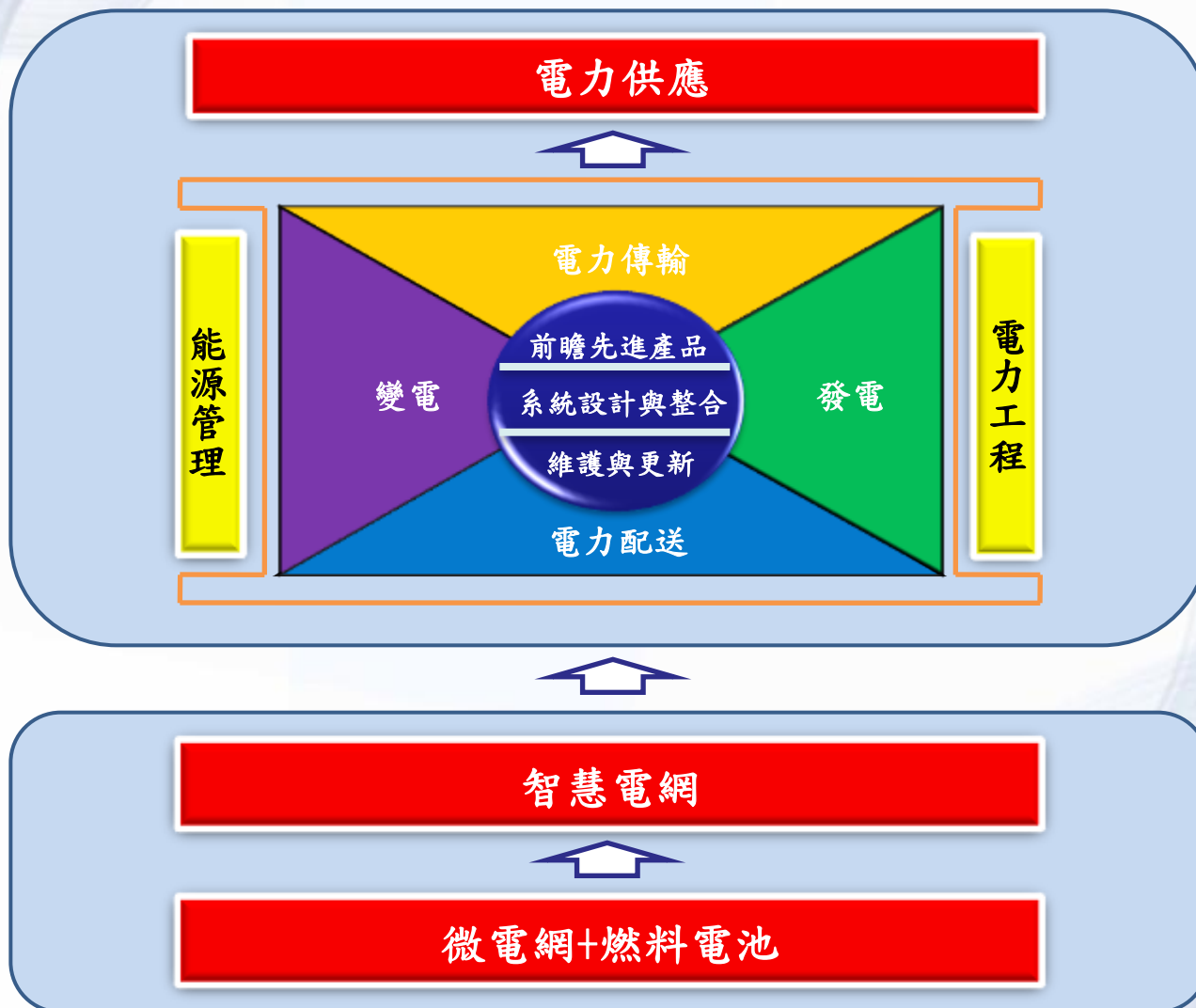


中興電工簡介

- 成立：1956年5月
- 資本額：42億元
- 營業額：100億元/年
- 業務：電力設備、電力工程統包、
能源管理
- 1994年在臺灣證券交易所上市 (1513)
- 總部：臺灣林口
- 認證：ISO 9001/9002/14001/ AS 9100
- www.chem.com.tw



電力系統整體解決方案



業務平台

GIS



Micro-Grid



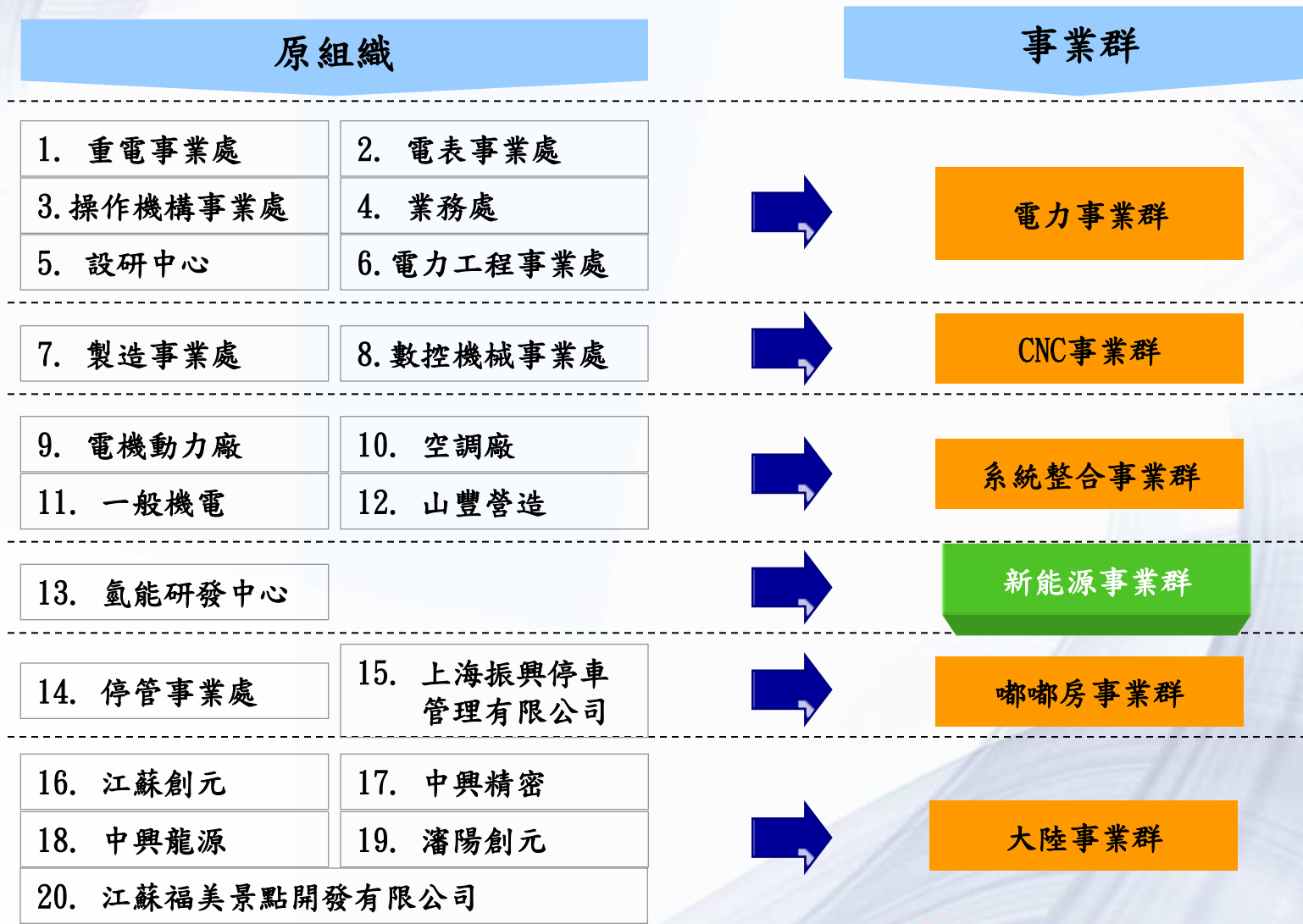
Manufacturing

- **台灣市場：**以「技術領先、價格優勢」主導市場。
- **大陸市場：**持續推動標準化、模組化，提升競爭力。
- **海外市場：**鎖定印度、土耳其區塊，以技轉與合資方式設立組裝廠切入市場。
- **大陸：**深化與美國應材的合作，跨入顯示器/半導體、航太與汽車零件等高端設備精密加工，並升級成為CM（合約製造）。
- **台灣：**(1) 推動轉型與升級(2) 抓住國防自主之軍需與航太精密加工業務 (3) 開發高速高精度加工中心機。
- **定位為微電網系統整合商：**以自行開發之各式轉換器、電源監測管理系統等核心技術結合分散式能源，建構微電網系統之運用。
- **綠色能源Fuel Cell：**完成PEMFC次系統之開發，及拓展BPS、定置型發電、Mutli-MW Distributed Generation 之業務。
- **智慧節能減碳：**擴充eEAC軟體，應用解析COP值推估節能效益與改善方案。

(電力工程)

(林口/海門之業務分工整合)

組織再造





創新策略目標

在傳產氛圍注入綠能新氣象，
在「升級與轉型」規畫中打造出新的成長引擎！

- GIS重電領域-技術充分自主，以  中興電工自有品牌前進國際市場，已成功開拓日本、大陸、中東..等市場，並技術授權/移轉予印度廠商。
- 燃料電池-自行開發各項關鍵次系統，掌握核心技術，以  及  品牌進軍國際市場。擁有研發能力與專利盾牌雙優勢，並以創新的服務商業模式，矢志成為全球性的氫能公司。
- 微電網系統-完成開發領先全球5-100KW的獨立/併網混合型的智慧型逆變器(Inverter)、電能量管理系統(PMS)、微電網調控系統(iFlex-EMS)搭配儲能系統(BMS)，可高效結合再生能源解決電網不穩或難以覆蓋的電力短缺問題，為2025年非核家園電力不足之最佳解決方案。
- 完成開發以線馬驅動為主的高速高精度天車式五軸龍門加工中心機暨製程加值系統，與歐洲名牌匹敵，並以  品牌推向市場，應用於航太、汽車模具等精密加工。
-  中興嘟嘟房 為全台停車管理產業之領導品牌，並開發”互聯網+智能停車“APP結合第三方支付，朝線上線下整合，建構大金融平台佈局，快速躍進「互聯網+行動」的商業模式。



歷年現金股利& 經營參考數據

年份	現金股利(元)
93	1.3
94	1.5
95	1.4
96	1.4
97	0.88
98	1.0
99	1.0
100	1.0
101	1.0
102	0.8(現金股利) 1.25(減資退還股款)
103	1.2
104	1.0
105	1.0
106	1.0
107	1.0

財務比率	107年	106年	105年
ROE 股東權益報酬率 (稅後淨利/股東權益)	7.41%	6.81%	6.61%
ROA 資產報酬率 (稅後淨利/總資產)	3.41%	3.46%	3.51%
毛利率	15.87%	16.01%	14.76%
營業利益率	4.75%	3.65%	3.47%
淨利率	4.59%	4.51%	3.95%

■ 108年 全年推估營收99.86億,
1-9月 稅後EPS \$1.15/股

■ 109年 營收/盈餘 大幅成長

■ “數字、願景、夢想”

GIS 市佔率

161kV GIS累積銷售 2,283檔 市佔率 80 %
345kV GIS累積銷售 391 檔 市佔率 96.5 %



GIS/GCB產品系列

產品國際認證



GIS



GIS



GCB

No.	TYPE	Location	Time of Cert. Issued
1.	345kV 63kA GIS (Pneumatic)	CESI	1997
2.	23kV 12kA GIS	CESI	1998
3.	69kV 25kA GCB	CESI	2000
4.	69kV 40kA GIS	KEMA	2003
5.	161kV 50kA GIS (1.4m Hydraulic)	CESI	2003
6.	161kV 50kA GIS (1.8m Hydraulic)	KEMA	2004
7.	362kV 63kA GIS (Hydraulic)	CESI	2005
8.	10kV 25kA GIS	Xian HP Lab.	2005
9.	145kV 40kA GIS	CESI	2006
10.	126kV 40kA GIS	Xian HP Lab.	2006
11.	40.5kV 31.5kA GIS	Xian HP Lab	2007
12.	550kV 50kA GCB (live tank)	CESI	2007
13.	252kV 40kA GIS	CESI	2007
14.	420/252/145/72.5kV GCB (live tank)	CESI	2008
15.	550kV 63kA GIS	CESI/KEMA	2009
16.	800kV 50kA GCB (live tank)	CESI	2009

CHEM 中國廠區

GIS/GCB Global Parts and Assembly Center

Total Space is 300,000 m²

中興精密

Chung-Hsin Precision Machinery

中興創元

Chung-Hsin Power System



電力工程統包專案 EPC

■ 23座整體變電所:

含設計、工程、採購、建造、
所有營造及機電之安裝及測試。

■ 統包實績:

- 谷關與青山水力發電工程
- 71座風力發電機，
安裝容量達99.46 MW
- 11座澎湖龍門風力發電機，
安裝容量達33MW

■ 台灣行政院公共工程委員會工程頒發之“金牌品質獎”

- 第五屆年度獎項 (2004)
- 第七屆年度獎項 (2006)
- 第八屆年度獎項 (2007)
- 第九屆年度獎項 (2008)
- 第十一屆年度獎項(2010)
- 第十二屆年度獎項(2011)
- 第十五屆年度特優(2015)
- 第十六屆年度優等(2016)
- 第十七屆年度特優(2017)
- 第十七屆年度優等(2017)
- 第十九屆年度優等(2019)

可靠、安全及高品質之服務





電力事業群已成交未實銷金額

統計至108/9/30

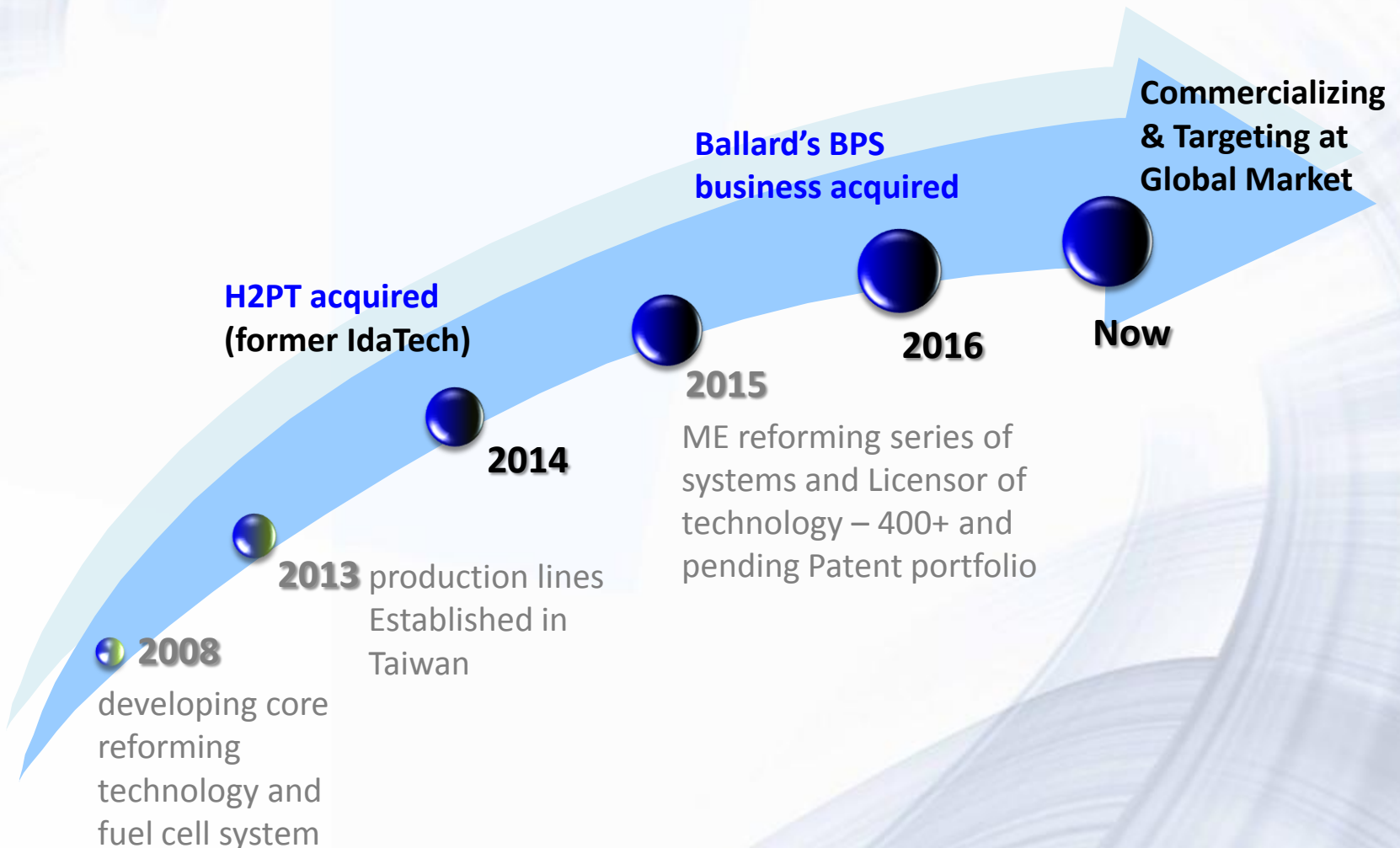
單位：新台幣元

重電	電表	電力工程
12,496,969,645	369,096,431	14,429,858,480
		合計 27,335,924,556

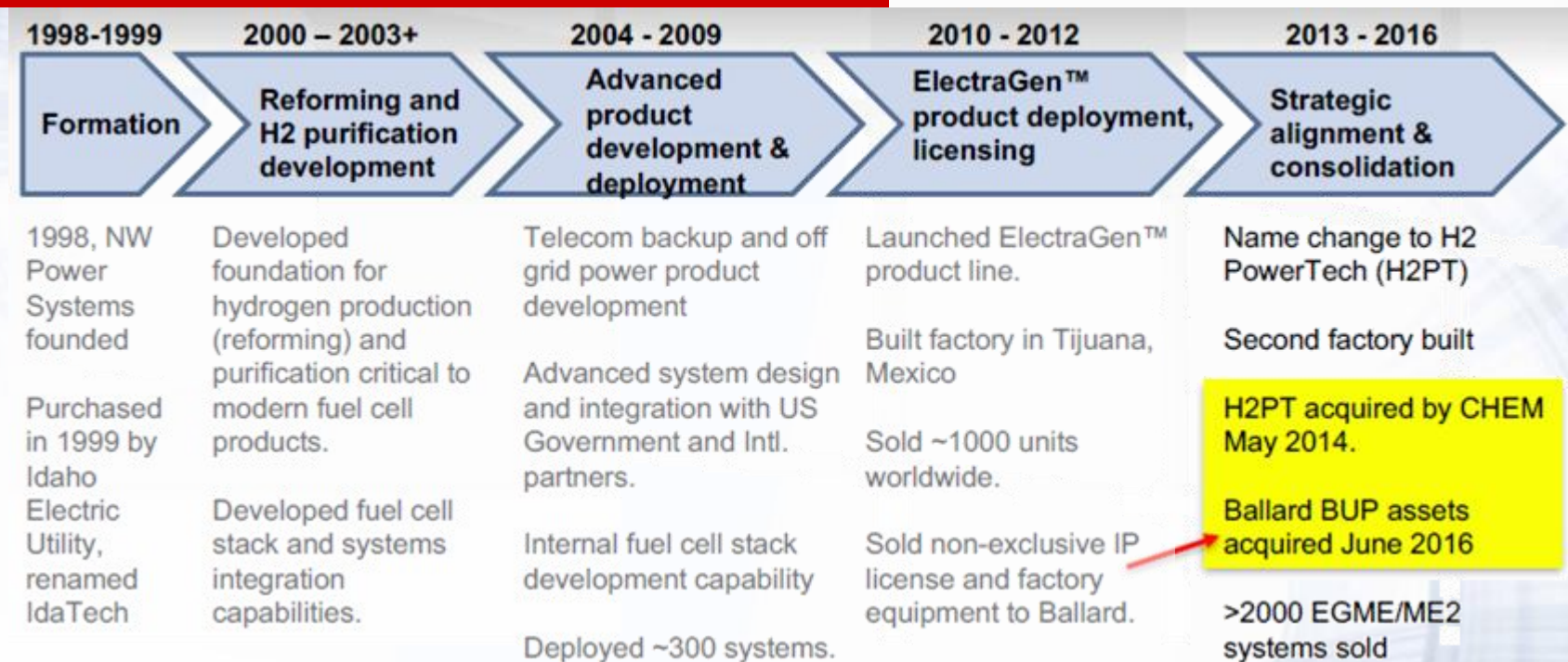


自主氫能技術介紹

Fuel Cell Milestones



H2PT Overview (Former IdaTech)



- All commercial methanol fuel cell products based on licensed IP
- 15+ years of experience and \$240+ million invested
- IP based on 400+ patents awarded and pending
- Continuing core development for advanced fuel cell products

燃料電池+微電網產品

Fuel Cell



Engine Carbon Removal



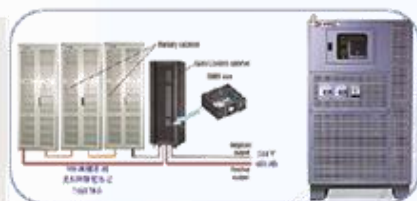
Hydrogen Generating Module



DC Charging



10/50/100kW
Smart Inverter



5kW/6kWh
5kW/12kWh Home
uGrid



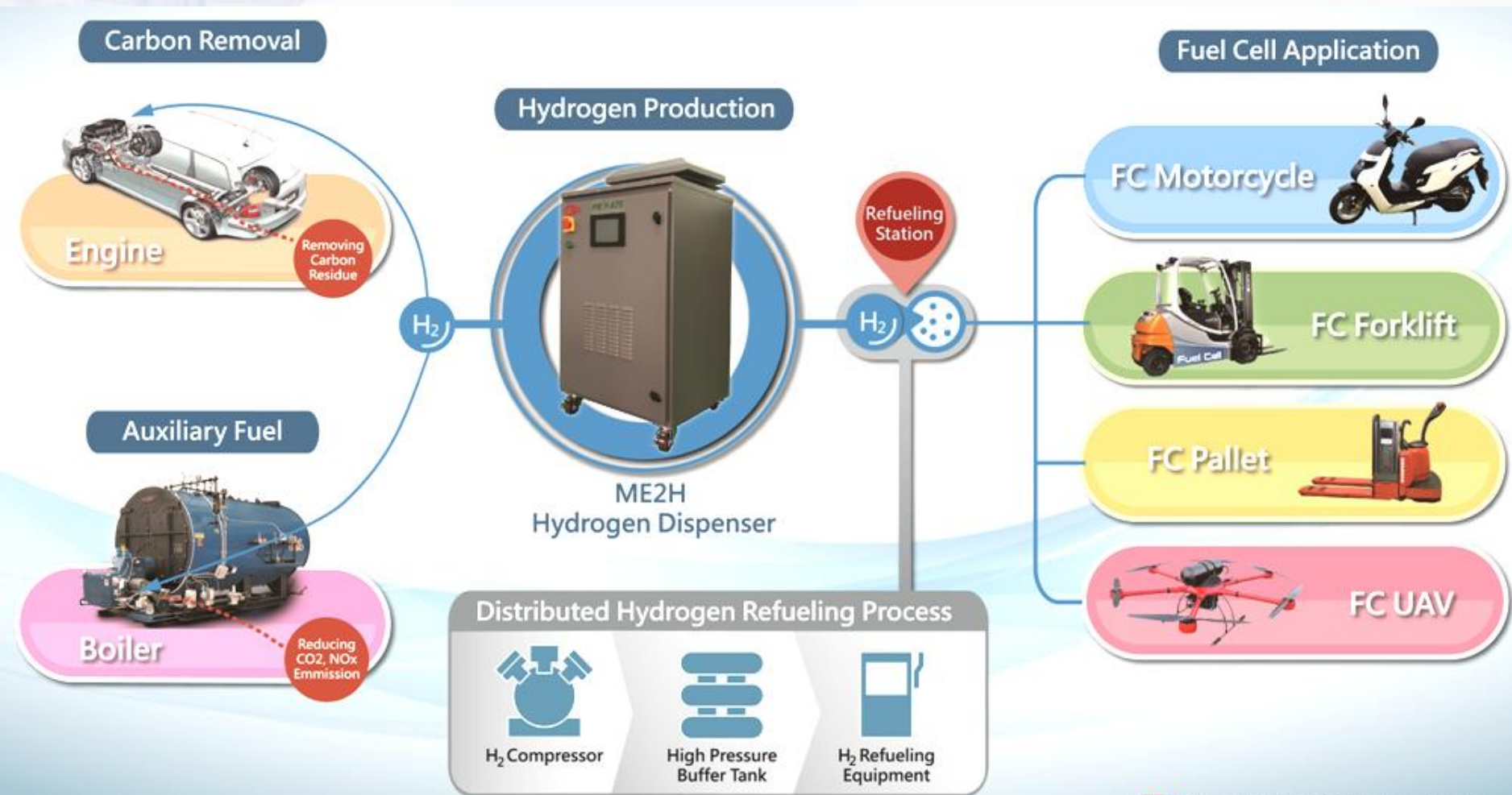
Fuel Cell
uGrid



Intelligent
Energy
Management



分散式加氫站 - 適用情境



引擎除碳機的應用 - 適用情境





引擎除碳整體效益

License Plate No.	Vehicle Brand	Engine Displacement (L)	Date	Emission Gases						Fuel Consumption		
				CO before	CO after	Efficiency	NOx before	NOx after	Efficiency	Treat before	Treat after 1 month	Efficiency
P7-5182	TOYOTA	1.6	20160202	318	7	98%	46	30	35%	12.5	14.0	12%
P7-5183	TOYOTA	1.497	20160202	3700	1000	97%	121	100	30%	10.0	11.1	11%
ABL-9623	MITSHBISHI	2.488	20160202	2700	1000	100%	121	100	100%	5.0	6.3	26%
DE-9648	TOYOTA	1.998	20160202	2700	1000	100%	121	100	100%	12.3	13.5	10%
4169-YZ (2nd)	HINO	2.7	20160202	2700	1000	100%	121	100	17%	8.2	9.0	10%
K9-8221 (2nd)	TOYOTA	1.998	20160202	2700	1000	100%	121	100	94%	6.8	7.8	15%
2913-UR	TOYOTA	2	20160202	2700	1000	100%	121	100	100%	9.2	10.5	15%
J7-5695	VOLVO	2	20160202	2700	1000	100%	121	100	100%	10.4	11.8	13%

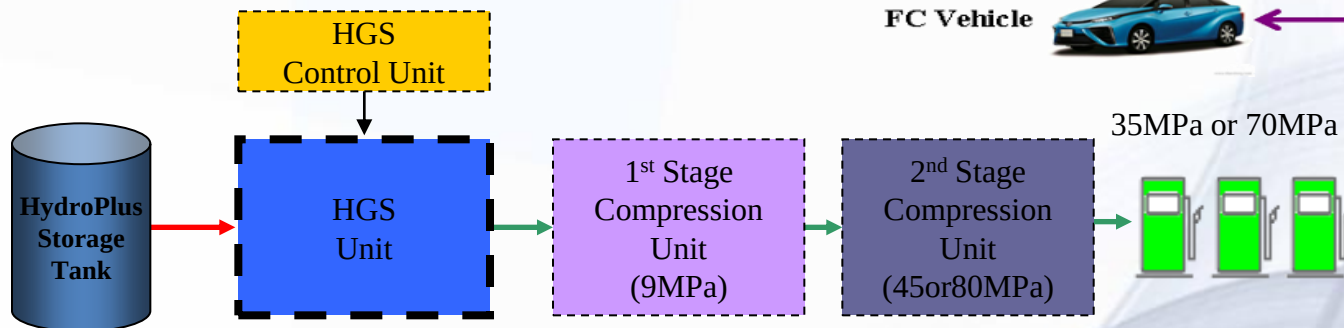
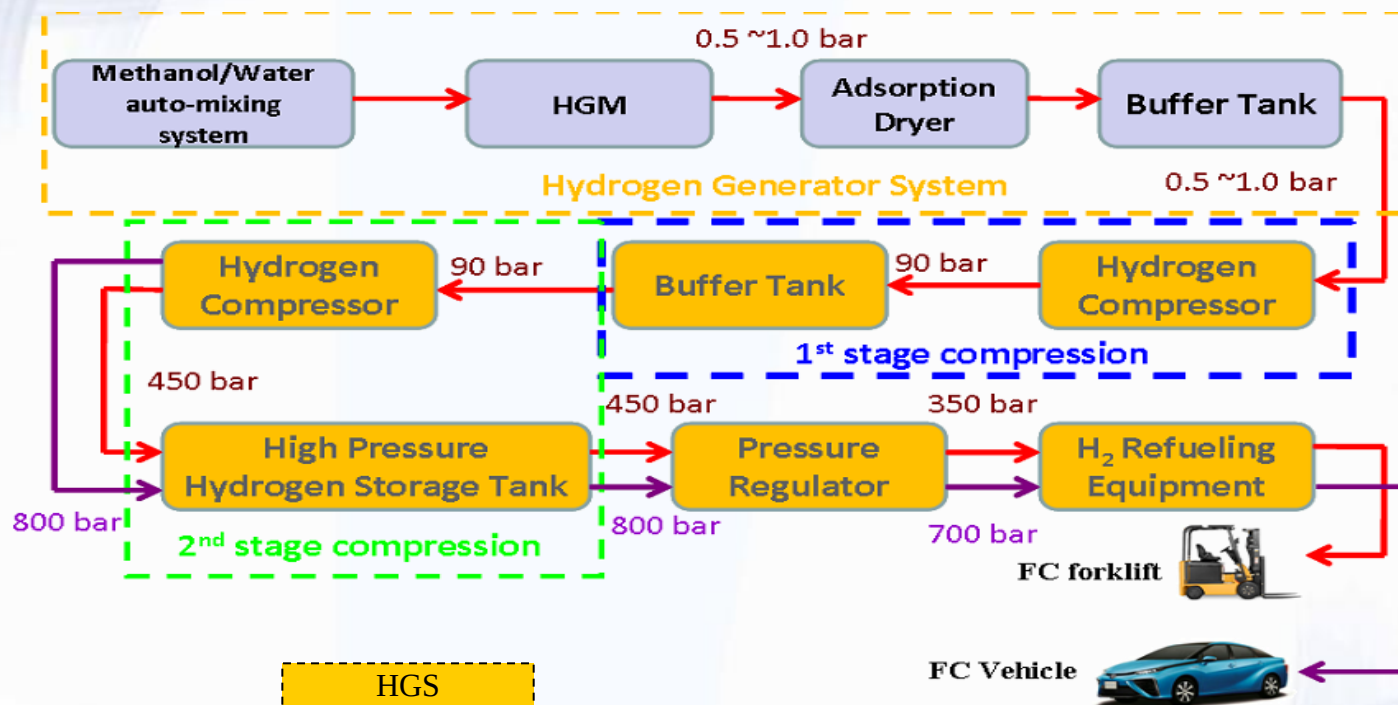
Average reduction
in CO $\doteq$ 83%

in NOx $\doteq$ 76%

Fuel Saving $\doteq$ 15%



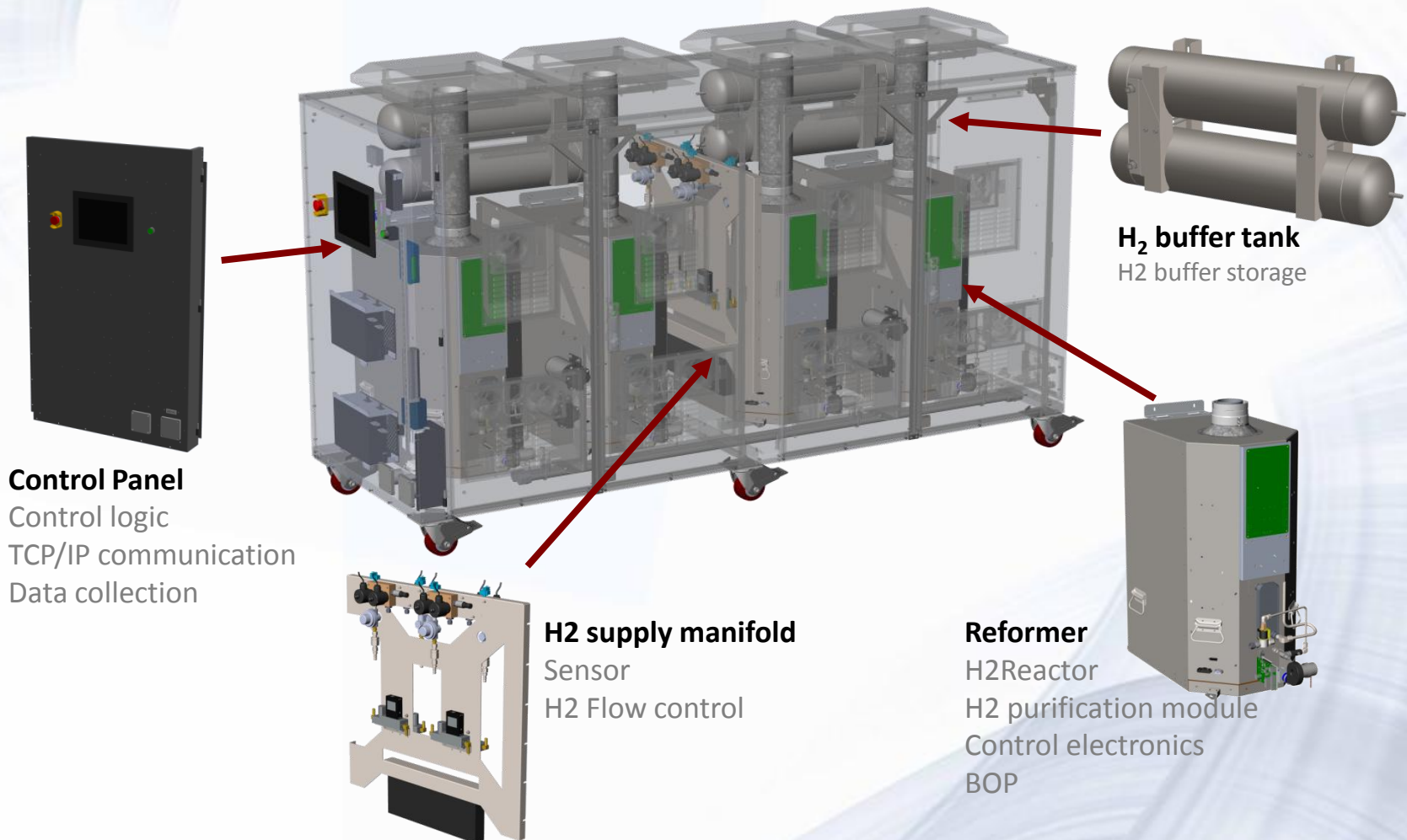
加氫站流程圖



壓縮機信號採集監控
加氫機信號採集監控
視頻採集監控
洩漏探測系統信號採集



Hydrogen Generator Module





H₂-Driven Forklift Total Solution

*Distributed
Hydrogen Station
with HGM*



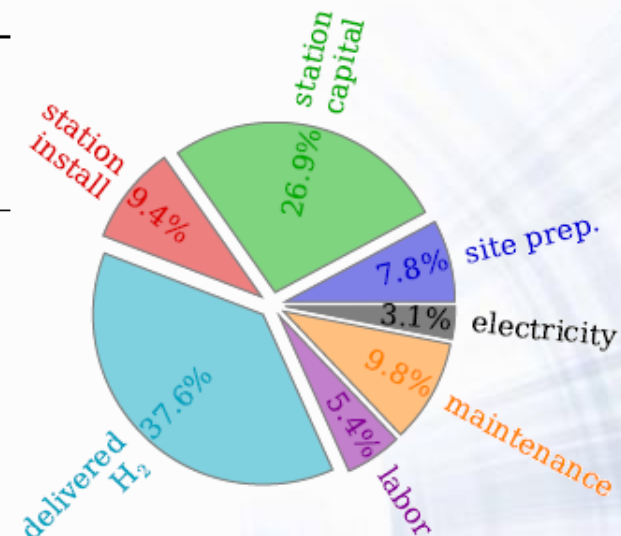
**Plug-in & Power it Up !
A Cost-Effective Solution On the Go**



SNL 產氫成本研究報告 VS. 中興電工甲醇重組製氫

Cost Breakdown on H₂-Generating by Sandia National Laboratories U.S. (2017)(SAND2017-2832)

station capacity →	100 kg/day		200 kg/day		300 kg/day	
station type ↓	installed cost (\$)	H ₂ cost (\$/kg)	installed cost (\$)	H ₂ cost (\$/kg)	installed cost (\$)	H ₂ cost (\$/kg)
conventional, delivered H ₂	\$1.51M	\$30.53	\$1.69M	\$18.37	\$1.86M	\$14.26
conventional, SMR H ₂	\$2.74M	\$38.47	\$3.83M	\$25.96	\$4.43M	\$20.23
conventional, electrolysis H ₂	\$2.38M	\$39.66	\$2.98M	\$26.51	\$3.45M	\$21.74
modular (\$1.5M), delivered H ₂	\$1.86M	\$33.90	\$1.86M	\$19.16	\$1.86M	\$14.25
modular (\$1M), delivered H ₂	\$1.36M	\$29.12	\$1.36M	\$16.77	\$1.36M	\$12.65
modular (\$1.5M), electrolysis H ₂	\$2.74M	\$43.03	\$3.14M	\$27.30	\$3.45M	\$21.73
modular (\$1M), electrolysis H ₂	\$2.24M	\$38.25	\$2.64M	\$24.91	\$2.95M	\$20.13



H₂ produced by Electrolysis/On-Site

\$26.51/kg

H₂ produced by SMR/On-Site

\$25.96/kg

H₂ to deliver/Off-Site

\$18.37/kg



*Assuming 200kg/day H₂ Production, unit in US\$

*SMR: Steam Methane Reforming



SNL 產氫成本研究報告 VS. 中興電工甲醇重組製氫

Methanol Reforming Tech. by CHEM - Total Cost Breakdown (including HRS facilities & operation)

Methanol-Based Fuel Cost	Unit	Cost	200kg/day HRS	Cost(\$)	Depreciation(Day)
Methanol Solution	\$/L	0.24	H ₂ Generator	480,000	187.87
Fuel Consumption	L/hr	5.50	HRS Facilities & Installation	700,000	273.97
Fuel Cost	\$/hr	1.30	Land, building, utilities	300,000	117.42
Power Consumption	kW/h	0.22			
Power Cost	\$/hr	0.03	Operation & Maintenance	118,000	323.29
H ₂ Generation	M3/hr	4.50	Equipment Depreciation + O&M		902.54
Total Cost	\$/hr	1.33	H ₂ Generation (kg/day)		200
H ₂ Density	g/M3	89.30	Total Cost for H ₂ Generation on the Above	\$/kg	4.51
H ₂ Generation	g/hr	401.85			
Total Cost of H ₂ Delivered \$/kg 3.32			Total Cost for H ₂ Delivered \$/kg 7.83		



The Proven Best Solution from CHEM

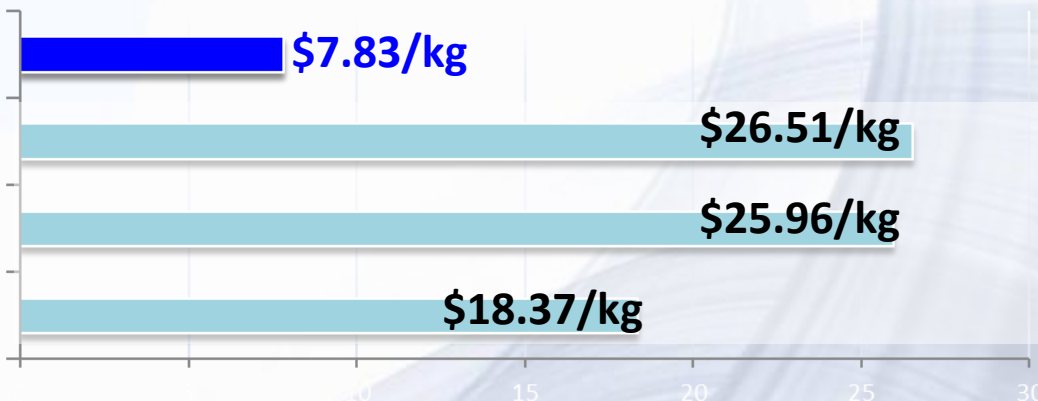
No transport cost and additional O/M cost, the calculation basis of CHEM' s cost includes only one-time investment from H2 generators, HRS facilities(compression & storage) & operation

H₂ produced by Electrolysis/On-Site

H₂ produced by SMR/On-Site

H₂ to deliver/Off-Site

CHEM



Calculation Basis: Assuming \$350/ton for Methanol, 200kg/day generated by HRS, Total Cost drops down to \$7.83/kg (Cost of Methanol \$3.32 + Facilities depreciation / Operation cost \$4.51)



燃料電池微電網應用實例 - 南非信任社區

南非信任社區-鄉村電氣化 自2014年8月開始商業運行



- 自2014年8月1日於南非安裝混合型儲能微電網系統
- 無噪音、無污染，不受天候影響，持續提供24小時不間斷的電力
- 自發電、自儲電、自用電的最佳應用。

孤島微電網應用實例 - 東吉嶼

東吉嶼微電網榮獲APEC 2017 能源智慧社區最佳倡議 - 智慧電網類-銀質獎

第一階段

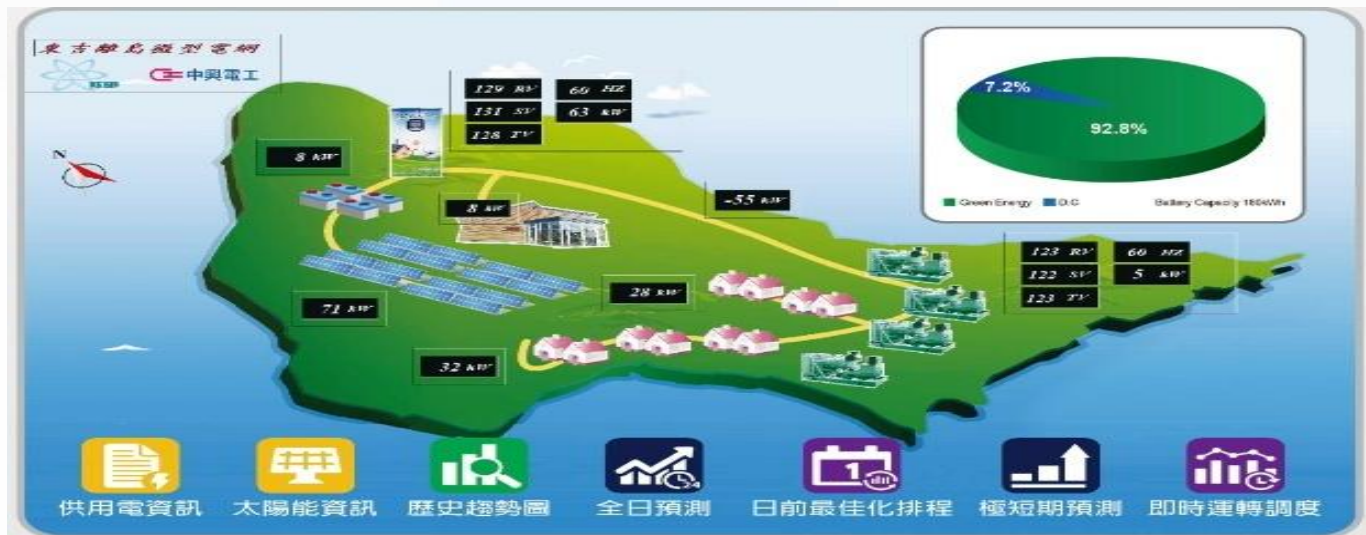
- DG為基載電力
- 整合太陽能與儲能

第二階段

- 智慧逆變器+PMS
- 導入遠端監控系統
- 即時數據

第三階段

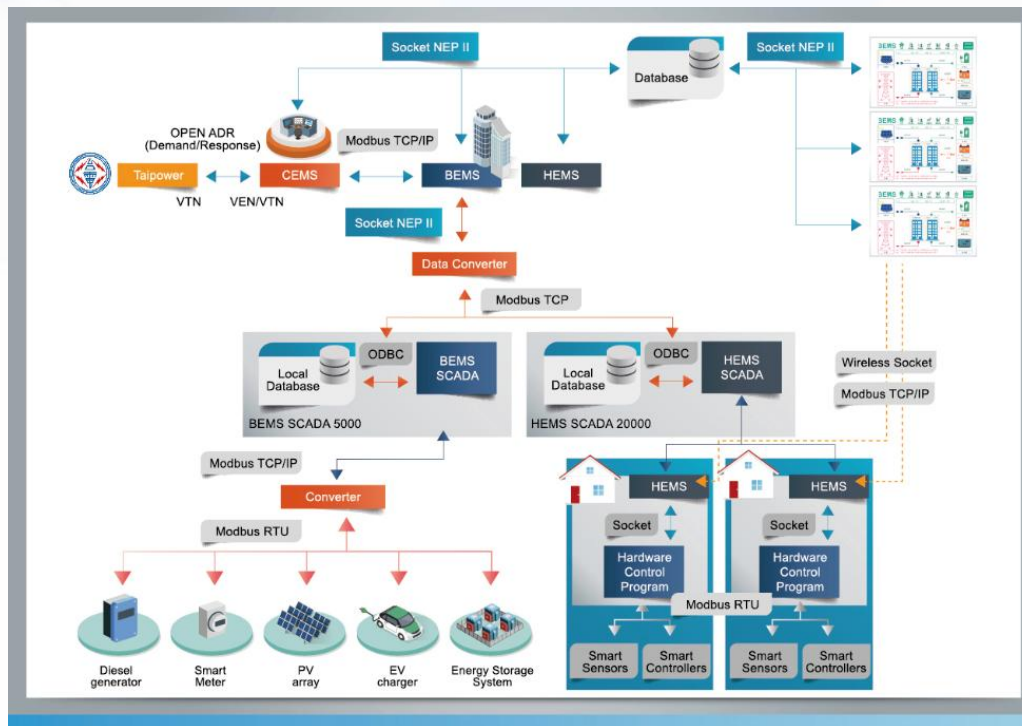
- 導入iFlex-EMS
- 擴充儲能電容量：
60kWh → 180kWh



- The maximum penetration rate of solar power increased from 32% up to 92.8%;

智慧社區應用 台北市興隆國宅

- 本公司2018年執行臺北市政府都市發展局「興隆公共住宅二區智慧電網採購案」，為國內第一個導入綠色能源於大型智慧公共住宅，並以本案參加2019年第四屆APEC能源智慧社區最佳案例(ESCI)評選競賽：於全球17個經濟體、63件競爭提案中，脫穎而出獲得智慧電網類金質獎殊榮，足見中興電工深耕智慧電網與微電網系統有成，技術能力深獲國際肯定。



中興氫能事業群－總結

完整的核心技術

- **甲醇重組技術**：唯一、獨特的世界性專利保護技術。利用甲醇重組制氫，應用在產氫機（環保節能減排）、除碳機、燃料電池、以及將來的氫能汽車動力。
- **甲醇型燃料電池**：量產產品，應用在備載(back up power)、基載電源(prime power)，全球已有3000台以上的應用實績。完整的甲醇重組制氫、電堆、控制單元等技術和專利保護。
- **微電網系統**：自主技術、品牌，包括系統和逆變器，可隨意組合再生能源為智慧型分散式系統，可實際解決離島、偏鄉之用電不足與不穩的問題。有多年多地的實績，獲得APEC 2017年微電網應用銀牌獎。
- **產氫機和加氫站技術**：這是制約燃料電池汽車發展的主因之一，可說掌握分散式加氫站的技術，就掌握燃料電池車輛的推廣之鑰。歐盟利用幾年時間研究電解水制氫、天然氣制氫，都達不到10歐元/kg氫氣的目標成本。利用甲醇重整制氫，約可達到6美元/kg直接成本，是一大突破。

中興氢能事業群－總結

中興電工的獨特競爭力-由點而面的total solution

➤ 電力供應：

完整的2.5~200KW的備用/基載電源和智慧微電網系統產品，100%自主品牌和技術，特別適用於偏鄉、離島、和緊急救難用電源。國內外應用實績證明該技術的可靠性、性能優越性。

➤ 運輸系統：

氫氣運輸、儲存和加氫站設置困難，使得甲醇重組制氫機和站內(on-site)製氫的分散式加氫站技術，逐漸變成主流意識。

中興電工的新能源的技術產品是

「全球領先，應用勝出」，甚具發展潛力！



Patent list (I)

No.	Patent Name	Expire date	Country
1	Tunneling resistance measurement system and measurement device structure	10/16/28	Taiwan
2	Fuel cell stack with Transparent runner and Bipolar plate structure	06/03/29	Taiwan
3	Battery self-tight structure	06/07/29	Taiwan
4	Double voltage circuit structure	09/22/29	Taiwan
5	Circuit construction for liner cw modulation converter	07/19/31	USA
6	Circuit construction for liner cw modulation converter	12/30/29	Taiwan
7	Adsorption construction for metal porous material	01/28/30	Taiwan
8	Exhaust ventilation system application in tunnel construction	07/28/20	Japan
9	Muilt- fuel cell converter paralell system and control method	09/30/31	USA
10	Muilt- fuel cell converter paralell system and control method	07/05/30	Taiwan
11	Muilt- fuel cell converter paralell system and control method	07/05/30	Taiwan
12	Muilt- fuel cell converter paralell system and contro method	07/05/30	USA
13	Recharge control system and method	10/04/31	USA
14	Fuel cell with shunt function	10/10/30	Taiwan
15	Power convert circuit	02/22/32	USA
16	Power convert circuit	12/28/13	Taiwan
17	Fuel cell CHP system include RFID	10/31/30	Taiwan
18	Fuel cell CHP system include RFID	01/27/32	USA
19	Energy adjustor	10/18/21	Taiwan
20	Energy adjustor	09/28/21	China
21	Fuel cell electric power supply system	05/06/22	China
22	Fuel cell electric power supply system	08/08/34	USA
23	Fuel cell electric power supply system	03/26/23	Taiwan
24	Electrical energy supply system	01/23/33	Taiwan
25	Micro grid system with energy storage function	08/20/24	Taiwan
26	Micro grid system with energy accumulation	08/20/24	Taiwan
27	Production method for fuel cell stack device and PEM	10/16/32	Taiwan
28	Micro-grid operation system with smart energy management	04/09/34	Taiwan
29	Fuel cell system controller	12/26/20	Taiwan
30	System and method for controlling the operation of a fuel processing system	12/26/20	Taiwan





Patent list (II)

No.	Patent Name	Expire date	Country
31	Fuel processor and systems and devices containing the same	03/11/21	Taiwan
32	Fuel processor feedstock delivery system	08/15/21	USA
33	Fuel cell system with stored hydrogen	02/24/22	Taiwan
34	Steam reforming fuel processor	04/07/23	Taiwan
35	Steam reforming fuel processor	04/07/23	China
36	Steam reforming fuel processor, burner assembly, and methods of operating the same	04/11/23	China
37	Hydrogen purification devices, components and fuel processing systems containing the same	09/23/22	China
38	Hydrogen purification devices, components and fuel processing systems containing the same	03/26/22	China
39	Distributed fuel cell network	09/23/23	Taiwan
40	Utilization -based fuel cell monitoring and control	05/22/25	China
41	Utilization -based fuel cell monitoring and control	05/22/25	China
42	Hydrogen-producing fuel processing assemblies, heating assemblies, and methods of operating the same	06/05/26	Taiwan
43	Thermally primed hydrogen-producing fuel cell system	08/28/26	Taiwan
44	Self-regulating feedstock delivery systems and hydrogen-generating fuel processing assemblies and fuel cell systems incorporating the same	09/12/26	Taiwan
45	Hydrogen-producing fuel cell systems with load-responsive feedstock delivery systems	05/14/27	Taiwan
46	Hydrogen-processing assemblies and hydrogen-producing systems and fuel cell systems including the same	05/21/27	Taiwan
47	Hydrogen-producing fuel processing and fuel cell systems with a temperature-responsive automatic valve system	08/26/29	China
48	Systems and methods for reliable feedstock delivery at variable delivery rates	11/07/28	China
49	Systems and methods for reliable feedstock delivery at variable delivery rates	12/09/28	Taiwan
50	Fuel processing systems with thermally integrated componentry	03/23/31	Taiwan
51	Fuel cell systems including hydrogen-producing assemblies	08/24/29	China
52	Systems and methods for independently controlling the operation of fuel cell stacks and fuel cell systems incorporating the same	06/10/30	China
53	System and Methods for maintaining hydrogen-selective membranes during periods of inactivity	10/06/31	China
54	System and Methods for maintaining hydrogen-selective membranes during periods of inactivity	10/06/31	Taiwan
55	Systems and methods for regulating fuel cell air flow during low loads or cold temperature operation	05/09/31	Taiwan
56	Electrical energy supply system	08/18/34	USA
57	Method of car engine carbon removal	12/29/35	Taiwan
58	Micro-grid stabilization device	05/16/36	Taiwan



Product Certification – Fuel Cell (I)

Certification Program	Standard	Issuing Unit	 EU Declaration of Conformity CE We: ME²Tech, LLC 2000 1st St. Suite 100 Petal, CA 94557, USA Phone: +1 (415) 453-1000 Fax: +1 (415) 453-1000 Email: info@me2tech.com Web: www.me2tech.com Declares, under sole responsibility, that the products: Electrolyte™ ME², ME²-MC 4.000-400-0, ME²-S 4000-20V-0, ME²-2.000V-40V-0, ME²-S 4000-40V-0, ME²-S 4000-40V-0-0 To ensure the declaration remains, it is in conformity with the following directives, standards and/or other normative documents: EN61010-1, EN62282-3-1, EN61000-6-4, EN61000-6-2 Including the following provisions of Directives: 2006/95/EC, 2004/108/EC Conformance of this product is per the TUV SUD America Report: UR 10 12 0014 021 The Electrolyte™ ME² System is a low-voltage power generator designed to provide DC power for telecommunication applications. When operating, the system converts a chemical fuel consisting of hydrogen and water into electricity, which is subsequently converted under the PEM fuel cell into electrical energy for use in the cellular applications. The undersigned, hereby declares that the equipment specified above conforms to the listed directives and standards. Place of Issue: Seoul, Chung Date: August 22, 2011  Michael Clement General Manager Idatech Fuel Cells Division  Hans Rudolph President & CEO Idatech LLC
The fuel cell system of analog seismic Specification	(1) GR-63-CORE , issue 3 , 4.3.1/5.4.1 (2) ANSI NCSL Z540-1 (3) ISO 17025:2005	USA NTS Lab.	 Test Report No. 114-00024 Page 1 of 11 Idatech, LLC 2000 1st St. Suite 100 Petal, CA 94557, USA Phone: +1 (415) 453-1000 Fax: +1 (415) 453-1000 Email: info@me2tech.com Web: www.me2tech.com March 29, 2011 Idatech, LLC 2000 1st St. Suite 100 Petal, CA 94557, USA Phone: +1 (415) 453-1000 Fax: +1 (415) 453-1000 Email: info@me2tech.com Web: www.me2tech.com Earthquake Zone 4 One (1) Electrolyte™ ME² 4V Per Standard 11113, Serial Number 0302 One (1) ME²-MC 4.000-400-0, Issue 1, Paragraphs 4.3.1.1 & 4.3.1.2 RESULTS This is to verify that the Electrolyte™ ME² 4V was subjected to the Earthquake Test with See Heavy Seismic according to the above specifications. Visual inspection showed no evidence of physical damage beyond that not Functional testing was conducted to Idatech, LLC and an Electrical operation was required. The Electrolyte™ ME² 4V was returned to Idatech, LLC for post test and final evaluation. Test data, an approved test and photographs are attached. NATIONAL TECHNICAL SYSTEMS  Michael Clement General Manager Idatech Fuel Cells Division  Hans Rudolph President & CEO Idatech LLC
Fuel Cell System • USA / Canada • Safety Regulations	(1) CAN/CSA-C22.2 No.61010-1/R:2009 (2) UL 61010-1/R:2008 (3) EN61010-1:2001 (4) ANSI/CSA US FC-1:2004 IEC (5) 62282-3-1:2007	TUV SUD	 EU Declaration of Conformity CE We: ME²Tech, LLC 2000 1st St. Suite 100 Petal, CA 94557, USA Phone: +1 (415) 453-1000 Fax: +1 (415) 453-1000 Email: info@me2tech.com Web: www.me2tech.com Declares, under sole responsibility, that the products: Electrolyte™ ME², ME²-MC 4.000-400-0, ME²-S 4000-20V-0, ME²-2.000V-40V-0, ME²-S 4000-40V-0, ME²-S 4000-40V-0-0 To ensure the declaration remains, it is in conformity with the following directives, standards and/or other normative documents: EN61010-1, EN62282-3-1, EN61000-6-4, EN61000-6-2 Including the following provisions of Directives: 2006/95/EC, 2004/108/EC Conformance of this product is per the TUV SUD America Report: UR 10 12 0014 021 The Electrolyte™ ME² System is a low-voltage power generator designed to provide DC power for telecommunication applications. When operating, the system converts a chemical fuel consisting of hydrogen and water into electricity, which is subsequently converted under the PEM fuel cell into electrical energy for use in the cellular applications. The undersigned, hereby declares that the equipment specified above conforms to the listed directives and standards. Place of Issue: Seoul, Chung Date: August 22, 2011  Michael Clement General Manager Idatech Fuel Cells Division  Hans Rudolph President & CEO Idatech LLC
Fuel Cell System' Europe' Safety Regulations Follow	(1) EN61010-1 (2) EN62282-3-1 (3) EN61000-6-4 (4) EN61000-6-2 (5) 2006/95/EC , 2004/108/EC	CE	



Product Certification – Fuel Cell (II)

Certification Program	Standard	Issuing Unit	
Fuel Cell System • USA / Canada • Monitoring Equipment Specifications (Ignition Controller PCB)	(1) CAN/CSA-E60730-1/R : 2007 (2) CAN/CSA-C22.2 No.199:2007 (3) UL 60730-1A:2002 (4) EN60730-1/A2:2008 (5) EN60730-2-5/A11:2005	TUV SUD	
Fuel Cell System USA / Canada DC / DC CONVERTER Specification	ISO / IEC Guide 67	TUV SUD	
Methanol reformer Fuel cell system performance	YDB-051(For Telcom Base Station purpose - Fuel Cell System)	Beijing Telecommunication Technology Labs	

Product Certification – Micro Grid

ETC ELECTRONICS TESTING CENTER, TAIWAN
NO.1, LANE 25, WEN-TE RD., GUISHAN TOWNSHIP, TAOYUAN COUNTY 33383, TAIWAN
TEL: (03) 324-4020 FAX: (03) 324-4175

EC-Attestation

Applicant : Chung-Hsin Electric & Machinery Manufacturing Corp.
No.25, Wen-Te Rd., Guishan Township, Taoyuan County 33383, Taiwan

Name of Object : Grid-tied/Standalone Hybrid Inverter

Model(s) : CHGSC-10-T222

Rating : Input: 360-400 Vd.c., MAX: 30A
Output: 230 Va.c., 50 Hz, MAX: 15A (3 phase)

Degree of Protection : IP20

Protection Class : I

The attestation is based on an evaluation of a sample of above mentioned product and the above product has been tested with the listed standards and found in compliance with the European directive LVD 2014/35/EU

Tested according to : EN 50178: 1997

Test Report No. : 14-09-YAB-013-001

Data : 2014-10-01


DANIEL YEH / Manager of Products Safety Department
ELECTRONICS TESTING CENTER, TAIWAN

 After preparation of the necessary technical documentation as well as the conformity declaration the required CE marking can be affixed on the product. Other relevant directives have to be observed.

ETC ELECTRONICS TESTING CENTER, TAIWAN
NO.1, LANE 25, WEN-TE RD., GUISHAN TOWNSHIP, TAOYUAN COUNTY 33383, TAIWAN
TEL: (03) 324-4020 FAX: (03) 324-4175

ATTESTATION OF CONFORMITY

Applicant : Chung Hsin Electric & Machinery Mfg. Corp. Ltd.
No.25, Wen-Te Rd., Guishan Township, Taoyuan County 33383, Taiwan (R.O.C.)

Name of Object : 10kW Smart Multi-function Bi-directional Inverter

Model(s) : CHGSC-10-T221

Rating : Input: 360-400 Vd.c., MAX: 30A
Grid Output: 230 Va.c., 50 Hz, MAX: 15A (3 phase)

Degree of Protection : IP20

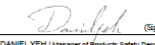
Protection Class : I

The attestation is based on an evaluation of a sample of above mentioned product and the above product has been tested with the listed standards:

Tested according to : DIN V VDE V 0126-1-1: 2006

Test Report No. : 14-09-YAB-013-002

Data : 2014-10-03


DANIEL YEH / Manager of Products Safety Department
ELECTRONICS TESTING CENTER, TAIWAN

ETC ELECTRONICS TESTING CENTER, TAIWAN
NO.1, LANE 25, WEN-TE RD., GUISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN (R.O.C.)
TEL: (03) 324-4020 FAX: (03) 324-4175

Attestation

No.: M00-CERT-1311080-02

Holder of Certificate : Chung Hsin Electric & Machinery Mfg. Corp. Ltd.
No.25, Wen-Te Rd., Guishan Township, Taoyuan County 333, Taiwan(R.O.C.)

Name of Object : 10kW Smart Multi-Functional Bi-directional Inverter

Model(s) : CHGSC-10-T222

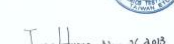
Comment Issues : CHGSC-10-T221

This certificate of conformity is based on evaluated sample(s) of product as below:

Tested according to : FCC 47 CFR, Part 15 Subpart B (2011) (Class A)
CSA Standard C108.8 / Interference-Causing Equipment Standard
ICES-003 (2004) / ICES-003 (2004) / CAN/CSA-CEU / IEC CISPR 22: 02 (Class A)

Test Report No. : 13-11-MAS-080-02

Date : Nov. 26, 2013


JERRY HUANG / Section Manager of EMC Testing Department I
ELECTRONICS TESTING CENTER, TAIWAN

ETC ELECTRONICS TESTING CENTER, TAIWAN
NO.1, LANE 25, WEN-TE RD., GUISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN (R.O.C.)
TEL: (03) 324-4020 FAX: (03) 324-4175

EC-Attestation

No.: M00-CERT-1311080-01

Holder of Certificate : Chung Hsin Electric & Machinery Mfg. Corp. Ltd.
No.25, Wen-Te Rd., Guishan Township, Taoyuan County 333, Taiwan(R.O.C.)

Name of Object : 10kW Smart Multi-Functional Bi-directional Inverter

Model(s) : CHGSC-10-T222

Comment Issues : CHGSC-10-T221

This certificate of conformity is based on evaluated sample(s) of product as below:

Tested according to : IEC 61000-6-4:2006(EMI)
CISPR16-2-1:2008
CISPR16-1-2:2006
CISPR16-2-3:2010
IEC 61000-3-2:2005(A1:2008/A2:2009)
IEC61000-3-3:2008
IEC 61000-6-2:2005(EMS)
IEC 61000-4-2:2008
IEC 61000-4-3:2008(A2:2010)
IEC 61000-4-4:2012
IEC 61000-4-5:2005
IEC 61000-4-6:2008
IEC 61000-4-8:2009
IEC 61000-4-11:2004

Test Report No. : 13-11-MAS-080-01

Date : Nov. 28, 2013

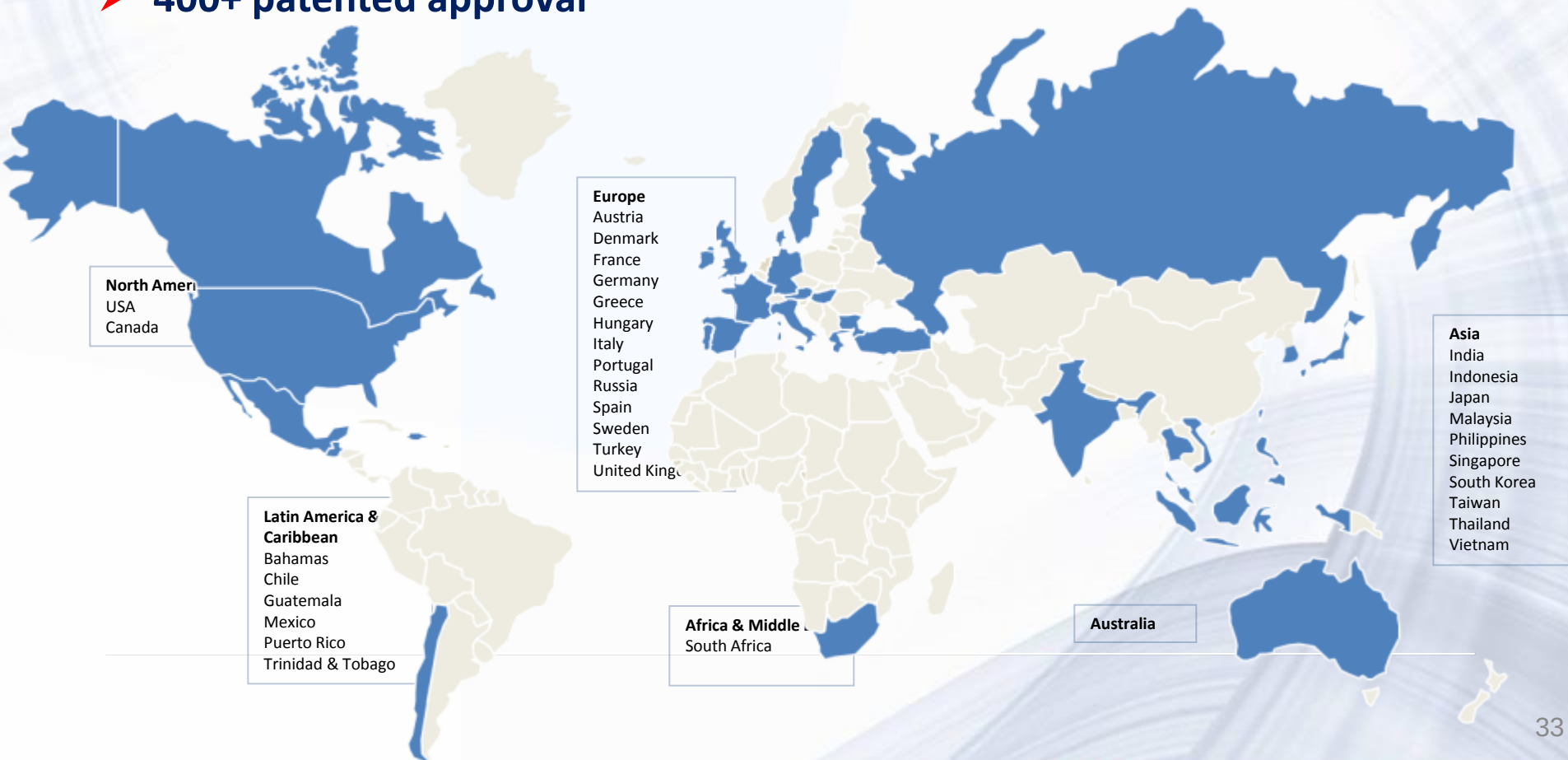

JERRY HUANG / Section Manager of EMC Testing Department I
ELECTRONICS TESTING CENTER, TAIWAN

 After preparation of the necessary technical documentation as well as the conformity declaration the required CE marking can be affixed on the product. Other relevant directives have to be observed.

Certification Received for the IEC61000-6-4, CISPR16-2-1, CISPR16-1-2 , CISPR16-2-3 , IEC61000-3-2 , IEC61000-3-3 , IEC61000-6-2 , IEC61000-4-2~6 , IEC61000-4-8 , IEC61000-4-11 , IEC CISPR22:02(Class A)

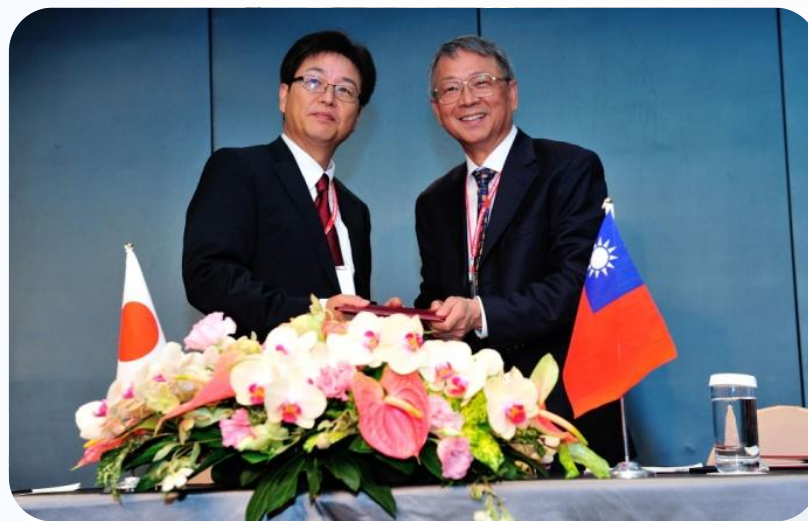
Achievement

- 3,000+ units installed in 30 countries
- Recognized by the 6 from the world's top 10 mobile companies
- 400+ patented approval



策略聯盟

The Signing Ceremony



 **TOYOTA TSUSHO**

**For FUEL CELL & Hydrogen
Business**

June 2017



氫能產業平臺

- 分散式加氫站
- 開發氫能叉車、堆高車、物流車
- Shuttle Bus/城市巴士
- 引擎除碳

產氫機

- Tele-com基地台/公共設施備載電力
- 銀行ATM、醫院緊急備載電力
- 交通號誌系統備援電力

燃料電池

- 5KW/6KWh室內及5KW/12KWh戶外型儲電系統
- 燃料電池創電模組(PGM)
- 微電網管理平臺(BMS, PMS, iFlex-EMS)

微電網

應用端

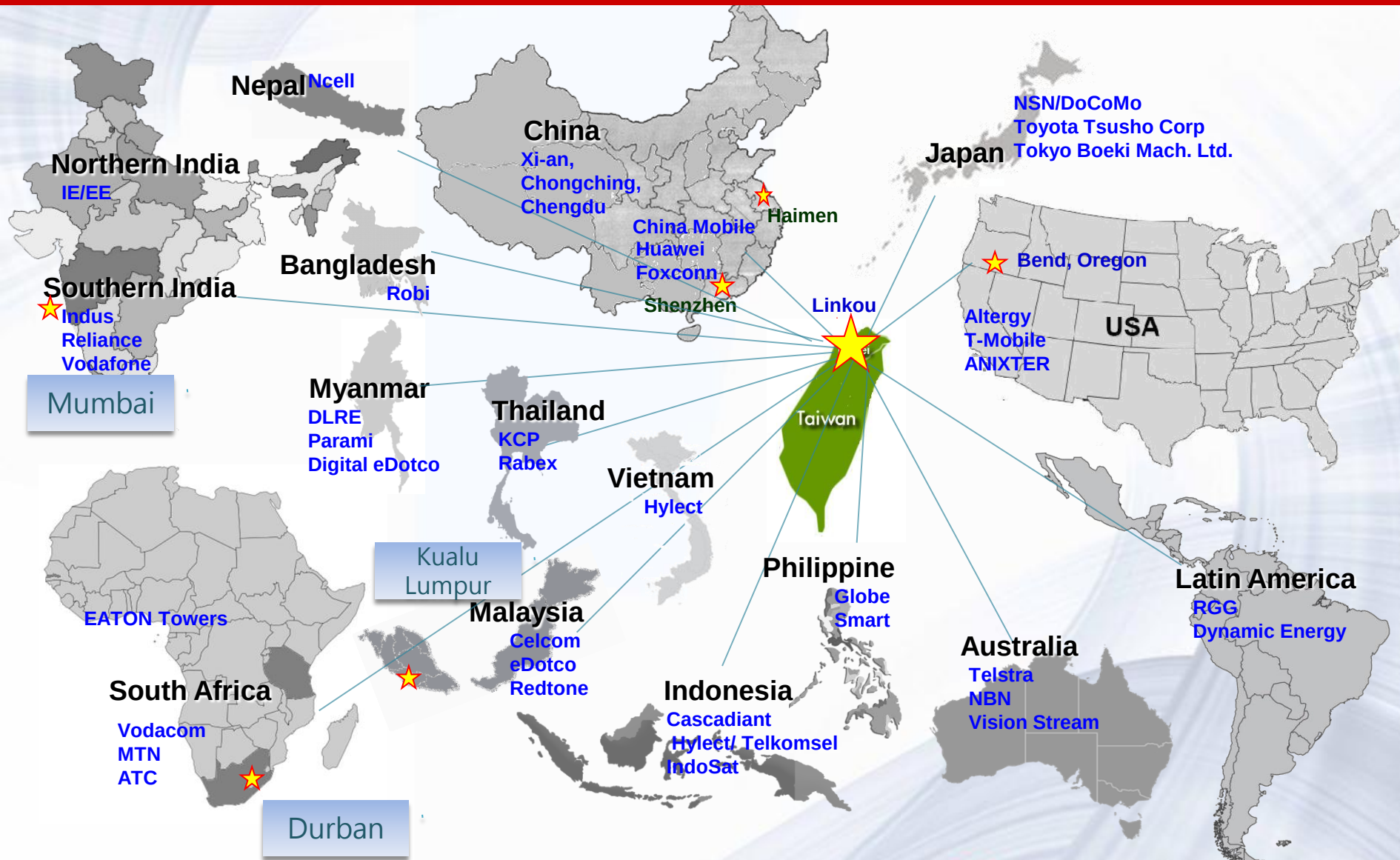
產業鏈

- 上游(原料/元件供應商):
甲醇供應商
貴金屬供應商
觸媒供應商
電子元件供應商
- 中游(模組供應商):
機械加工廠、PCB板製造廠、觸控螢幕製造廠
- 下游(使用者):
汽車保養業、鍋爐業者、物流業者、巴士業者
- 周邊廠商(配合廠商):
氫氣壓縮機廠商、高壓儲氫鋼瓶廠商、建築廠商、電動堆高機、叉車生產廠商、電動巴士業者

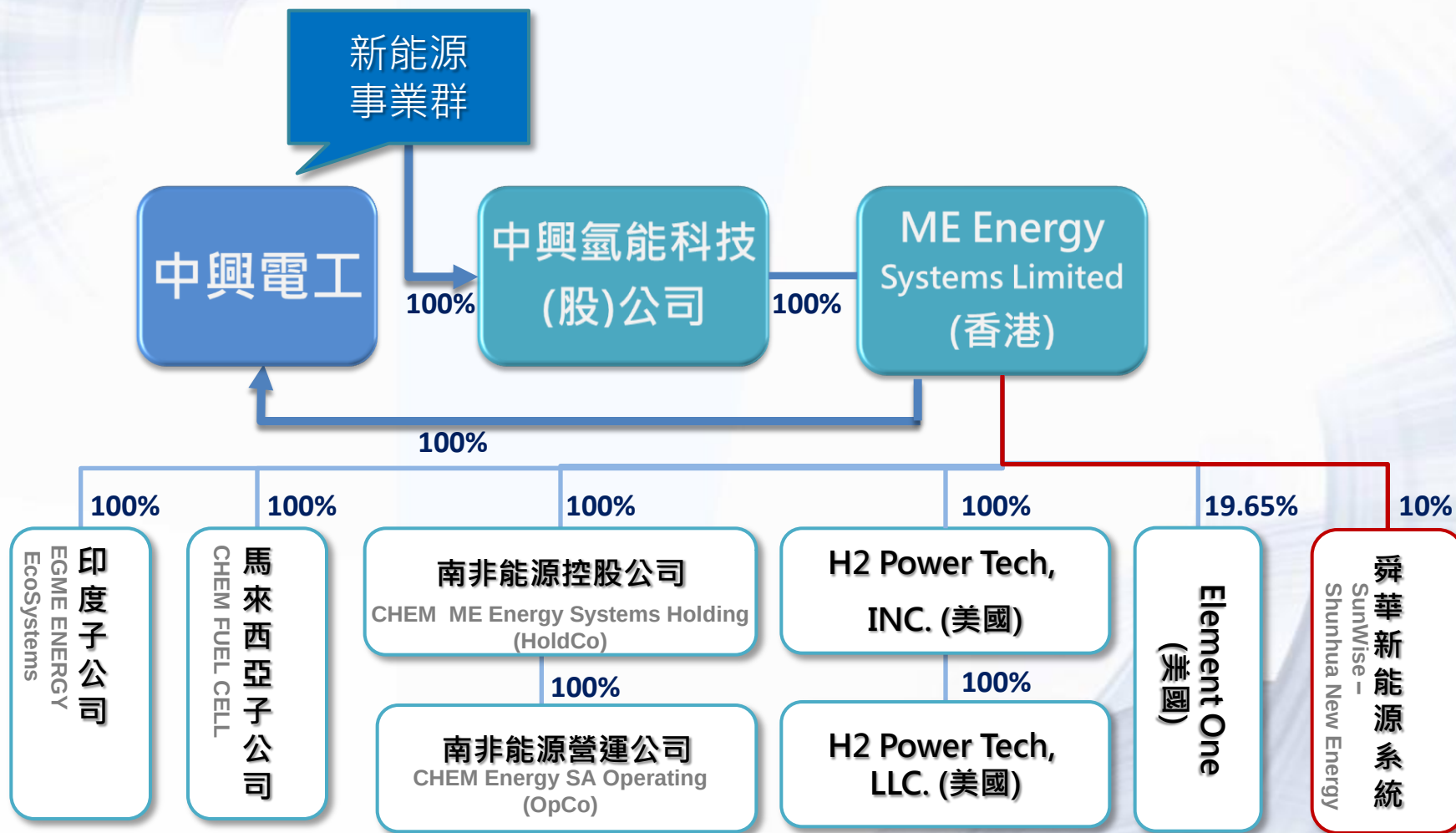
- 上游(原料/元件供應商):
膜電極組(MEA)
雙極板(Bipolar plate)
金屬加工廠商
- 中游(模組供應商):
電堆製造廠、PCB板製造廠、重組器製造廠/SNESOR供應商、閥件供應商、泵浦供應商、機構件 供應商
- 下游(使用者):
燃料電池系統生產商、燃料電池系統應用商
- 周邊廠商(配合廠商):
高壓儲氫鋼瓶廠商、甲醇水供應商、燃料電池系統維護商

- 上游(材料供應商)
矽材、薄膜、模電極組、電極材料、電池芯
- 中游(模組件供應商)
太陽能板、燃料電池、電力轉換器、儲能電池、工業電腦、機構組件
- 下游(系統供應商)
能源管理系統、偏鄉/離島型微電網系統、併網型微電網系統、移動型微電網系統
- 周邊廠商(配合廠商)
甲醇供應商、PCB零組件

Global Footprint



新能源事業群分拆關聯圖





業務聚焦

ME Energy (HK)

- 策略規劃&市場佈局
- 技術授權
- 資本市場操作
- IPO規畫

H2PT

- 技術研發
- 技術支援

CHEM SA

- 生產銷售ME
- 拓展東非鄉村電力業務

EGME (IN)

- 建構Eco-System; 合資設廠; 深耕ME市場

China (CN)

- 以產氫技術開拓氫能叉車、分散式加氫站及引擎除碳機業務

CHEM (TW)

- 參與H2PT之研發及對各區塊之生產、人力、技術、管理、資訊等提供支援





Machining : Aviation Engine Parts



Shroud

**Combustor Case
(Waspaloy)**



**CNC Vertical Lathes
(O-M Vtlex 1250)**



**Vertical Multi-Tasking Turning
Center (5 Axis)
(Mazak e-1550 V/10)**



Machining : Vacuum Chamber Parts



Chamber

**Vertical Multi-Tasking
Turning Center (5 Axis)
(Mazak e-1550 V/10)**

**CNC Five-face
machining center**



南科樹谷廠



南科樹谷廠



4M/5M, 70頓荷重, 落地塘銑床



高精度高切削力, 五面加工機



Capability Status for Manufacturing

Process	Technique	Assessment	Major Customer
中興 精密	Welding	Carbon Steel Stainless Steel Aluminum Alloy	中微 UCT AKT F Fiti 理想
	Machining	Machining	
	Polishing	Jitterbug Raceway polishing	
	Surface Treatment	Chemical Cleaning/ Anodize/Electro Polish	
中興 林口	Welding	Carbon Steel Stainless Steel Aluminum Alloy	AMAT Semi ULVAC AIDC AEF EGAT EBARA
	Machining	Machining	
	Polishing	Jitterbug Raceway polishing	
中興 樹谷	Welding	Carbon Steel Stainless Steel Aluminum Alloy	AMAT ULVAC
	Machining	Machining	
	Polishing	Jitterbug Raceway polishing	





CNC事業群-真空腔體業務

臺南
樹谷廠

林口
總公司

江蘇
海門廠



■ 林口廠

1. 完善技術和管理平台
2. 航太關鍵部件業務
3. 半導體關鍵部件業務

■ 台南樹谷廠

1. 配合美國應材顯示器部門
2. 不斷成長的OLED和10.5代顯示器設備業務。

■ 江蘇海門廠

1. 供應中國地區急速成長之半導體設備關鍵部件
(LED, SOLAR, Display, 和SEMI)
2. 主要客戶-
中微半導體/理想能源/Solibro/UCT等



嘟嘟房事業群－互聯網＋智能停車



嘟嘟房

dodohome.com.tw

+



停車酷



fondata

庫 網 科 技

營收與場站

- 107年營收19.2億，
108年預估營收19.5億
- 現有場站326站，預估108年底340站
- 預定依據108年度年報進行分拆

線上線下整合

- 已完成開發app，線上整合
信用卡優惠停車 (中信,永豐,台新銀行等)
合作保險業業者(富邦產險,新安東京海上產險,泰安產險等)
- 異業結合(車麗屋、汽車美容愛駒)
- 已整合線下場站261場
- 目前庫網會員84000人
預估108年底可達10萬人

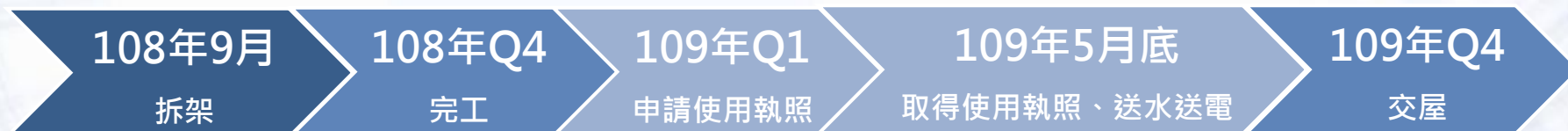


都更-敦南御所



敦南都更案執行情形

➤ 工程進度



➤ 銷售狀況

1. 已完成簽約18單元，金額15.61億，占總銷48.52億之32%
2. 洽談中客戶有17單元

➤ 損益分析

1. 總投入金額約28.5億
2. 預估銷售金額約48.52億(含找補)
3. 初估獲利約20億



台南七股建置太陽能設施案



天衝能源

裝置容量：

98.952MW

土地面積：

957,501.74M²

天禽能源

裝置容量：

22.320MW

土地面積：

209,211.92M²

天籐能源

裝置容量：

71.3496MW

土地面積：

682,608.85M²

