

ASEAN: Shifting Towards Circularity Together

Reforming Waste Management Policies and Mobilizing ASEAN Through Innovation and Sustainable Involvement for Economic Growth and Zero Waste Literacy.

Team STARKL

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12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



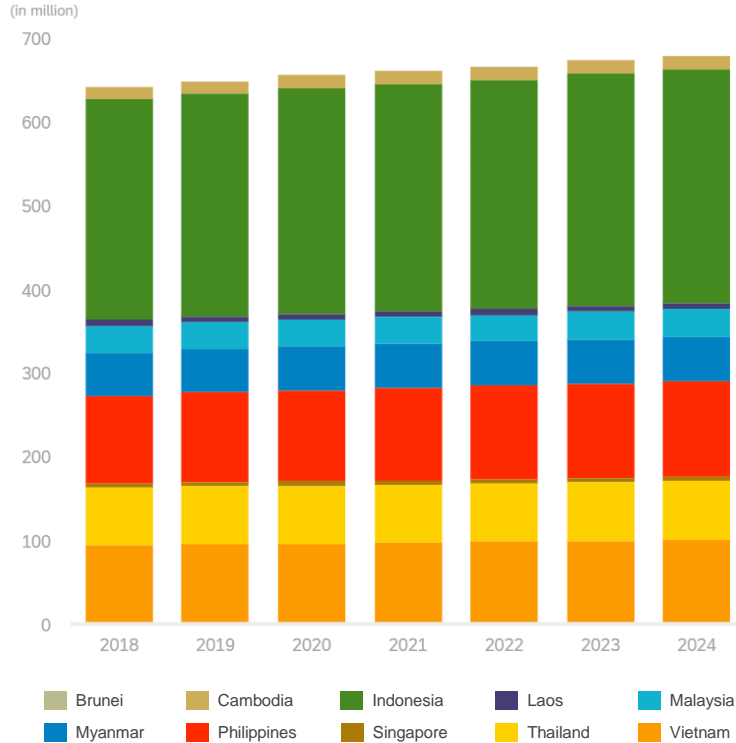
11 SUSTAINABLE CITIES
AND COMMUNITIES



13 CLIMATE
ACTION



Population in ASEAN Countries from 2018 to 2024



ASEAN home of 685.75 million inhabitants

ASEAN has become the world's third-most populous region, reflecting a **consistent increase in population** across its countries over the years.

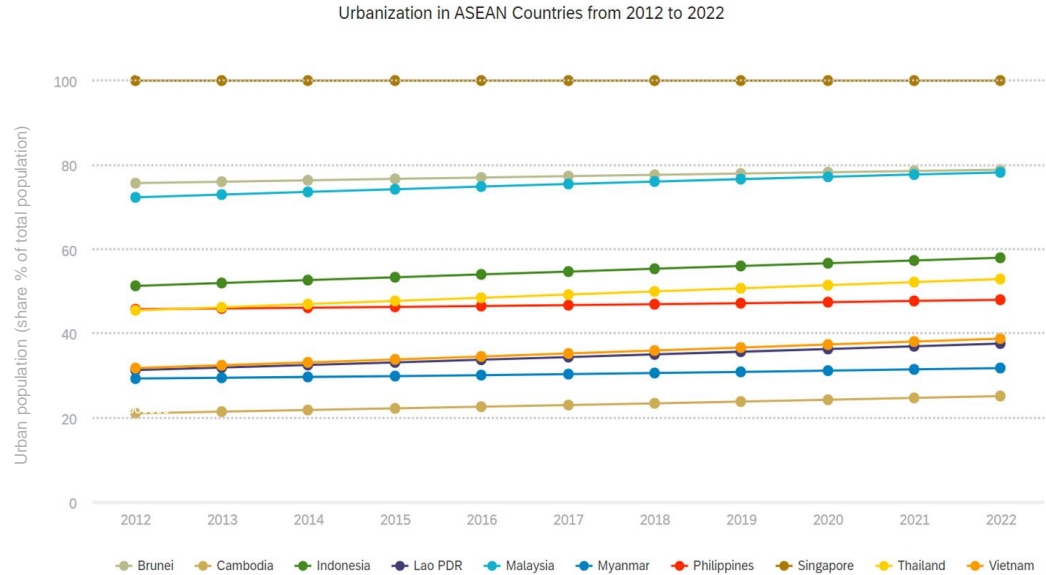




High Urbanization rate

ASEAN experienced a strong urbanization rate with 50.1% or **half of the population** living in the urban areas in 2020.

This is expected **to increase to 55.7%** by 2030, with the urban population projected to reach nearly 405 million people out of a total population of approximately 726 million.



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION





Urbanization helps the economic transformation

ASEAN **economy grew by 5.7%** in 2022, maintaining an average annual growth rate of **4.4%** during 2010-2022.

\$ 3.63 T



2022 ASEAN
Nominal GDP

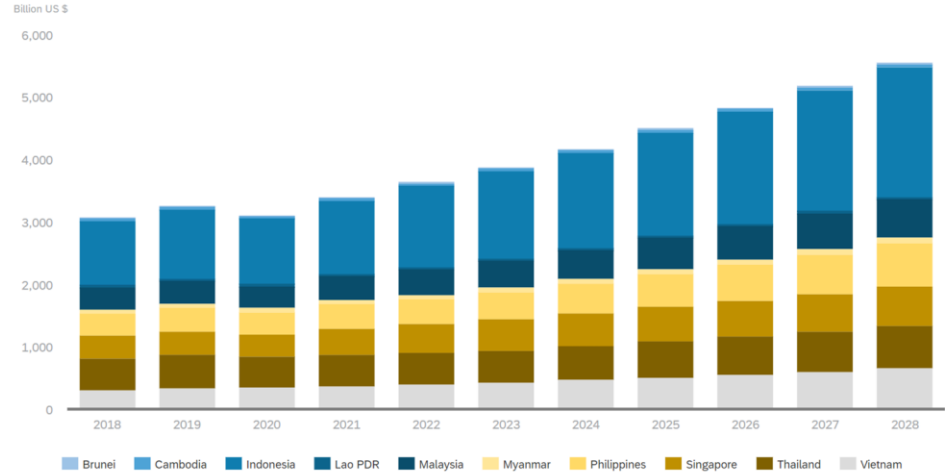
ASEAN Economy placed as 5th Largest in the World and the 3rd Largest in Asia and **continue its GDP growth trajectory** in 2023.



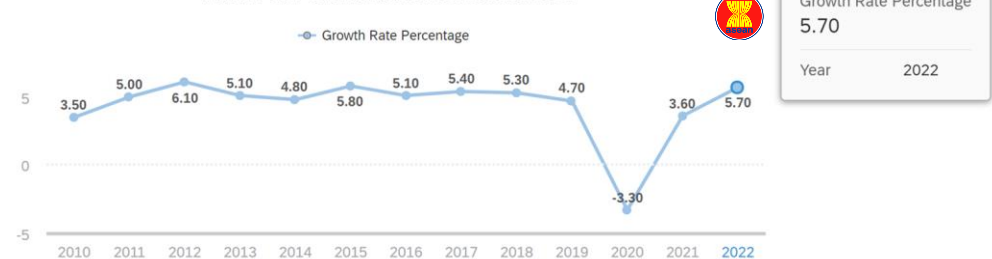
*with projected GDP

Source: ASEAN Secretariat, ASEANstats database, IMF World Economic Outlook 2023, Aaron O'Neill (2023)

Gross domestic product (GDP) of the ASEAN countries from 2018 to 2028



ASEAN GDP Growth Rates from 2010 to 2022





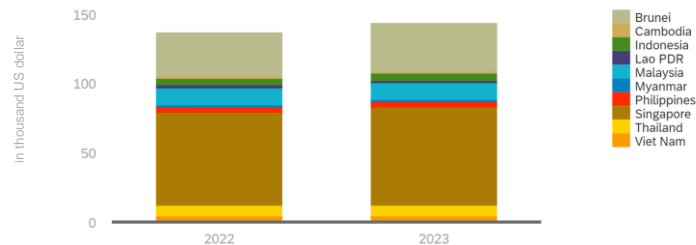
ASEAN's GNI upholds its economic stability

The Gross National Income (GNI) of the ASEAN region remains **one of the fastest-growing in the world** with an **increase of 21.05%** from 2020 to 2023.

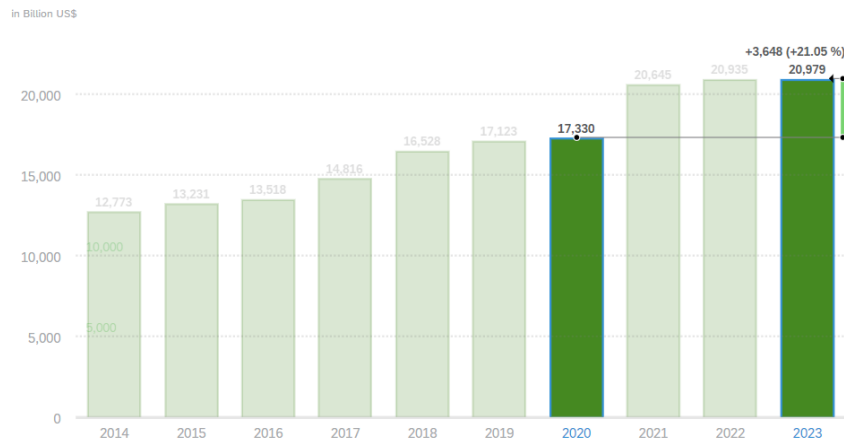
The Asian Development Outlook 2024 envisions a **strong economic growth** for the ASEAN region. Despite uncertain external prospects, the **region's economy** is expected to **remain resilient and positive**.



Gross National Income (GNI) of ASEAN Countries in 2022 and 2023



Gross National Income (GNI) for All Income Levels in East Asia and Pacific, 2014 to 2023





Urbanization brings mountains of waste and expenses

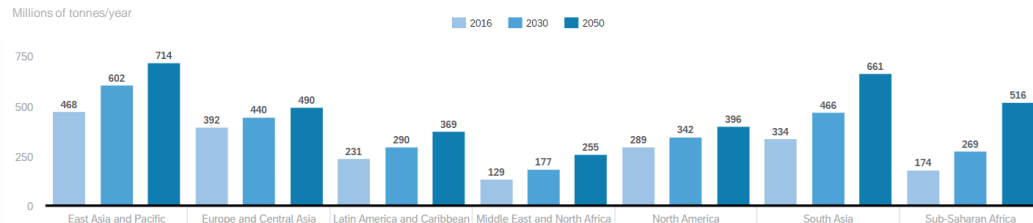
High volumes of waste lead to exorbitant waste management costs. Generally, the **higher the income level of a city** or region, **the higher volume of waste produced.**

In ASEAN countries, solid waste-related charges account for 0.02% of yearly GDP on average and UNEP estimates that plastic production, use, and disposal could account for **19% of the total global carbon budget** by 2040.

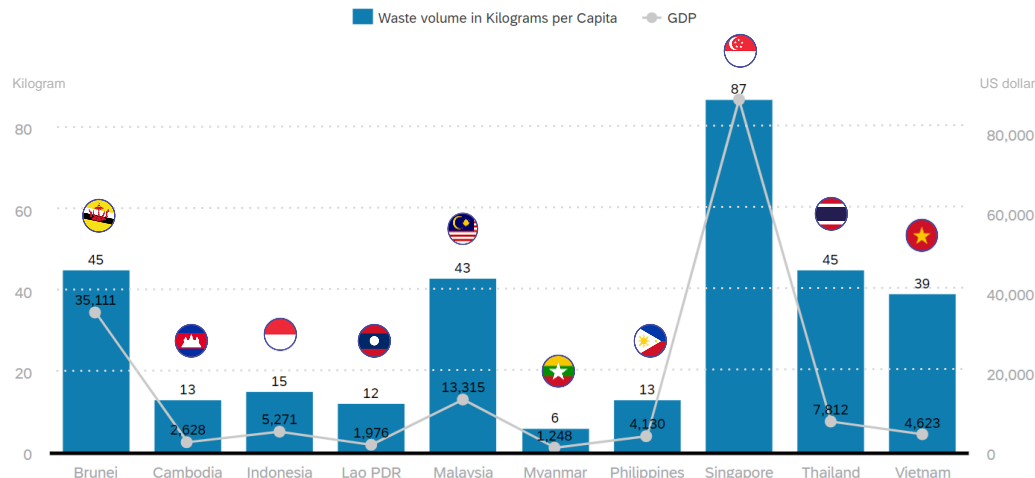


***plastic waste volume as of April 2024 and with projected waste generation in 2050
Source: IMF 2024, OECD Revenue DB(2022), Baguio Official, Leander von Kameke(2024), World Bank*

Projected Waste Generation by region



ASEAN Countries 2024 GDP and Plastic Waste Volume in Kilograms per Capita

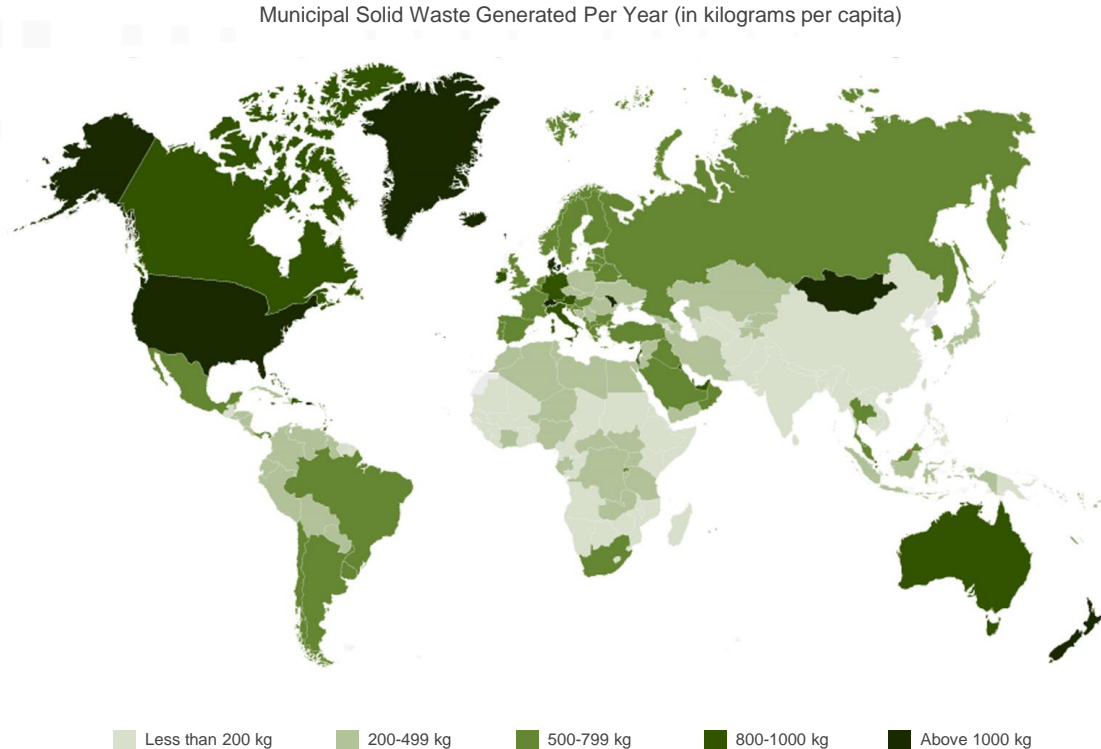




Waste generation is driven by consumption

Waste generation is ultimately driven by **consumption of goods and services**. The world generates nearly **two billion tons** of municipal solid waste each year.

According to the World Bank, the amount of municipal solid waste (MSW) generated globally is **expected to increase** by as much as 70%, reaching up to **3.4 billion tonnes** by 2050.



13

CLIMATE
ACTION

12

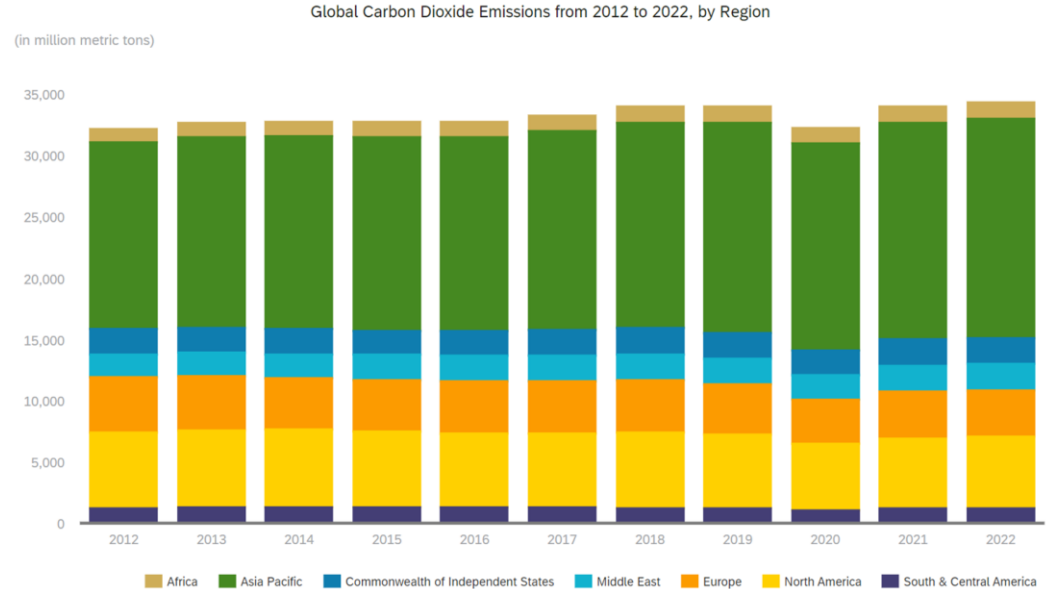
RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Greater waste generation means greater CO₂ emissions

The Asia-Pacific region produced **17.96 billion metric tons** of CO₂ emissions in 2022 and the rise in emissions is mainly due to rapidly **growing economies** and increasing energy demand in developing regions.

Increasing CO₂ levels raise sea temperatures resulting to ocean acidification.



The Norm



LGUs and businesses spend too much on waste management.



Plastic production is constantly increasing



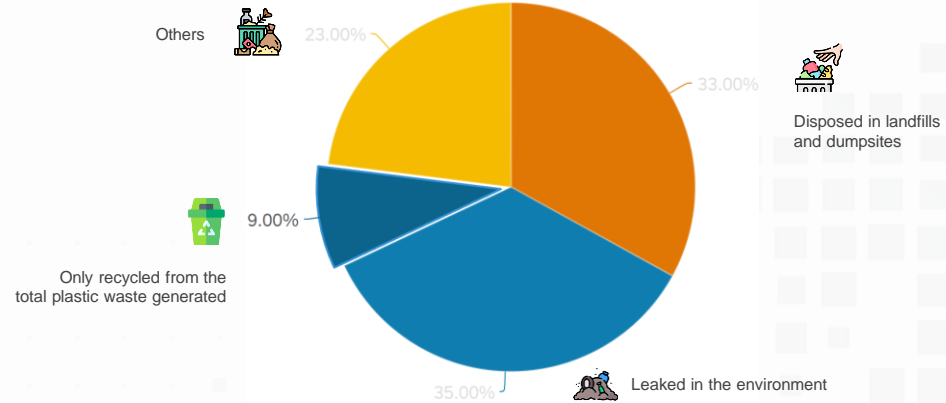
Tons of plastic waste leak into the ocean



Transition away from plastics. It saves money and creates jobs.

Plastic packaging waste is one of the **most prevalent waste products** worldwide and **plastic pollution is a critical challenge** for the future of the ASEAN region.

Percentage Distribution of Plastic Waste Generated



Increased burden on waste management leads to **exorbitant costs**.

But if we are using plastics more efficiently, **we could save**

\$100
Billions

Annual financial risk for businesses dealing with waste management

\$4.5
Trillion

Environmental and Social Cost in the next 17 years as underscored in UNEP's report





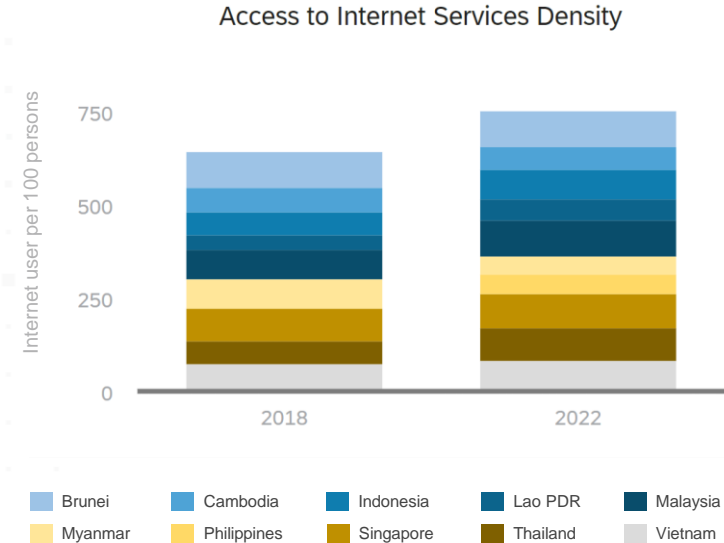
Narrowing Digital Divide to accelerate Unity

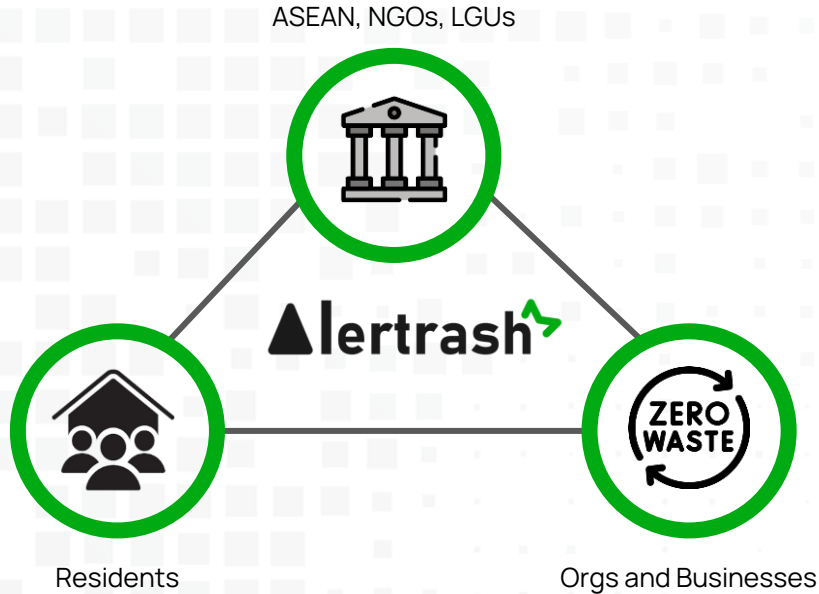
ASEAN region is moving towards **becoming a digital economy and society**.

Between 2024 and 2029, the number of **internet users** in Southeast Asia is expected to grow by **77.4 million (+13.24 percent)**.

The ASEAN Digital Masterplan 2025 envisions that a substantial portion of the population will **adopt broadband devices** as part of a **broader digital innovation and transformation strategy** in the region.

* Internet Subscribers Services per 100 persons





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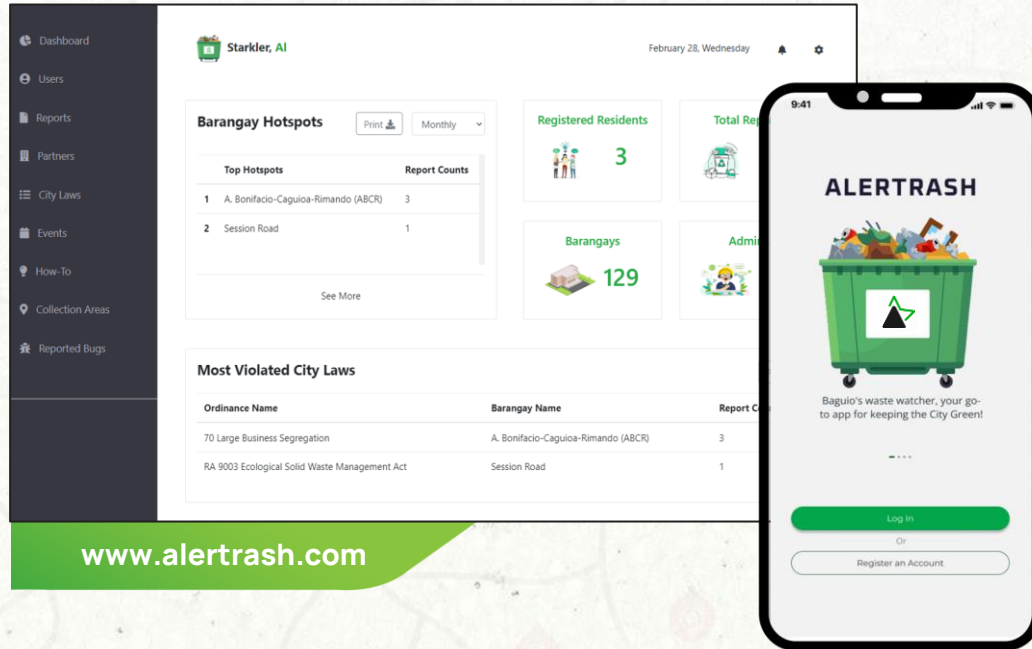
*If people are given an accessible avenue to help address waste management issues, they are given the **sense of responsibility** and **empowerment**, which in return, helps the **government improve its services and programs** while strengthening **zero waste initiatives**.*



- **Team STARKL**



A **reporting application** for waste disposal violations and an advocate for **zero waste** living.



www.alertrash.com



United Nations' Sustainable Development Goals

TARGET 11.6

Reduce Environmental impacts of cities, particularly municipal and other waste management

11 SUSTAINABLE CITIES AND COMMUNITIES



TARGET 12.5

By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



TARGET 13.3

Improve education, awareness-raising and human and institutional capacity to combat climate change

13 CLIMATE ACTION



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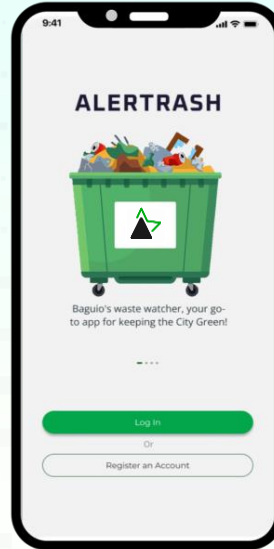
Report and Geotagging
Submit detailed waste disposal
violation reports



Events and Waste Practices
Be part of the zero-waste movement



**Collection Areas and
Schedules**
Community information



Hotspots and Statistics
Transparency of reports

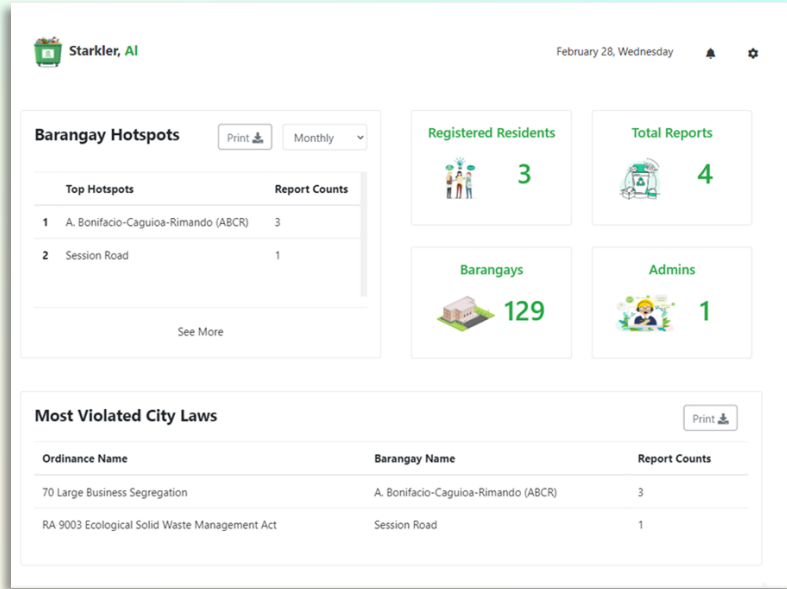


City Laws and Ordinances
Waste Management awareness



Promos and Partners
Encourage zero-waste living





Hotspots and Statistics

Transparency of submitted number of reports

Tactic to alert barangay offices

Indicates user patronage

Basis to improve WM policies

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Be an active **Starkler**, send report to us!

Select barangay name ▼

Select Date


Select Ordinances/Violat ▼

Select Status ▼

Exact location/Nearest est. ▼

Urgency Level ▼

Type Description





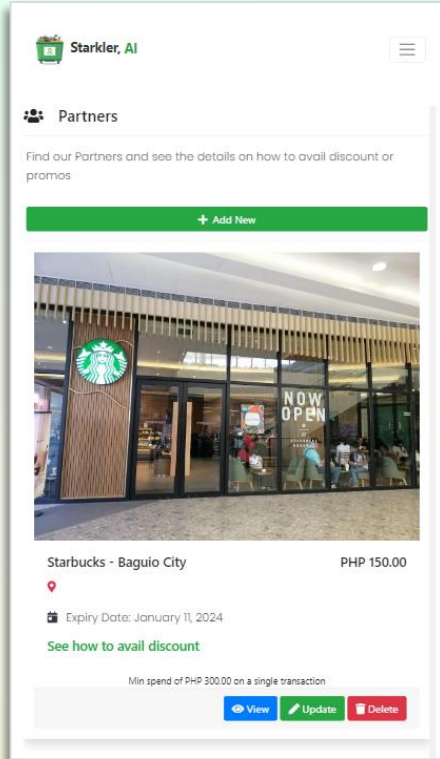
Report and Geotagging

Submit detailed waste violation reports

Enables citizen participation

Better documentation

Digitization of reports



Promos and Partners

Encourage Zero Waste Living

Gets businesses involved

User patronization

Network expansion

alertrash

Be informed with the schedule and proper areas of wastes.

Session Road


Monday

03:20 AM

to

03:45 AM

Upper Session Rd.





Collection Areas and Schedules

Community information

Barangay Updates

New residents

Read and be informed with our existing City waste ordinance and laws.

Category Law
City Ordinance
Philippine
Barangay Ordinance

x

+

Cancel

Submit

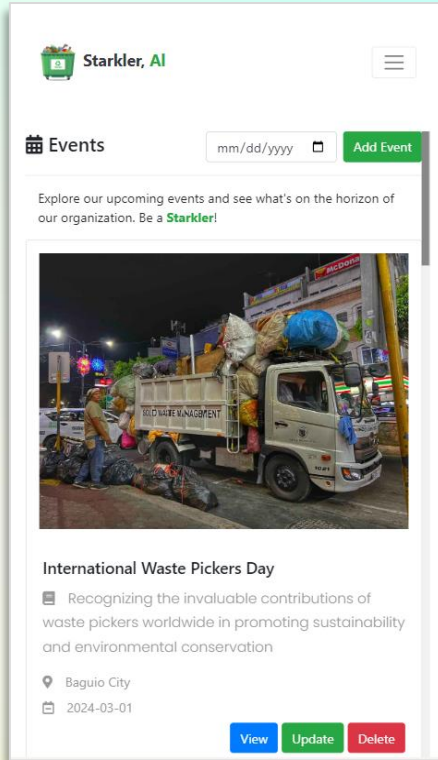


City Laws and Ordinances

User awareness

National and Local

Barangay Ordinances



Events and Zero Waste Practices

Be involved in the zero waste movement

Promote Zero Waste Participation

Avenue for Zero waste groups and orgs

Alertrash in Action : Implementation Plan

Goals

Timeline

Actions

Partners

Project Reach



Phase 1 City-wide Deployment

City-wide implementation and national and international reach

2024-2025

Implement Alertrash in Baguio city's operations and establish SAP-ASEAN partnership for national and international scalability.



City-wide use and forming connections for national and international recognition

Phase 2 Engagement & Expansion

Introduce Alertrash in a National scope

2026-2028

Improve the scalability of Alertrash to integrate into Philippine E-Gov system and partner with businesses to gain sponsorships and carry out zero-waste promotions.



Partnership with different zero waste organizations, businesses promoting zero waste practices, and local governments.

Phase 3 ASEAN Waste Management Pioneer

Influence ASEAN countries with Alertrash concepts to strengthen waste management innovations

2029-2030

Introduce Alertrash to different ASEAN countries to influence smart city initiatives and waste management regulations and policies across the region.



Engagement with waste management organizations across ASEAN.

Alertrash is aligned with the AEC and ASCC Blueprints

Key Problems:	Increasing waste generation	Ineffective G2C waste management collaboration	Unsanitary urban areas
Key Strategies:	Encourage Zero waste living	Centralized system	Reporting App/System



SEC. B.6
Good Governance

SEC. C.2
Information and
Communications
Technology



SEC. C.4
Sustainable
Consumption and
Production

SEC. E.2
Towards a Creative,
Innovative, and
Responsive ASEAN



Milestones



Featured on National TV
(GMA News' Game Changer Segment)
July 2024



**Successful Beta Test by
Residents & Officials**
February - March 2024



Regional DSE 2024
October 2024

National DSE 2024
September 2024



**Presented in the Int'l
Research Conference**
July 2024

**Copyright
Registration**
July 2024



**Established Partnership
with Zero Waste Baguio**
November 2023



You can make a change. Let Alertrash empower you.

- Team Starkl 

References

United Nation Stats. <https://unstats.un.org/sdgs/dataportal>

ASEAN Stats. <https://data.aseanstats.org/sdg>

ASEAN Statistical Highlights 2023. <https://www.aseanstats.org/wp-content/uploads/2023/10/ASH-2023-v1.pdf>

ASEAN Key Figures 2023. <https://www.aseanstats.org/wp-content/uploads/2023/12/ASEAN-Key-Figures-2023.pdf>

World Bank Data. Urban population (% of total population) - East Asia & Pacific (excluding high income). <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?>

ITU 2023. Measuring Digital Development Facts and Figures 2023
https://www.itu.int/hub/publication/d-ind-ict_mdd-2023-1/

THE ASEAN E-COMMERCE DATABASE PROJECT
<https://asean.org/wp-content/uploads/2021/09/ASEAN-eCommerce-Database-Project.pdf>

The ASEAN – ASEAN Revs Up: digital transformation
<https://asean.org/serial/the-asean-volume-november-2022-number-23/>

The ASEAN Digital Masterplan 2025
<https://asean.org/wp-content/uploads/2021/08/ASEAN-Digital-Masterplan-2025.pdf>

UN Habitat. https://unhabitat.org/sites/default/files/2019/02/Indicator-11.6.1-Training-Module_Solid-waste-in-cities_23-03-2018.pdf

Revenue Statistics in Asia and the Pacific 2023. <https://www.oecd.org/tax/tax-policy/revenue-statistics-in-asia-and-the-pacific-5902c320-en.htm>

Why Southeast Asia's growing waste problem presents huge opportunity for climate tech start-ups. <https://www.eco-business.com/news/why-southeast-asias-growing-waste-problem-presents-huge-opportunity-for-climate-tech-start-ups/>

GDP Growth in Asia and the Pacific, Asian Development Outlook (ADO)
<https://data.adb.org/dataset/gdp-growth-asia-and-pacific-asian-development-outlook>

UNEP. https://unfoundation.org/blog/post/protect-our-planet-from-plastic-pollution-5-things-to-know/?gad_source=1&gclid=EAlaIqobChMlt6nNk8fAhgMV_6NmAh1PTQbjEAAYAAEgLDcfD_BwE

Advancing ASEAN's Circular Economy Agenda Advocacy Paper (2020) <https://www.eu-asean.eu/wp-content/uploads/2022/02/Advancing-ASEANs-Circular-Economy-Agenda-Advocacy-Paper-2020.pdf>

What a Waste 2.0. <https://openknowledge.worldbank.org/server/api/core/bitstreams/92a50475-3878-5984-829e-0a09a6a9badc/content>

National Solid Waste Management Commission.
https://nswmc.emb.gov.ph/?page_id=4082

Department of Energy. Philippine Energy Plan. <https://doe.gov.ph/sites/default/files/pdf/f/pep/PEP-2020-2040-Final%20eCopy-as-of-15-June-2023.pdf>

Solid Waste Management in Developing Asia: Prioritizing Waste Separation.
<https://www.adb.org/sites/default/files/publication/652121/adbi-pb2020-7.pdf>

ASEAN leadership key to the success of global plastic treaty to end plastic pollution.
https://resolutions.unep.org/incres/uploads/final_csos_joint_statement_asean_leadership_key_to_the_success_of_global_plastic_treaty_to_end_plastic_pollution_compressed.pdf

How to defeat the plastic tide threatening the ASEAN region's green growth.
<https://www.weforum.org/agenda/2023/10/defeat-plastic-tide-threatening-asean-green-growth/>

Health Effects of Waste Mismanagement. World Cleanup Day Organization.
<https://www.worldcleanupday.org/post/health-effects-of-waste-mismanagement>

References

Waste. OECD Data. <https://data.oecd.org/searchresults/?q=waste>

Business Insider. <https://www.businessinsider.com/plastic-in-ocean-outweighs-fish-evidence-report-2017-1>

WWF-Philippines, EPR Scheme Assessment for Plastic Packaging Waste in the Philippines, 2020, p. 35.

Kaza S, Yao L, Tata P B and Woerden F V 2018 World Bank Group
<https://iopscience.iop.org/article/10.1088/1755-1315/896/1/012003/pdf>

Jed Alegado, Froilan Grate, "A zero-waste Philippines is possible", February 7, 2019.

Danessa Rivera, "Waste-to-energy: A boon or bane for Philippines?", May 31, 2022

Leander von Kameke. Plastic waste volume produced per capita in the Asia-Pacific region in 2024. <https://www.statista.com/statistics/1361987/apac-plastic-waste-volume-per-capita-by-country-subregion/>

Zero Waste Cities of Southeast Asia.
<https://www.breakfreefromplastic.org/2021/02/11/zero-waste-cities-of-southeast-asia/>

National Geographic. <https://www.nationalgeographic.com/environment/article/you-eat-thousands-of-bits-of-plastic-every-year>

Just One Ocean. https://justoneocean.org/?gad_source=1&gclid=EAIaIqobChMI0oGL_MXAhgMVlqlmAh31HQSmEAAyAAEgIMRPD_BwE

Waste Management in ASEAN Countries: Summary Report.
<https://www.unep.org/ietc/resources/publication/waste-management-asean-countries-summary-report>

GNI 2023. World Bank Data. <https://data.worldbank.org/>

GDP 2023. World Bank Data. <https://data.worldbank.org/>

Identifying Priorities for the Development of Waste Management Systems in ASEAN Cities. <https://www.mdpi.com/2813-0391/2/1/6>

Zero-Waste Communities Across the Globe. <https://www.zerowaste.com/blog/zero-waste-communities-across-the-globe/>

Gross national income (GNI) per capita in the Asia-Pacific region in 2022, by country
<https://www.statista.com/statistics/632376/asia-pacific-gross-national-income-per-capita-by-country/>

Aaron O'Neill (2023). Statista 2023 (*projected population).
<https://www.statista.com/statistics/796222/total-population-of-the-asean-countries>
<https://www.statista.com/statistics/796245/gdp-of-the-asean-countries/>

Ian Tiseo (2023). Global carbon dioxide emissions from energy 1965-2022, by region.
<https://www.statista.com/statistics/205966/world-carbon-dioxide-emissions-by-region/>

World Bank Country and Lending Groups
<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>

Federal Reserve Economic Data - Economic Research Division. Gross National Income for Developing Countries in East Asia and Pacific, Current U.S. Dollars, Annual.
<https://fred.stlouisfed.org>

GNI per capita, Atlas method (current US\$) - East Asia & Pacific.
<https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?end=2023&locations=Z4&start=2023&type=shaded&view=map>

ASEAN GDP 2024
<https://www.imf.org/external/datamapper/NGDPDPC@WEO/THA/IDN/PHL/VNM/MYS/BRN/KHM/LAO/MMR/SGP>

World Economic Outlook . <https://www.imf.org/external/datamapper/profile/SEQ>

Carbon Dioxide. <https://ourworldindata.org/co2-emissions>