



Sino-American Silicon Products Inc.
GlobalWafers Co., Ltd.
2016 / 01

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Solar Business Sector

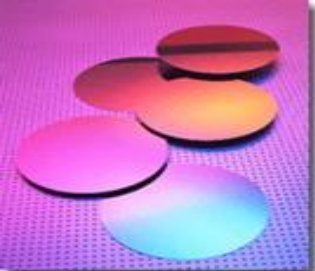
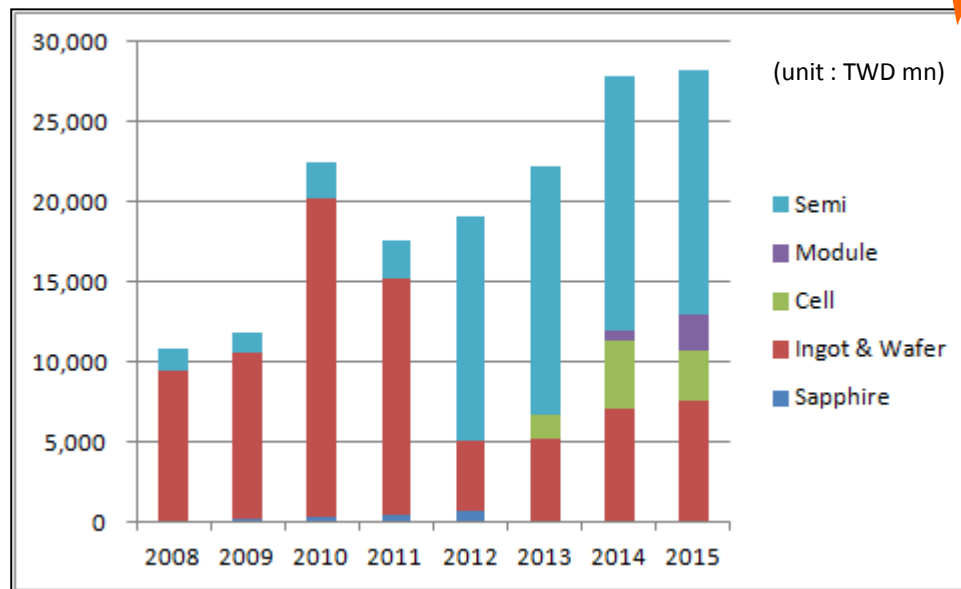


Sino-American Silicon Products Inc.

SAS Company Profile



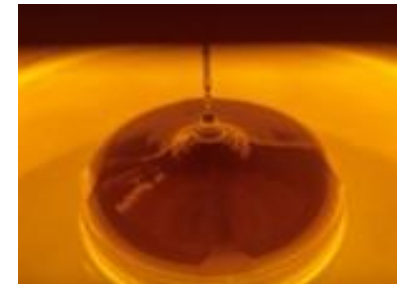
- **Established** : 1981
- **Paid-in Capital** : TWD 5,800mn
- **Employees** : 4,633 (2016/01)
- **Headquarter** : Hsinchu Science Park, Taiwan R.O.C.
- **Products** : Solar Wafer / Cell / Module / Power Plant
Semiconductor Wafer (3"~12") ~ all-time high ~
- **Revenue** : 2015 Jan~ Dec TWD 28,283 mn



SAS Milestones



- 1981** Sino-American Silicon Products Inc. established
.....
- 1999** SST established in China
- 2000** Enter Solar Ingot / Wafer Business
- 2001** SAS IPO in Taiwan (5483 TT)
- 2008** Acquired GlobiTech Incorporated, TX, USA
- 2011** Company spin off – SAS / GWC / SSC
- 2012** Acquired Covalent Silicon, Japan
- 2014** Acquired ALEO module fab of Bosch group, Germany
Merged Sunrise Global Solar Energy Co., Ltd. Taiwan
- 2015** SAS Sunrise Inc. (SSR) established for Solar Power
Plant, Project Palo ground breaking
- 2015** GWC IPO in Taiwan (6488 TT)



Organization Structure



sapphire

semiconductor

solar

40.38%

Crystalwise
formerly
Sino Sapphire Co., Ltd.

66.7%

GWC
GlobalWafers
Co.,Ltd, Taiwan

100%

SAS
(Chunan fab)

100%

SSR
(British Cayman
Islands)

100%

SSY
(Yilan fab)

90%

SAM
Sino-American
Material Corp.

100%

SST
Sino Silicon
Technology China

100%

GT
GlobiTech USA

100%

GWJ
GlobalWafers
Japan

Sepalco
Palo
Philippines

100%

ALEO
aleo solar GmbH
Prenzlau, Germany

100%

ALEO-SUNRISE
aleo sunrise GmbH
Prenzlau, Germany

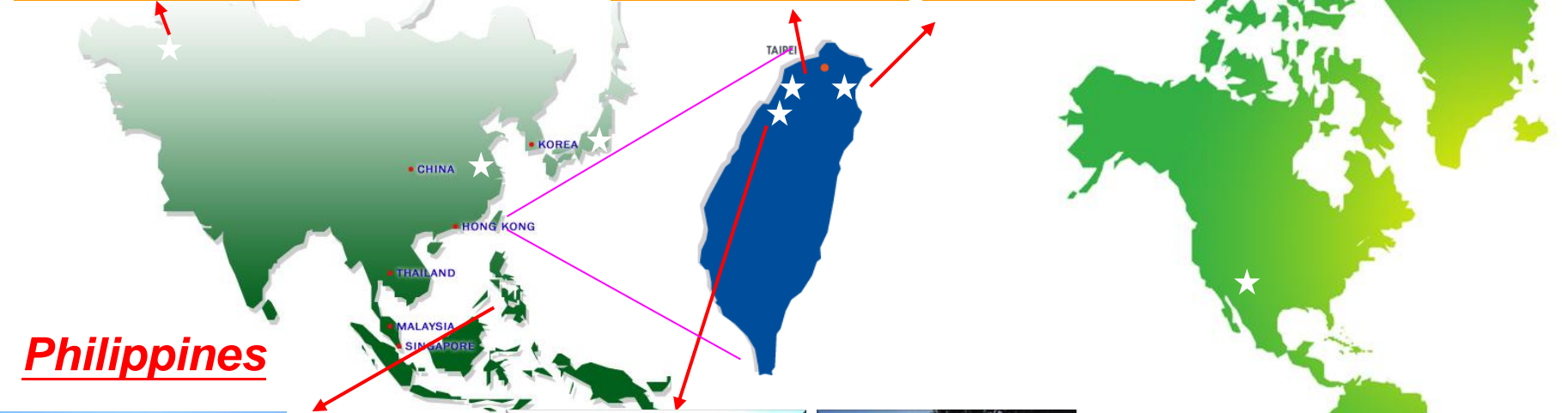
SAS Group (Solar)



Europe



Taiwan



Philippines



Taiwan

SAS Consolidated Financial Statements



TWD mn	2013	%	2014	%	9M-2015	%
Revenue	22,215	100	27,821	100	21,270	100
Gross Margin	2,439	11	3,498	13	3,253	15
Operation Income	629	3	1,447	5	1,782	8
PBT	128	-	1,925	7	1,659	8
PAT	295	1	1,128	4	496	2
Total Debt & Debt ratio	19,088	48	19,304	47	16,146	36
ROE (%)	1.62		6.16		4.61	
EPS	0.57		2.06		0.86	

*ROE: annualized rate

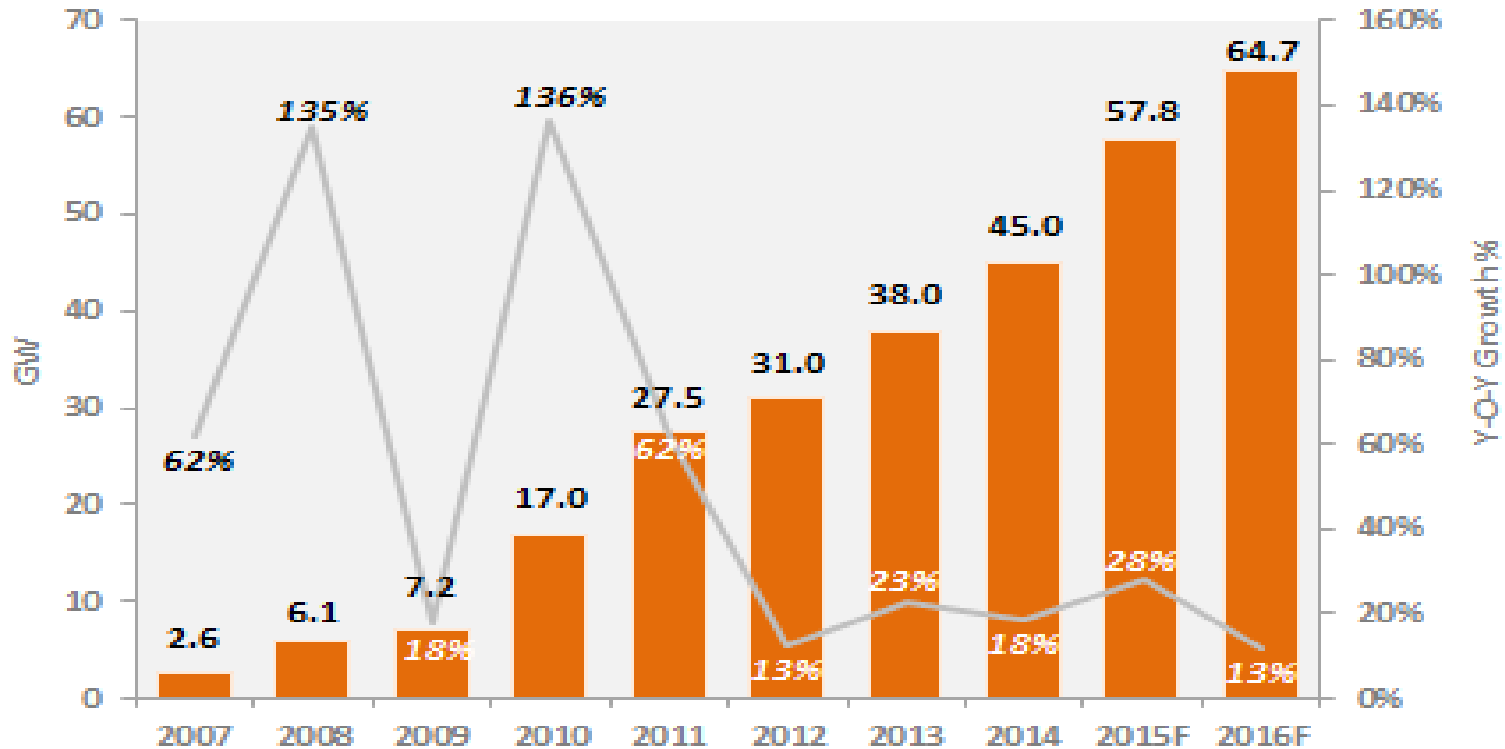
SAS – Solar Financial Statements



TWD mn	2013	%	2014	%	9M-2015	%
Revenue	6,662	100	11,917	100	9,479	100
Gross Margin	(1,226)	(18)	(233)	(2)	59	1
Operation Income	(1,583)	(24)	(906)	(8)	(378)	(4)
PBT	149	2	1,287	11	628	7
PAT	295	4	1,128	9	496	5
Total Debt & Debt ratio	11,467	36	11,193	35	9,185	29
ROE (%)	1.51		5.66		3.02	
EPS	0.57		2.06		0.86	

*ROE: annualized rate

Global Solar Market Forecast

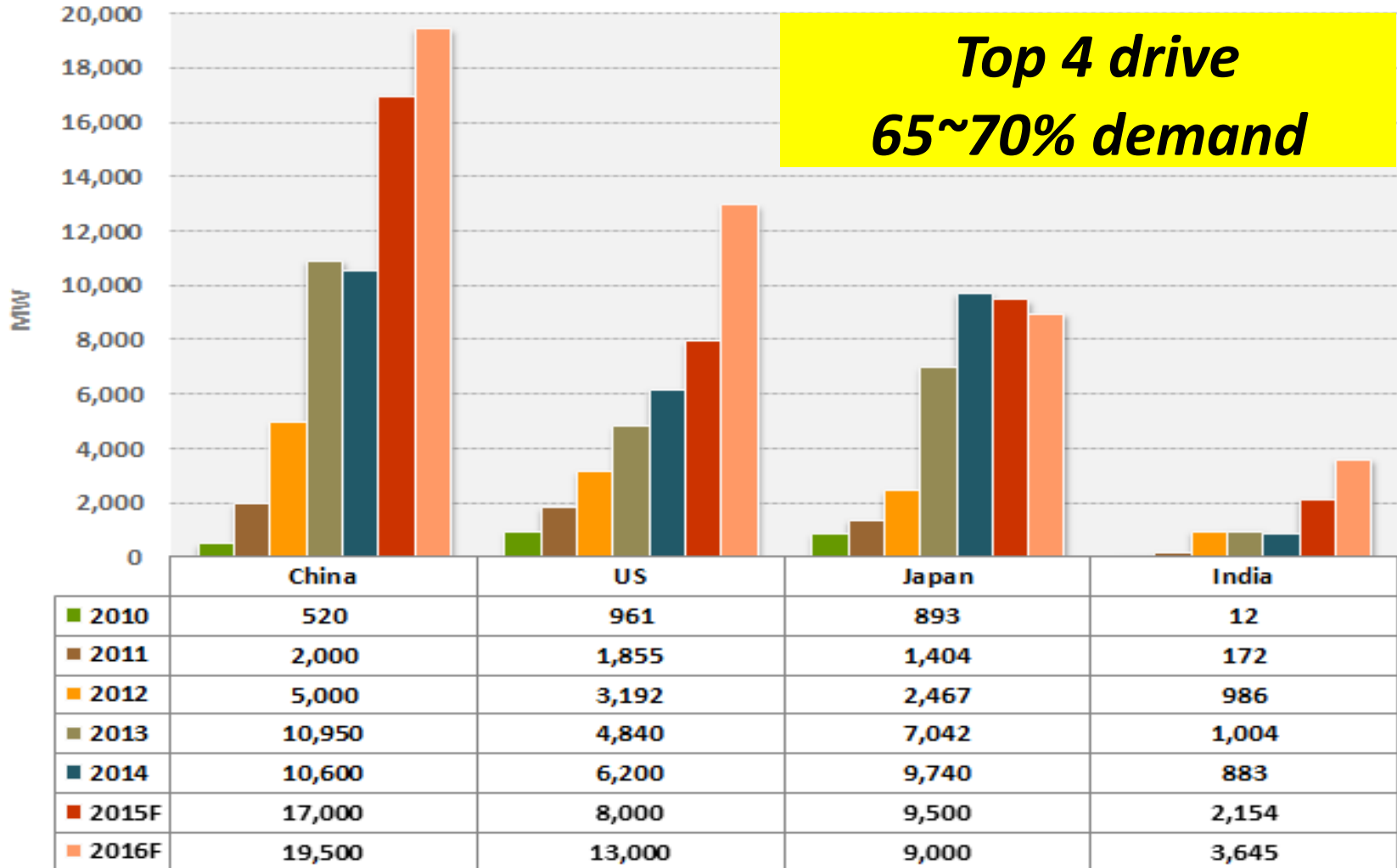


Source: Mercom Capital Group, LLC

Dec 2015

Sustainable Growth in the past & future

Top Solar Market in 2016



Source: Mercom Capital Group, LLC

Dec 2015

SAS Solar Manufacturing Site



(unit: MW)

S A S	Company	Products	2015	2016	Location
		<i>Wafer</i>	<i>1,000</i>	<i>1,200</i>	<i>Taiwan</i>
		<i>Cell</i>	<i>800</i>	<i>800</i>	<i>Taiwan</i>
	Aleo-Sunrise		<i>0</i>	<i>200</i>	<i>Germany</i>
		<i>Module</i>	<i>340</i>	<i>340</i>	
		<i>Solar Farm</i>	<i>0</i>	<i>50+</i>	<i>Philippines</i>
		<i>EVA</i>	<i>40</i>	<i>90</i>	<i>Taiwan</i>

(as of Jan 2016)

Presence along the solar value chain



SAS dedicate to provide the PV Total Solutions with Competitive LCOE and WACC.

能源計算器的平準化成本 Levelized cost of electricity (LCOE) 加權平均資本成本 (Weighted Average Cost of Capital, WACC)

SAS Sunrise Inc. (SSR)



- ◆ Company name: SAS Sunrise Inc. (SSR)
- ◆ Established : Jun 2015
- ◆ Business scope : Solar Power Plant

◆ Project Palo (Sepalco)

- . Location : **Palo Philippines**
- . Capacity : 50MW
- . Groundbreaking on 3 July 2015
- . Commercial operation in Q1/'16
- . Output 71M(KWH) per year
- . 20 years contract with Philippines government
- . To use mainly ALEO high conversion-efficiency mono module

◆ Next Project :



Solar cell tariff to US market



❖ US Commerce 1st final tariff & 2nd preliminary tariff (July, Dec 2015 & Jan 2016)

表、中美2012太陽能雙反重審稅率比較表

中美2012太陽能雙反第一次重審稅率終判 (2015/7月)				中美2012太陽能雙反第二次重審稅率初判 (2015/12月)			
公司名稱	反補貼	反傾銷	合併稅率	公司名稱	反補貼(E)	反傾銷	合併稅率(E)
英利	20.94%	0.79%	21.73%	比亞迪	15.43%	7.27%	22.70%
比亞迪	15.43%	9.67%	25.10%	天合光能	20.94%	4.53%	25.47%
天合光能 阿特斯 晶科 昱輝 其他配合廠商	20.94%	9.67%	30.61%	阿特斯 晶澳 無錫尚德 其他配合廠商	20.94%	7.27%	28.21%
光為	23.28%	9.67%	32.95%	光為	23.28%	7.27%	30.55%
無錫尚德	20.94%	33.08%	54.02%	英利	20.94%	11.47%	32.41%
其他中國廠商	20.94%	238.95%	259.89%	其他中國廠商	20.94%	238.95%	259.89%

*英利旗下的Yingli Green Energy Holding 及 Yingli Green Energy International Trading的稅率不同於英利，稅率為20.94%+9.67%=32.95%

*本次反補貼稅率為EnergyTrend先以持平做預估，實際稅率仍以後續美國商務部公佈為準。

Source: EnergyTrend, Dec., 2015

中美2012太陽能雙反第二次重審稅率初判 (2016/1月)

公司名稱	反補貼	反傾銷	合併稅率
天合光能	19.62%	4.53%	24.15%
晶澳 無錫尚德	19.62%	7.27%	26.89%

Source: Collected by EnergyTrend

Date: 2016.01.08

◆ **Taiwan:** anti-dumping only
ave. 19.5%(1st final)

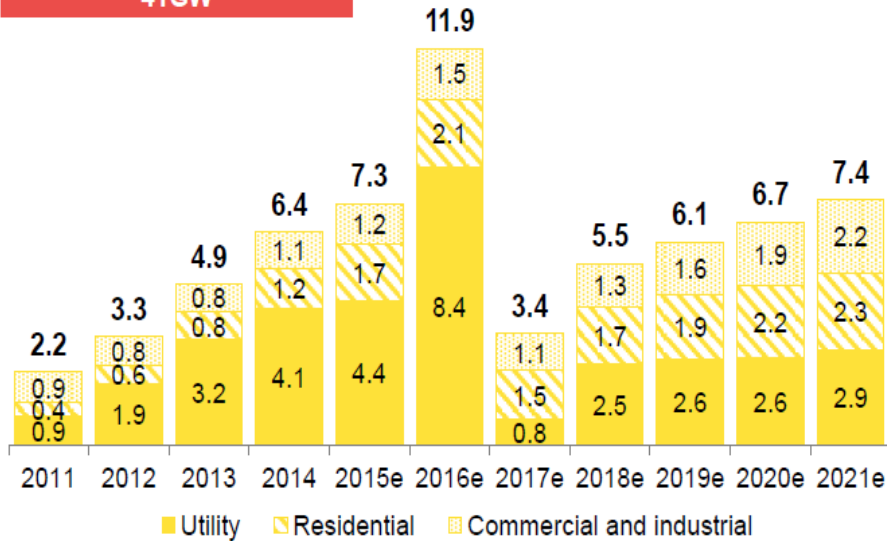
◆ **China:** anti-dumping/subsidy
ave. 31%(1st final)
ave. 24~26%(2nd preliminary)

US policy of reducing import tax tariff continuously will surely accelerate solar installation boom in 2016 & onward

Impact of Tax Credit Extension (US)

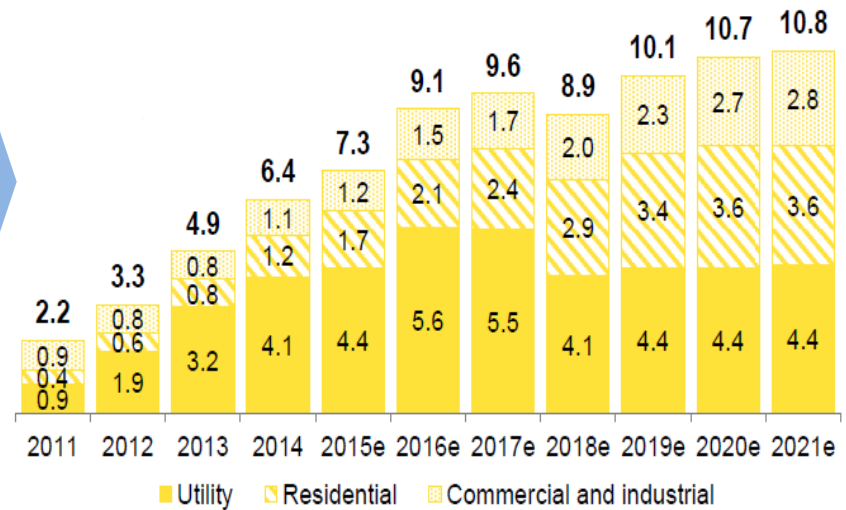
before 5 years Tax Credit extension

Cumulative build (2016-21e):
41GW



with 5 years Tax Credit extension

Cumulative build (2016-21e):
59GW



Source: Bloomberg New Energy Finance 2015/12

Extra 20~25 GW solar installation till 2021

EU Anti-Circumvention investigation result



✘ EU Commission announced investigation result (22 Dec 2015)

- ◆ Including SAS, total 21 Taiwan-based solar cell, module makers, plus 5 Malaysia-based makers have passed EU anti-circumvention investigation.

➔ **ZERO tariff**

(Exempted from EU anti-dumping tariffs of 53.4% and anti-subsidization tariffs of 11.5%)

EU anti-circumvention exempted list			
Taiwan			Malaysia
安集科技 ANJI Technology	英懋達 Inventec Energy	鍊德 Ritek	友達 AUO
友達 AUO	英穩達 Inventec Solar	中美矽晶 Sino-American Silicon	偉創力 Flextronics
太陽光電 Big Sun Energy	樂福LOF	昇陽光電 Solartech	韓華Q Cell
長生太陽能 EEPV	明徽 Ming Hwei	光陽Sunengine Corporation	松下Panasonic
益通 E-TON	茂迪 Motech	聯景 Topcell	TS Solartech
昱晶 Gintech	新日光 NEO Solar	元晶 TSEC	
同昱 Gintung	全能 Perfect source	有成 Win Win Precision	

COP 21 Decisions in Dec 2015

The Paris climate agreement: key points

The historic pact, approved by 195 countries, will take effect from 2020



Temperatures

2100



- Keep warming “well below 2 degrees Celsius”. Continue all efforts to limit the rise in temperatures to 1.5 degrees Celsius”

Finance

2020-2025



- Rich countries must provide 100 billion dollars from 2020, as a “floor”
- Amount to be updated by 2025

Differentiation



- Developed countries must continue to “take the lead” in the reduction of greenhouse gases
- Developing nations are encouraged to “enhance their efforts” and move over time to cuts

Emissions objectives

2050



- Aim for greenhouse gases emissions to peak “as soon as possible”
- From 2050: rapid reductions to achieve a balance between emissions from human activity and the amount that can be captured by “sinks”

Burden-sharing



- Developed countries must provide financial resources to help developing countries
- Other countries are invited to provide support on a voluntary basis

Review mechanism

2023



- A review every five years
First world review: 2023
- Each review will inform countries in “updating and enhancing” their pledges

Climate damage



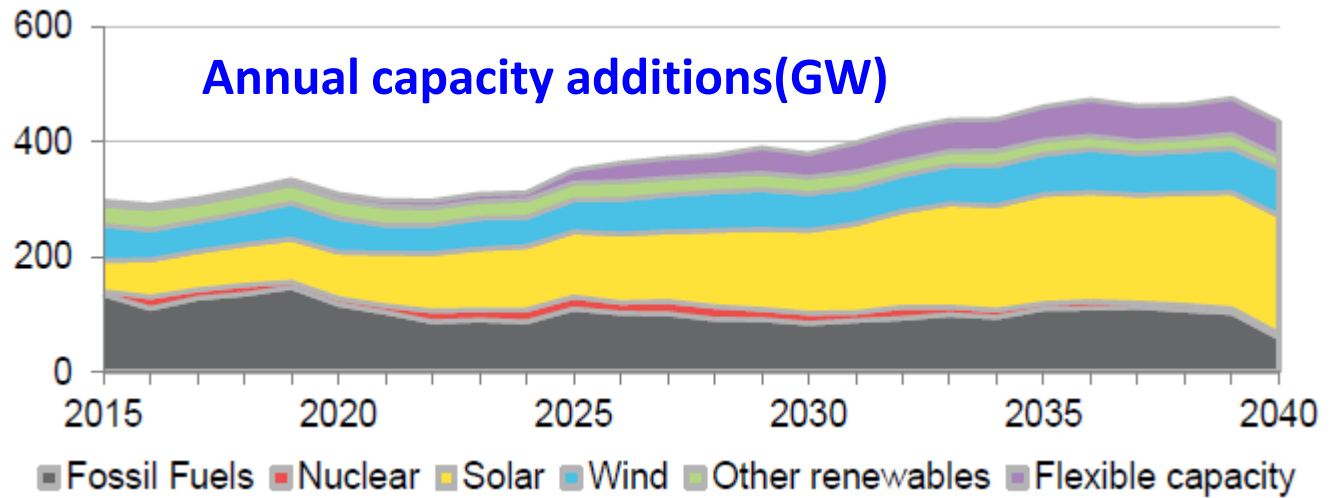
- Vulnerable countries have won recognition of the need for “averting, minimising and addressing” losses suffered due to climate change



Next action?

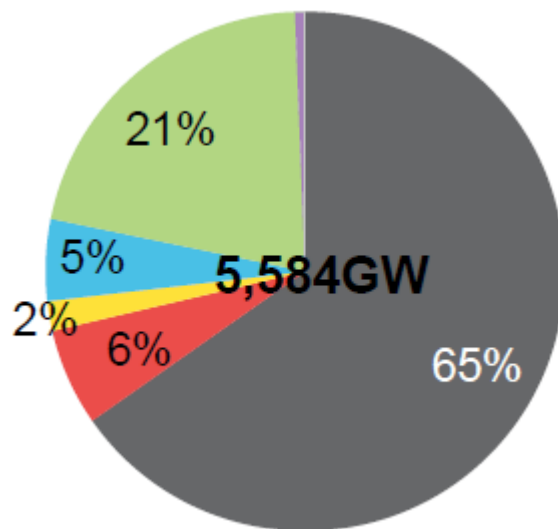
Source: Bright Green Enterprise 2015/12

WW Power-Generating Mix Trend

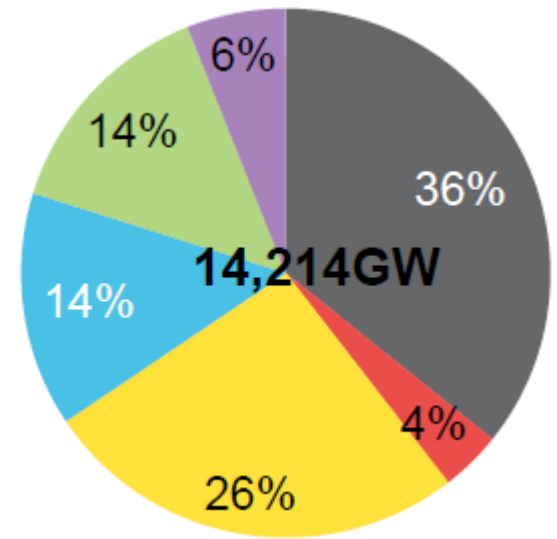


In next 25 years:

- Solar will boom worldwide
- accounting for 35% (3,429GW) of capacity additions
- nearly a third (\$3.7 trillion) of global investment
- split evenly between small- and utility scale
- real solar revolution will be on rooftops, driven by high residential and commercial power price & the availability of residential storage in some countries



2012
(Solar=2%)



2040
(Solar=26%)

Source: Bloomberg New Energy Finance 2015/06



Semiconductor Business Sector



GWC fab in Niigata, Japan

GlobalWafers Co., Ltd.

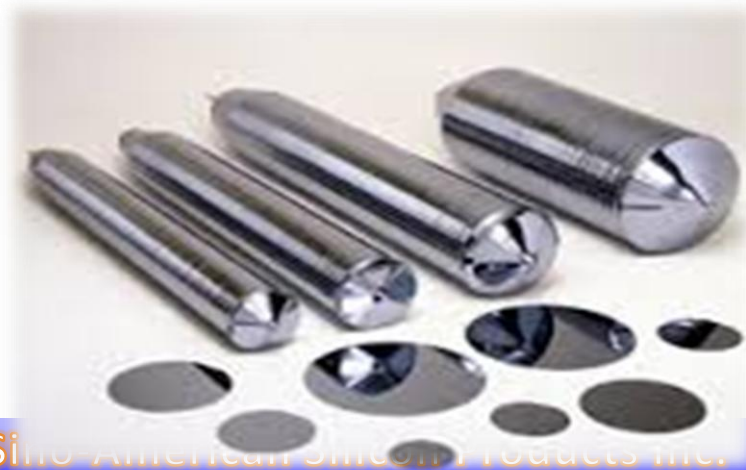




Company Profile



Established	2011 (Spin off from SAS)
IPO	2015/09/25 Listed in Taipei Exchange (6488 TT)
Headquarter	HsinChu Science Park, Taiwan, R.O.C.
Products	3" ~ 12" Semiconductor Wafers
Manufacturing Sites	Taiwan, China, U.S.A. & Japan
Paid-in Capital	NTD \$3.693 billion
Chairperson & CEO	Doris Hsu
Employees	2,483 (2016/01)

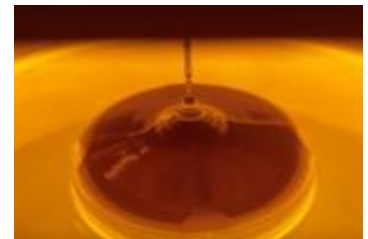




Milestones <|>



1981	Sino-American Silicon Products Inc. established
.....	
1998	New owners and management team join SAS
1999	SST established in China
2001	SAS IPO in Taiwan (5483 TT)
2008	Acquired GlobiTech Incorporated, TX, USA
2011	Company spin off – SAS / GWC / SSC
2012	Acquired Covalent Silicon, Japan
2015	GWC IPO (Taipei Exchange)





Products



Annealed wafer

- Diameter: 8、12
- Application: Memory, LCD driver & Logic IC

EPI wafer

- Diameter: 4、5、6、8
- Application: Discrete, Logic IC, Analog & Memory

Polished wafer

- Diameter: 4、5、6、8、12
- Application: 4"~6" for Epi substrates & Analog
8"~12" mainly in logic IC

Diffused wafer

- Diameter: 3、4、5、6
- Application: Discrete

Non-polished wafer

- Diameter: 3、4、5、6
- Application: Discrete





Organization



GWC

GlobalWafers Co.,Ltd,
Taiwan

100%



SST

Sino Silicon Technology China

100%



GT

GlobiTech USA

100%



GlobalWafers Japan

GWJ

GlobalWafers Japan





Global Manufacturing Sites



JAPAN - GWJ



TAIWAN - GWC



CHINA - SST



USA - GT





Manufacturing Sites Capacity

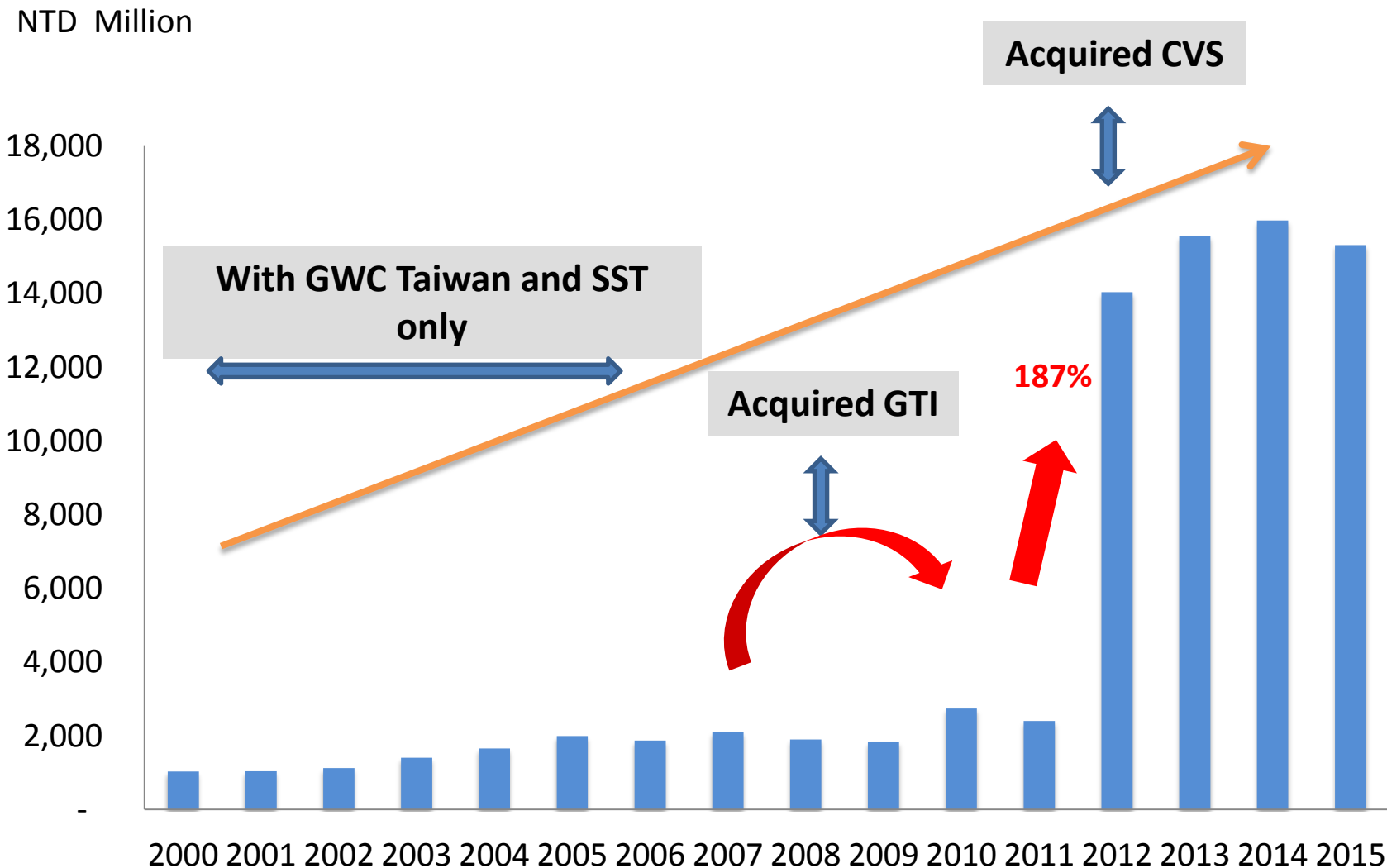


Sites	GWC (Taiwan)	SST (Kunshan, China)	GTI (Texas, USA)	GWJ (Japan)
Products	<ul style="list-style-type: none"> • 3" - 8" ingots • 3"- 6" wafers • Heavily-doped • Diffusion • Lapped/Etched/Polished 	<ul style="list-style-type: none"> • 3" - 8" • Heavily-doped 	<ul style="list-style-type: none"> • 5" - 8" • Epitaxial 	<ul style="list-style-type: none"> • 5" - 12" • Light & Heavily-doped • Diffusion • Annealed • SOI • Epitaxial
Group Products Application	<ul style="list-style-type: none"> • Power Discrete • Logic..... • Sensor..... • Memory..... 			
Capacity	<ul style="list-style-type: none"> • 6" equivalent polished: 70kwm • ≤6" non polished : 1,000kwm 	<ul style="list-style-type: none"> • 8" equivalent 40kwm • 6" equivalent 390kwm • 4" equivalent 400kwm <p>72kwm</p>	<ul style="list-style-type: none"> • 6" & 8" 460kwm <p>520kwm</p>	<ul style="list-style-type: none"> • 12" 188kwm • 8" 360kwm • Diffusion 130kwm • EPI 150kwm • SOI & FZ <p>8" 405kwm</p>





Group Revenue Trend





Tier-1 Major Customers



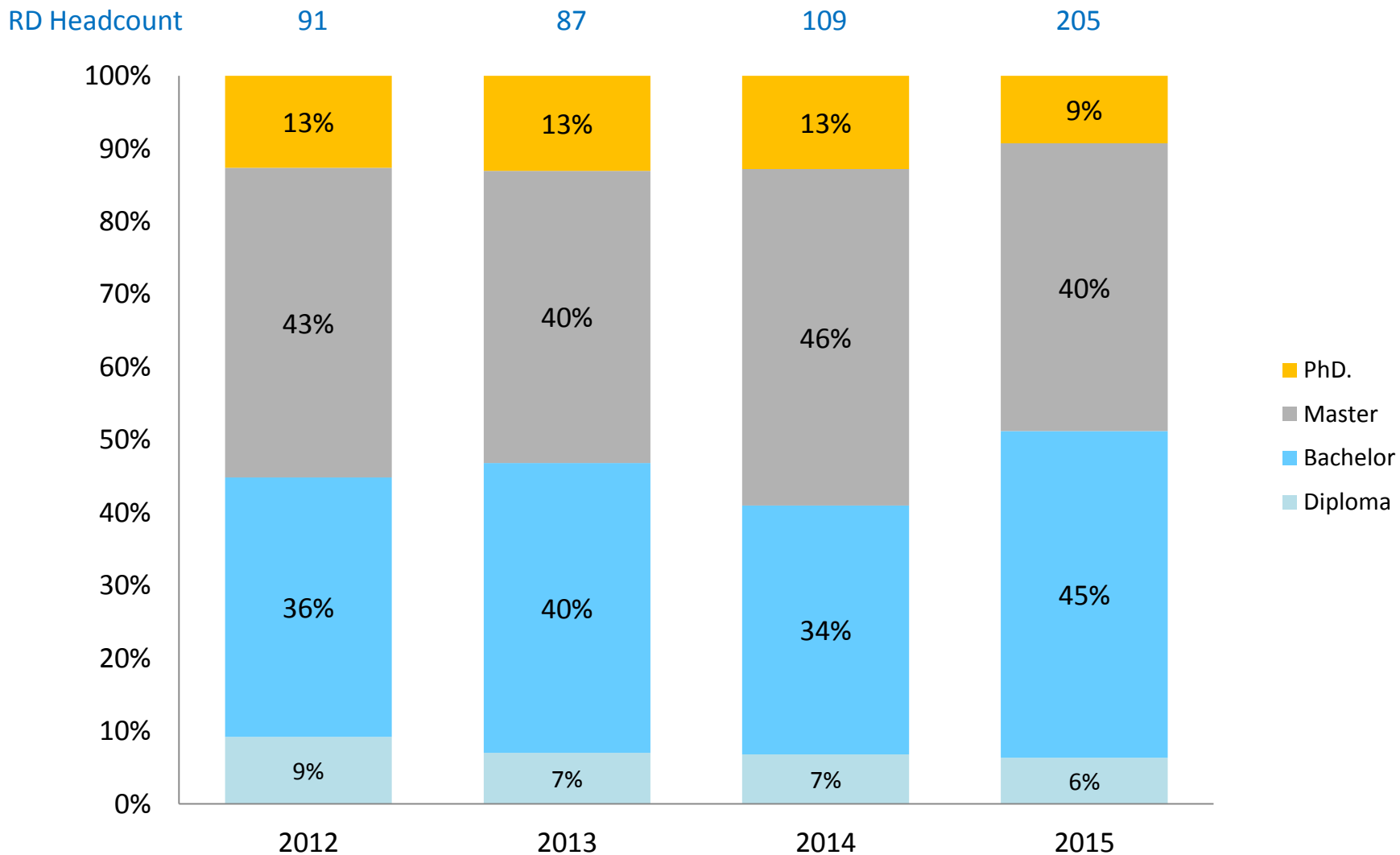
ASIA

US/ Europe





R&D Team Education Background





New Products Roadmap



Items	Application
8" ultra heavy dopant ingots growth	Low power consumption device
GaN on Silicon	Power device/ RF
Nano-structure wafers	Ultra thin wafers/ Strengthen substrate
Ultra high resolution CIS wafers	Image sensor 、 Sensor
Next generation automotive power device SiC wafers	Automotive power, High temp. power, Microwave & RF devices, UV LED, Photodiodes, Blue laser diodes

Specializing in next generation wafer development



Significant Financial Performance

2015/9M



DEBT
-15%
7,009
Million NTD
2014.3Q -- 8,218 mn

PBT
+25%
2,245
Million NTD
2014.3Q -- 1,795 mn

EQUITY
+28%
16,465
Million NTD
2014.3Q -- 12,856 mn

Gross Margin
+18%
3,192
Million NTD
2014.3Q -- 2,708 mn

Operating Income
+28%
2,148
Million NTD
2014.3Q -- 1,671 mn

COGS
-7%
8,600
Million NTD
2014.3Q -- 9,260 mn



Consolidated Financial Statements

2015/9M <I>



Million NTD	2013	%	2014	%	2015.9M	%
Revenue	15,570	100.0	15,922	100.0	11,792	100.0
Gross Profit	3,663	23.5	3,728	23.4	3,192	27.1
Operation Income	2,194	14.1	2,336	14.7	2,148	18.2
PBT	2,204	14.2	2,679	16.8	2,245	19.0
PAT	1,948	12.5	2,095	13.2	1,582	13.4
Total Debt & Debt ratio	7,939	37.7	8,184	38.3	7,009	29.9
ROE(%)	14.83		15.87		14.22	
EPS(NTD)	6.14		6.60		4.56	



Consolidated Financial Statements

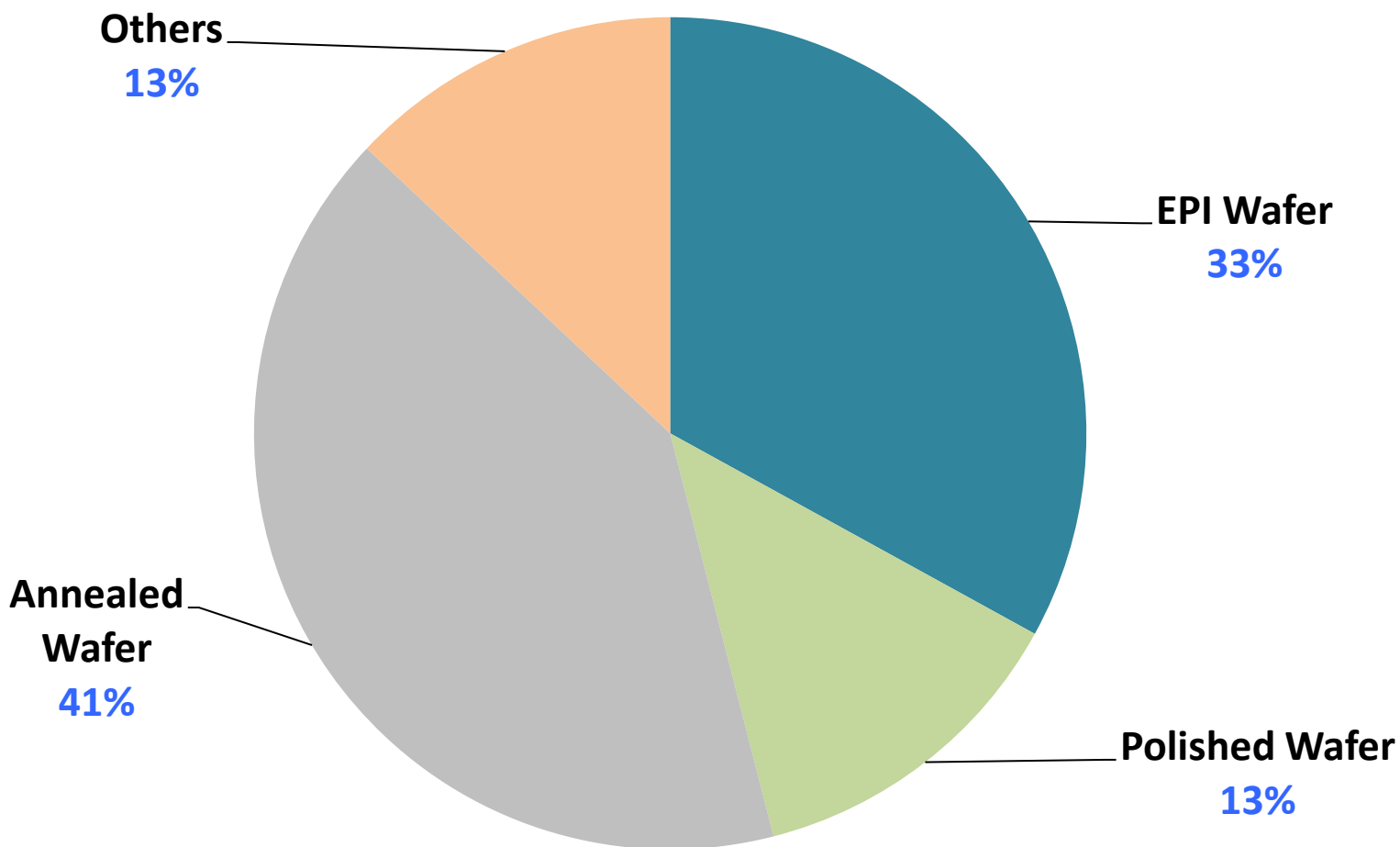
2015/9M <II>



Million NTD	2015.1Q	%	2015.2Q	%	2015.3Q	%
Revenue	4,044	100.0	3,983	100.0	3,764	100.0
Gross Profit	1,019	25.2	1,055	26.5	1,118	29.7
Operation Income	688	17.0	705	17.7	755	20.1
PBT	665	16.4	740	18.6	841	22.3
PAT	476	11.8	512	12.9	594	15.8
Total Debt & Debt ratio	7,148	31.4	8,871	39.0	7,009	29.9
ROE(%)	13.2		13.9		15.7	
EPS(NTD)	1.40		1.47		1.69	

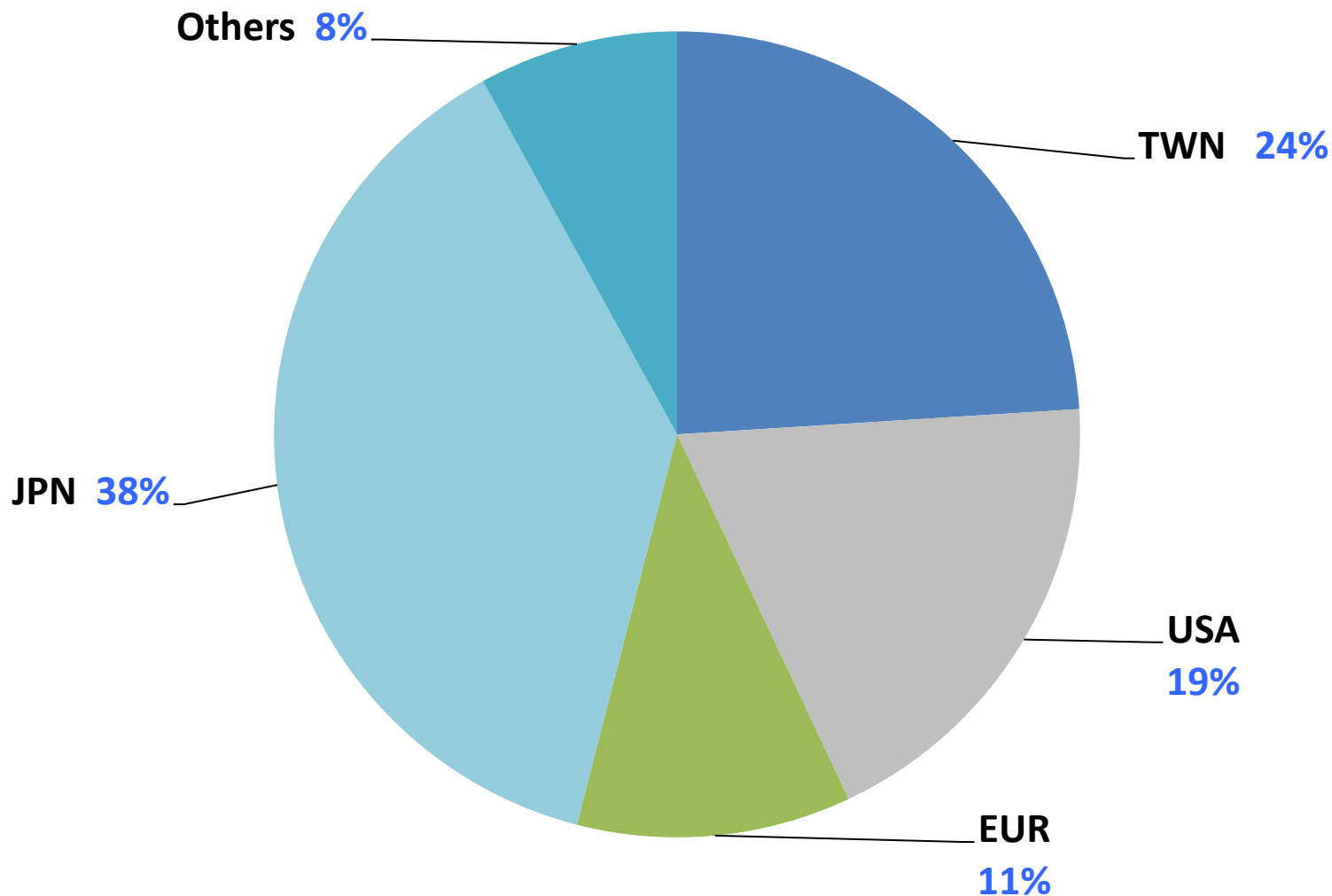


2015 Sales Distribution – by Products



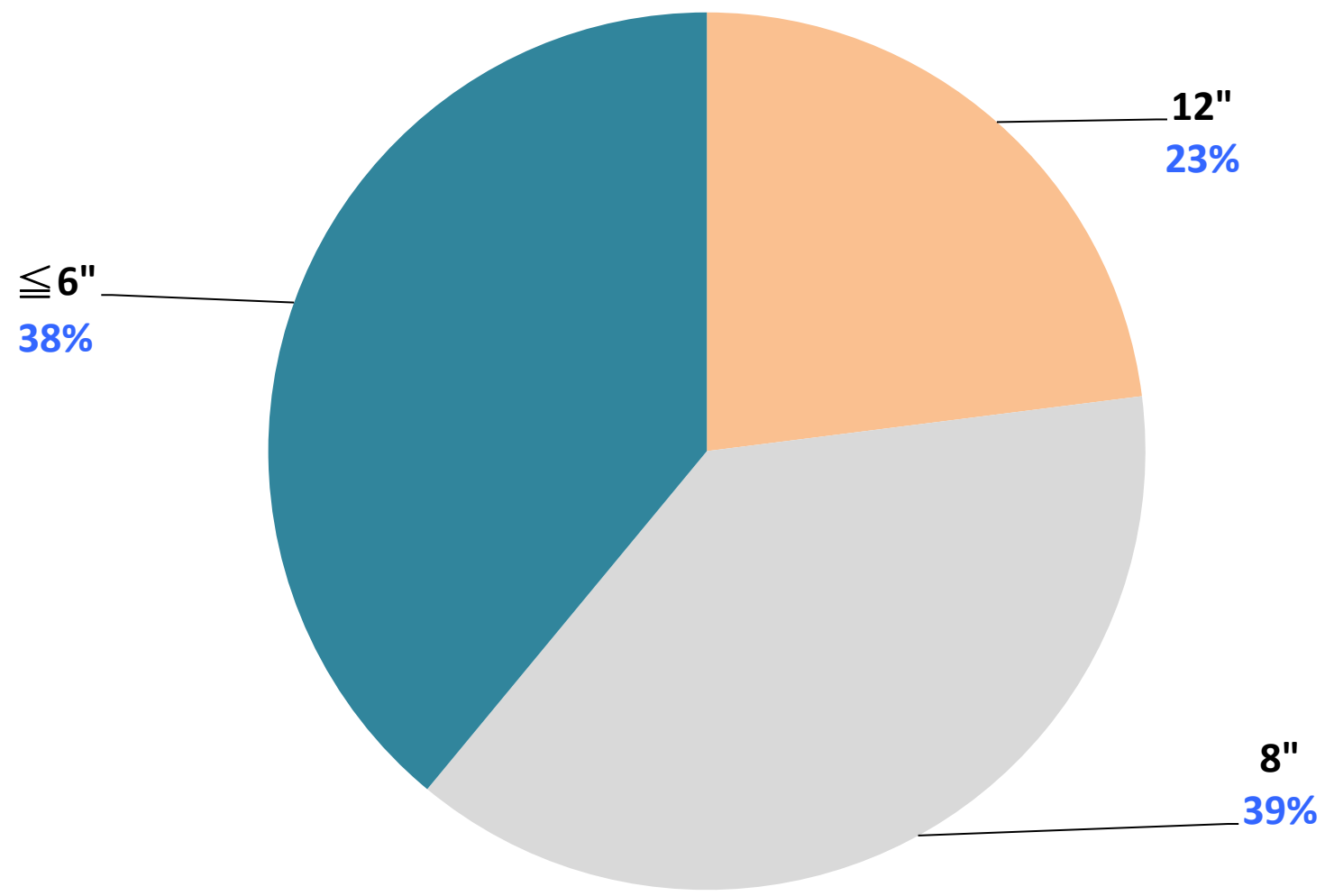


2015 Sales Distribution – by Regions





2015 Sales Distribution – by Diameters





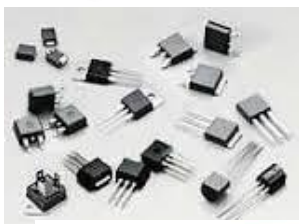
Here GWC Wafers are Used....



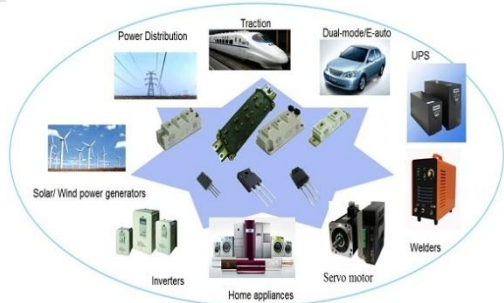
Strong demands in IoT , Automotive 、 LCD Drive IC 、 Handset device ...



Automotive devices
 Power/Discrete device
 Memory Applications
 LCD Driver IC/CIS/Logic
 Consumer Electronic
 Industrial Applications



Smart phone is driving new MEMS developments





Competitive Advantages



■ Global Customers Base

- * Global Tier-1 customers base in US, EU, Japan, Taiwan, Korea & A/P

■ Leading Technology & RD Team

- * ex-TI, ex-Toshiba R&D/Engineering experiences & training
- * Strong development & manufacturing capability

■ Global Sites Competitive Cost

- * Global 7 manufacturing sites, centralized Purchasing, Production & Sales
- * Acquired lowest manufacturing assets cost via M&A

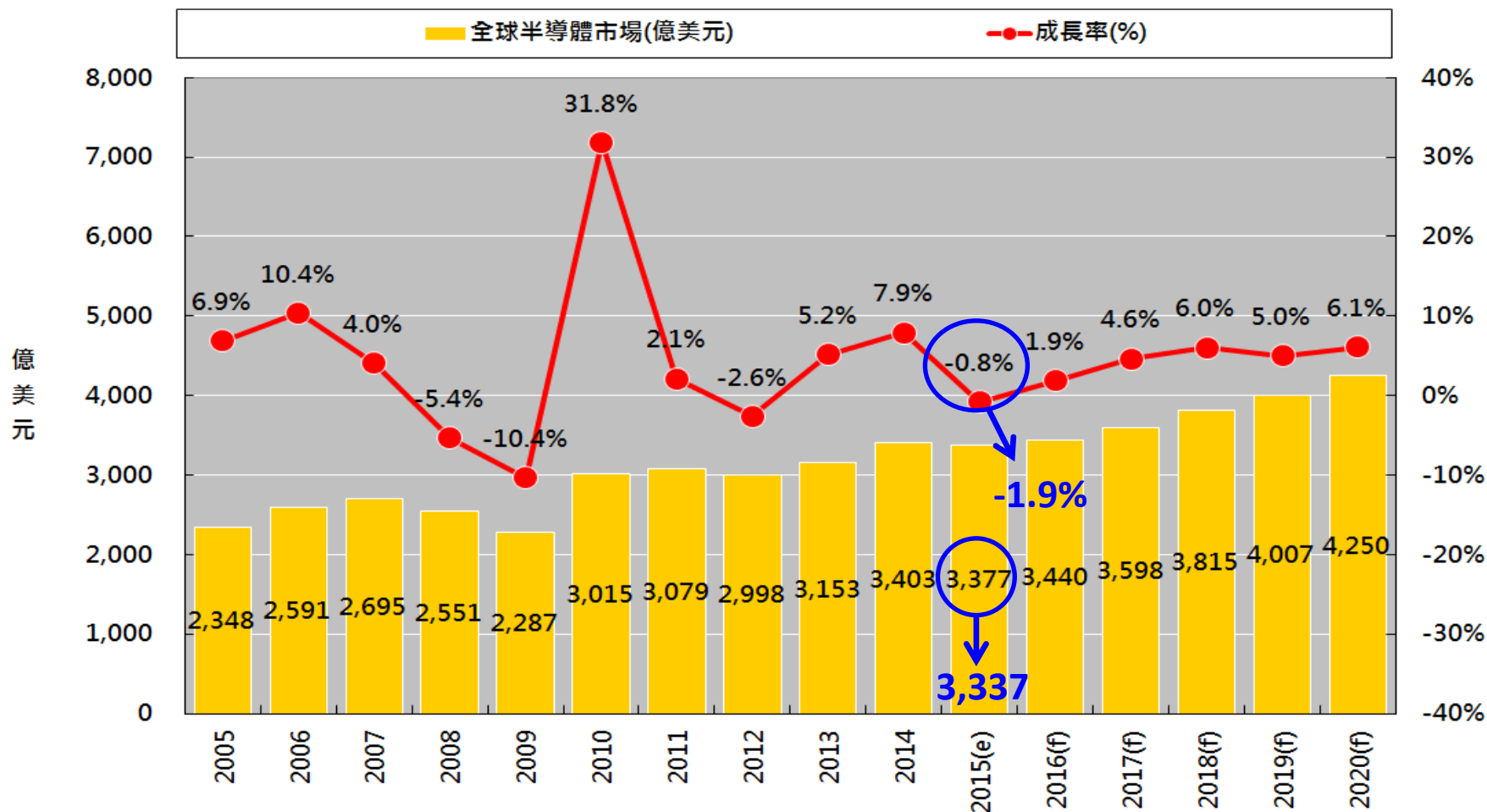
■ Strong Demands Growth

- * Automotive, LCD drive IC, Handset devices
- * IoT booming demands





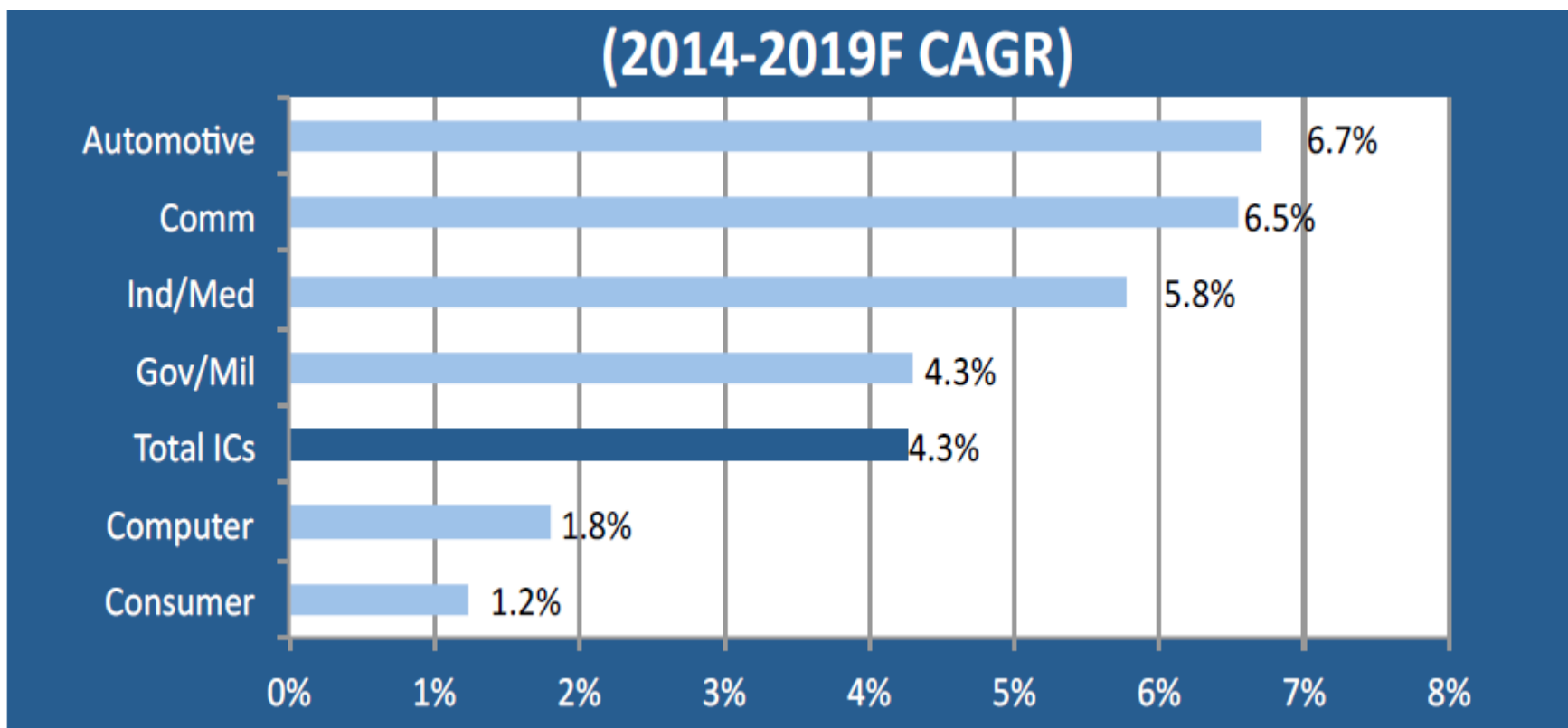
Global Semiconductor Market trend



Source: Gartner, WSTS, 工研院IEK 2015-11

Gartner revised worldwide semiconductor revenue declined from -0.8% to -1.9% in 2015 (2016/01)





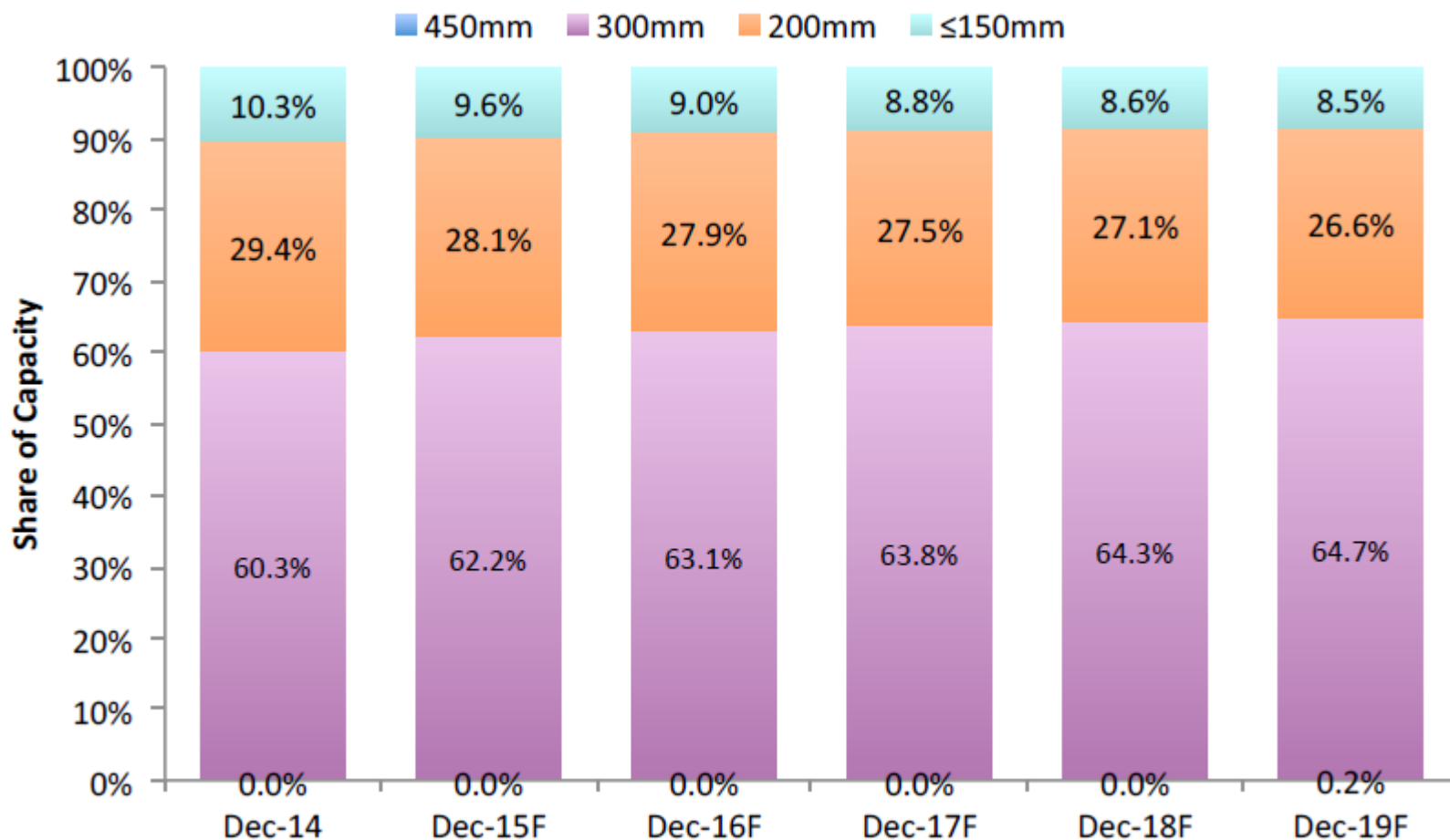
Source: IC Insights, 2015-11

Total ICs CAGR shows 4.3% up till 2019
Automotive, Communication, Industrial & Medical
indicate strong growth prominently





Forecast for Wafer Size Shares



Source : IC Insights, 2015-09

Monthly Installed Capacity
(200mm-Equiv. Wafers)

200mm & 300mm still play key materials for IC manufacturing



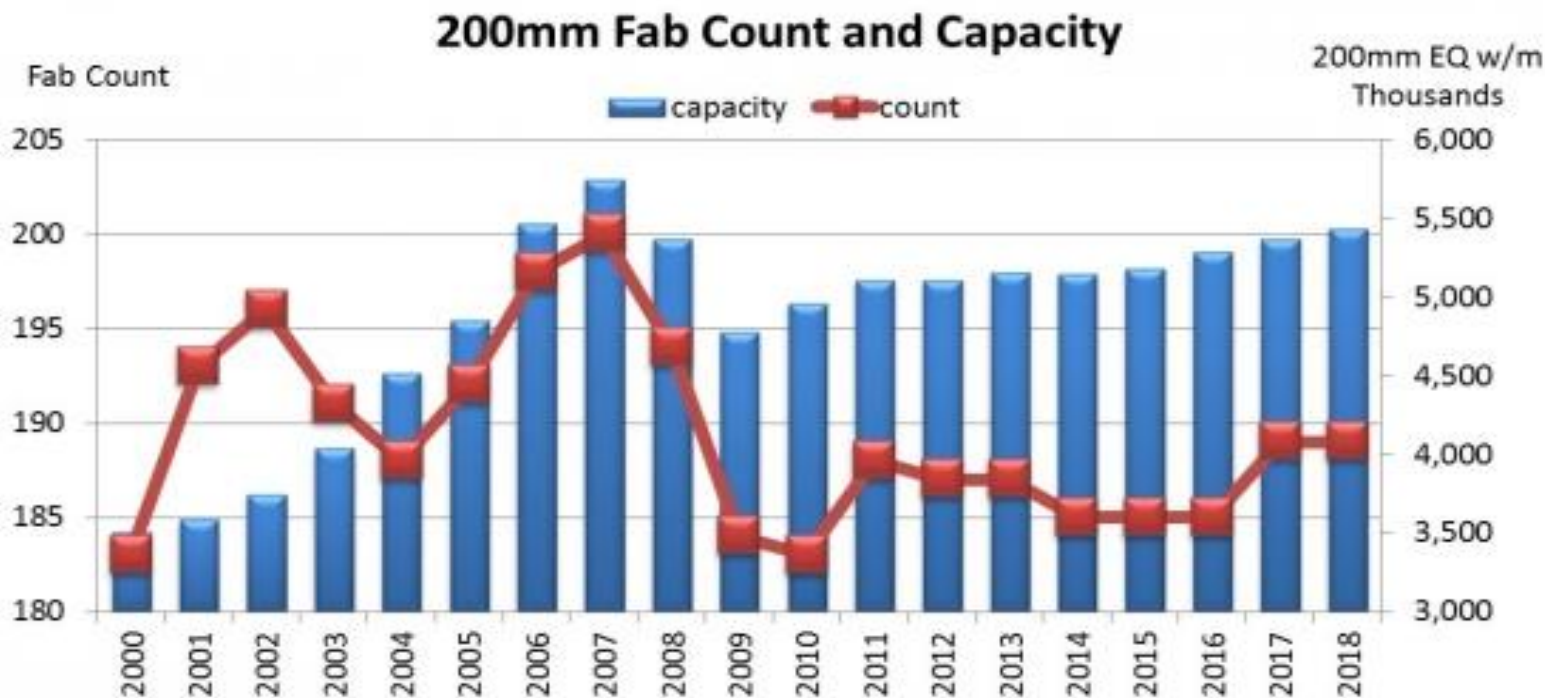


Semi Wafers Demands – by Application



Year	1997	2002	2007	2012	2017
Fab Capacity (200mm equiv. thousand wafer starts per month)	5,655	7,519	15,441	18,068	20,609
Memory	20%	19%	36%	29%	27%
Foundry	13%	19%	18%	27%	30%
MPU & Logic	35%	31%	22%	17%	16%
Analog, Discrete, MEMS & Other	32%	31%	24%	27%	26%

Source: SEMI (<http://www.semi.org/>)



Source: Global 200mm Fab Outlook, SEMI October 2015

2015~2018

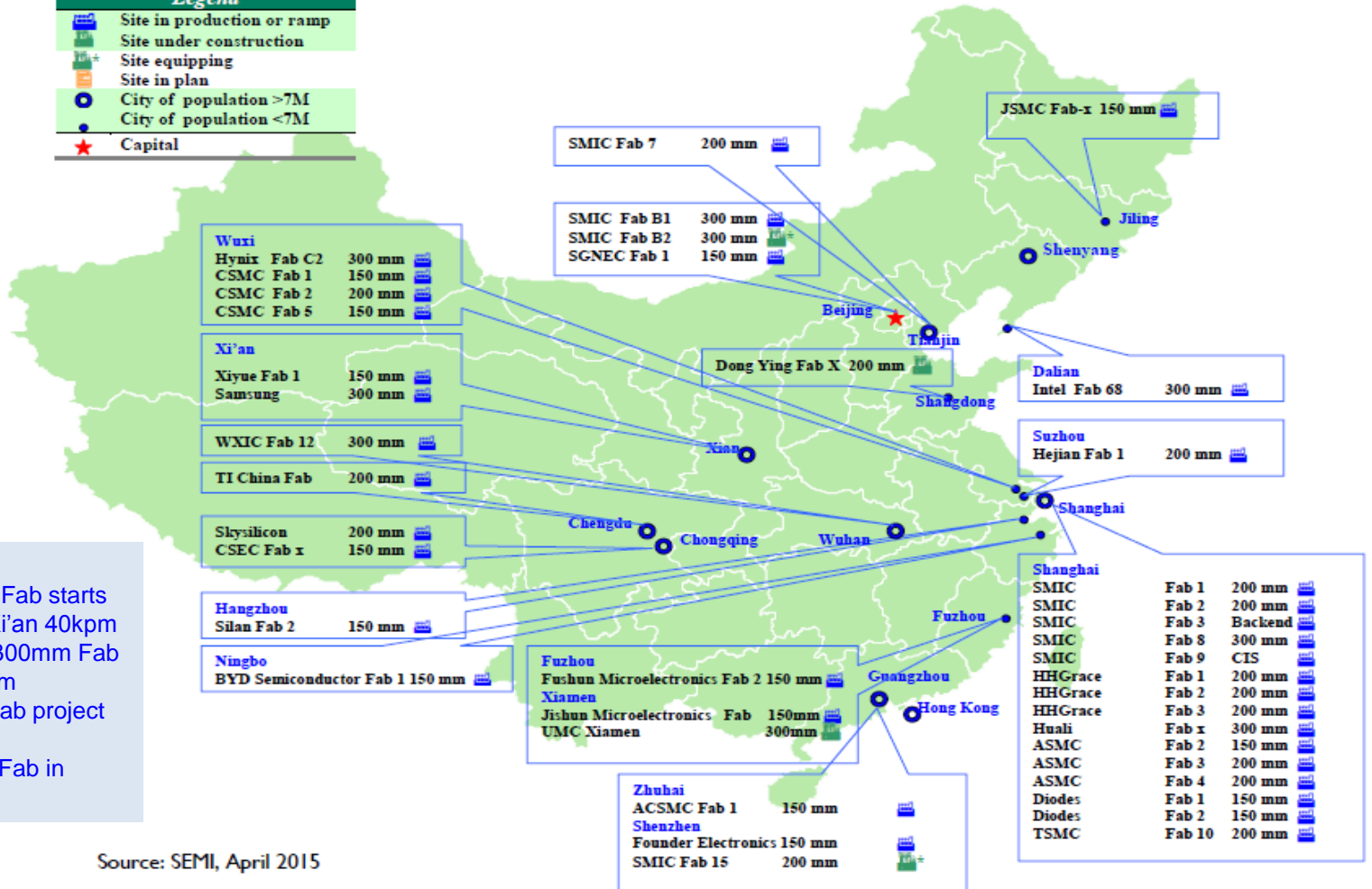
- **Strong 200mm demand for IoT, sensors, MEMS, analog, power device**
- **200mm input to increase 400kspm**
- **Eight new 200mm facility/lines to begin operation**
- **China & Southeast Asia to lead 200mm expansion**



China IC Fab Distribution



Legend	
	Site in production or ramp
	Site under construction
	Site equipping
	Site in plan
	City of population >7M
	City of population <7M
	Capital



new project ongoing,
 • SAMSUNG: 300mm Fab starts mass production in Xi'an 40kpm
 • POWERCHIP: new 300mm Fab project in Hefei 40kpm
 • UMC: new 300mm Fab project in Xiamen 50kpm
 • TSMC: new 300mm Fab in Nanjing 20kpm

Source: SEMI, April 2015



Expanding 300mm Capacity in China



Company	Location	Tech-node (nm)	Capacity (K/month)	Products	Status
Huali	Shanghai	55	25	Foundry	Will add capacity to 35K/M
SK Hynix	Wuxi	29	130	DRAM	Production & Upgrade
Intel	Dalian	65	15	Chipset	Production
Samsung	Xi'an	20	40	NAND Flash	Total plan for Xi'an 1 st phase: 100K/month
SMIC	Beijing	40	36	Foundry	Production
SMIC	Beijing	40-20 (Planned)	-	Foundry	Construction. 5K—6K/M in end of 2014
SMIC	Shanghai	40	14	Foundry	Production and expand to 14K/M in 2014
WXIC	Wuhan	45	9	NOR Flash, Foundry	Production

Source: SEMI China, Oct. 2014

New project:

UMC (Xiamen 50kpm), Nexchip (Hefei, 40kpm), TSMC(Nanjing 20kpm)..





China IC Demand vs. Local Supply

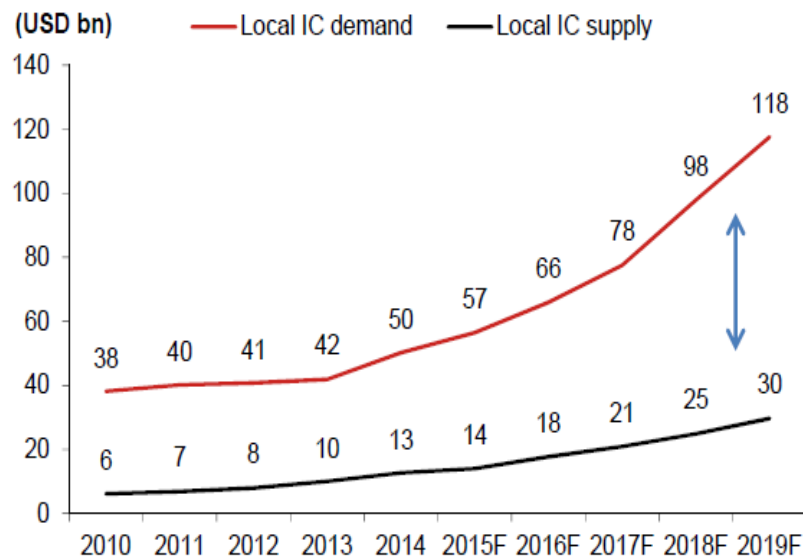


China IC industry size and weight in global market



Source: IHS, Nomura Research, 2015/12

Imbalance between local IC supply and demand



Source: ICWise, SMIC, Nomura Research, 2015/12

China Local IC Supply fulfill IC Demand 25% only





Dividend Policy



Sino-American Silicon Products inc.

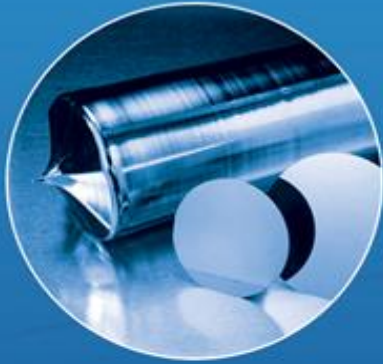
<u>Year</u>	<u>EPS</u>	<u>Dividend</u>
2010	10.5	TWD 5.5
2011	1.02	TWD 0.85
2012	(4.9)	-
2013	0.57	TWD 1.0
2014	2.06	TWD 1.8
2015 Q3	0.86	

GlobalWafers Co., Ltd.

<u>Year</u>	<u>EPS</u>	<u>Dividend</u>
2011	-	spin off
2012	3.44	TWD 2.8
2013	6.14*	TWD 5.5
2014	6.60	TWD 5.7
2015 Q3	4.56	

* If using ROC GAAP, it would be 6.22





Q&A