

台英智慧電網產業技術交流會議
Smart Grid Industrial Technology Exchange Between Taiwan and UK

The Introduction of Taiwan Smart Grid Industry Association

A non-profit organization established on the basis of law

 *Taiwan Institute of Economic Research, TIER*
Secretariat

報告人：陳彥豪 副祕書長，

Speaker : Deputy Secretary General Dr. CHEN, Yenhaw

時間：2011年11月14日(一)

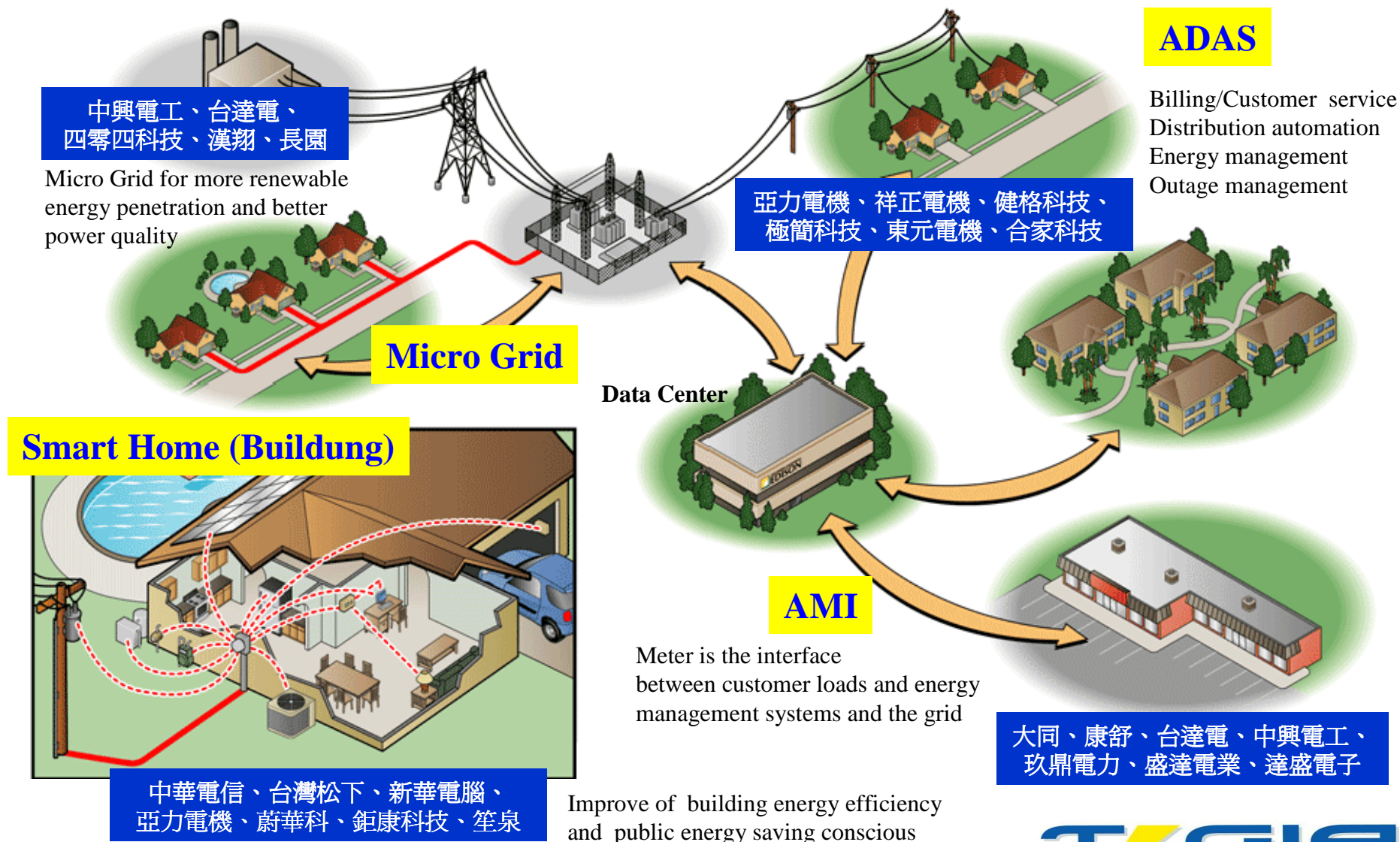
Time: Monday, November 14, 2011

地點：臺大醫院國際會議中心402AB會議室

Venue: NTUH International Convention Center-402AB



NSC Intelligent Grid and Advanced Metering Infrastructure General Project



Source : Lin, Faa-Jeng , EPA-Intelligent Grid and Advanced Metering Infrastructure General Project ,NSC

Taiwan Smart Grid Industry Association

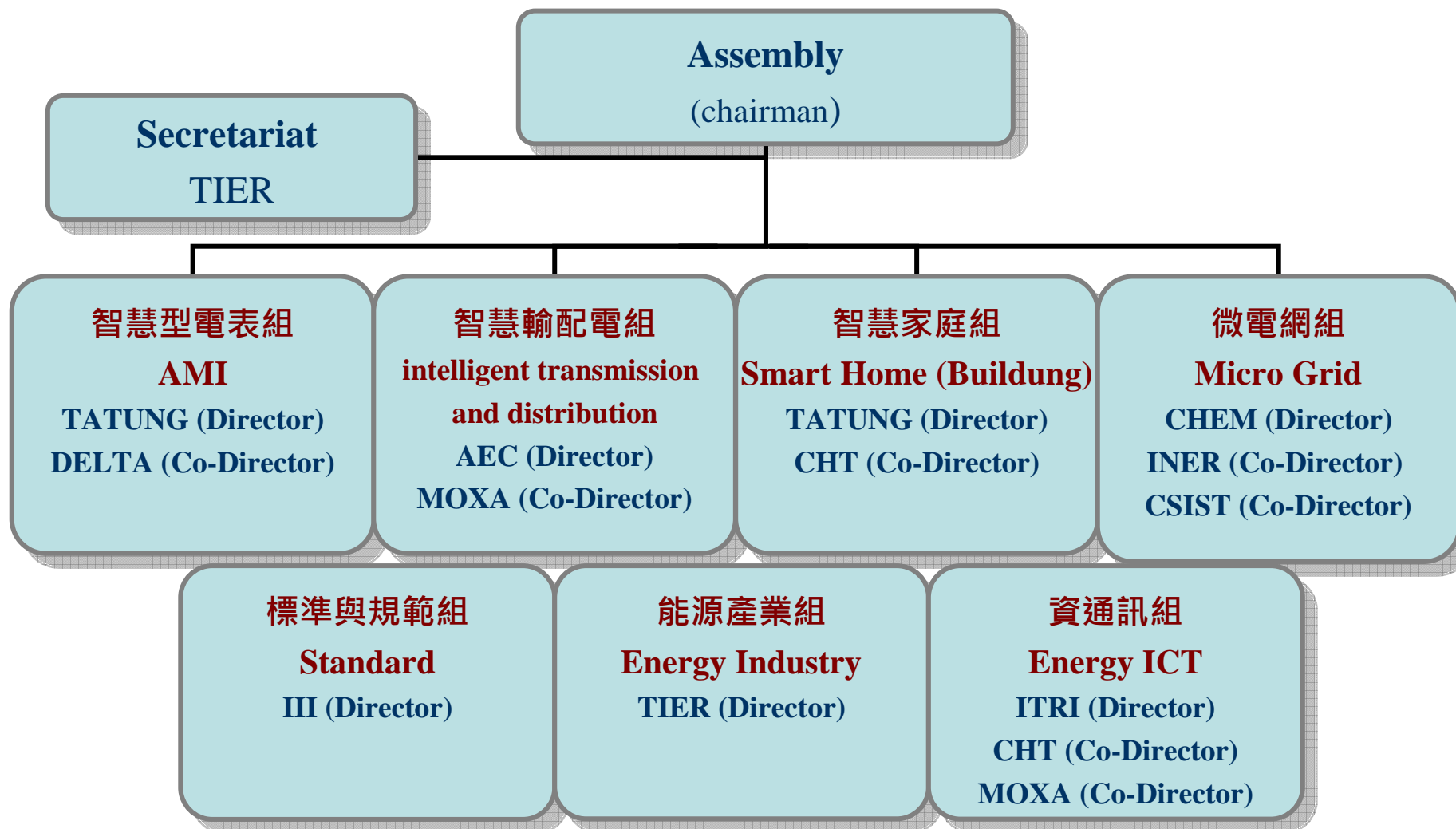
■ Object

- To coordinate the development of power, electrons, EE and ICTs to develop the Smart Grid Industry in Taiwan

■ Mission

- To build up Smart Grid System design and integration Capability.
- A platform for integration and exchange of the Smart Grid Technology
- Bridging the industry to the government to create an industry-friendly society and policy structure encouraging the development of Smart Grid Industry.
- Assisting in the Taiwan Smart Grid Industry to reinforce the opportunities of international market shares.

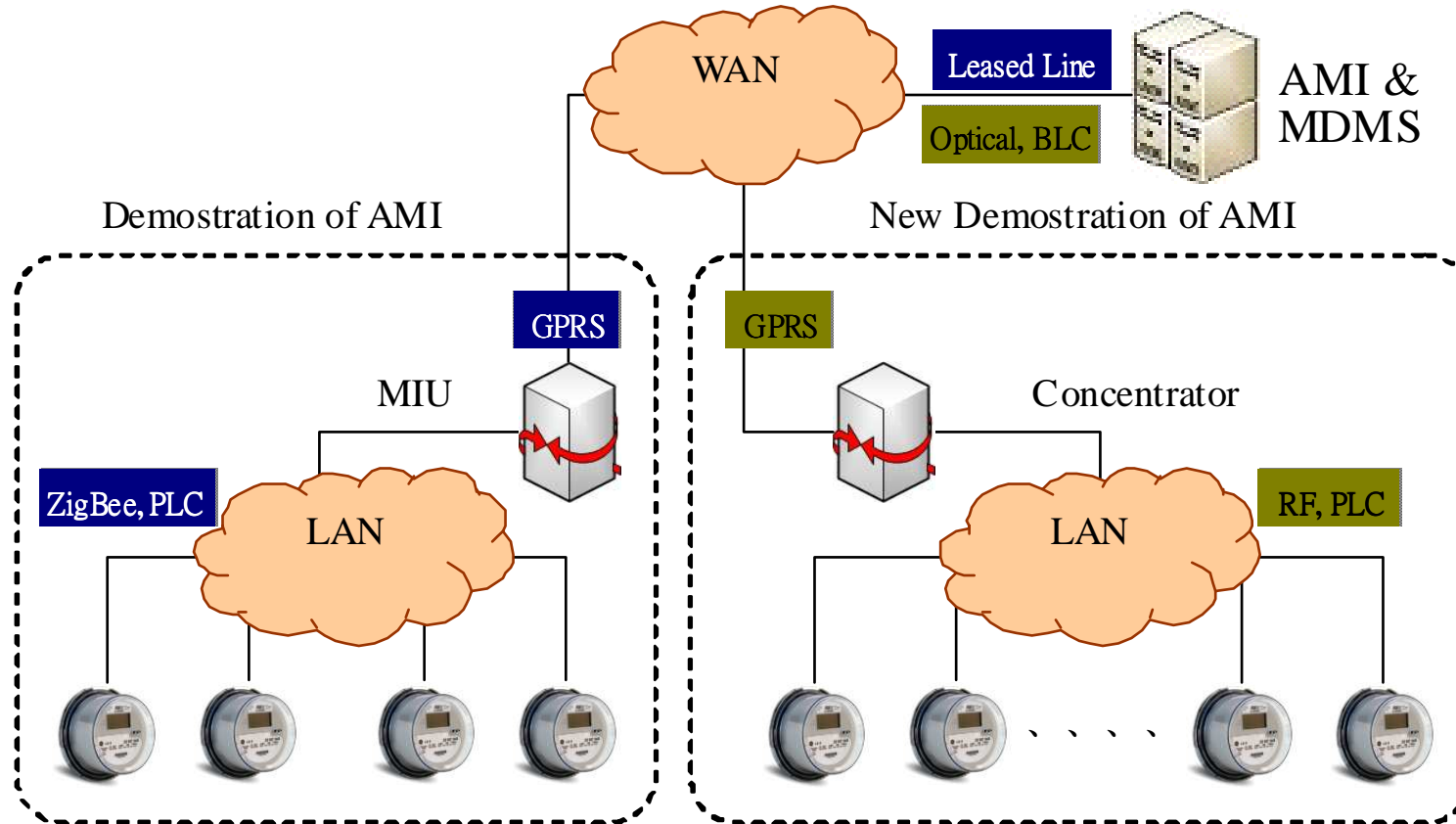
Structure of TSGIA



ALLIS ELECTRIC CO (AEC), Chung-Hsin Electric and Machinery Manufacturing Corp. (CHEM), Institute for Information industry (III), Industrial Technology Research Institute (ITRI), Institute of Nuclear Energy Research (INER), CHUNG-SHAN INSTITUTE OF SCIENCE & TECHNOLOGY (CSIST), ChungHwa Telecom(CHT)

AMI System Structure

- AMI include the smart meter, network of communication and meter of control center.
- Smart meter is composed by meter and Concentrator or Meter Interface Unit.



資料來源：能源國家型科技計畫－智慧電網與先進讀表主軸專案計畫總計畫 NSC 100-3113-P-008 -001 -PO

Taiwan AMI Component Provider

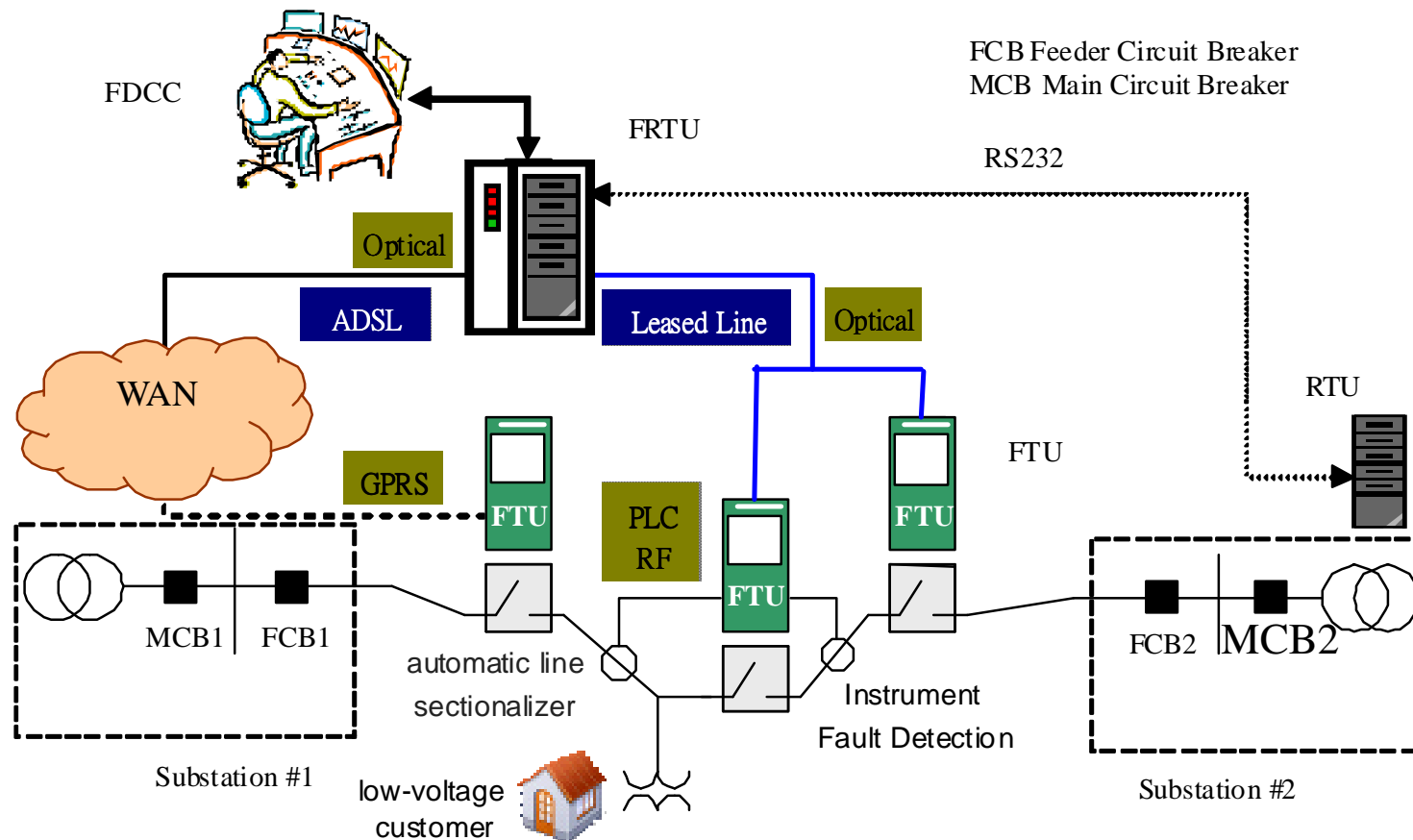
- The high voltage AMI System of Taiwan Power Company is constructed by Tatung (with Institute for Information Industry) . MIU is provided by Tatung and CHEM
- The scale of low voltage AMI is about 6 million smart meters ◦

Component	Provider in Taiwan
Smart Meter	TATUNG, CHEM, SHIHLIN(Arch), DELTA, AcBel, Itron, Danielgroup, Schneider Taiwan
Communications Module	AcBel, DELTA Networks, Billion Electric, TATUNG , Arch, MOXA, SensingTEK, Itron, ITRI
Concentrator or MIU	MOXA, AcBel, DELTA Networks, ZyXEL, Itron, ITRI
AMI Sytem	III, TATUNG, DELTA, Chunghwa Telecom, Ladis+Gyr 、 Itron, Altos , ITRI
Meter Data Management System(MDMS)	TATUNG , III,Chunghwa Telecom, eMeter, Oracle, Ladis+Gyr, Itron, Altos

資料來源：能源國家型科技計畫－智慧電網與先進讀表主軸專案計畫總計畫 NSC 100-3113-P-008 -001 -PO

Distribution Feeder Automation System

- Distribution Feeder Automation System include Feeder Dispatch and Control Center (FDCC), Feeder Remote Terminal Unit (FRTU), Feeder Terminal Unit (FTU) ◦ FRTU is the Concentrator in Substation.
- Distribution Feeder Automation System has the function of monitoring , control, SCADA, FDIR (Fault, Detection, Isolation and Restoration).



Taiwan DAS Equipment Provider

Sort	Equipment	Provider
Power Distribution Equipment)	Transformer Oil Gas Analyzer	CHEM, Fortune, SHIHLIN, TATUNG, PIC(G.E)
	Pad- & Pole-Mounted Transformers	TATUNG, SHIHLIN, Fortune, ALLIS
	Recloser	Fortune, SHIHLIN
	Automatic Line Switches	CHEM, Fortune, ALLIS, SHIHLIN, TECO, TATUNG, Schneider Taiwan
Distribution Feeder Automation System	RTU, FRTU, FTU	CHEM, Connet, HCE , TATUNG
	SCADA System	CHEM, Connet, HCE , TATUNG , Chunghwa Telecom, Siemens 、 ACS 、 SNC
	SCADA Server	ADVANTECH, HP
	GPRS/Fiber MODEM	Korenix, MOXA, EDIMAX
	Switch, Router	Connet, Wallnet, TATUNG, MOXA, Cisco, Altran

Development of Smart Appliance in Taiwan

Traditional Appliance



1949

First Generation Smart Appliance

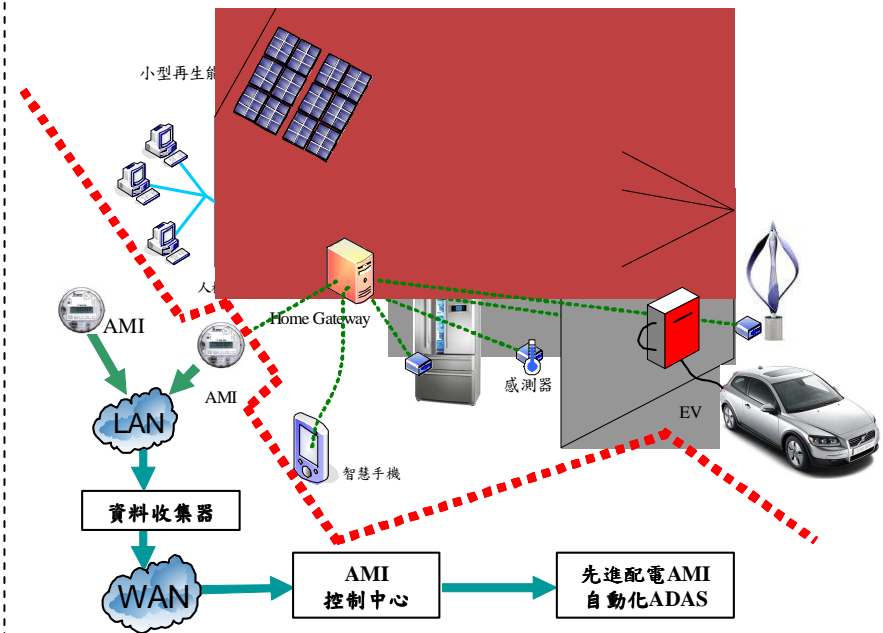
Real time display electricity expenditure, automatically energy saving control, ex inverter Appliance.

- 0 Standby power and auto regulate water consumption (with washing machine image)
- Multi-sensing and adjust temperature of refrigerator (with refrigerator image)
- Visible of power consumption and expenditure (with power meter image)
- Automatically adjust suction power by waste amount (with vacuum cleaner image)

2000

Second Generation Smart Appliance

Using ICT technology to integrate Smart Appliance and Smart Grid, enhance the costume to joint.

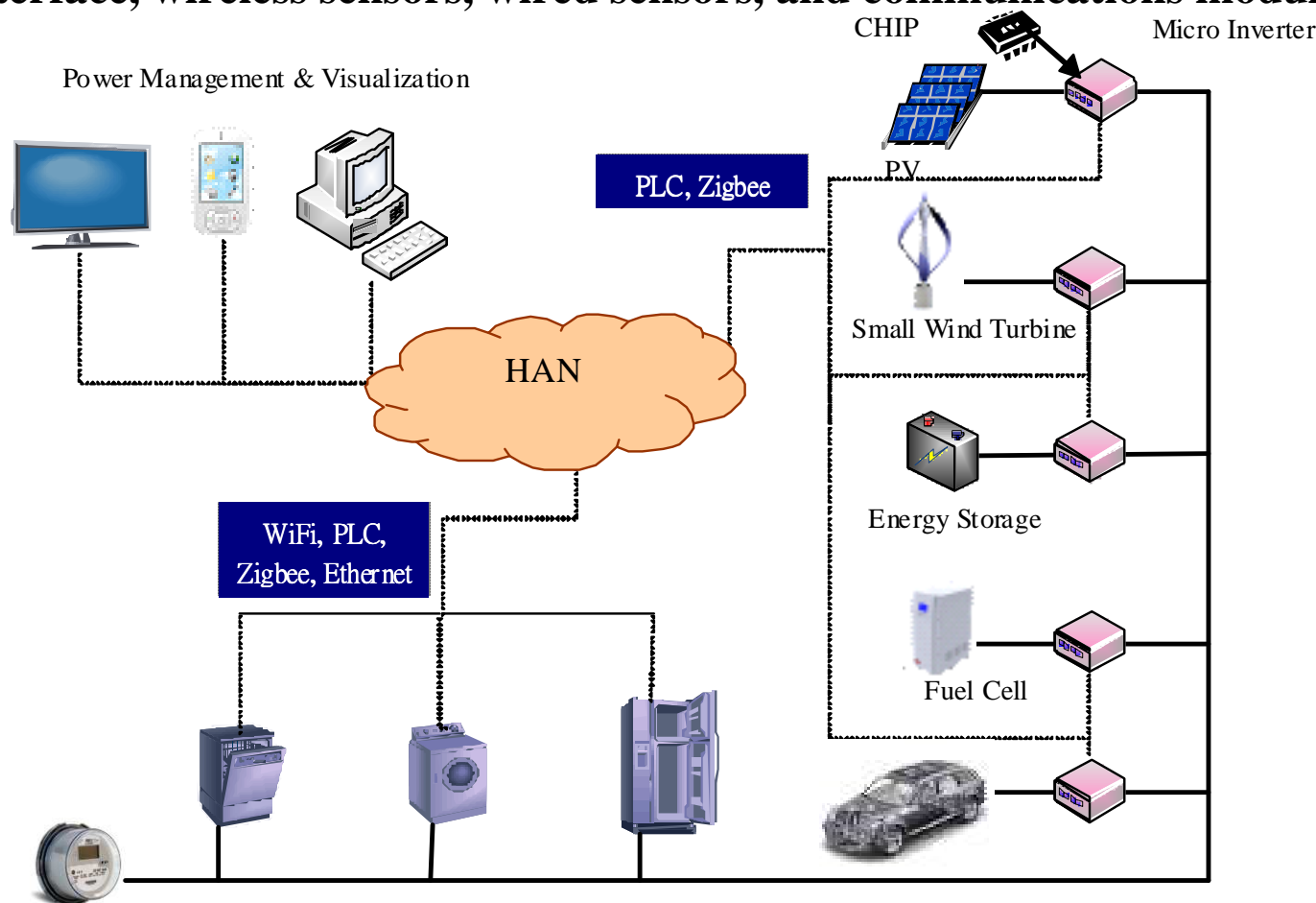


The condition and timing of integration smart appliance and smart Grid: (1) Interoperability standards between Appliance and grid mature. (2) Time price system of electricity.

2014 ~ 2016

Smart Home and Building System

Equipment associated with smart home energy system including intelligent home appliances, slow chargers for electric vehicles, power management chips, energy management system, home gateway, human-machine interface control, load type of control interface, wireless sensors, wired sensors, and communications module.

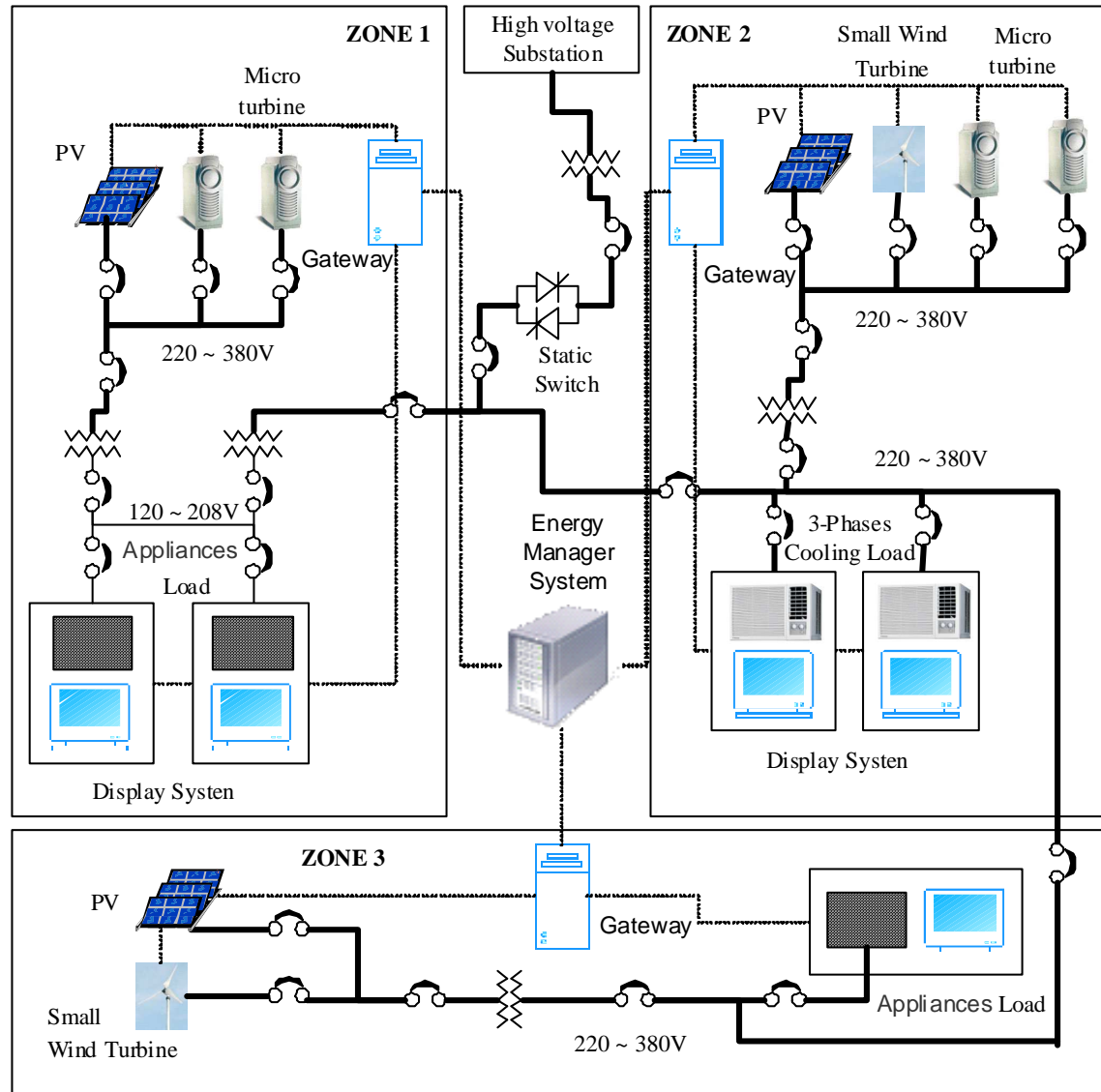


Taiwan Smart Home and Building Equipment Provider

Equipment	Provider
Intelligent home appliances	EHome : Cheng Xiang Control4 EMS : Justyle, ITRI
Electric vehicles charger	DELTA, ALLIS, LITEON, Fortune, Schneider Taiwan, ITRI
Power management chips	VIA
Energy management system (Interface)	Panasonic Taiwan, Chunghwa Telecom, INTEC, Tung-Chou, ITRI, Schneider Taiwan
Home Gateway	Panasonic Taiwan, Micortime Chunghwa Telecom, ITRI, Schneider Taiwan
Human-machine interface control	Panasonic Taiwan, Chunghwa Telecom, ITRI, Schneider Taiwan
Load type of control interface	Netvox, JosephTech
Wireless sensors	ZigBee : ICP DAS, Netvox
Wired sensors	Hom-thai, Winling
Communications Module	PLC : AcBel, Billion, ITRI ZigBee : ICP DAS, Netvox , ITRI Wi-Fi , Ethernet :MOXA

Micro Grid System

- The general idea of Micro Grid is to integrate a series of power loads with micro sources. The integrated system so called Micro Grid is controllable and would provide users with electric power and thermal energy.
- The Concept of Multi-Micro Grid is that arbitrary Micro Grid could be integrated or separated and become a new grid. This concept could support the development of Cellular Smart Grid.

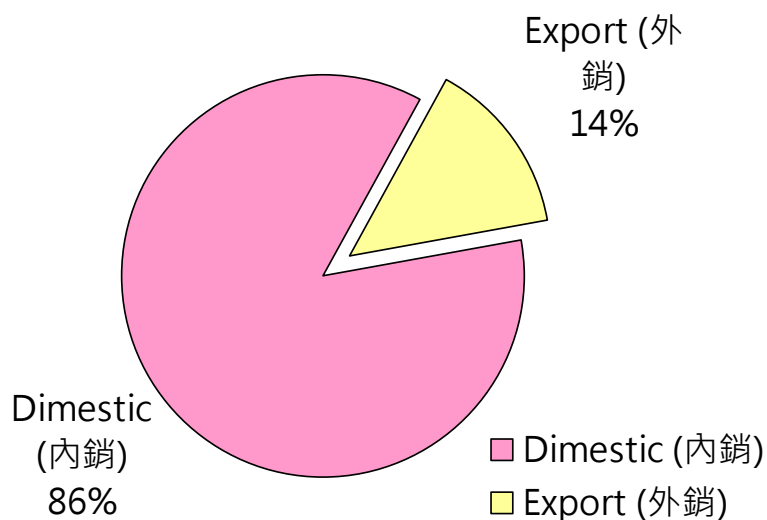


Taiwan Micro Grid Equipment Provider

Equipment	Provider
DG – Stationary fuel cell	CHEM, ITRI
DG - PV	Unienergy, HELIUS, ALLIS, Lucky Power, JosephTech, MOTTECH, GPI, DELTA, ITRI, TATUNG
DG – Small wind turbine	Hi-VAWT, PGC, Boltun, iWIND, STU, ITRI, TATUNG
DG – Micro turbine	AIDC
DG – Energy saving system	FEMTC, AcBel, ALLIS, Lucky Power, ITRI, CSISTDUP
Electric vehicle quick charger	ALLIS, DELTA, LITEON, Fortune, Schneider Taiwan, ITRI
Bi-directional dc-dc converter	CHEM, DELTA, Ablrex, MOTTECH, INER, ITRI, TATUNG
Micro Inverter	ALLIS, DELTA, Fortune, CHEM, Jubilee, Top Tower, GEOPROTEK, Schneider Taiwan, ITRI, TATUNG
Maximum Power Point Tracker	DELTA, INER, ITRI
Local SCADA	ALLIS, ADX, 榮成興業, CHEM, Chunghwa Telecom, ITRI, TATUNG
LVRT (AVR)	MOTTECH
Distribution SVC	DELTA, TAIK
Distribution STATCOM	DELTA
AVR	DELTA, CHEM
Power controller / conditioner	INER
Loop Balance Controller (LBC)	NA
Static switch	榮成興業
Protective Relay	ALLIS, TAIK, Schneider Taiwan
Communication Equipment	MOXA

Taiwan's Smart Grid Product Sales Amount

2010 Taiwan Smart Grid Product domestic sales amount is NT\$ 10.87 Billion (86%) and export sales amount NT\$ 1.73 Billion (14%). Taiwan's Smart Grid Product rely on domestic market.



	Stock Listed	Stock Unlisted	Total
Domestic sales	10.7	0.15	10.8
Export Sales	1.14	0.52	1.67
Total	11.87	0.67	12.55

Unit : billion NT\$

TSGIA First Board Members

	No.		Name	Unit
Board Member	1	Chairman	Chi, Gou-Chung	NCTU
	2	Standing Director	Chen, Shi-Lin	CYCU
	3	Standing Director	Lin, Faa-Jeng	NCU
	4	Director	Gary W. Chang	CCU
	5	Director	Chen, Chao-Shun	ISU
	6	Director	Yang, Jin-Shyr	CIER
	7	Director	Chu, Rong Hwa	CHT
	8	Director	Ho, Wu-Chi	ITRI
	9	Director	Feng, Ming Hui	III
	10	Director	Her, Ming-Guo	TATUNG
	11	Director	Cheng, Chao-Pin	AEC
	12	Director	Wang, Shu-chen	CHEM
	13	Director	Tsao, Leo	MOXA
Supervisor	1	Standing Supervisor	Chang, Yung-Ruei	INER
	2	Supervisor	Liao, You-Min	CSIST
	3	Supervisor	Chu, Wen-Chen	TTU
Secretariat		Secretary-General	Tso, Chunto	TIER
		Deputy Secretary General	Chen, Yen-Haw	TIER

台英智慧電網產業技術交流會議
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Introduction of Participation Company

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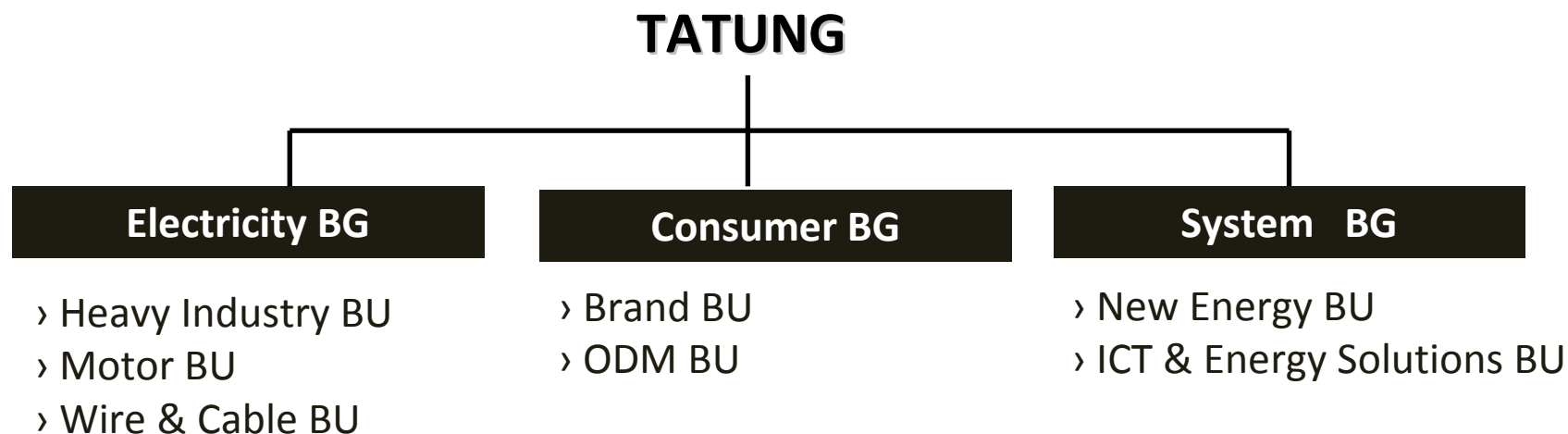
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Venue: NTUH International Convention Center-402AB



Company Profile

Established	1918
Capital	USD 1.5 Billions
Revenue	USD 10 Billions (Group Consolidated)
Employees	Over 30,000 Worldwide (Group Consolidated)
Headquarters	Taipei, Taiwan
Global Network	USA, Mexico, China, Japan, Korea, Singapore, Thailand, Vietnam, Czech, etc.



Smart Grid related products

- IEC/ ANSI Smart Meters (Single/ Poly Phase)
- MIU (Meter Interface Unit)/ Concentrator
- MDMS System/ AMI System/ SCADA System/ BEMS System
- High-Efficiency Small Wind Turbine
- Thin-film PV Module/ Crystalline PV Module
- High-power PV Inverter/ Micro Inverter
- PV System
- Fuel Cell /Energy Storage Material
- FTU/ FRTU & DA / ADAS



中興電工機械股份有限公司

(Chung-Hsin Electric & Machinery MFG. Co.,)



- **Founded in 1956**
- **Capital : ~ USD 146 M (NT\$ 4.8 B)**
- **Headquarter : Linkou, Taiwan (87,721 m²)**
- **Group Chairman : Mr. Eric Chiang**
- **Public Listed in 1994 on Taiwan Stock Market (Code: 1513)**
- **2008 Total Revenue : USD 244 M (NT\$ 7.3B)**
- **URL : <http://www.chem.com.tw>**



- **Chung-Hsin Electric and Machinery Manufacturing Corp. (CHEM) was founded in 1956. Following the footsteps of the industrialization of Taiwan, CHEM has been working hard to start its business in manufacturing of electric motor and generator. Along with the economic cycling of Taiwan, CHEM diversifies its business scopes strategically; specifically, CHEM has been doing very well in electric industry. The company is towards globalization from Taiwan base to pursue another peak time in its history by integration of R&D, manufacturing and marketing.**
- **CHEM has a major product, SF6 gas insulated switchgear (GIS), and other diversified business groups. The business scopes include power equipments, meters, air conditioning systems, generators, electricity automation, parking lots management, wireless communication and system engineering. Furthermore, CHEM has invested in R&D of new renewable energy in order to produce better energy-saving and cleaner products to the world in the future.**
- **After 50 some years of transformation, CHEM has developed itself to be the number one brand in Taiwan power equipments industry. Nevertheless, CHEM is not fully satisfied with the leaders role only in Taiwan. CHEM expects to become an outstanding global company by competing with international leading companies for global market.**

中興電工機械股份有限公司 (Chung-Hsin Electric & Machinery MFG. Co.,)

Major Product

■ Heavy Electricity

- **GIS:** Protection, switch & adjustment of power system
- **GCS /GCB /GIL:** Safety assurance of power facility and enhance power quality
- **Electronic Meters** Automatic meters used to measure electricity consumption of power lines & households

■ Power Automation

- **RTU:** Remote terminal unit, remote controlling & monitoring system for substation use
- **FTU:** Feeder terminal unit, remote control unit for line protection, metering, & fault detection
- **iEDG:** Data concentrator & gateway, interface between SCADA, RTU, FTU, IED
- **iFlex:** A smart program with features of simple and user-friendly

■ General Engineering

- **Diesel Engine Generator:** Comprehensive range of generators for Industrial & commercial use. Our 10kW mobile type has been certified by US DOD for military use.
- **Chiller:** Customized industrial & commercial orders

中興電工擁有 智慧電網
Smart Grid
全系列產品

- 工業用電表
Power Meter
- 多功能電表
Multi-Function Meter
- 燃料電池
Fuel Cell
- 乙太網路
開道器
IEDG
- 變壓器油中氣體
總量分析儀
i TAR-2000
- 變壓器油中氣體
線上分量分析儀
i TAR3000
- 饋線資訊末端設備
FTU
- 瓷訊末端設備
RTU
- 電力自動化平台
iFlex-EMS

台灣中興電工集團
Chung-Hsin Power Systems
網址: <http://www.chem.com.tw/>
電話: 886-3-3284170

亞力電機股份有限公司 (Allis Electric Co., LTD)

- **Founded on September 25, 1968, Allis Electric Co., Ltd.** began operations producing low-voltage switchgear, motor control centers, high/low-voltage integrated start-up panels, AC/DC industrial control equipment and transmission and distribution apparatus. Its steady operations led to the development of independent departments which produce transformers, switching devices and power electronic products designed to meet the requirements of heavy electric products sought by renowned private and state-run companies such as Taiwan Power Company, China Petroleum Corporation, China Telephone & Telegram Company to name a few.
- Currently, the Yangmei factory manufactures high/low-voltage switchgear and transformers while the Hsinchuang factory produces transmission and distribution apparatus as well as distribution switch & CB & power electronics products. where constant technological improvement and quality enhancement have been very successful in excelling the confirm as a heavy weight producer in the area of heavy electrical equipment manufacturing.
- **A successful public offering in 1994** has allowed Allis Electric to continue its steady growth and to venture into the telecommunications and high-tech green energy industries. Through investments and joint ventures, Allis Electric continues to develop green energy 、 smart switches 、 T&D automation 、 SCADA and Smart Grid strategic business alliances to persue the AEC business group eternally management.



亞力電機股份有限公司

ALLIS ELECTRIC CO., LTD.

SMART T&D SWITCH
DIDITAL PROTECT SYSTEM

FEEDER AUTOMATION SCADA SYSTEM
RENEWABLE WIND/SOLAR POWER & SMARTGRID SYSTEM



SMART 4WAY SWITCH



SMART SWITCH(LBS)



SEL DIGITAL RELAY



UPS



PV CHARGER



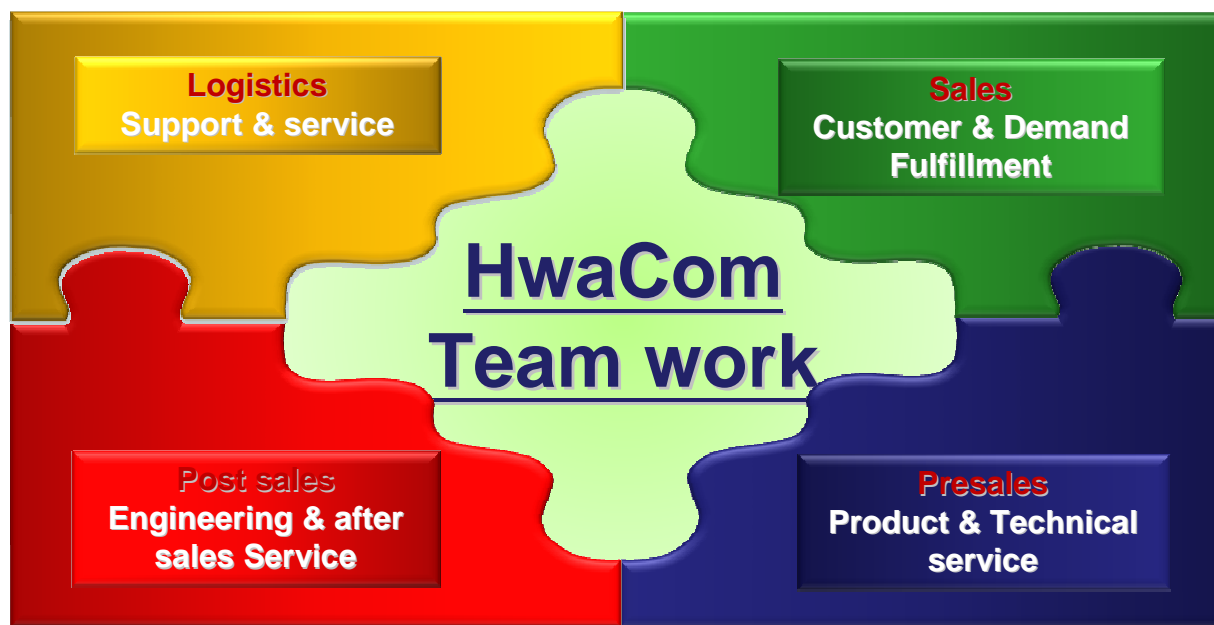
Head Office : 12/F, 19-11.Sanchung Road ,Taipei,Taiwan
TEL:(02)2655-3456 **FAX:(02)2655-2286~7**
E-Mail:sales @allis.com.tw **http://www.allis.com.tw**

華電聯網股份有限公司 (HwaCom Systems Inc.)

- **Established** : March. 1994
- **Chairman and President** : Mr. Gary Chen
- **Listed Market** : Public listed Company in Taiwan OTC (over the counter) market since 2002
- **Office**
 - Headquarter Located at Taipei, Taiwan
 - Branch offices at ChungLi / Hsin-Chu / Taichung / Kaohsiung
- **Subsidiary**
 - HwaQung Shanghai SI Corp. (China)
- **Employees** : 250
- **Revenue** : USD\$168M (year 2008) USD\$ 145M(year 2009)
- **Web site**: www.hwacom.com

華電聯網股份有限公司 (HwaCom Systems Inc.)

Perform ICT system integration and deployment functions for telecom, utility, and enterprise customers



Thank You