




10/1/2017

Members of Advisory Committee on Recycling Fund visited The Hong Kong Polytechnic University (PolyU) on 10 Jan, 2017 in order to understand recycling technologies and research.

Technical Visit - PolyU

Purpose

-  In order to introduce recycling technologies and research to recyclers, the Recycling Fund Secretariat organized a technical visit to The Hong Kong Polytechnic University (PolyU) on 10 January 2017.

Participants

RFAC Members

(Jimmy Kwok, Raymond Leung,
Teddy Cheung, Cary Chan,
Edward Chan)

30 representatives from Recycling trade

Staff of Recycling Fund Secretariat



Sustainability Development and Waste Management Strategies in PolyU

♻️ Waste Management and Implementation Framework

♻️ Policy

- Sustainability and waste management policies on campus
- Green procurement

♻️ Adheres to the 3R principles: Reduce, reuse and recycle

♻️ Promotion and education

- Waste separation at source, Bring Your Own (BYO), Eat Wisely, etc.

♻️ Research and Development

♻️ Programmes offered on Sustainability

- ♻️ Undergraduate and postgraduate programme in Environmental or sustainability related discipline

♻️ PolyU Micro Fund

- ♻️ Cultivate Entrepreneurship, Social and Technology Innovations



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Turning Wastes to Construction Resources

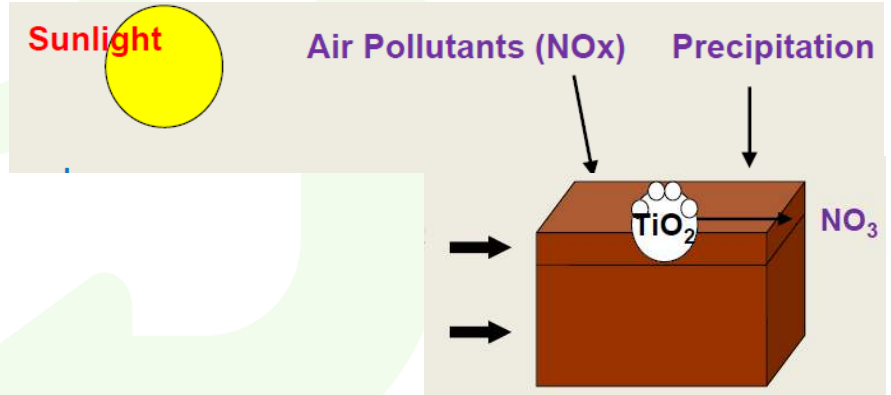
- Presented by Professor CS Poon from Department of Civil and Environmental Engineering



- Sources of construction and demolition waste (C&D waste): Renovation, road work, construction, excavation, etc.
- Construction waste is the #1 solid waste stream in HK, about 57,000 tonnes/day
- Recyclable concrete waste about 3,000 – 6,000 tonnes/day

Waste Glass -> Eco-blocks

- Generation: About 300 tonnes per day
 - <10% recycled in 2014
 - >90% of waste glass go to landfills
- 3rd generation Eco-blocks -> Removal of air pollutant
 - besides recycled glass material, the addition of TiO_2 enables the photocatalytic decomposition of NO_x from car exhaust
- Applications of Eco-blocks



Construction Wood Waste -> Cement-bonded Particleboard

- 🌱 Source: About 4,200 tonnes of construction waste were disposed in landfills in 2015. Among them, timber waste amounted to 30-40%.
- 🌱 Types of particleboard:
 - Conventional particleboard – virgin wood
 - Recycled particleboard – preservative treated waste wood
- 🌱 Features: Fire resistant, water resistant, ready to paint, termite proof, etc.
- 🌱 Applications: Elevator shafts, balconies, floors, ceilings, roofs, walls, noise barriers, etc.



Timber Waste -> Liquid Fuel

- Pretreatment -> Enzymatic Hydrolysis -> Fermentation -> Biofuel

Turning Wastes to Construction Resources

- Presented by Dr. Yuhong Wang from Department of Civil and Environmental Engineering



- Application of scrap tyre rubber into asphalt pavements
 - as an asphalt cement modifier ; or
 - as a portion of the fine aggregate
- Other application of scrap tyres in highway construction
 - Embankment construction



PolyU graduates: The Second Box

- ♻️ A social enterprise
- ♻️ They empower the elderly scavengers and help to increase their earnings through upcycling cardboard boxes
- ♻️ They purchase second-hand carton boxes from scavengers and business sectors with a price higher than the market price.
- ♻️ After sorting, processing and labelling the carton boxes, they resell to public and business sectors.
- ♻️ Start to develop diversified products, e.g. Christmas cards and paper buttons.



Founder – Mr Herbert Wu



Upcycling Paper Button



Upcycling Christmas Card

PolyU graduates: ATB Auto Art Ltd.

- 🌱 A social enterprise
- 🌱 They collect waste car parts from scrap yards and upcycled into home accessories, furniture, trophies and souvenirs through their creativity and craftsmanship of marginalized local workers.



Founder – Ms Telly Woo



Lamp



Trophies



Furniture

Conversion of recycled glass into eco-blocks



Professor Poon explained the theory behind eco-block.



Ingredient for Eco-block - Waste glass



Lab test sample



Eco-block products and showcase.

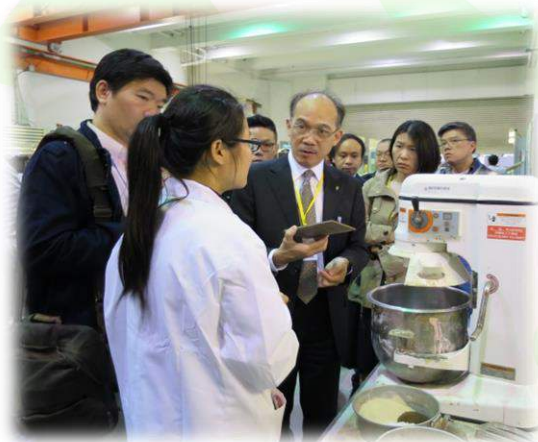
Conversion of Construction Wood Waste into Cement-bonded Particleboard



Ingredient for cement-bonded particleboard



Professor Poon explained the theory behind cement-bonded particleboard.



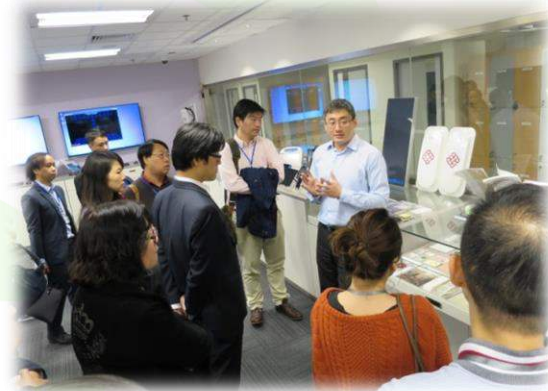
Sample of particleboard

RFID/IoT Solutions Laboratory

- RFID/IoT Solutions Laboratory is equipped with advanced hardware and software for the research and development of Radio Frequency Identification (RFID), Internet of Things (IoT), Industry 4.0 and Business Intelligent (BI) applications.



Introduction on collaborative robot



Introduction on Radio Frequency Identification (RFID) Technologies



Bluetooth beacon device



Form and Function 3D demonstration

House of Innovation

- House of Innovation showcased PolyU's unique innovative research projects and exceptional achievements from various disciplines, such as Construction, Recycling and Environmental Technology, and Space Exploration, etc.



Representative introduced showcases



Introduction on space exploration



Showcase on Solar Powered Air Conditioning System



Showcase on Catalyst for Green Biodiesel Production

Acknowledgment

Ir Professor Ping-kong Alexander Wai, Vice President (Research Development), PolyU

Mr Joseph Chan, Head (Campus Sustainability), PolyU


Professor CS Poon, Department of Civil and Environmental Engineering, PolyU

Dr Yuhong Wang, Department of Civil and Environmental Engineering, PolyU

Mr Herbert Wu, The Second Box

Ms Telly Woo, ATB Auto Art Ltd.





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The End

