



Solu

Harnessing technology to **fix** MSW management in developing nations

by **Matthew Barrie, CEO and Founder of Solu.**

Asian Development Bank, 5th June 2018

The system is broken...

Door to door collection doesn't work in developing nations.

Expensive... yet ineffective.

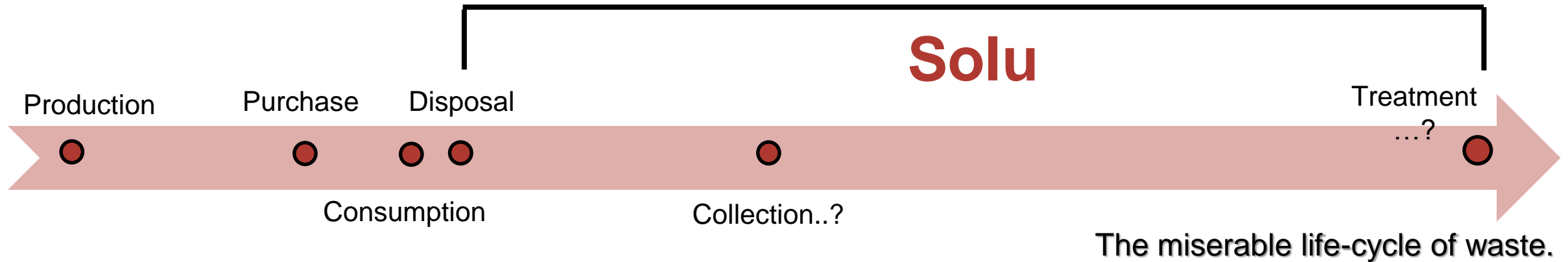
Collection rates typically between 50-70%.

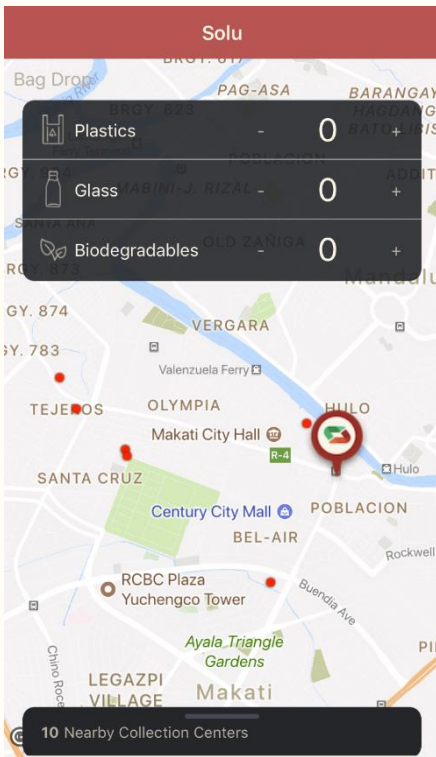
Terrifically unreliable.

You segregate? You're wasting your time.

Everything to the dump site!

The necessary niche.





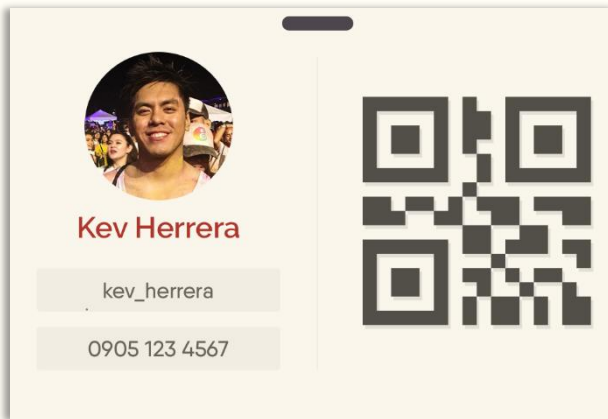
What is Solu

Valorization. Solu is a platform that **monetizes waste** by creating a marketplace for segregated materials.

Optimization. Proprietary technology creates an efficient exchange of segregated materials to **maximize resource value** and potential.

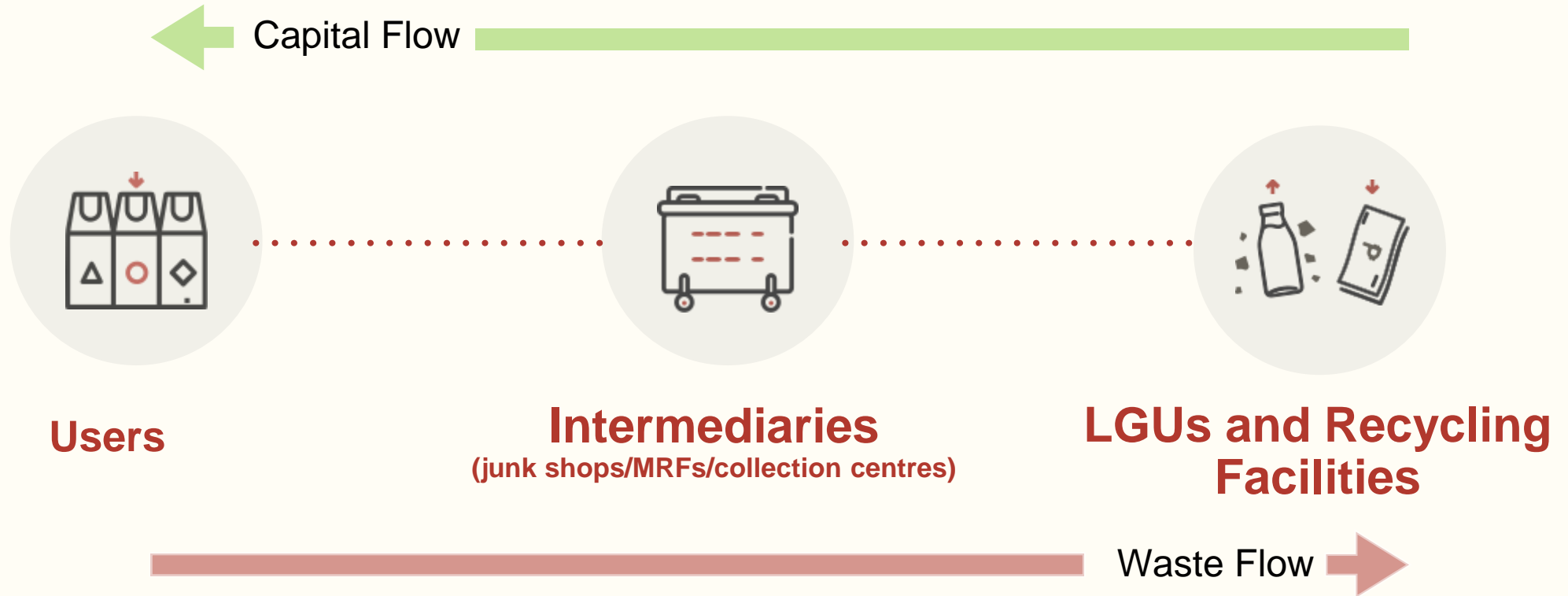
Integration. Brings waste generators, street sweepers and recycling facilities into the **same marketplace**.

Yesterday's **trash** is tomorrow's **resource**.



Initially focus on 3 materials

How It Works



Solu streamlines the process to provide significantly more value to users and intermediaries.



Solu x Waste to Energy. A Symbiotic Relationship

“Collection of separated waste streams makes the utilisation of different treatments more viable”

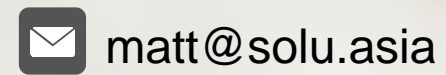
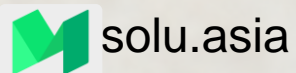
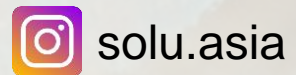
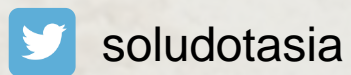
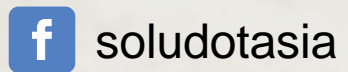
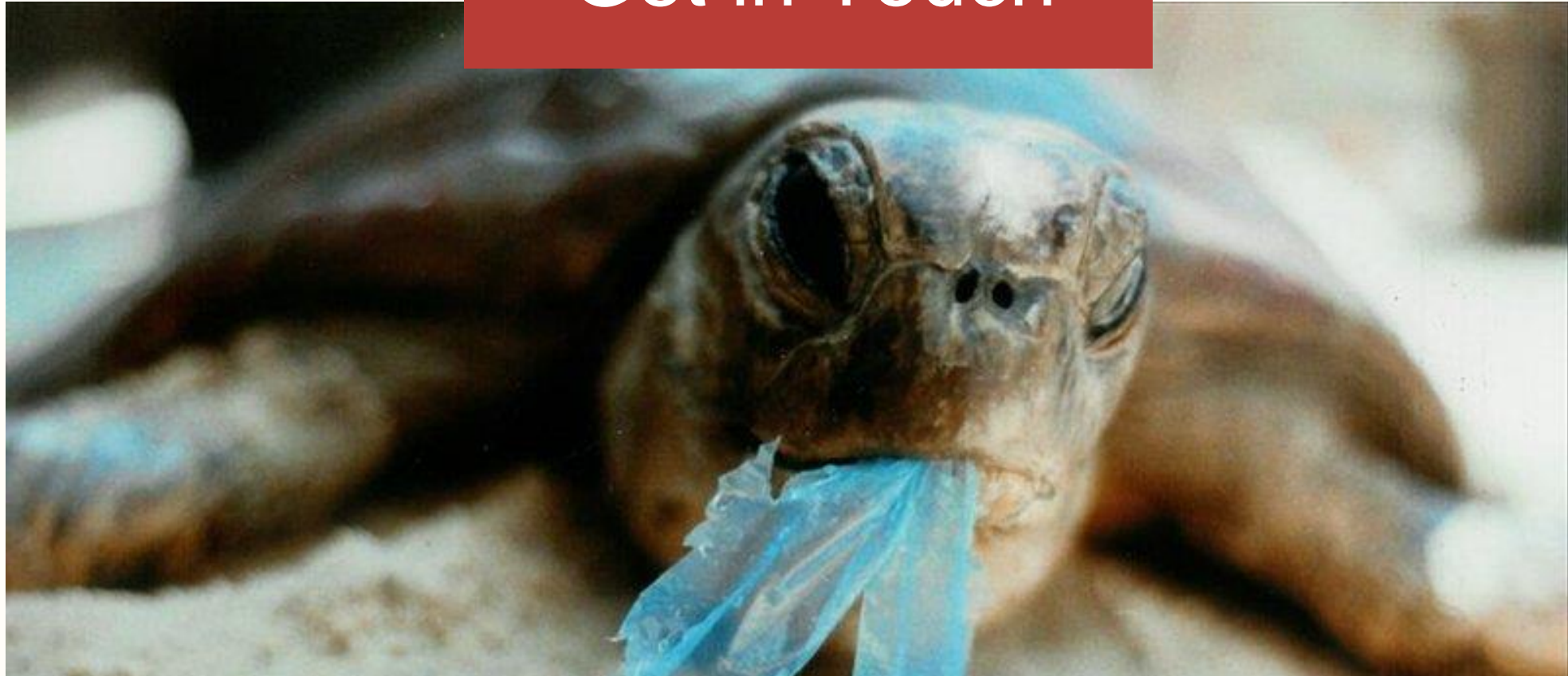
giz

- **Less construction waste.** You can say goodbye to inert materials finding their way into WtE facilities.
- **Segregated organic waste.** Increase that calorific value as **Solu** ensures that organics go to more suitable treatment facilities like composts, piggeries and anaerobic respirators.
- **Reliable feedstock.** Operate 24/7 as segregated waste materials, courtesy of **Solu**, are available on demand.
- **Government.** A convenient absolution of responsibility whilst maintaining jurisdictional oversight.

Reduce residual percentages -> increase efficacy of waste-to-energy plants -> greater margins & faster scaling



Get in Touch



www.solu.asia



Appendix



Who Uses Solu?

We're initially focusing on 16-30 year olds, that earn <P5000 a week for whom supplementing their earnings with Solu is an attractive proposition.

These citizens typically have smartphones, are very familiar with mobile apps and have a growing awareness of global issues thanks to the spread of engaging and informative material on social networks.

Customer Acquisition

- Content production (we have a clear plan for this) + brand creation
- Social media utilisation
- Email campaign
- PR and mainstream media
- Influential community figures and brand ambassadors
- Hustle hard and get the word out there.
- Solu, NGOs, FMCGs & Govt campaign
 - 'OurPlanet, YourMoney' (or similar)

Nice idea right... **Does it work?**

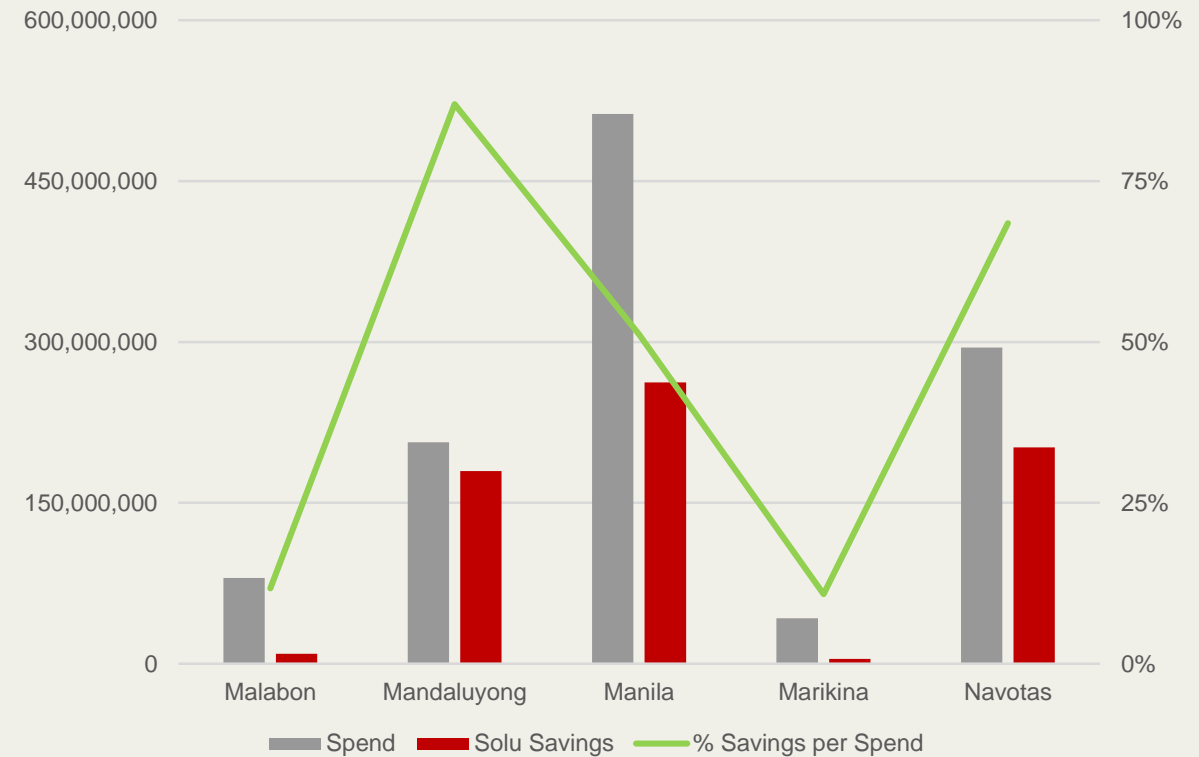
CASE STUDY: 7 Municipalities in NCR*

Malabon
Manila
Marikina
Mandaluyong
Navotas
Pasig
Taguig

a combined 4.8m people
1.3m tonnes of waste generated a year.

and Solu can save **₱695 million...**
a 27% saving.

Solu could save Metro Manila
₱2bn a year



* Data from Malabon, Manila, Mandaluyong, Marikina, Navotas, Pasig, Taguig 10 Year Solid Waste Management Plans 2015-2024



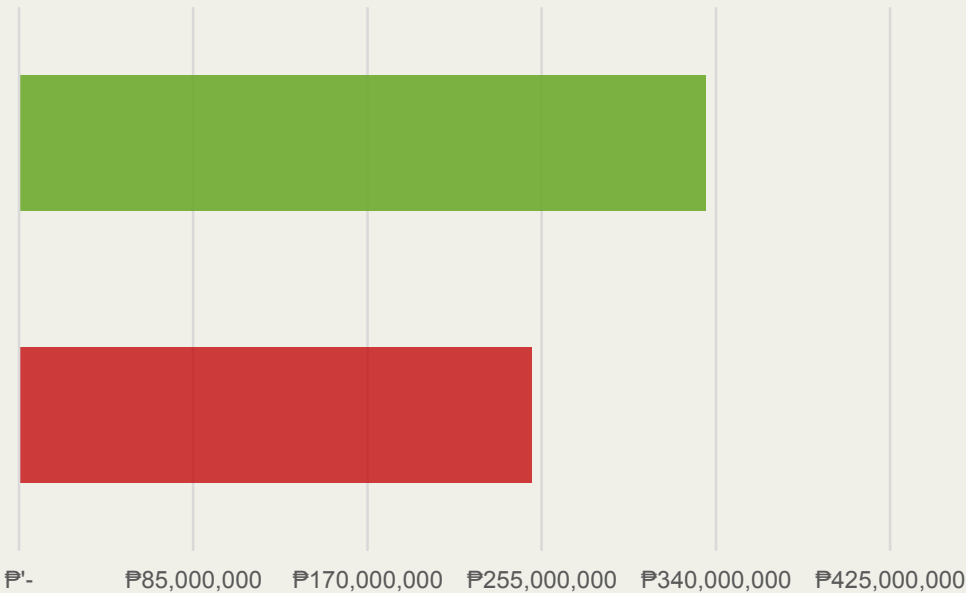
Nice idea right... Does it work?

CASE STUDY:
Manila

1.8m population
32% waste diversion rate
Approx. spend P550m

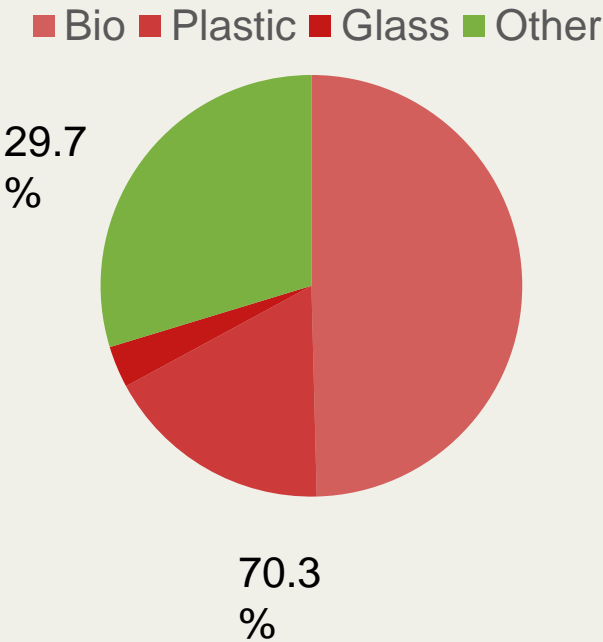
Solu promises

- 90%+ diversion rate.
- Solu. spend P250m on 70.3% of total waste.
- Reduced staff costs, haulage costs, tipping fees.
- Accurate data for better budgeting and forecasting.
- Burden transferred to Solu and citizens.



Solu could save Manila
₱84.5 million a year

25.3% SAVING



* Data from Manila 10 Year Solid Waste Management Plan 2015-2024



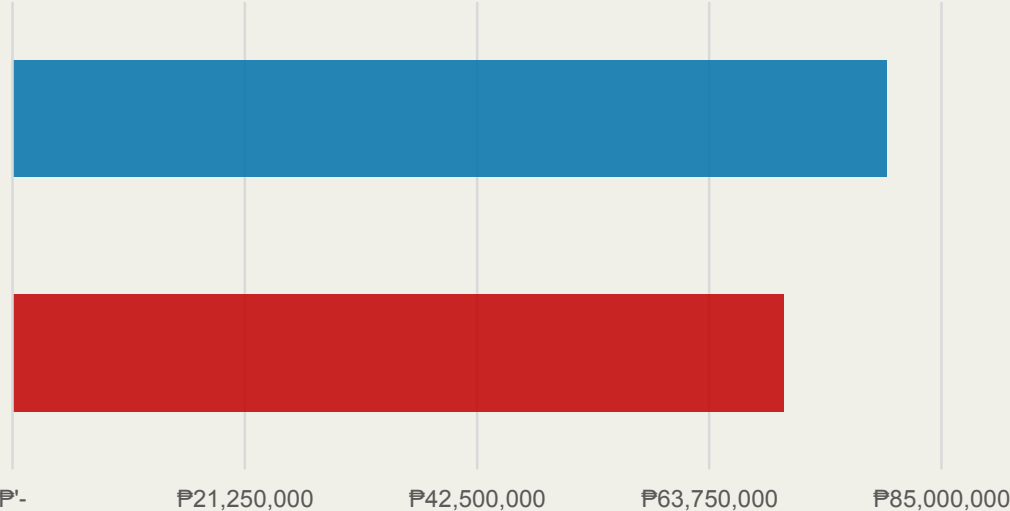
Nice idea right... Does it work?

CASE STUDY:
Malabon

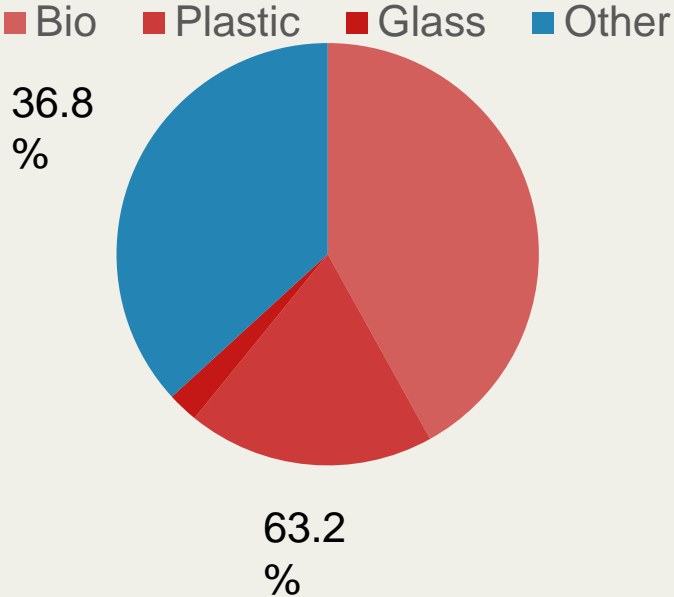
365,000 population
49% waste diversion rate
Approx. spend P105m

Solu promises

- 90%+ diversion rate
- Solu. spend P70.6m on 63.2% of total waste
- Reduced staff costs, haulage costs, tipping fees
- Accurate data for better budgeting and forecasting
- Burden transferred to Solu and citizens



Solu could save Malabon
₱14.6 million a year



12.3% SAVING

** Data from Malabon 10 Year Solid Waste Management Plan 2015-2024*



Traction **so far..**

Endorsed by Snr Gatchalian, NGOs, FMCGs

Strong team formed

Customer acquisition plan in place

Tech roadmap finalized

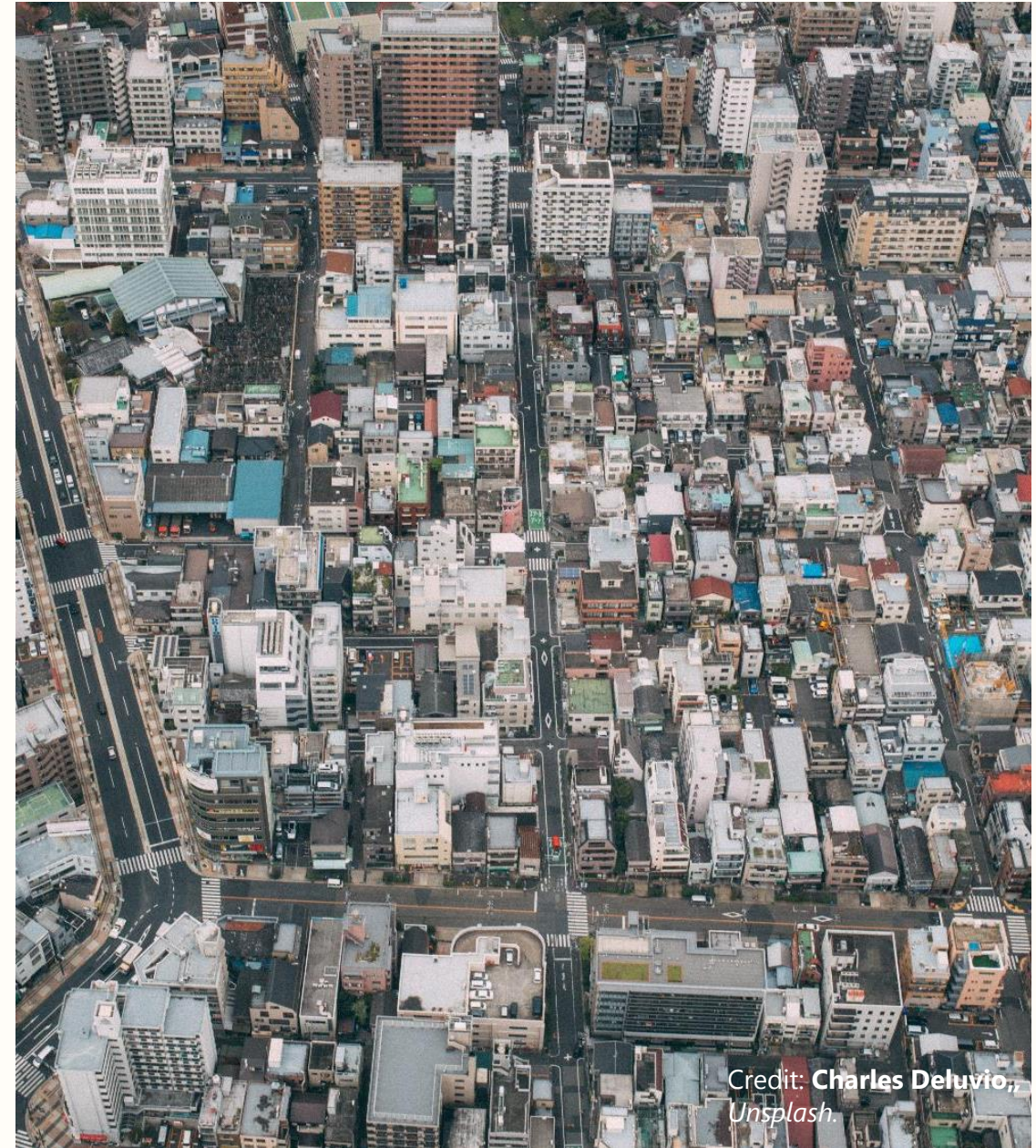
What **Next?**

\$15-25k 'bridging fund' to push us to angel/seed

Incorporation + SEC registration

2x developers full-time & interns onboarded

Partnerships contractualized



Credit: **Charles Deluvio**,
Unsplash.

Fact

**“More than 30% of waste created in developing nations is
UNCOLLECTED AND UNTREATED”**

—‘Sustainable Development Forum’ 2015, UN



“

“MOST OF ECONOMICS CAN BE
SUMMARISED IN 4 WORDS;
PEOPLE RESPOND TO INCENTIVES”

—*Gary Mankiw, 10 Principles of Economics*

Solu's Payment Architecture



Solu controls the price
In-app digital wallets
2-click payment
Easy cash-out

Work with UnionBank/Mynt to power our payments process.

Utilise QR tech for identity validation and payment authentication.

Bank branches/Cebuana Lhuillier act as brick and mortar cash out.

One message campaign

Solu at the centre, big round table + liase with NGOs, Govt, FMCGs.

Co-branding on goods

"Remember to sell with Solu"

'Sponsor' Solu events

e.g. 'Intro to Solu' for a community. We have an 'air-drop' of bottles/glass for consumers to bag and sell. Coca-Cola is with us giving out free Cokes.

COMPETITORS

Status Quo

This is clearly a powerful force that shouldn't be underestimated. But with societal trends pushing people our way and Solu providing real benefit to all, we hope that we can overcome this notion.

Localised 'Trash-to-Cash' schemes

These initiatives do good work but they don't do enough. They can't provide enough material value to citizens because they don't streamline the chain. Solu fixes this.

Tech-Enabled Waste Solutions

Gargeon.com in Malaysia – use basic tech to provide 'on demand' optionality for waste collection + with optimisations for haulage cos.

I Got Garbage in India – uses tech to legitimise informal waste pickers. Good solution but not as rapidly scalable as Solu.

RTS in New York – the original *Gargeon.com*. Founders are insufferable with hubris.

Rubicon Global in USA – the first mover. \$b company. The original RTS/*Gargeon*.

RePurpose in US/India – a really early stage player who's just had \$200k grant funding from Penn Uni. V. similar model/idea to my original in Feb. I think they'll find it won't work and it'll be interesting to see if they pivot to Solu-esque bis or to something different. Will keep a close eye.

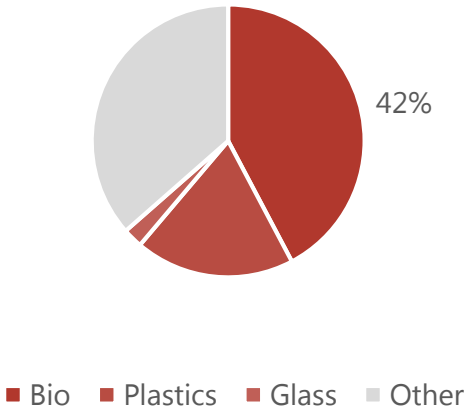
... there really isn't much else. But we're constantly searching, trying to find other innovative waste solutions.

A Deeper Dive: Waste in Metro Manila

7 municipalities
4.9m people

21,744 cu.m per day
.0044 cu.m pp per day

waste gen. increasing at 1.5% p.a.
45.2% not disposed of sufficiently



at ~P30, P70, P200 respectively

x 2.62

x 1.15

Solu takes 4.5% of each

IMPORTANT NOTE:

This data is by no means reflective of total waste generation. This data reflects the estimated total waste collected by governmental collection services. This does not include the influence of informal waste pickers or privately contracted haulage operations. However these are the best data samples available. Solu does not attempt to extrapolate this data to factor additional waste collection services in.

Biodegradable cu.m p.d.	Plastics cu.m p.d.	Glass cu.m p.d.
9289	4017	748
24337	10525	1960
P730,110	P736,750	P392,000
P839,627	P847,263	P450,800
P70,638	P71,281	P37,926

Solu for business + condominiums

tiered subscription: ~\$20, \$50, \$100 per month dependent on volume.

N.B. these are v. rough estimates, more work needs to go into finding optimum price points. S4B estimates do not factor in increase in waste through standard Solu process

estimate 1,000 bis, 200 condos at avg \$40 p.m.
~\$48,000 p.m.
~ \$143,984 p.q.
~ \$575,936 p.y.

Month - P5,470,885, \$109,418
Quarter - P16,410,857, \$328,217
Year - P65,643,426, \$1,312,869

- Market potential for ~\$2m a year rev from NCR.
- **85%** of Ph population untapped and **191** urban areas of **100k+** pop. in Ph.
- Easily scalable.

**Data obtained from 2014 WACS from Mandaluyong, Makati, Malabon, Manila, Marikina, Navotas, Pasig, Taguig. Full analysis can be seen on request.*

HOW TO INCENTIVISE BIODEGRADABLES – simple gamification.

- 3-5 bags of biodegradables sold a week and you're entered into the Solu ~₱10,000 lottery (must fill in a quick Solu questionnaire first so we gain consistent feedback from users).
- *Live weekly draw with celebrities announcing winners. In-app + FB live.*
- We can fix this 'lottery' – e.g. a Bgy isn't collection biodegradables. We ensure someone wins within Bgy – immediate word of mouth and encouragement to collect and sell bio.

Additional social leaderboards in play to 'compete' with friends as to amount earned/bags recycled etc. Can earn badges, can show vol of plastic saved from the oceans etc too. Constant positive engagement.

Dashboard to see statistics, trends, earnings. Solu can give hints here for to optimise user potential.

'Easter Egg' in loading screen.

Filipinos incentivised by rewards – Robertson Chiang, DragonPay

Possibility to work with FMCGs/reward based cos/TagCash to implement this.

ADDITIONAL 'Intermediary' FACING FEATURES

to be further developed

Complete dashboard showing trends, earnings per day/month/quarter etc. Solu can use past data to predict future volume flows and earnings.

Solu will send news notifications – e.g. price of Brent has fallen to \$30 a barrel, you'll earn less for plastics in the foreseeable future to help intermediaries.

Optional premium membership for intermediary to be shown at the top of all marketplaces.

ADDITIONAL 'End-User' FACING FEATURES

to be further developed

Complete dashboard showing trends, earnings/costs per day/month/quarter etc. Solu can use past data to predict future volume flows and earnings.

Solu will send news notifications to LGUs – e.g. price of Brent has risen to \$100 a barrel, now might be a good time to sell your plastics stockpile.

Optional premium membership for treatment facilities to have access to the last 10mins of the auction. Frozen for non-premium members.

Waze API for route optimisation.

Exact volume per trip calculated so # of trucks, size of trucks, # of employees can all be optimised.

ADDITIONAL 'Tech to be used within Solu'

to be further developed

ML to sift through our huge data sets to help us more competitively price waste.

Basic AI/chatbot features to send notifications and help 'assist' users/intermediaries/end-users in 'potential optimisation' feature.

Mitigating Potential Roadblocks

1. Payment architecture – strong conversations had thus far with key executives at Mynt & UnionBank. Agreement must be reached but plenty of PayM/DigiPay cos in SE Asia. We want an easily accessible method to cash out and a simple ux for users.

2. Data usage costs – ongoing conversations with GSMA to become a part of their mobile for development programme, which would allow free usage. If fails then Globe/Smart/PLDT conversations.

3. Customer acquisition – always difficult when consumer based. 'Growth Hacker' a part of satellite team. Multiple strategies will be tested and we'll be very active to ensure best results. Wider branding and marketing effort a key part of this.

READ ON...

Check out our blog at medium.com/@solu.asia

National Solid Waste Management Status Report (2008 – 2014)

<https://nswmc.emb.gov.ph/wp-content/uploads/2016/06/Solid-Wastefinaldraft-12.29.15.pdf>

DENR, 2015.

Stemming the Tide: Land-based strategies for a plastic-free ocean

<https://oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf>

Ocean Conservancy, 2016.

The New Plastics Economy: Rethinking the future of plastics

<https://www.weforum.org/reports/the-new-plastics-economy-rethinking-the-future-of-plastics>

World Economic Forum, 2016.

National Solid Waste Management Strategy (2012-2016)

<https://nswmc.emb.gov.ph/wp-content/uploads/2016/07/NSWM-Strategy-2012-2016.pdf>

DENR, 2013



“SOLVING FOR **COLLECTION INFRASTRUCTURE** WOULD
UNLOCK **ADDITIONAL INVESTMENT** ACROSS THE
SYSTEM.”

—Rob Kaplan, greenbiz.com