

**工業技術研究院**

Industrial Technology  
Research Institute

# **Advanced Metering Infrastructure Development in Chinese Taipei**

**Morris Liang**

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Industrial Technology Research Institute**

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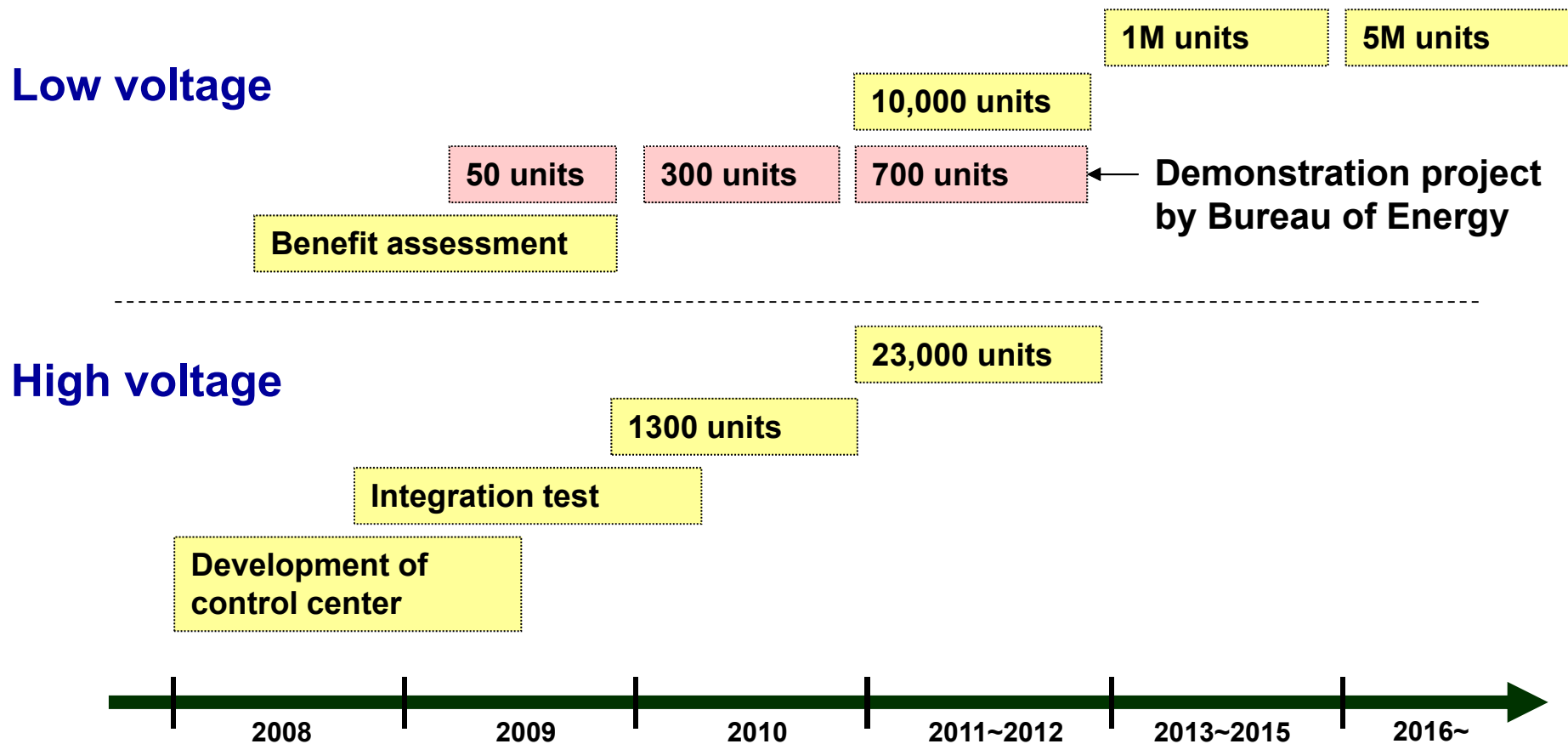
**2011/08/24**



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# Roadmap of AMI Deployment





# Demonstration Project

- **Start in 2009**
- **50 and 300 meters are installed in 2009 and 2010**
- **400 meters will be installed with few IHDs in 2011**
- **ITRI is responsible for the project**
- **Team members**
  - **III, Archmeter, eMeter, Tatung, Delta Electronics, Works Systems, etc.**

# Filed Test in Taipei

154 meters installed in 2010



**場域1A-大樓**  
光復北路199號  
58戶 (PLC)

**場域1C-大樓**  
光復北路181號  
28戶 (ZigBee)

**場域1B-透天厝**  
民生東路五段27巷9弄  
22戶 (ZigBee/PLC)

**場域2A-公寓**  
民生東路五段39號  
74戶 (ZigBee)

# Field Test in HsinChu

154 meters installed in 2010



- 雙併透天28戶：
  - 採用 PLC
- 公寓住宅49戶
  - 採用 Wi-Fi技術



## WAN規劃

- 集中器之間採RF Mesh
- 上固接網點玖鼎電力
- 兩區RF中繼點新桃營運處



科學園區(77戶)

- 雙併透天23戶
- 大樓公寓54戶
  - 採用 PLC, BPL及 Wi-Fi技術





# Project Team Mebers



- Meters by Tatung, ChungHsin, Archmeter, Delta

- PLC by Archmeter

- BPL by Billion, AcBel

- WiFi by Zyxel

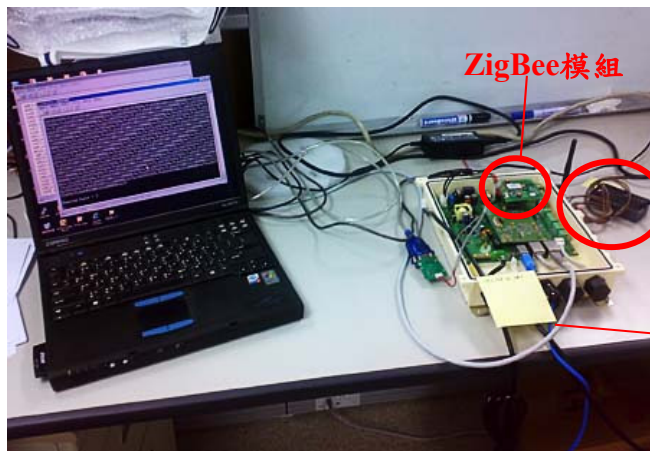
- Zigbee by III

- Concentrators by Archmeter, Delta, AcBel

- Communication Servers by Works Systems, Zyxel

- MDMS and System integration by eMeter, ITRI and III

# Integration Test in Lab



測試主機

測試集中器

ZigBee模組

集中器與電表透過  
ZigBee及電力線連接

PLC耦合器

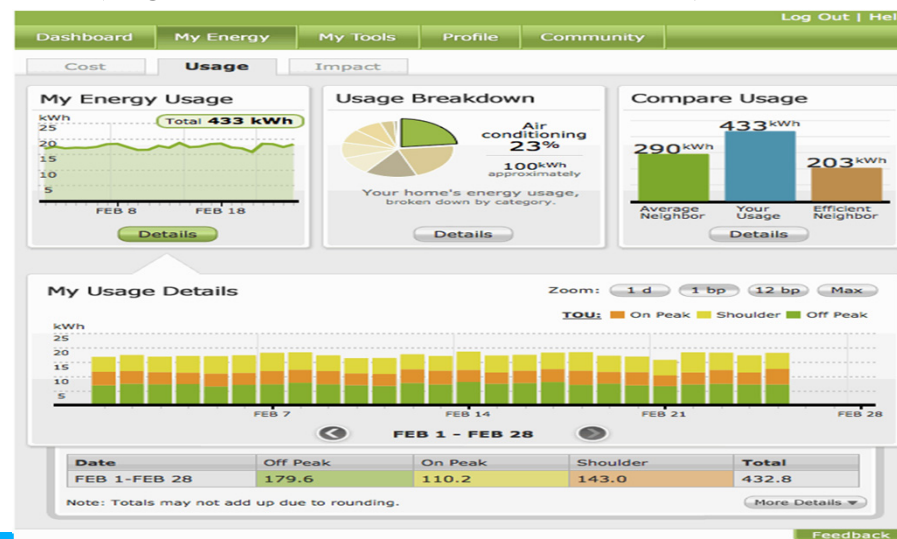
集中器與主機透過  
Ethernet連接



各通訊技術測試  
(ZigBee, PLC, WiFi電表進行測試)



WiFi通訊板 PLC通訊板 BPL通訊板 ZigBee





# Field Operation

集中器  
施工



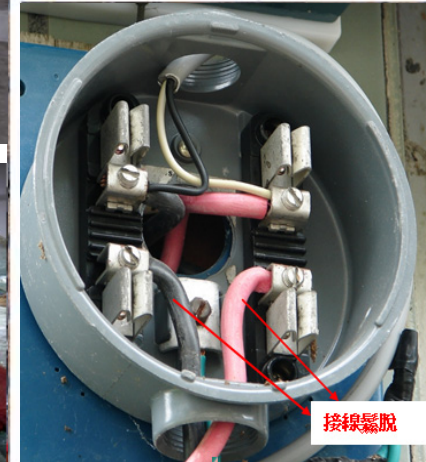
中間抄表



裝表



地下室入口被封死  
只有這塊可活動





# Web Service



Log Out | Help

Dashboard My Energy Profile

2 new Alerts: Usage\_Spike(2) [Settings](#)

Your daily usage spiked on DEC 27, 2010 [View Graph](#)

Your daily usage spiked on DEC 22, 2010 [View Graph](#)

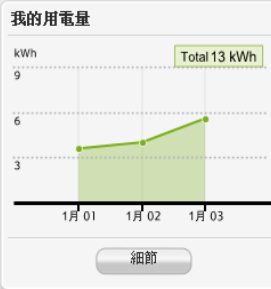
[Alert History](#) [Minimize this](#)



歡迎您來訪:  
**First Name4 Last ...**  
Account #: 5000004

Website updated through:  
2011-01-04 00:00

[Edit Profile](#)



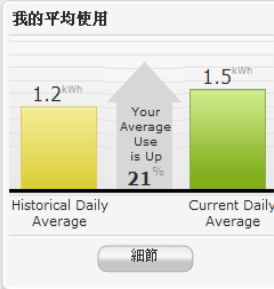
環境衝擊

多少磅的垃圾

6

Use the arrows to see more  
這一期的標準相當於這應多的垃圾處理?的排放量

[細節](#)



[Feedback](#)

## Cut Energy Costs

### 擺脫你的備用冰箱

您可以節省金錢和精力，如果您拔掉或回收在你的車庫不需要的備用冰箱。

[More Ways to Cut Costs](#)

## Be Energy Efficient

### 管理您的能源使用

安裝一個可編程的自動調溫器，以維持你的家有個舒適的溫度及在冬季和夏季管理使用情況

[More Ways to Use Less](#)

## Reduce Your Impact

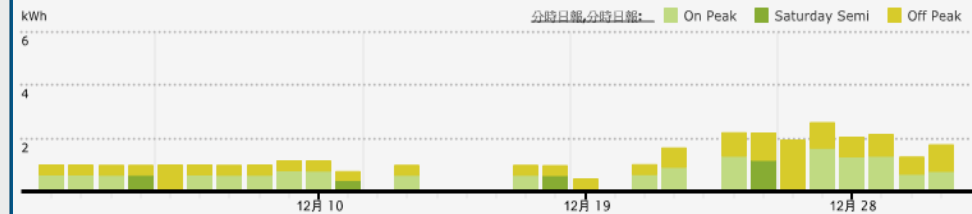
### 利用生靈友好的，碳中和產品

無論在哪裡，購買那些能盡量減少二氧化碳排放量公司的產品，並且這些公司在製造跟運送產品過程中是可以抵消剩餘的排放量

[More Ways to Go Green](#)

## 我的使用細節

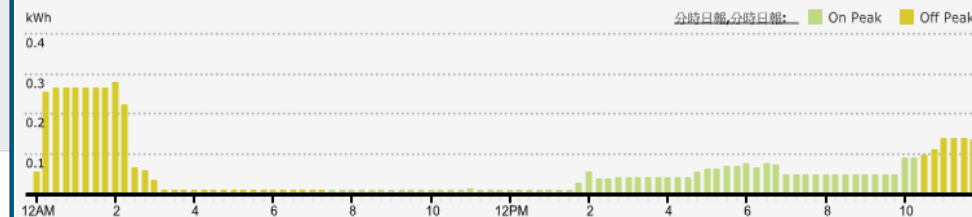
Zoom: 1天 1個月 12個月 最大



◀ 12月 01, 2010 - 12月 31, 2010 ▶

## 我的使用細節

Zoom: 1天 1個月 12個月 最大

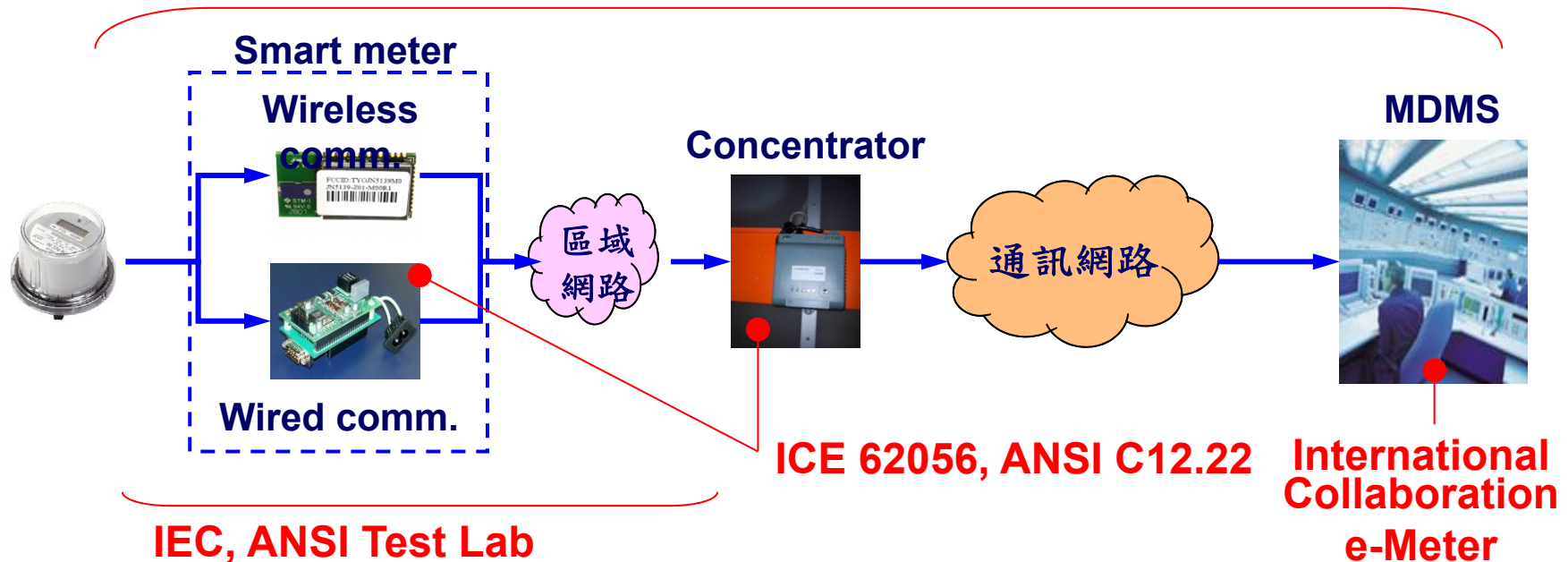


◀ 1月 03 ▶



# Research Project in ITRI

## System Integration and Testing Platform

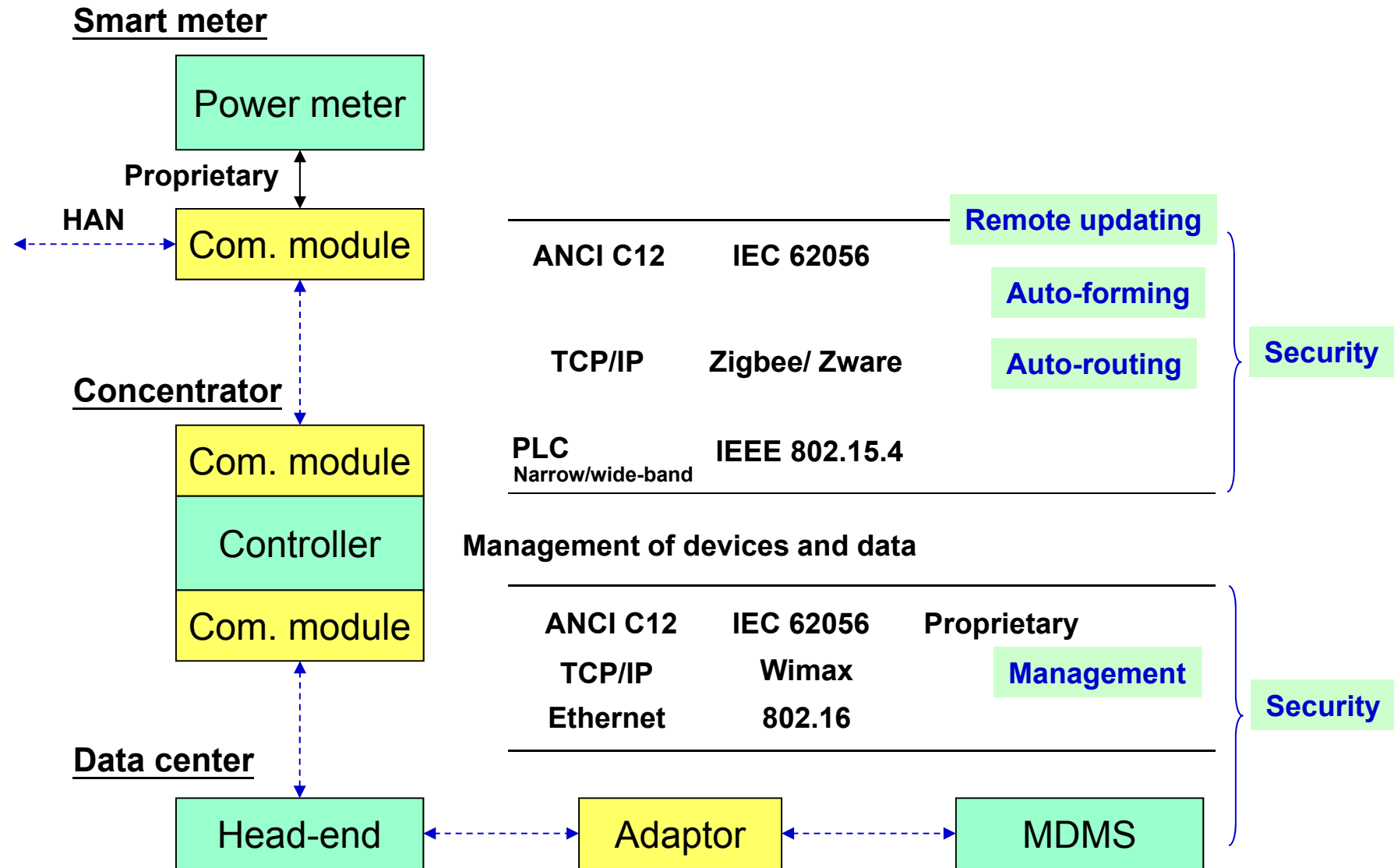


## ■ R&D Focus

- Interoperability
- Network Robustness
- Security




# System Architecture





# Summary

- **Taipower will soon start the deployment of 10,000 meters**
- **Bureau of Energy support both AMI demonstration and research projects**
- **Electronic and ICT companies are establishing capabilities of AMI system design and deployment**

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<b>Educational Background</b>	<b>B.S. Engineering of Aeronautics and Astronautics National Cheng Kung University – Chinese Taipei</b> <b>Ph.D. Engineering of Aeronautics and Astronautics National Cheng Kung University – Chinese Taipei</b>	
<b>Work Experience</b>	Current: Director of Power Division, Green Energy and Environment Research Laboratories, Industrial Technology Research Institute.  He previously joined research projects related to the applications of Information and Communication Technologies on energy saving and life wellbeing. He is currently leading the design of smart appliance and the program of energy optimization in residential and commercial departments.	
<b>Autobiography</b> ITRI plays the role of think tank to offer recommendations to government official of Chinese Taipei, and as Pei-Fang's role, he played an important role to the "National AMI Deployment Plan" of Chinese Taipei. To achieve better energy efficiency, he is help local industry to build up the key technologies and standards, and the outcome results are widely appreciated. Currently, he is leading his team to offer advices to build up the master plan of Smart Grids. Many of Pei-Fang's contribution can be found in paper publications.		