



Property & Facility Management Division  
Sr Daniel Hui PFMD Council Chairman

## Research on the Application of Radio Frequency Identification (RFID) Technology to Facilitate E-waste Collection and Recycling by Sr Shelley Chan

### The Producer Responsibility Scheme (PRS) on Waste Electrical and Electronic Equipment (WEEE)

The Producer Responsibility Scheme (PRS) on Waste Electrical and Electronic Equipment (WEEE) was implemented in August 2018. It aims to promote recycling and the proper disposal of eight types of electrical or electronic equipment in Hong Kong: air conditioners, refrigerators, washing machines, televisions, computers, printers, scanners, and monitors. However, there are questions over the efficiency of the WEEE's collection methods.

### Research

To create a better understanding of the current practice of e-waste collection and enhance its efficiency and traceability, the PFMD was honoured to invite Ir Professor Winco KC Yung and his team from the Hong Kong Polytechnic University (Green Manufacturing & Eco-Design Research Group of the Industrial Systems Engineering Department) to examine the application of RFID technology to facilitate e-waste collection and recycling. The group's project included the following three analyses.

- I. A study of the current e-waste collection methods and their recycling efficiency and traceability
- II. A feasibility study of the application of RFID technology to enhance e-waste collection, recycling efficiency, and traceability

### III. Case studies of the application of RFID technology by e-waste recycling companies

After the PRS's launch, it was found that the promise of free statutory removal services by a licenced recycler within three working days after a request is received could not be met. This led to the illegal disposal of REEs along roadsides and at unlicensed shops. What are the reasons behind this? What are the difficulties for households and recyclers?

Professor Yung and his team studied the three major ways to dispose of e-waste. They are:

- Household pickup service
- Private housing estate disposal
- Community green station



(a) Household Pick-up Service



(b) Private Housing Estate Disposal



(c) Community Green Station

Three Major Approaches to the Disposal of E-waste

### Challenges

A study of the current market practices revealed the following issues:

- A lack of recyclers offering collection services for air conditioners and refrigerators
- A lack of effective communication between households, recyclers, and retailers



Effective Communication between Households, Recyclers, and Retailers is the Key to a Seamless Collection Process

### Solutions

Based on the above findings on Hong Kong's market practices, Professor Yung and his team suggested using RFID to accelerate the collection and recycling process.

The key element is the RFID tag, each of which contains a unique electronic product code that is loaded with information on the soon-to-be e-waste such as product type, size, and weight. The retailer would give the tag to the buyer (household).



Recycling Label with RFID Tag

A booking system with both recycler and consumer interfaces has been developed to process and record all RFID tag information. Buyers and retailers can then arrange for the collection service by scanning the RFID tag. Recyclers can check the information against that in the system. This should largely reduce the communication breakdown between the aforementioned stakeholders and enable a seamless collection process.

### Sharing Session

A sharing session on the research findings was held on 1 February in Surveyors Learning Centre. Professor Yung and his team enlightened the audience with details on how the recycling industry operates. Participants from both the property management and recycling industries then had a fruitful discussion. The presentation material is shared at the following link [https://www.hkis.org.hk/en/professional\\_cpd2.html?id=4549](https://www.hkis.org.hk/en/professional_cpd2.html?id=4549).

### Proposed CPD Events for 2019

A series of CPD events has been planned and members are encouraged to attend them to enrich their technical knowledge. They are listed below. More CPD events are still being arranged and the PFMD will update members on their details.

Date	Topic	Speaker
5 June 2019	Mediation in Building Management Disputes (Section 1)	Sr Eric Ting
5 August 2019	Mediation in Building Management Disputes (Section 2)	Sr Eric Ting
TBC	Technical Site Visits to QPFMA 2018 Properties	TBC
September	How to Run a Shopping Mall Successfully	TBC
TBC	Technical Site Visit to a Residential Care Home for the Elderly	TBC
TBC	Technical Site Visit to a Heritage Project Site	TBC
TBC	Accounting and Finance for Property & Facility Management	Sr Benny Kwok