# 2019 Knowledge Sharing Seminars

ADB

**October 22-25, 2019**

**Asian Development Bank**
**Manila, Philippines**

Chinese Institute of Engineers (CIE)

2019 Knowledge Sharing Seminars

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# *Preface*

The Chinese Institute of Engineers (CIE) is one of the most historic engineering institutes in Asia. As of today, the CIE has around 20,000 individual members and 90 group members, from engineering industries, government agencies, research institutions and individual experts. The main activities of the CIE include, among others, 1) to encourage communication and to promote mobility among engineers in different disciplines worldwide, 2) to conduct trainings and seminars on research and application of advanced engineering technologies, and 3) to assist government in promoting sustainability of the environmental and economic development.

Internationally, CIE is the National Member to the World Federation of Engineering Organization (WFEO), Member Economy to Federation of Engineering Institutions of Asia and the Pacific (FEIAP) and Member Economy to the International Professional Engineers Agreement, (IPEA), (formally the Engineers Mobility Forum Agreement). As a member of international society of professional engineers, CIE devotes itself as its duty and obligation in sharing with other countries and economies with similar nature, of its knowledge and past experiences gained along the economic development. Our engineering industries are also ready to participate in the potential markets of these developing countries.

To fulfill such duty and obligation, and to develop such opportunity, CIE's delegation visited the Asian Development Bank (the Bank) in November, 2016. Through dialog meetings with the Bank's officials and consultants, the consensus was reached that a seminar would be held in the Bank, while CIE would provide lectures focusing on 'Water Resource Engineering'. On June 17, 2017, the Bank and CIE jointly administered the seminar, viz., Improving Water Security through Intelligent Water Management - Taiwan's Success Stories, specially focused on two topics, 1) Renovation of the Shihmen Reservoir for Sustainability, and 2) Integrated Hydrological Analysis Platform for Flood Prevention Design and Water Resource Development. The lectures, based on the feedback survey conducted, were well rated and the contents are deemed acceptable. Therefore, similar lectures and presentation with wider scopes, such as transportation, environment, etc., were recommended to continue by both ends.

Upon various exchanges on emails and telecommunications between the Bank's officials and CIE's secretariat, the "2018 Knowledge Sharing Seminar" was then conducted on July 5 to 6, 2018 in the Bank. Other than experts and consultants from the Bank, the Seminar was expanded to inviting participants from representatives of Indonesia and the Philippines. The themes and topics are

listed below, for which the contents successfully generated interactions and discussions among all participants.

Theme I：Development of Smart City and Smart Mobility

- ITS Development in Taipei
- Experience on Smart Bus Operation in Taiwan
- A Successful PFI & PPP Model of Smart Street Light

Theme II：Water Resources Development and Management

- Overview of Taiwan Water Loss Management and Smart Water Management
- Flood Control Management in Taiwan (Case of Yuan-Shan-Tsu Flood Diversion Project)

Having successful experiences in 2017 and 2018, the Bank welcomes CIE to continue holding the "2019 Knowledge Sharing Seminar" (the Seminar) in the Bank. A series of video conferences and exchanges in emails in February and May respectively were conducted and confirmed three themes to be included in the Seminar, viz., "Water Supply System of Taipei City", "Trash Collection and Treatment of Taipei City" and "The Development of Smart Transportation in Taipei" as indicated in the following chapter.

In order to continue jointly organizing technical seminars with the Bank for introduction of the strengths and effectiveness, and share the experiences of engineering sector of Taiwan in the following years, CIE proposes to the Bank for signing a Memorandum of Understanding (MOU) with the Sustainable Development and Climate Change Department (SDCC) of the Bank to establish a partnership and arranging the seminar on an annual basis. The Bank agrees that the knowledge sharing seminars are beneficial to facilitate best practices for infrastructure development of other members. Therefore, by taking the occasion of holding the 2019 Seminar in ADB, both sides agree to complete the signing of the MOU. We believe that the MOU will serve as a commitment to work together between CIE and the Bank for promoting best practices of infrastructure development schemes in the Region.

# Theme I

## Water Supply System

# 2019 Knowledge Sharing Seminars

## October 23, 2019
## Theme Ⅰ : Water Supply System

| Time | Topic / Speaker |
|---|---|
| **10 : 00 ~ 10 : 10** | Opening Remarks<br>ADB |
| **10 : 10 ~ 11 :10** | ***Sustainable Management of Feitsui Reservoir***<br>▪ Shih-Chin HUANG<br>Division Chief of Dam Safety, Taipei Feitsui Reservoir Administration<br><br>***Introduction of Taipei Tap Water Policy and Renovation Project***<br>▪ Chuan-Chiang FAN<br>Director, East District Business Office, Taipei Water Department<br>▪ Chang-Yuan HSIEH<br>Engineer, Water Works Department, Sinotech Engineering Services, LTD. |
| **11 : 10 ~ 11 : 50** | Discussion |
| **11 : 50 ~ 12 : 00** | MOU Signing |

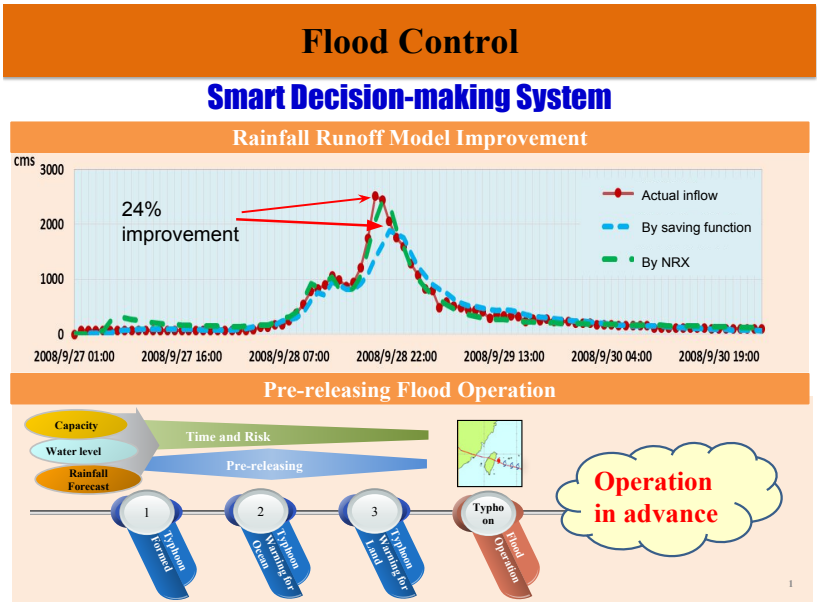
## *Sustainable Management of Feitsui Reservoir (Taipei Feitsui Reservoir Administration)*

Feitsui reservoir, the second largest reservoir in Taiwan, regulates Pei-Shih Creek and is located about 30 km from Taipei City. The service population of Feitsui Reservoir is about 5 million and will reach as many as 6 million in the near future. In other word, one quarter of the population in Taiwan will rely on this water source. Therefore, sustainable management of Feitsui Reservoir will become more and more important in the future.

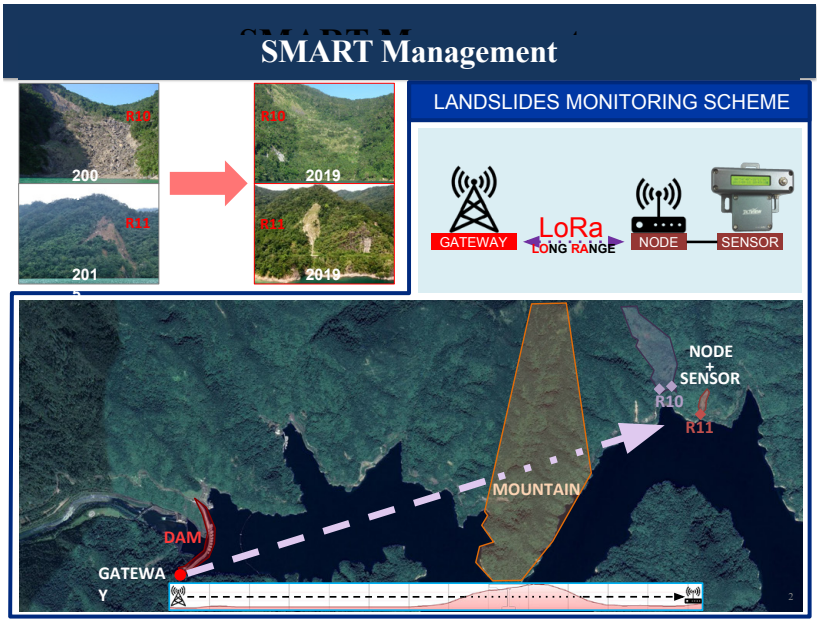
As to reservoir management, safety always comes first. Since the reservoir is located about 30 km from metropolitan Taipei area, we pay more attention on dam safety. The robust dam safety surveillance system with a 3D model collects and analyzes data from hundreds of instruments every hour, and the strong motion monitoring system detects and records ground motions in the reservoir. With the aids of our smart decision making system, we will be informed to take actions immediately as long as the system issues warnings.

Sediments control is the key factor to measure the lifetime of a reservoir. After more than 30 years of operation, the rate of silting of Feitsui Reservoir is only 6.54%. We develop a strategy called “Storing the clear and releasing the muddy”. By monitoring the turbidity distribution, we can determine when to discharge sediments by hydraulic desiliting. We also develop smart reservoir operation techniques to accomplish sustainable management. Applying a new RNARX neural network technique, we improve our rainfall runoff model to optimize the reservoir operations with the pre-discharge strategy.

▲ *Feitsui Reservoir and Associabed Facilities*




▲ *Landslides Monitoring*




▲ *Smart Operations*

Internet of Things (IoT) technology plays a more important role in reservoir management. We apply LoRa (Long Range) technology in vehicles tracking and landslides monitoring to ensure our safety of reservoir. Also, LoRa technology also helps enhance the reliability of data transmission.

For sustainable management of Feitsui reservoir, we keep seeking for balance between reservoir management and wildlife conservation. We preserves diverse ecological resources before the reservoir started to operate. According to ecological surveys, there are 553 species of fauna and flora in the reservoir. We dedicate to conserve endemic species, such as emerald green tree frogs and yellow-margined box turtles.

## *Introduction of Taipei Tap Water Policy and Renovation Project*

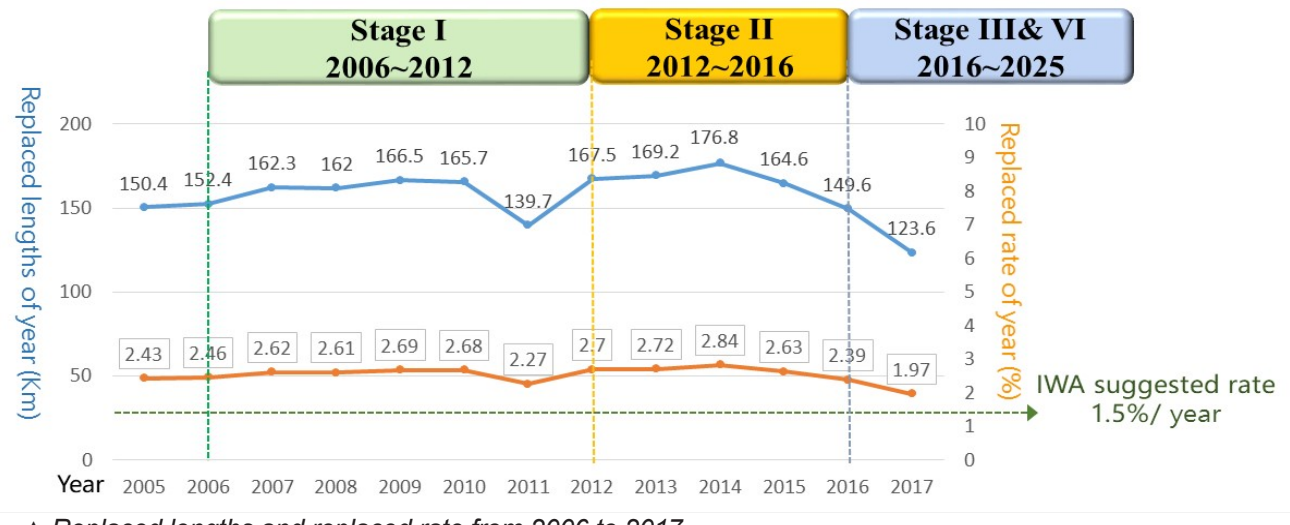
Taipei Water Department (TWD) supplies tap water to 11 regions inside Taipei city and a part of New Taipei city. The water supply system in Great Taipei Area consists of three major water purification plants, 3,977 km distribution pipeline in distance as well as over 80 boosting stations. Among the major water purification plants, Zhitan Purification Plant with design capacity of 3.4 million CMD supplies about 77% water to the households.

The water fee is composed of basic fee and usage fee. Basic fee increases proportional to the diameter of the household's flow meters. Usage fee is mainly divided into 5 levels, calculated by progressive rates. The average water fee is adjusted from 0.3 USD/M3 to 0.385 USD/M3 in 2016. The percentage of population served is 99.66% in 2018.

To build a livable and sustainable city, TWD has put a lot of efforts in providing drinkable tap water, providing better citizen services, and ensuring clean water resources. Measures has been taken by TWD include:

1. Continual renewing devices in water purification plants, which has increased the operating reserve rate by 23% since 2006.

2. All water quality tests from water source to final use, including water purification units and pipeline network, can meet Taiwan's drinking water quality standard.




▲ *Replaced lengths and replaced rate from 2006 to 2017*

3. From 2005 to 2017, 1,900 kilometers of pipelines were replaced. The average annual replacement rate is 2.54%, and the leakage rate is reduced by 12.8%. The rate of non-revenue water has decreased from 44% to 21.5% since 2002.

4. Smart water meters, transmitters and mobile devices were built by TWD. They can provide TWD managers with instant information and strategic analysis. The detected pressure signal shall be feed-backed to control the frequency converter and make the pressure in the pipeline network homogeneous to reduce leakage.

In addition, some of water supply facilities and pipeline infrastructure have been used for over 40 years. Due to facility aging, structure deformation, or pipeline leakage resulting from topography effect or poor material quality, and also because of higher regulation

▲ *Zhitan purification plant*


▲ *Mixers and scrapers replacement in water purification plant*

standard compared to the past, the older water facilities are getting harder to comply with present regulation and subject to more energy consumption. Therefore, the key factors to future sustainable development rely on performance upgrade and life extension. TWD will set out the Water Supply System Renovation Project to repair or rebuild water supply facilities. The phase I project will be a 15-year-plan, and it will invest 600 million US dollars for renovation to attain the following aims:

1. To achieve functional stability and ensure structural safety by complying with the newest seismic design specifications.
2. To elevate the operating efficacy of each system and conform with the functional demand.
3. To strengthen the connections, back-up ability and operating reserve rate between systems.
4. To extend the life cycle of pipeline for transporting and distributing water.
5. To ensure the implementation of standard operation and maintenance (O & M) procedure for the further goal of device life extension and complete asset management.

# Theme II

# The Development of Smart Transportation

# 2019 Knowledge Sharing Seminars

October 23, 2019

Theme Ⅱ : The Development of Smart Transportation

| Time | Topic / Speaker |
|---|---|
| **14:00 ~ 14:10** | Opening Remarks<br>ADB |
| **14:10 ~ 15:00** | ***Operation and Integration Experiences of Fully Automated Metro in Taipei***<br>▪ James HUANG<br>Deputy Director of Information Technology Division, Taipei Rapid Transit Corporation<br>▪ Wei-Joung CHU<br>Deputy Manager of Operations Center (Circle Line), Taipei Rapid Transit Corporation (TRTC)<br><br>***Communication Transformation of Driverless Metro System in Taiwan***<br>▪ Eric CHANG<br>CEO, GLORY Technology Service Inc.<br>▪ CH TSENG<br>Vice General Manager, GLORY Technology Service Inc. |
| **15:00 ~ 16:00** | Discussion |

## *Operation and Integration Experiences of Fully Automated Metro in Taipei*

With almost 40 years of operating experience, the automated metro system has proven its maturity and accumulated extensive operating experience. There are currently more than 1,000km of automated metro in operation on 65 lines in 42 cities around 19 countries.

Planning of the Taipei Mass Rapid Transit (MRT) System began in 1975. Following the approval of the initial Taipei MRT network in April 1986, the Department of Rapid Transit System (DORTS) was formally established on February 23, 1987, as a task-force unit under the jurisdiction of Taipei City Government. Taipei Metro, a metro system serving Taipei City and New Taipei City in Taiwan, is operated by government owned Taipei Rapid Transit Corporation which was incorporated on July 27, 1994.

Since the opening of the first line on March 28, 1996, the Taipei metro system network now has expanded to 5 lines, totaling to 131.1km with 117

▲ *Circular line*

◄ *Wenhu line*

stations. Meanwhile, after 22 years of revenue service, the overall ridership has reached 10 billion people on March 31, 2019 and the daily ridership is over 2.2 million beginning 2019.

A 10.5 km-long driverless automated system Muzha line, the first metro system in Taipei, was introduced with 12 stations in 1996 and extended to 25.2km-long Wenhu line with 24 stations in 2009. Another 15.4 km-long Circle line will join the metro services with 14 stations at the end of this year. The keynote will share the operation and retrofit experience of the driverless system in Metro Taipei and introduce the Circle line which is an integrated system of Track circuit and CBTC as well as present the collision avoidance logic of Circle Line.

The outline of the keynote：

- Introduction of Metro Taipei

  Describing the development of Taipei metro system and its world class performance

- Fully Automated system of Wenhu Line

  Introducing the first metro system in Taipei and its transformation from a fixed-block system to a moving-block system

- Integration Experience in System Retrofit

  Sharing the upgrading experience of retrofitting the driverless signaling system without interrupting the daily operation

- CBTC with Track Circuit in New Circle Line

  Presenting the advantages of integrating both CBTC and Track Circuit in a new fully automated metro system

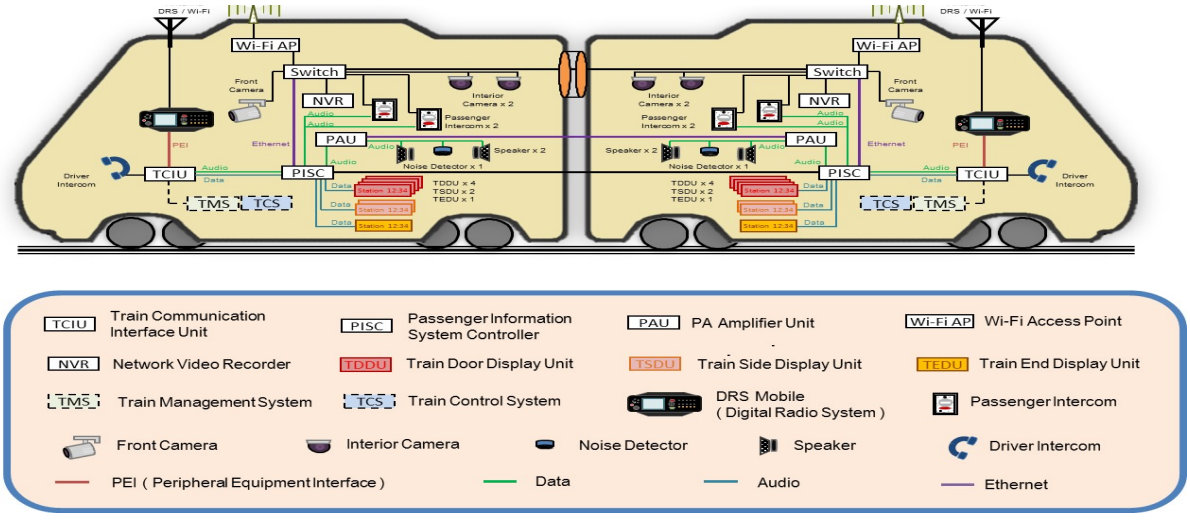
## *The Communication Transformation of Driverless Metro System in Taiwan*

- The communication in CBTC Signaling
  (Communication Base Train Control)
  Describing the communication transformation of signaling system toward the CBTC in Taipei Metro
- Integration Experience in System Retrofit

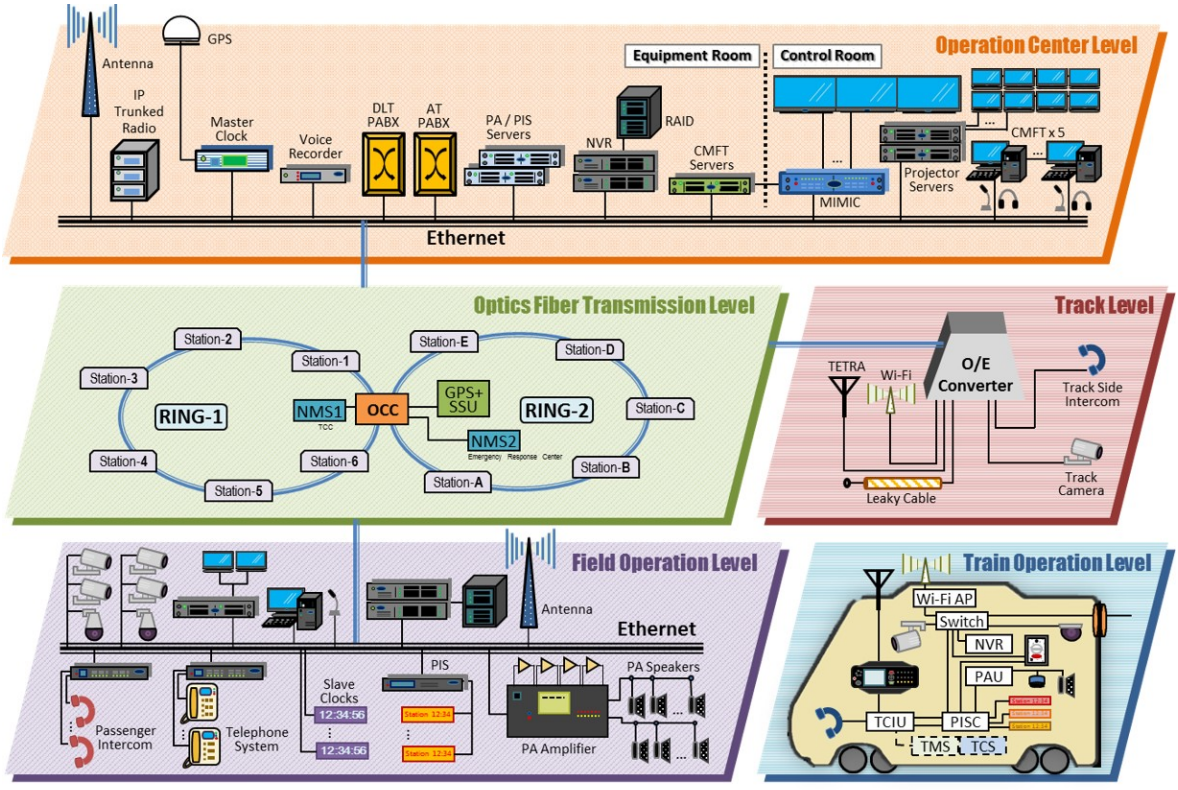
  Sharing the upgrading experience of retrofitting the driverless signaling system to CBTC related communication challenge
- Communication transformation in Taipei Metro

  Presenting the communication transformation from analogue base to packet base in different time zone in Taipei Metro
- Communication transformation in Taiwan Railway

  Sharing the potential selection of the communication system for retrofitting the existed aged system in Taiwan Railway




▲ *On Train Communications System*




▲ *Metro Communications System*

# Theme III

## Trash Collection and Treatment

# 2019 Knowledge Sharing Seminars

## October 24, 2019
## Theme Ⅲ : Trash Collection and Treatment

| Time | Topic / Speaker |
|---|---|
| **10 : 00 ~ 10 : 10** | Opening Remarks<br>ADB |
| **10 : 10 ~ 11 : 10** | ***Waste Management in Taipei City***<br>▪ Minhau LI<br>Chief of Waste Treatment Division, Department of Environmental Protection Taipei City Government<br>▪ Ming-Tsun (Kevin) LIAO<br>Project Director, Professional Engineer (PE) of Environmental Engineering<br><br>***The Development of Energy-from-Waste (EfW) Plants in Taiwan***<br>▪ Richard L.C. Huang<br>Manager, Marketing and Sales, ECOVE Environment Services Corporation |
| **11 : 10 ~ 12 : 00** | Discussion |

## *Waste Management in Taipei City*
## *( Per Bag Trash Collection Fee & Waste To Energy )*

In the 1970s, most people in Taipei dumped their garbage randomly, which affected environmental sanitation. Taipei City Government then had adopted several waste disposal methods: from open dump, sanitary landfill to incineration over time. In the 2000s, Taipei City Government had promulgated a policy named "Per bag trash collection fee", and had executed mandatory recycling, kitchen waste recycling, plastic bags and single-use utensil bans. Taipei City Government had also promoted dual-use bag and furniture repair service. The cumulative effort had led to a reduction of 65% in household waste.

To achieve the goals on zero burial, Taipei City Government had carried out projects of the recovery of incinerator buttom ash, fly ash, and sludge as alternatives of construction materials. The Government will continue to promote the anaerobic digestion for food waste, bio-gas power generation, fine separation of incinerator buttom ash, construction of waste sorting sites, with an intent to move towards the goal of zero waste in material and energy recycling.

In the past, the amount of household waste used to be 2,970 TPD. Incineration was mainly adopted as waste disposal method with landfill


▲ *Fig. 1 History and effect of waste treatment in Taipei City*


▲ *Fig.2 Right position in a week*


▲ *Fig.3 Dual-use shopping bage*

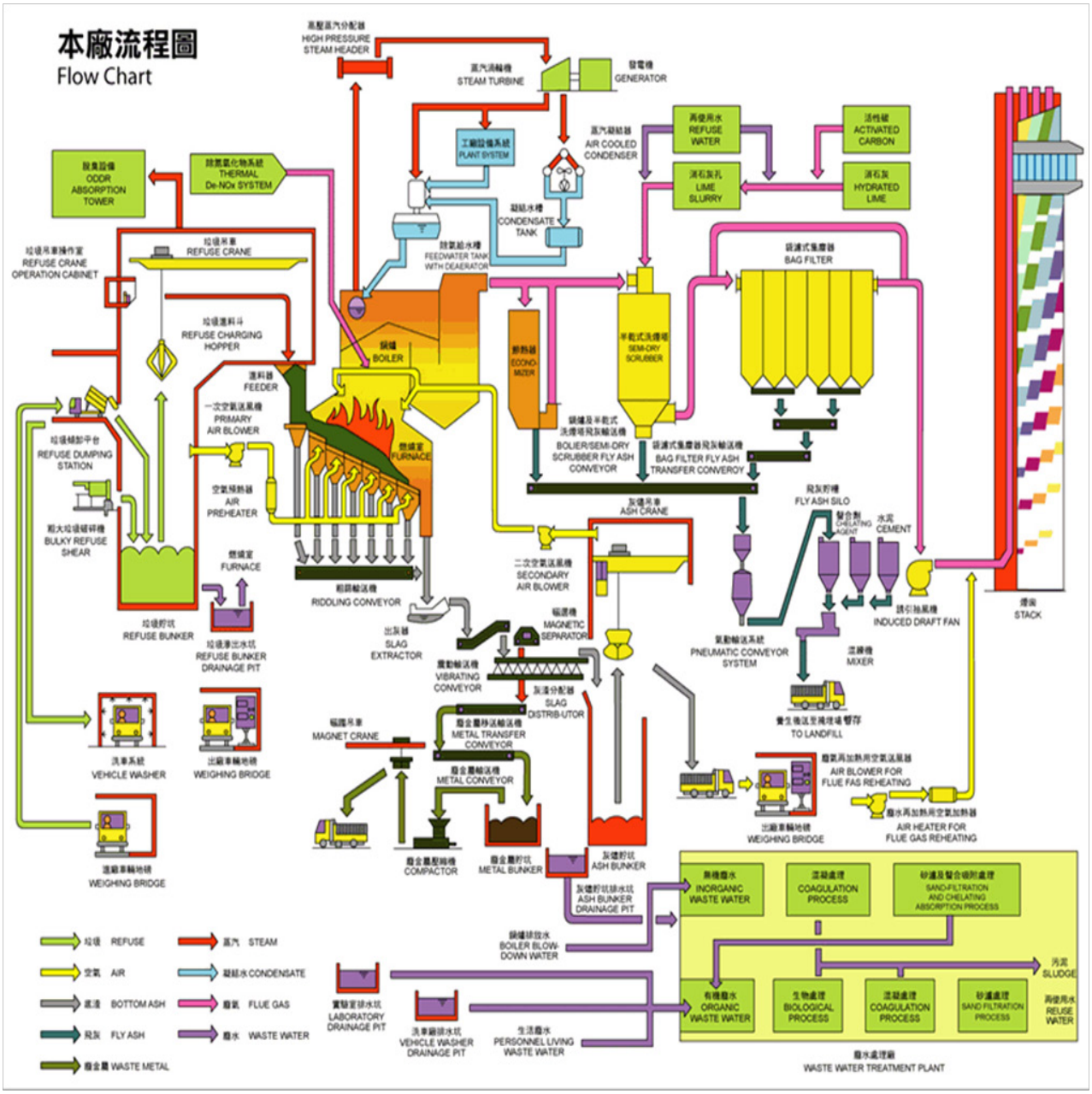
as an auxiliary method. However, due to the scarcity of land, Per bag trash collection fee was executed in July 2,000. After 20 years, household waste reduction reached 65%, while the resource recovery rate was increased from 2% to 64%; in addition to achieving the goal of zero burial, it was also unnecessary for incineration plant expansion due to the achievement in waste reduction also.

In recent years, in order to further promote the source reduction, Taipei City Government continue to promote the policy of banned disposable utensil and dual-use bag. In the meanwhile, the Government also plan to construct anaerobic digestion for kitchen waste. Towards the goals on waste reduction, material reuse, and waste energy recovery, the Government will achieve the vision of making Taipei City a livable and sustainable city.

## *The Development of Energy-from-Waste（EfW）Plants in Taiwan*

Taiwan has limited lands but large population. For the development of the metropolitan area, the government has promoted waste incineration since 1979 to achieve rapid volume reduction and stabilization of waste, and to effectively control air pollution. Currently, there are 24 operating incineration plants in Taiwan, with treatment capacity of 24,650 tons per day and power generation of 560 MW.

▲ *Fig. 1 Beitou Refuse Incineration Plant in Taipei City*




▲ *Fig.2 Flow chart of Beitou Refuse Incineration Plant*

In the early stage of promoting incineration plant, the government budgeted and contracted the construction. Later, in order to upgrade the domestic environmental engineering technology and support related industries, public-private partnership (PPP) is introduced for the construction and operation of the incineration plant.

Because all the incineration plants have been continuously operating for more than 15-20 years. Therefore, retrofit solutions are proposed to meet the future waste disposal requirements, stricter environmental protection standards and also for energy conservation and carbon reduction.

By observing the development trend of incineration plants, in addition to the waste disposal, the more attention is paid to heat recovery and power generation. Taiwan has set a preferential renewable energy feed-in tariff (FiT) to encourage the retrofitted plants or new plants to pursue maximum power efficiency. Moreover, as the idea of circular economy becomes mainstream, the government also plans to promote various waste treatment technologies, such as the development of Solid Recovered Fuel (SRF), anaerobic digestion of kitchen waste to produce biogas energy, and upgraded treatment to produce high quality incineration bottom ash aggregate, etc., in order to achieve a comprehensive effect of proper treatment and resource regeneration.

At present, the main orientation of incineration plant retrofit in Taiwan is to extend the life cycles. In recent years, large-scale improvement engineering will be carried out successively. The primary goal is introducing new air pollution control technologies to reduce the emission amount, and replace old equipment to restore the availability. It will ensure the waste treatment capacity in the next 15 years, and safe government expenditure.

In the long run, it follows the concept of "renew/reconstruction cycle". Before the life cycle of retrofitted plants end, rebuilding projects will begin, applying state-of-the-art incineration technology, and enhancing the efficiency of incineration power generation. The integration with biogas plant and incineration bottom ash treatment plant will complements the gap in the resource cycle and moves towards sustainability.

# Delegation List

## *Ching-Jong LIAO*

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**Education:**

- Ph.D., Dept. of Industrial Engineering, Pennsylvania State University
- M.S., Dept. of Management Science, Illinois Institute of Technology
- Diploma, Dept. of Industrial Management, Ming Chi Institute of Technology

**Affiliation or Company Name:**

- President, Chinese Institute of Engineers
- President, National Taiwan University of Science and Technology (Taiwan Tech)
- President, Association of National Universities of Science and Technology of Taiwan
- Director of the Board, Industrial Technology Research Institute (ITRI)
- Chair Professor, Dept. of Industrial Management, Taiwan Tech
- Editor-in-Chief, Journal of the Chinese Institute of Engineers
- Executive Director, Institute of Engineering Education Taiwan (IEET)

**Experience:**

- Vice President, Taiwan Tech
- President, Chinese Institute of Industrial Engineers (CIIE)
- Chairman, Industrial Engineering Program, National Science Council

**Honors:**

- Distinguished Research Fellow, National Science Council, Taiwan
- Distinguished Research Award, National Science Council, Taiwan
- Corresponding Member, International Academy of Engineering,
- Excellent Teaching Award, Ministry of Education
- Fellow, Asia Pacific Industrial Engineering and Management Society (APIEMS)
- Fellow and Distinguished Industrial Engineer Award, CIIE

**Publications:**

- Nearly 100 papers published in SCI journals

## *Taff TU*

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**Education:**

- Master of Business Administration, National University of Singapore, 1999
- Graduate, Civil Engineering Dept., National Taipei University of Technology (formerly, National Taipei Institute of Technology), 1973

**Affiliation or Company Name:**

- Chairman, International Relations Committee, Chinese Institute of Engineers
- Deputy CEO, Chinese Taipei APEC Engineer/IPEA Monitoring Committee, Chinese Institute of Engineers

**Experience:**

- Deputy Secretary General, Chinese Institute of Engineers
- Senior Vice President, Sinotech Engineering Consultants Ltd.

**Specialty:**

- Management on Infrastructure Development Project
- Contract Management of Engineering projects
- Planning, Design and construction management of Water and Sewerage Systems
- Urban and Rural Infrastructure Development Planning

## *Yi-Chang CHEN*

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**Education:**

- Master, Department of Civil Engineering, National Taiwan University, 1997
- Master, School of Law, Soochow University, 2016

**Affiliation or Company Name:**

- Section Chief, Public Construction Commission, Executive Yuan

**Experience:**

- Technical Specialist, Department of Technology, Public Construction Commission, Executive Yuan
- Planning educational and training programs for professionals engaged in public construction.
- Supervising professional services provided by engineering consulting firms and professional engineers engaged in public construction.

**Specialty:**

- Professional Engineer (Structural Engineer)
- Trade in Professional Services

## *Shih-Chin HUANG*

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- Master, Laws, National Chengchi University, 2011

**Affiliation or Company Name:**

- Division chief of dam safety, Taipei Feitsui Reservoir Administration

**Experience:**

- Division chief of reservoir management, Taipei Feitsui Reservoir Administration
- Professional Engineer (Civil Engineer)
- Professional Engineer (Structural Engineer)

**Specialty:**

- Structural analysis and design in steel reinforced concrete (SRC)
- Watershed management
- Dam safety evaluation
- Construction laws


## *Chuan-Chiang FAN*

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**Experience:**

- Project Engineer, China Engineering Consultants, INC.
- Design Section Chief of Engineering Division, Taipei Water Department
- Vice Chief Engineer of Engineering Division, Taipei Water Department

**Specialty:**

- Management on Infrastructure Development Project
- Contract Management of Engineering projects
- Planning, Design and construction management of Water Supply Systems
- Bridge Engineering

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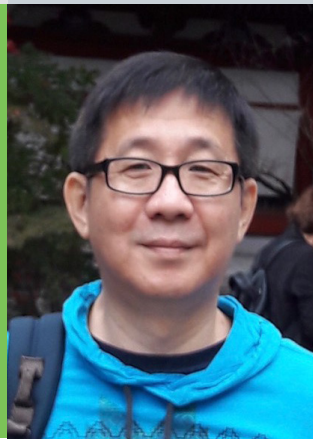
**Experience:**

- Engineer, Water Works Department, Sinotech Engineering Services, LTD.
- Engineer, Department of Environmental Engineering I, Sinotech Engineering Consultants, LTD.

**Specialty:**

- Water and wastewater treatment design
- Wastewater treatment plan operation management



## *James HUANG*

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- Master, Mechanical Engineering, University of California - Santa Barbara, USA, 1992
- Bachelor, Mechanical Engineering, Tamkang University, Taiwan, 1986

**Affiliation or Company Name:**

- Deputy Director of Information Technology Division, Taipei Rapid Transit Corporation

**Experience:**

- Manager of Wenhu Line Operation and Control Center, Operation Division
- Manager of Business Division
- Chief of Gondola Operation Center
- Control Center Supervisor of Muzha Operation Division

**Specialty:**

- Management on Metro Operation
- Management on Cable Car Operation
- Management on Metro Affiliated Business
- Project Management on Fully Automated System Extension and Retrofit
- Consultant for Taoyuan International Airport People Mover System and Sun Moon Lake Ropeway System


## *Wei-Joung CHU*

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**Education:**

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**Affiliation or Company Name:**

- Deputy Manager of Operations Center (Circle Line), Taipei Rapid Transit Corporation (TRTC)

**Experience:**

- Deputy Manager of Operations Center (Circle Line)
- Senior Engineer, Consultant (expatriated by TRTC) for Taoyuan MRT
- Deputy Manager of Operations Center (Wenhu Line)
- Planning Section Manager
- Consultant for PMS, Taiwan Taoyuan International Airport
- Chief Controller of Muzha line

**Specialty:**

- Responsible for supervising the establishment of Circle Line control center
- Supervision, surveying, integration testing, opening and operation consultant for Taoyuan MRT
- In charge of Operations Center (Wenhu Line), including establish and implement departmental policies, goals, objectives, and procedures
- Participating the verified and operation of Muzha Line, the first driverless MRT system in Taiwan

## *Eric CHANG*

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**Education:**

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- Ph. D, Civil Engineering, National Taipei University of Technology
- Master, Institute of Industrial Engineering, National Taiwan University
- Master, Business Administration, National Tsing-Hua University

**Affiliation or Company Name:**

- CEO, GLORY Technology Service Inc.
- General Secretary, Taiwan Smart City Association
- Managing Director, New Taipei City Computer Association

**Experience:**

- Supervisor, Taiwan Intelligent Fiber Optical Network Co., TAIFO
- Managing Director, Taiwan Safety And Security Industry Association, TSSIA
- Director, Subsidiary of Alcatel-Lucent (Taiwan) (Now, Nokia Taiwan), 5 years
- Sr. Director, Subsidiary of Kajima Co. (Taiwan), 12 years

**Specialty:**

- Project Management experiences on Railway Civil Projects, including Taipei DORTS MRT projects, Kaohsiung KRTC project, and THSR High Speed Railway projects
- Procurement and Contract Management of Infrastructure projects, including Metro, High Speed Railway, Power Plant, and High-tech Factory projects

## *CH TSENG*

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**Education:**

- Bachelor of Science, Electronic Engineering, Fu-Jen University Taiwan, 1984

**Affiliation or Company Name:**

- Vice General Manager, GLORY Technology Service Inc.

**Experience:**

- Project Director of Manila Metro Rail Transit Line 3 Rehabilitation Project
- Onboard PA system
- Project Director of BKK Red Line Radio and Train Communications systems
- Consultant of Taipei Wanda Line Optics Transmission, Telephony, Radio and Train Communication systems
- Lead of Strategic Industries - Public Sector, APAC, Alcatel-Lucent
- Solution Architecture of SID Public Sector, Global, Alcatel-Lucent
- Solution Engineering of Taiwan island-wise Emergency Disaster Prevention and
- Rescue Communication system
- Solution Engineering of Taiwan island-wise Train Detection system

**Specialty:**

- Project Management on Metro Communications system
- Solution Architect on Public Safety Communications system
- Solution Architect on Railway Communications system

## *Minhau LI*

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**Education:**

- Master, Civil and Construction Engineering, National Taiwan University of Science and Technology, 2010

**Affiliation or Company Name:**

- Chief of Waste Treatment Division, Department of Environmental Protection Taipei City Government

**Experience:**

- Sub-division Chief of Waste Treatment Division
- Subsection Leader of Environmental Cleaning and Maintenance Division

**Specialty:**

- Public Policy on City Waste Management
- Planning on Waste Treatment Facility
- Human Resource Management on Environmental Cleaning

## *Ming-Tsun (Kevin) LIAO*

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**Education:**

- Master, Environmental Engineer, National Chung Hsing University, 1991

**Affiliation or Company Name:**

- Project Director, Professional Engineer (PE) of Environmental Engineering, Sinotech Engineering Services, LTD.

**Experience:**

- Project manager, Engineering Services, LTD.
- Senior Engineer/Project manager, Sinotech Engineering Consultants, Inc.

**Specialty:**

- Planning and Design of Incineration Plant
- Planning and Design of Incinerator Bottom Ash Sorting Plant
- Planning and Design of sanitary landfill
- Project Management of Environmental Engineering

## *Richard L.C. Huang*

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**Education:**

- Master, Engineering Management, Drexel University, USA
- Master, Environmental Engineering, Drexel University, USA

**Affiliation or Company Name :**

- Manager, Marketing and Sales, ECOVE Environment Services Corporation

**Experience:**

**January 2014 to Present, Manager, Marketing and Sales**

- Developing overseas projects in South-East Asia, India, Middle East, South America and Europe
- Participated in bidding a 2,400 tpd DBOO WTE project in Singapore
- Bidding a 1,000 tpd BOT WTE project in Kuala Lumpur of Malaysia

**January 2012 to December 2013, Senior Director, Development and investment for overseas PV projects**

- Developed PV projects in emerging markets including Japan, Mongolia, Africa, and Middle East
- Grid connected a 2.3 MWp PV project in Japan for Japan's first round FIT scheme

**September 2005 to January 2012, Director, Development of GHG program in Taiwan**

- Completed the first validation/verification project in Taiwan against Voluntary Carbon Standard
- CDM Lead Assessor
- International tutor for ISO14064, the ISO standard to implement GHG inventory, project, validation and Verification

**October 1996 to August 2005, Senior Project Manager, Development of BOT/ BOO project in Taiwan**

- Financial closing for a 300 TPD BOO WTE project in Taiwan
- Participated in 6 other WTE BOT/BOO projects in Taiwan


## *Yingfen LIN*

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**Education:**

- PhD Economics, University of Sheffield, UK
- MSc Statistics and Management Science, University of the West of England, UK

**Affiliation or Company Name:**

- Senior Planner, International Division, Institute for Information Industry

**Experience:**

- Senior Planner, International Division, Institute for Information Industry
- Tutor, Statistical Methods for Economics, University of Sheffield, UK

**Specialty:**

- International Business Collaboration and Foreign Relations
- Statistics and Quantitative Analysis
- Labour Economics in Female Relative Labour Market Outcomes

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**Education:**

- **M**aster of International Business, California State University, 1999
- BA, General Business, University of Central Oklahoma, 1997

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- Chinese Institute of Engineers

**Present Position:**

- Secretary

**Experience:**

- Specialist, Chinese International Economic Cooperation Association

MEMO

# 2019 Knowledge Sharing Seminars


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