



A Global Picture of Solid Waste Management

Challenges, Trends and Sector Development Approaches

from What-a-Waste 2.0: Solid Waste Management to 2050



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Main Messages

- Waste generation is anticipated to increase by 70% by 2050 with Sub-Saharan and South Asia growing the fastest (35% of global waste by 2050)
- Despite all efforts, investments in the waste sector do not match the growth of waste volumes → impacts on public health and the environment are getting worse
- One-quarter of global plastic waste is coming from East Asia and the Pacific with ocean waste primarily coming from 5 countries in the region
- Nearly 50% of solid waste operations involve the private sector or civil society and there is further opportunity to engage





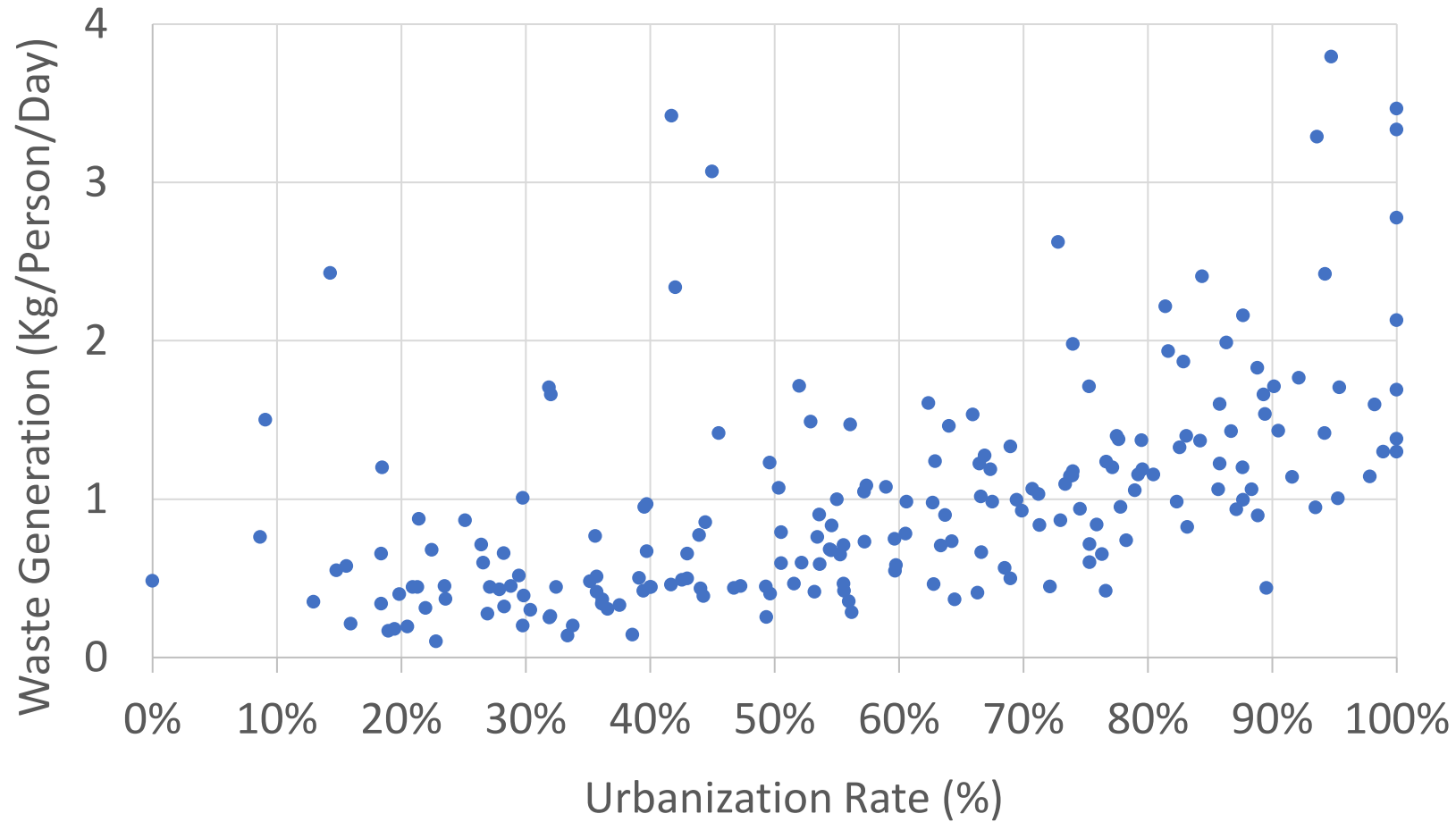
Waste is expected
to increase by 70%
by 2050

2016: 2.01 billion tonnes



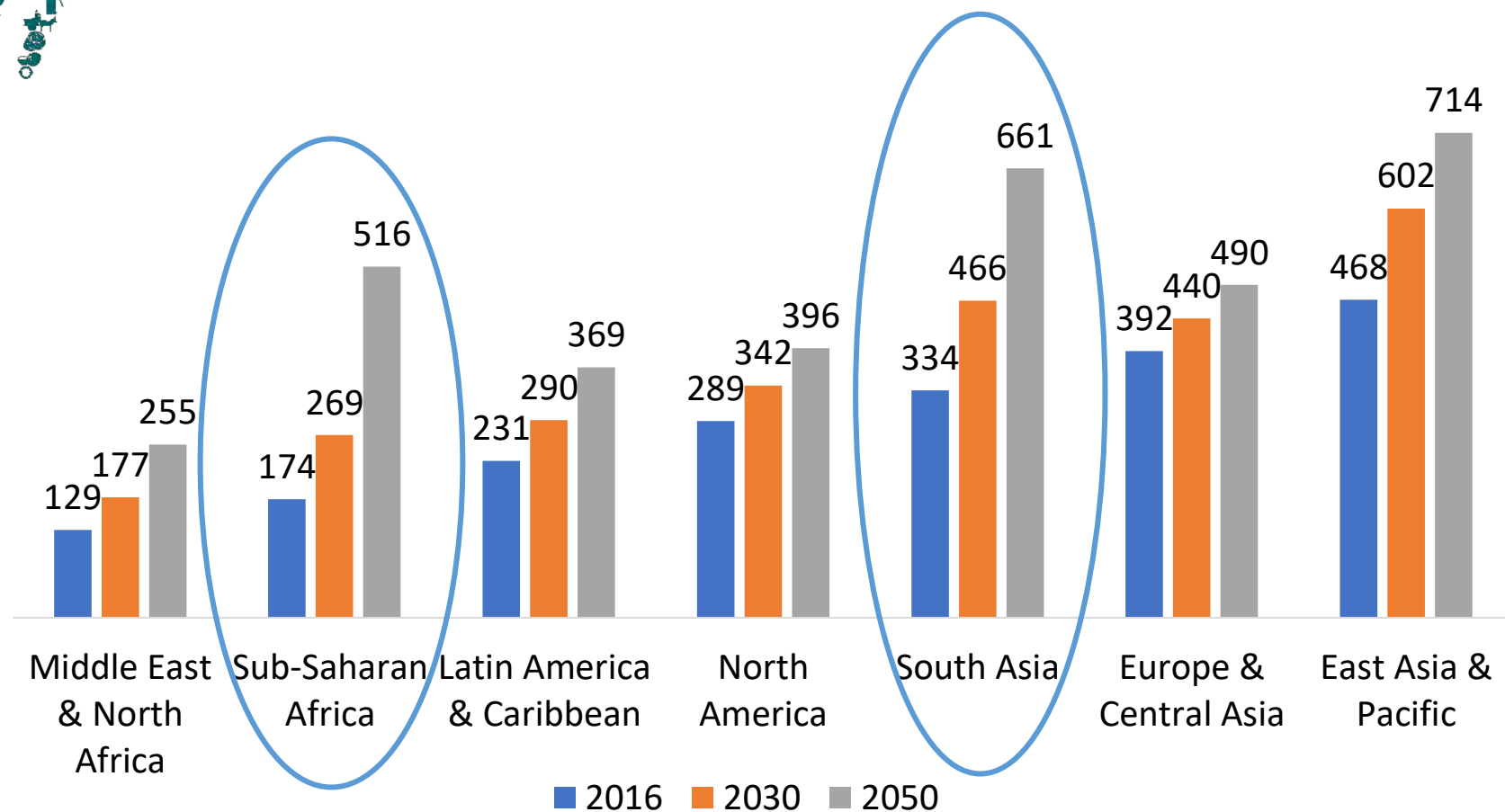
2050: 3.40 billion tonnes

Waste generation is positively correlated with urbanization

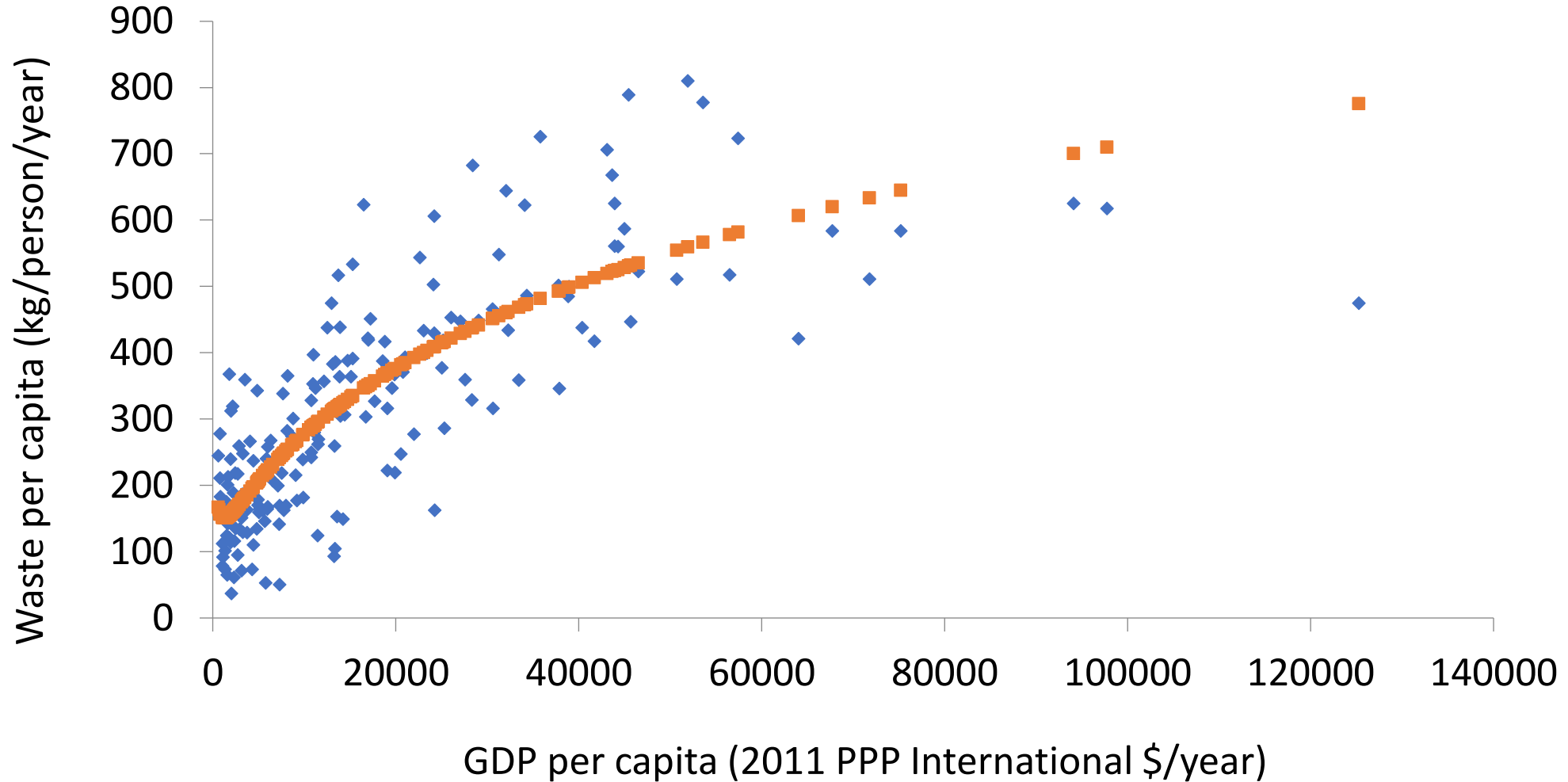




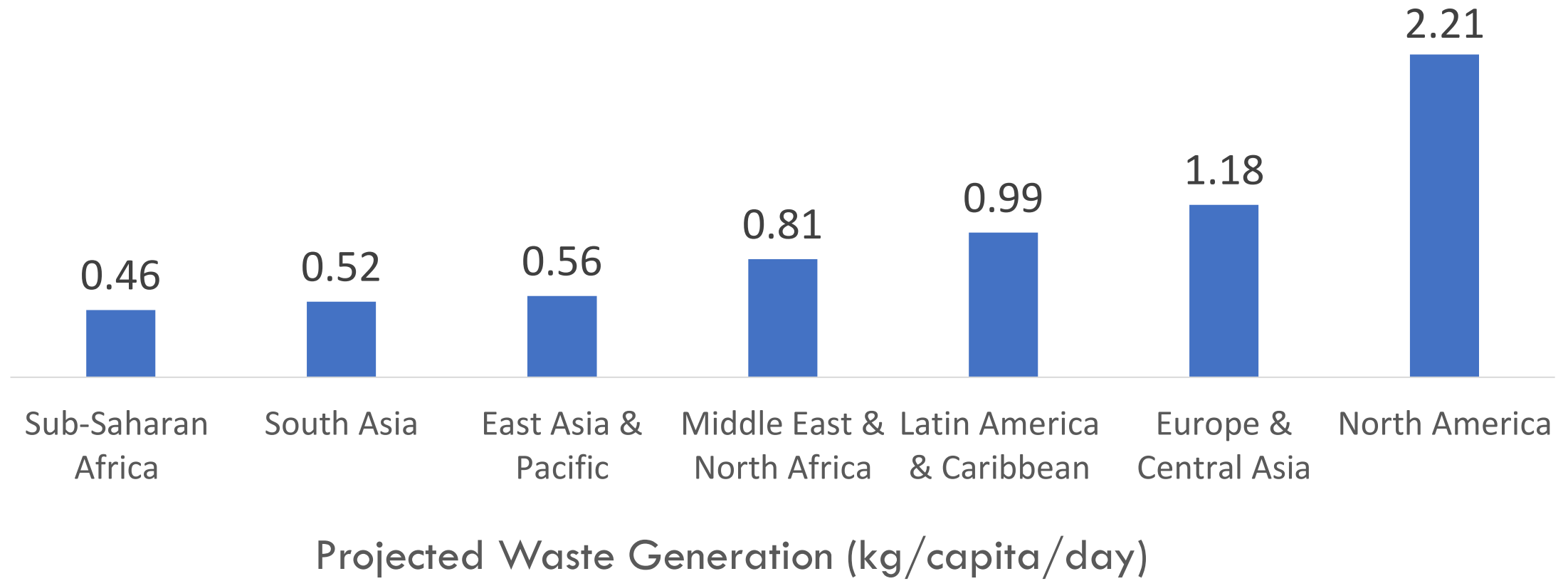
Sub-Saharan Africa and South Asia are the fastest growing regions



Per capita waste generation increases with income



High income countries generate 34% of the world's waste with 16% of the global population



Average global waste generation is 0.74 kg/capita/day



Composition of waste varies by income





Food loss and waste
amounts to 30% globally

Source: FAO

Plastic waste generation is growing rapidly



24 trillion plastic bottles

242 million tonnes

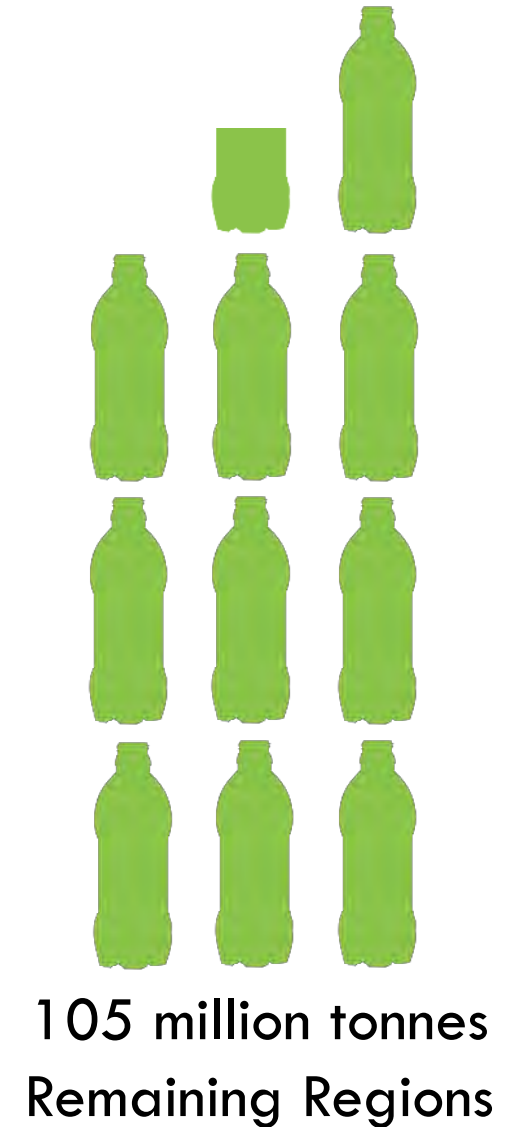
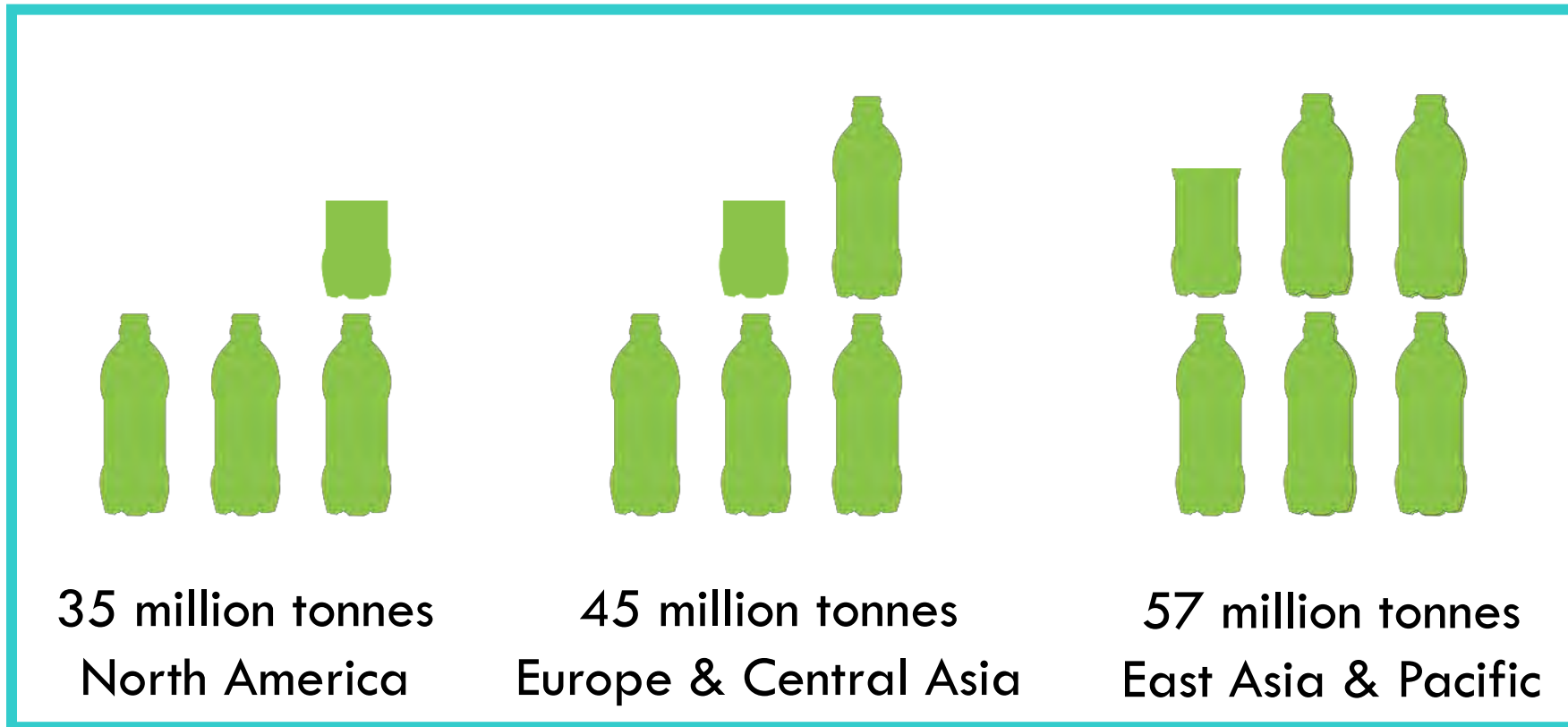
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4.8 million Olympic-sized swimming pools



Three regions account for 60% of plastic waste generation

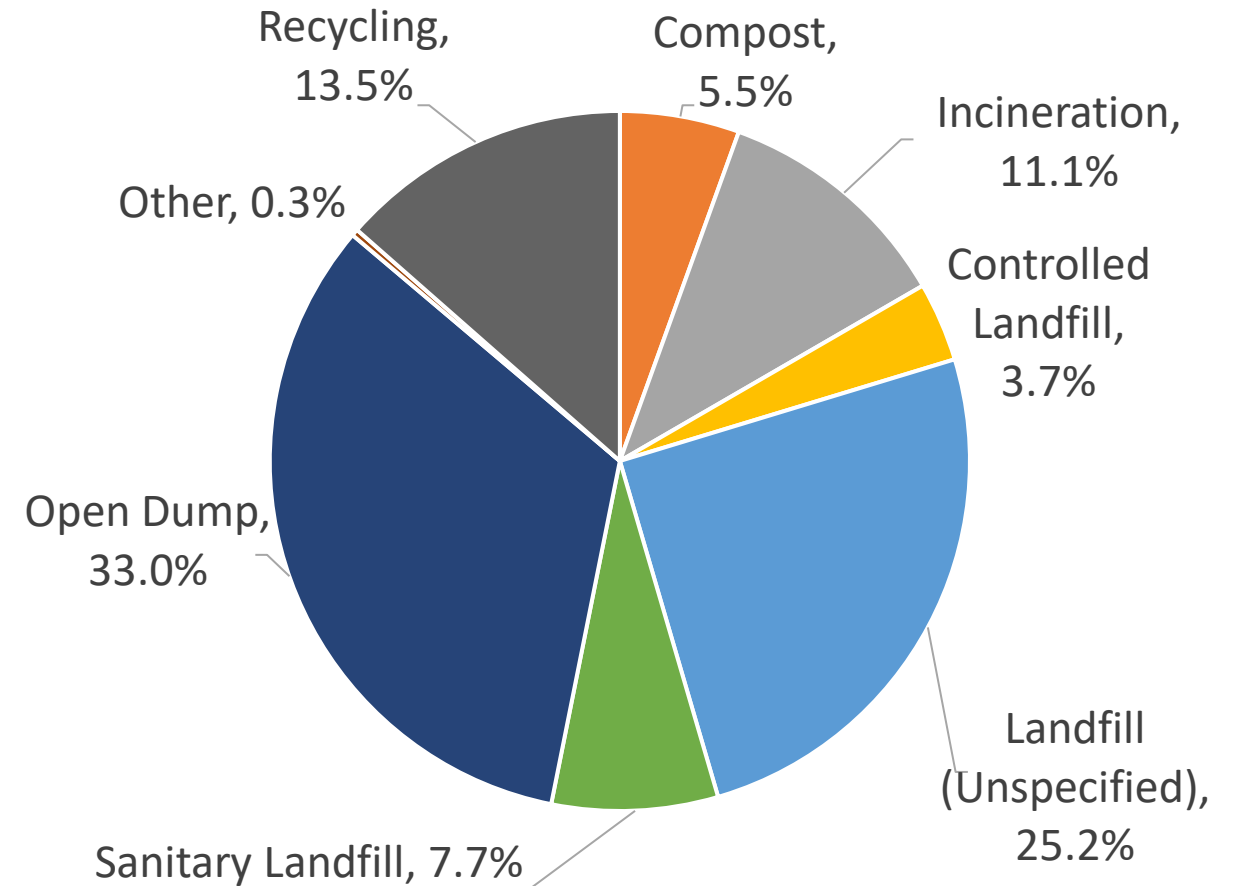




Low-income countries collect only
39% of waste



33% of global waste is openly dumped with over 90% in low-income countries



Solid waste management contributes to 5% of global emissions (excluding transportation)

2016: 1.6 billion tonnes CO₂-equivalent GHG emissions

2050: 2.6 billion tonnes CO₂-equivalent GHG emissions



The poor are most affected by
inadequate waste management



30% of countries **do not** have any
institutions or policies to
address waste



Waste is overwhelming a predominantly local government responsibility





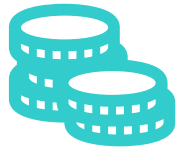
Local governments often lack funds, **only covering ~50% of investment costs** for waste systems

Remainder comes mainly from national government subsidies and the private sector

>50% of services are operated by public entities & ~1/3 involve a public-private partnership



In low-income
countries waste
management
consumes ~20%
of municipal
budgets



High income countries: >\$100/tonne

Lower-income countries: ~\$35/tonne



Major investment is needed



- 1) Particularly in Sub-Saharan Africa and South Asia which will generate 35% of the world's waste by 2050



... but only when local operational budgets and management capacity can sustain investments

- 1) Operations and maintenance more than 70% of total costs
- 2) Can be financed from local budget, sustainably from waste generation tariffs



Engage the private sector

3) Adopt regulations and incentives to attract financing and the right partners, private sector, nonprofits, or civil society





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Key World Bank program, supporting low- and middle-income countries with development of their municipal solid waste sectors.

We work with the public sector, typically central government, on-lending/granting to local governments; International Finance Cooperation (IFC) as part of World Bank Group works with the private sector.

Investment lending, policy development, analytical work. US\$4 billion for lending operations since 2010, at increasing pace.

Broader trends

Shift from infrastructure investment focus to sector reforms, addressing typical sector challenges such as operational finance, institutional capacity and land issues.

Waste recycling and circular economy approaches including waste reduction more and more integrated parts of municipal solid waste management projects.

World Bank and Solid Waste Management



Experiences and observations in Solid Waste Management

Sector Issues

Sector governance challenges often more constraining than access to investment funding

Typical governance challenges in the waste sector: land issues; lack of operational finance (tariffs, budget); local and central government capacity; monitoring and enforcement; public outreach and public support → most common challenge is operational finance

Operational finance, typical funding \$5-20/ton; benchmark for required funding; \$75+/ton

Land issues (NIMBY, availability) increasingly drivers behind recycling and alternative technologies

Marine plastics as global good -- influencing national SWM policies

Technology, basis remains landfilling

Landfilling trends: sanitary landfilling, vertical expansion; consolidating dump sites; regional landfill concepts often administratively complication

Experiences and observations in Solid Waste Management

Segregation at source, recycling

IT solutions for recyclables collection and sorting

Alternative technologies

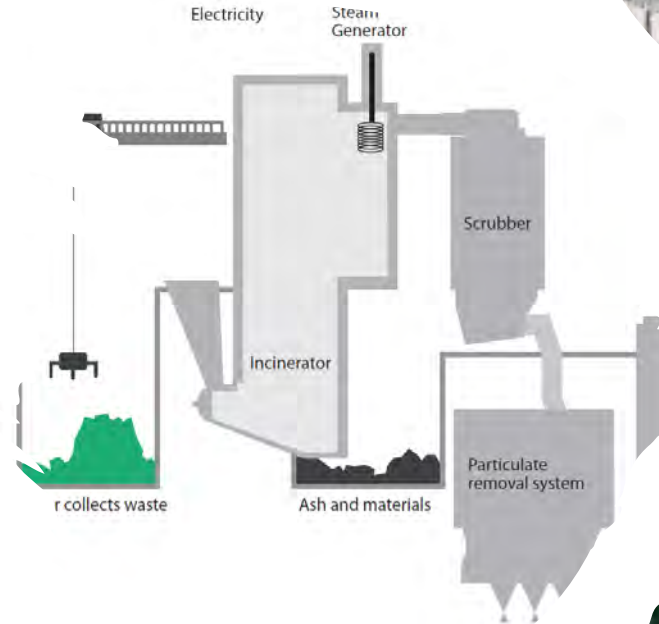
Anaerobic digestion is becoming established technology in municipal solid waste management, particularly for high-organics waste streams (kitchen waste)

Composting remains most common approach in MBT for organics

Mixed picture for RDF, increasing in some countries (high energy prices), decreasing in high-recycling countries

Waste-to-energy/incineration, partial phasing out in high-recycling countries (EU); development complicated (10 years and more of preparation) due to costs, administrative/contractual/ financing arrangements incl. feed-in-tariffs; challenges with high organic/moisture feedstock; interest in small scale incineration (<10 ton/hour)

Limited applications for advanced thermal treatment (gasification, pyrolysis)



A large, sprawling pile of plastic waste, including bottles, containers, and other debris, stretches across the landscape under a sunset sky. The sun is low on the horizon, casting a warm glow over the scene.

Thank you

worldbank.org/what-a-waste