Report 2023 – The Green Investment Landscape.

Long-Term Ecosystem Value



Environmental

Less landfill, lower emissions



Economic

Cheaper raw materials, new market opportunities



Social

Job creation for recyclers, SMEs, and logistics partners

From Idea to Implementation

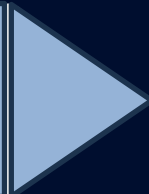
Problem analysis

Problem

Solution

Impact

Implementation



Implementation Roadmap: From Vision to ASEAN Impact

Timeline: 2025–2027

Year	Milestone	Description
2025	MVP Launch in Yangon	Basic matching engine + manual marketplace with pilot industries
2026	Pilot Scale-up in 3 ASEAN cities	Add logistics optimization, ESG dashboard, and blockchain tracking
2027	Regional Rollout across ASEAN	Multi-country launch, multilingual UI, policy alignment for ESG compliance

Implementation Roadmap: From Vision to ASEAN Impact





Waste-to-Value: Building a Greener, Smarter ASEAN Together

Thank You

**“We are Team NEXUS, and this is our
vision for a better, cleaner ASEAN.”**



Team NEXUS - ASEAN DSE 2025 Regional Finals References

Global & Regional Datasets

1. **World Bank. (2018).** *What a Waste 2.0: A Global Snapshot of Solid Waste Management*. Washington, DC: The World Bank.

Dataset: Trends in Solid Waste Management (country totals and per-capita data).

<https://datatopics.worldbank.org/what-a-waste/>

2. **United Nations Environment Programme (UNEP). (2021).** *Waste Management in ASEAN Countries: Summary Report*. Nairobi: UNEP, Regional Office for Asia and the Pacific.

<https://environment.asean.org/public/uploads/repositories/20220725-Summary-Report-Waste-Management-in-ASEAN-Countries-UNEP.pdf>

3. **ASEAN Secretariat. (2023).** *ASEAN Investment Report 2023 – The Green Investment Landscape*. Jakarta: ASEAN Secretariat.

<https://asean.org/wp-content/uploads/2023/12/AIR-Special-2023.pdf>

Country-Level Data Sources

4. **Solid Waste and Public Cleansing Management Corporation (SWCorp Malaysia). (2022).** *National Recycling Rate Statistics 2022*. Putrajaya, Malaysia.

<https://www.swcorp.gov.my/>

5. **Pollution Control Department, Thailand. (2018).** *Plastic Waste Management Roadmap 2018–2030*. Ministry of Natural Resources and Environment, Bangkok.

<http://infofile.pcd.go.th/mgt/PlasticRoadmapEng.pdf>

6. **Department of Environment, Parks and Recreation (JASTRe), Brunei Darussalam. (2023).** *Circular Economy Roadmap for Waste Management 2023–2033*. Ministry of Development, Brunei Darussalam.

<https://www.env.gov.bn/>

7. **National Environment Agency (NEA), Singapore. (2023).** *Waste and Recycling Statistics 2014–2023*. Singapore.

<https://www.nea.gov.sg/our-services/waste-management/waste-statistics-and-overall-recycling>

<https://www.nea.gov.sg/docs/default-source/default-document-library/waste-and-recycling-statistics-2014-to-2023.pdf>

Supporting Reports & Policy Documents

8. **UN ESCAP. (2019).** *Closing the Loop: Regional Policy Guide for Circular Economy in Asia and the Pacific*. Bangkok: United Nations ESCAP.

<https://repository.unescap.org/bitstream/handle/20.500.12870/101/ESCAP-2019-MN-Closing-the-loop-regional-policy-guide.pdf?sequence=1>

9. **Ellen MacArthur Foundation. (2016).** *The New Plastics Economy: Rethinking the Future of Plastics*.

<https://www.ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive>

10. **European Commission Eurostat. (2021).** *Municipal Waste Statistics – EU Average Recycling Rate*.

https://ec.europa.eu/eurostat/statistics-explained/index.php/Municipal_waste_statistics

11. **United States Environmental Protection Agency (EPA). (2023).** *Facts and Figures about Materials, Waste, and Recycling*.

<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling>

ASEAN Policy Framework References

12. **ASEAN Secretariat. (2015).** *ASEAN Socio-Cultural Community (ASCC) Blueprint 2025*. Jakarta: ASEAN Secretariat.

<https://asean.org/book/asean-socio-cultural-community-blueprint-2025/>

13. **ASEAN Secretariat. (2015).** *ASEAN Economic Community (AEC) Blueprint 2025*. Jakarta: ASEAN Secretariat.

<https://asean.org/book/asean-economic-community-blueprint-2025/>

Analytical References (for appendix or dashboard)

14. **EDGAR Database v8.0. (2023).** *GHG Emissions – Waste Sector by Country*. European Commission Joint Research Centre (JRC).

https://edgar.jrc.ec.europa.eu/dataset_ghg80

KPI Calculation Models - Appendix 1

1. CO₂ Emissions Saved

Formula:

Total CO₂ Saved (tons) = Σ [Waste type (tons) × Emission Factor (tCO₂/ton)]

Example:

- 10 tons plastic × 2.7 = 27 tCO₂
- 5 tons food waste × 1.9 = 9.5 tCO₂
- 5 tons paper × 3.3 = 16.5 tCO₂
- → Total = 53 tCO₂ saved

2. Waste Diverted from Landfill

Formula:

Total Waste Diverted (tons) = Σ [Waste Supplied × Diversion Rate]

Example:

- 30 tons collected × 70% diversion
- → = 21 tons diverted

3. Cost Savings for Suppliers

Formula:

Total Cost Savings = (Disposal Cost Avoided + Revenue Earned from Sale)

Example:

- Disposal: \$100/ton × 21 tons = \$2,100
- Sale of waste: \$150/ton × 21 tons = \$3,150
- → Total = \$5,250 saved

4. Recycled Material Market Value

Formula:

Market Value = Σ [Recycled Waste × Market Price/ton]

Example:

- Plastic: 10 tons × \$300 = \$3,000
- Food (as compost): 5 tons × \$60 = \$300
- Paper: 5 tons × \$200 = \$1,000
- → Total = \$4,300

5. Platform Transactions

Formula:

Total Matches = Suppliers × Avg Upcyclers per Supplier × Time

Example:

- 10 suppliers × 3 matches/month × 3 months = 90 matches

6. ESG Compliance Score

Formula:

A weighted score (scaled to 100%) based on:

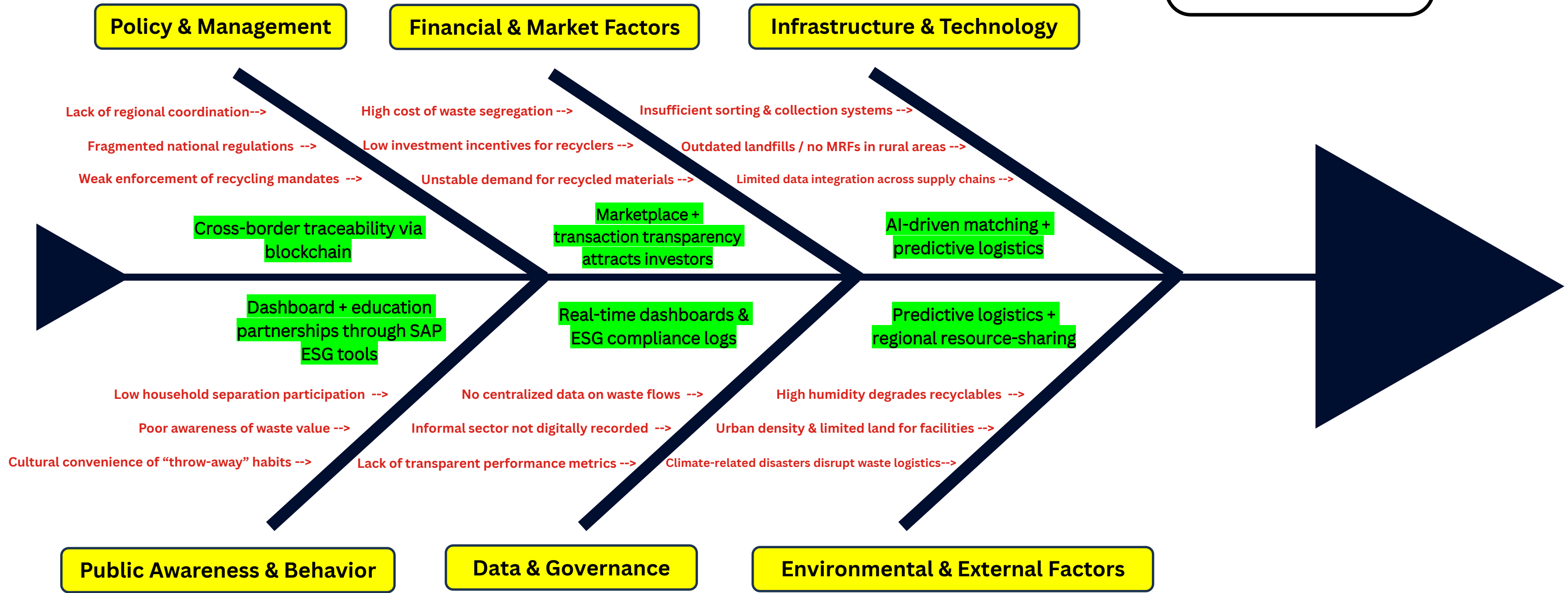
- Traceability (35%)
- Waste reduction (30%)
- Verified reports (20%)
- Carbon savings (15%)

Example Weights:

$(0.9 \times 35) + (0.7 \times 30) + (0.6 \times 20) + (0.9 \times 15) = 78.5\%$

Root-Cause Analysis: Why ASEAN's Recycling Systems Fail - Appendix 2

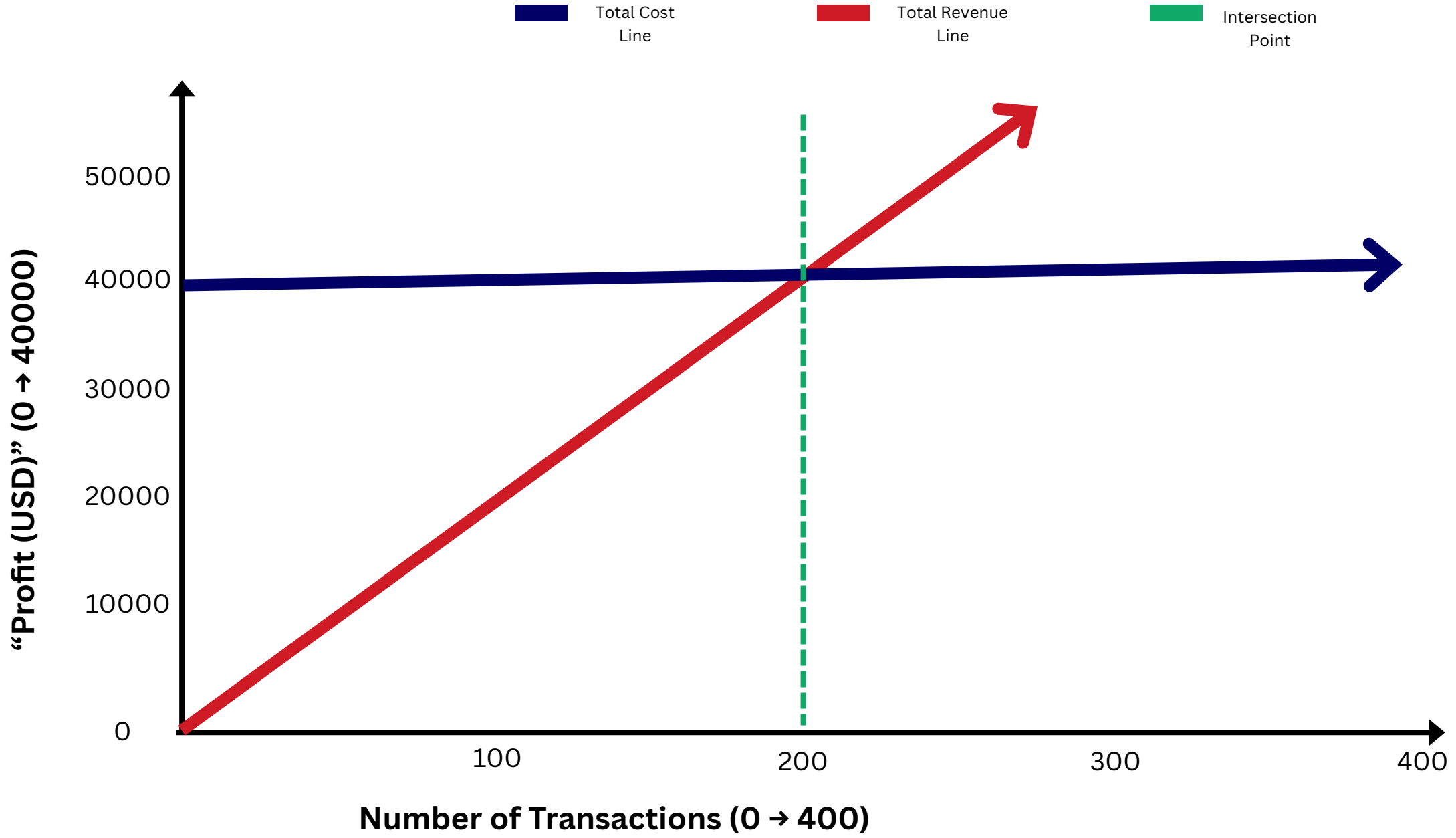
● Problem areas
● Solution



Break-Even Point (BEP) Analysis - Financial Feasibility of Waste-to-Value Platform - Appendix 3

Goal: Determine the number of successful waste-upcycler transactions needed for the platform to break even.

$$\text{Break-Even Point (BEP)} = \frac{\text{Fixed Costs}}{\text{Selling Price per Unit} - \text{Variable Cost per Unit}}$$



Fixed Cost (FC)	Platform development, hosting, admin, marketing (annual)	40000
Average Transaction Value	Typical waste-upcycling trade on the platform	5 000
Commission (Revenue %)	5 % of each transaction	—
Revenue / Transaction (SP)	5 % × 5 000	250 / transaction
Variable Cost / Transaction (VC)	Payment gateway, logistics data, handling	50 / transaction
Contribution Margin (SP – VC)	250 – 50 = 200 USD / transaction	

Break-Even Point = 200 transactions per year
 At 200 matched waste-upcycler transactions (~USD 1 million total value), the platform covers its yearly costs and becomes profitable.