



ISCN Award 2021

Cultural Change for Sustainability: Towards a Zero Waste NUS 2030

20 May 2021

Mr Deliang LOO

Chairman, Waste Minimisation & Recycling Taskforce

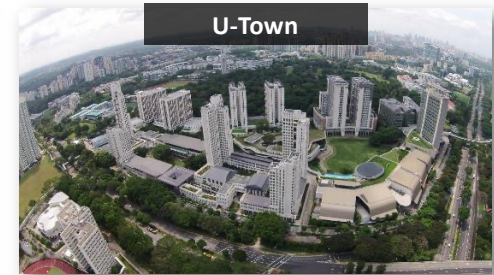
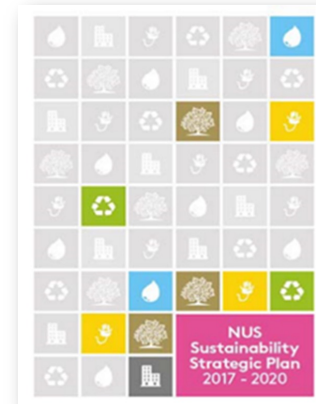
Accompanied by Mr Tommy Cheong, NUS Alumnus



About National University of Singapore (NUS)





- Founding of Straits Settlement and Federated Malay Government Medical School in 1905
- NUS established in 1980
- Comprehensive research university with 42,600 students, 12,300 faculty & staff



ISCN Award 2017: Excellence in Building & Innovative Infrastructure, University Town

- NUS Sustainability Strategic Plan 2017-2020
- **Smart, Safe & Sustainable (S3) Campus 2030** – *Carbon Neutral Campus, Cool NUS and Zero Waste NUS*

Singapore's Challenge: Raising Low Domestic Recycling Rate

- Efficient waste management infrastructure
- Landfill constraint
- Convenient waste disposal
- Recycling contamination
- Excessive use of disposables
- SG Green Plan 2030 
- Zero Waste Masterplan – 30% domestic recycling rate by 2030 



Zero Waste Campus by 2030: Whole-of-University Cultural Change

2020

Modest 30% recycling rate
(from 9% in 2012)



Campus-wide plastic bag tax
in 2009 by NUS SAVE



Reducing disposables in
student residences since 2016



Packaging recycling at bin
centres



Food waste recycling at major
dining establishments

2030

A Zero Waste Community sorting out
their waste & taking pride in the 4Rs
(Reduce, Reuse, Recycle & Reimagine)



Towards
**a ZERO
WASTENUS**
ACTION PLAN 2030



Horticulture

Food Waste

Packaging Waste

E-waste



**How might we
create a Zero
Waste campus
where students
and staff take
pride in the
3Rs?**

Campus Living Lab

Deepening involvement through interdisciplinary testbeds to tackle perennial waste challenges



Heartware



Campus Infrastructure

Recycling and reusing facilities and visible cues at key touchpoints

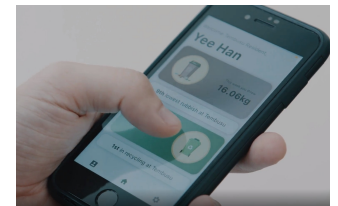


Hardware

Software

Smart Waste Management System

Feedback for individuals & programme review



Creating new
social norm of
waste sorting:
Visible cues
embedded at key
touchpoints

Food waste sorting



Dining halls



Canteens | Food courts

Sorting & recycling it right



Common areas

IT ONLY
TAKES ONE
**UNFINISHED
DRINK** TO SPOIL
AN ENTIRE BIN
OF GOOD
RECYCLABLES

recyClean

Publicity



Continuous Journey to Get Recycling Right

Harnessing behavioural & user insights to nudge correct recycling


Heavy contamination



2008
Standardisation of housekeeping



2009
Cues at disposal & publicity



2010s
New bin design



2016
FYP project



2018
FYP projects



2020
Behavioural Study



2020
FYP: Prototyping



2021
FYP: Recycle Right bins

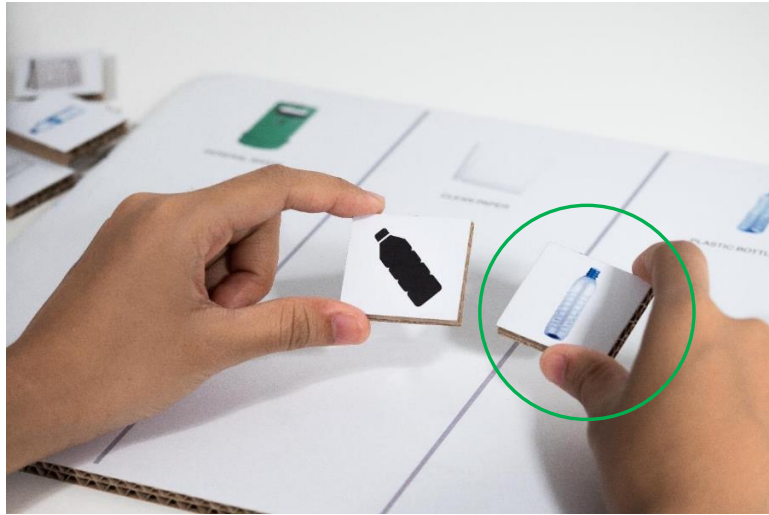


Goal:
Zero
Contamination

New bins reduced plastic contamination from 60% to 27%

Next Leap: Sorting Out Key Material Streams





Card sorting Exercise : Iconography vs **Actual Items**



3D Visualization of contaminants as educational materials

Items Display

Identifying actual items for its specific material type & visible qualities



Shrinking of the bin opening for specific recyclables to go through only

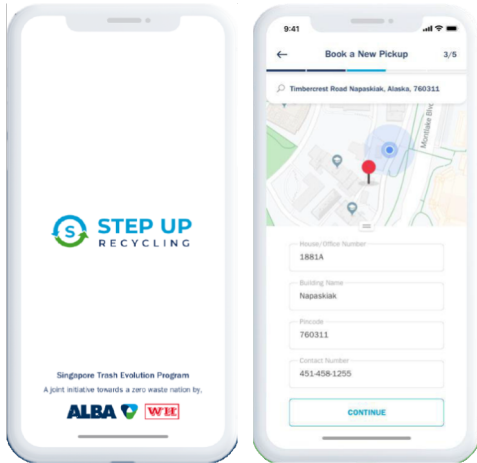


Reducing the number of contaminants easily disposed

Slide-able Lid

Disrupts waste disposal automaticity by adding friction through a lid

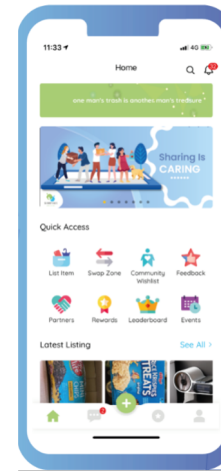
Behavioural Feedback for Individuals & Stakeholders Enabled by Digitalisation (In Progress)



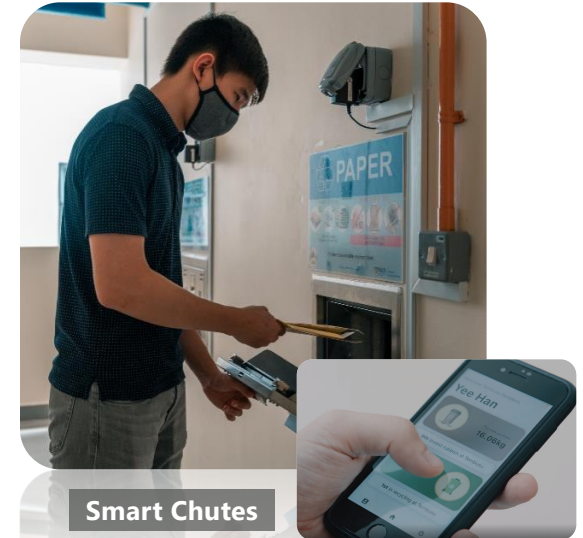
Smart Waste & Recycling Collection (ALBA)



Reuse system



Sharetings



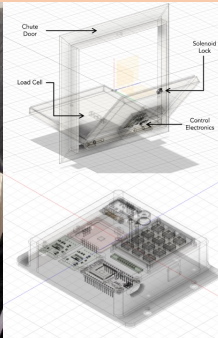
Smart Chutes

- On-demand recycling collection app
- Waste and recycling analytics

- Reuse container rental & return system by students (in progress)
- Sharetings sharing app by students

- Smart chutes and application developed by students

Reimagine: Concepts



Relevance: Operationalising Prototypes



3P Collaboration: Community, Industry & Agency



Deepening Involvement Through Living Lab

Zero Waste Testbed Initiative



"This is a wonderful way to make our university a living lab for new technology and bringing it down to actual practices."

Ms Grace Fu, Minister for Sustainability and the Environment



Reimagining New Concepts

Continuous iteration with project sponsor and mentorship to find right behavioural levers and solutions to tackle perennial issues, e.g. contamination in recycling



Operationalising Prototypes

Implementation in real-world trials to refine feasibility and viability



Collaborating with 3P Partners to Scale Up Initiatives

Collaboration with People (community), Private (industry) and public (agencies) sectors to scale up initiatives

Spreading Message Beyond the Campus

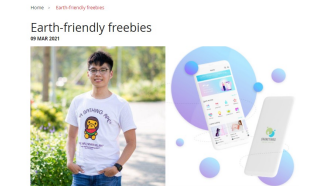
Working with stakeholders to heighten awareness on digital & social media



FB Post by Minister for Sustainability and the Environment



Articles by Ministry of Education on their FB & website



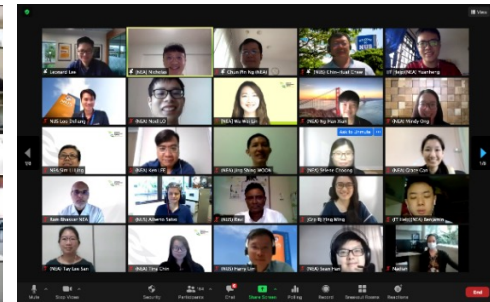
Active participation in govt-led forums & workgroups



Ministry of Sustainability and the Environment's Citizen Workgroup on Reducing Excessive Consumption of Disposables



National Environment Agency's Board Strategy Advance Nov 2020



National Environment Agency's Behavioural Science Nudgeathon Jan 2021



nus.edu.sg/zerowaste

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WASTE MINIMISATION & RECYCLING TASK FORCE

NUS Sustainability Steering Committee

Supported by:

Office of Campus Amenities

Office of Environmental Sustainability

Office of Estate Development

Office of Facilities Management

Office of Housing Services

Office of Safety, Health and Environment

Office of Senior Vice President (Campus Infrastructure)

Office of Student Affairs