



World Electronic Circuits Council

WECC Global PCB Production Report For 2012

Published August 2013

A Product of the Partnership among the WECC Member Associations
on Behalf of their Members in the Electronic Circuits Industry Worldwide



IPCA

Indian Printed
Circuit Association



HKPCA
Hong Kong Printed Circuit Association



Association Connecting Electronics Industries



JPCA **KPCA**
Korea Printed Circuit Association

TPCA 台灣電路板協會
Taiwan Printed Circuit Association

Table of Contents

About the WECC Global PCB Statistical Program.....	1
Estimates of 2011 PCB Production Value.....	3
Industry Growth	4
Product Profiles of Major PCB-Producing Countries/Regions	6
Vertical Markets for PCBs by Country/Region	11
Questions and Trends	15
Appendix: Average Exchange Rates for 2010 and 2011	16

About the WECC Global PCB Statistical Program

Development Team

The World Electronic Circuits Council (WECC) is a strategic partnership formed in 1998 by the major industry associations serving member companies in the global electronic circuits industry. Its purpose is to increase the global influence and effectiveness of its member organizations for the benefit and improvement of the industry. The member associations cooperate on standards, market research, marketing, resource development, environmental issues, world trade, and economic and political affairs.

The member organizations of WECC formed a working group in 2005 to pool their statistical resources and produce a global statistical report on printed circuit board (PCB) production for the benefit of their members. This group became the WECC Statistics and Market Committee.

The following individuals contributed to this report and represent their respective associations on the WECC Statistics and Market Committee:

- ◆ CPCA – Kevin Yan, Vice President, China Printed Circuit Association, kevin_yyh@cpc.org.cn
- ◆ EIPC – Kirsten Smit-Westenberg, Executive Director, European Institute of Printed Circuits, KWestenberg@eipc.org
- ◆ HKPCA – Alfred Chong, Executive Director, Hong Kong Printed Circuit Association, alfredchong@hkpc.org
- ◆ HKPCA – Manda Wong, Administration Officer, Hong Kong Printed Circuit Association, mandawong@hkpc.org
- ◆ IPC – Sharon Starr, Director of Market Research, IPC, sharonstarr@ipc.org, (committee chair)
- ◆ IPCA – Viral Bhulani, President, Indian Printed Circuit Association, viralbhulani@gmail.com
- ◆ IPCA – K.S. Babu, Secretary, Indian Printed Circuit Association, babu@ipcaindia.org
- ◆ JPCA – Noriaki Wakakuri, Manager, Japan Electronics Packaging and Circuits Association, wakakuri@jpca.org
- ◆ JPCA – Kyoko Aota, Staff, Japan Electronics Packaging and Circuits Association, aota@jpca.org
- ◆ KPCA – Kyoung-Hee Lee, Deputy Secretary General, Korea Printed Circuit Association, khlee@kpca.or.kr
- ◆ TPCA – Michelle Hung, Deputy Secretary General, Taiwan Printed Circuit Association, michelle@tpca.org.tw

Please contact the representative at your association with any questions about the report or suggestions for improving this program.

Availability

The *WECC Global PCB Production Reports* are available only from these participating associations to their members. The reports are not available for sale.

Methodology

The *WECC Global PCB Production Report* includes estimates of PCB production by country or region based on the data collected by the WECC organizations from their member PCB companies. The estimates in these reports may differ from estimates published by other sources due to differences in methodology and sources. No source of data on worldwide PCB production can claim to be 100 percent accurate. There are only estimates based on data collected from representative samples of the companies in the industry.

WECC has published its Global PCB Production Reports since 2005. The reports are published annually. The data are collected by the associations and reported here in local currencies so that real growth rates can be shown. For the sake of comparability, all of the estimates are also reported in U.S. dollars. These nominal values are not adjusted for inflation or for fluctuations in exchange rates. Year-on-year growth rates have been adjusted for currency fluctuations. A table of average exchange rates for the period is included as an appendix to this report.

Confidentiality Policy

It is the WECC organizations' policy never to share any company-specific information with other associations (including the other WECC members) or with their member companies. Only aggregate data are shared for the compilation of this report. In this way, the WECC associations maintain complete confidentiality for all of their member companies.

Definitions

PCB production attributed to a country or region reflects the value of the PCBs produced there, regardless of where the companies are headquartered, and should not be confused with the PCB market (i.e., where PCBs are sold).

Many flexible circuit producers also offer assembly and other value-added services. Because these producers sell assembled or partially assembled boards, it can be difficult for them to separate the value of the bare circuits from total sales. The estimates for flexible circuit production in this report, therefore, may include some assembly revenue.

Estimates of 2012 PCB Production Value

The member associations collected production data from companies producing PCBs in their countries or regions. Every effort was made to eliminate duplication between the associations' survey samples. The countries and regions included in this analysis produce approximately 99 percent of the world's PCBs, based on value.

Estimates of 2012 PCB Production in the World's Major PCB-Producing Areas

In millions of local currency

Country or Region Where PCBs Were Produced	Rigid 1-2 Sided	Standard Multilayer	HDI/ Microvia/ Build-Up	IC Substrate	Flexible Circuits	Rigid Flex	Others	Total Aggregate Data	Currency
China	13,135	81,838	27,328	3,672	27,609	1,395	23	155,000	RMB
Hong Kong	31	555	57	419	0	0	8	1,070	HKD
India	14,505	9,015	112	0	1,480	0	0	25,112	INR
Japan	111,060	177,940	80,410	246,230	105,540	14,320	29,690	765,190	JPY
South Korea	671,717	2,070,707	1,363,636	2,424,242	1,575,758	641,414	0	8,747,475	KRW
Taiwan	23,000	56,798	35,742	74,905	44,058	4,070	0	238,573	TWD
Other Asia	32,130	43,280	24,840	50,500	132,010	2,650	0	285,410	JPY
Western Europe	591	1,121	247	37	184	146	38	2,365	EUR
North America	323	1,776	542	25	188	165	0	3,019	USD
Central & South America	140	82	2	0	2	0	0	226	BRL

In millions of U.S. dollars

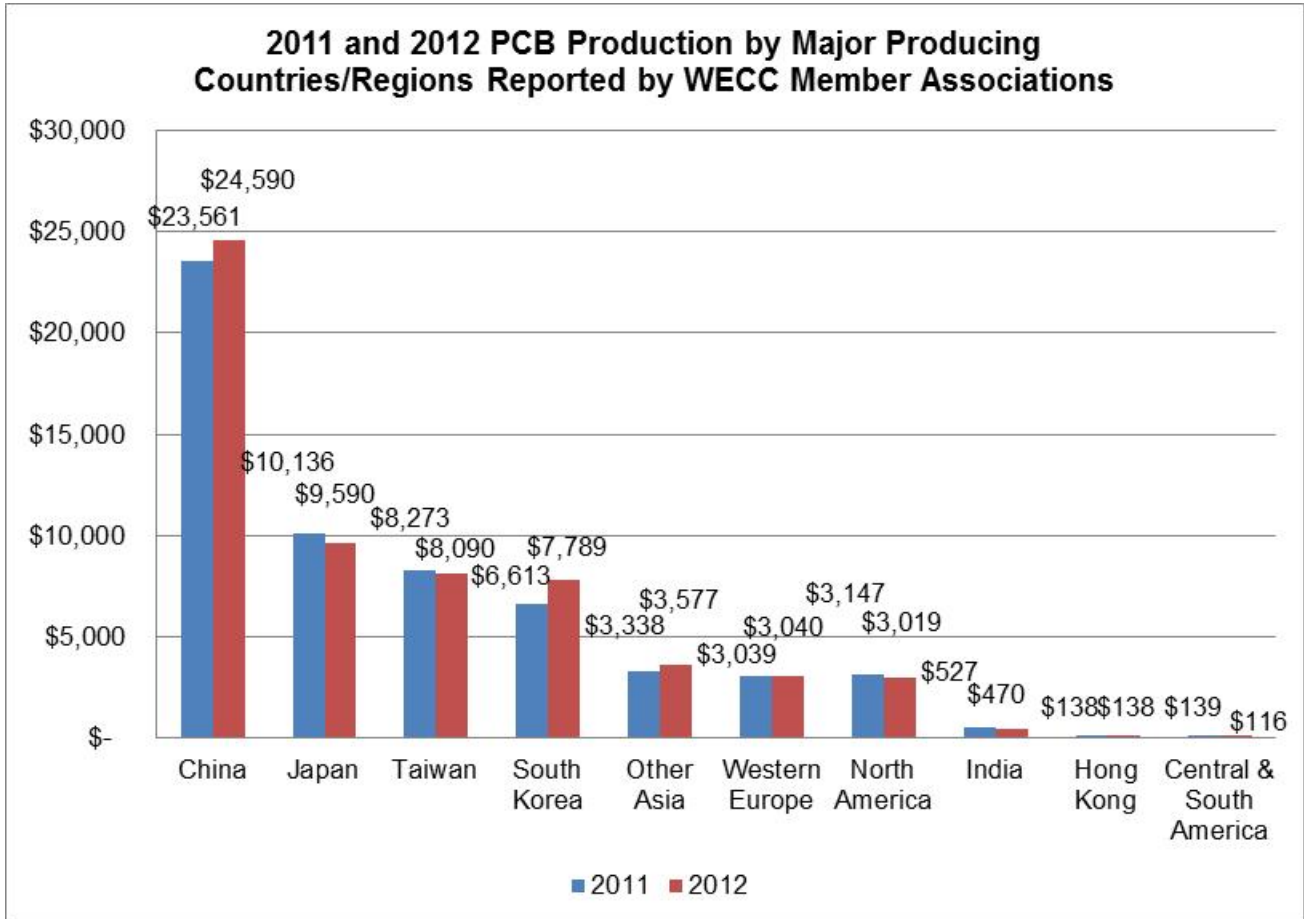
Country or Region Where PCBs Were Produced	Rigid 1-2 Sided	Standard Multilayer	HDI/ Microvia/ Build-Up	IC Substrate	Flexible Circuits	Rigid Flex	Others	Total Aggregate Data in US\$
China	2,084	12,983	4,335	583	4,380	221	4	24,590
Hong Kong	4	72	7	54	0	0	1	138
India	271	169	2	0	28	0	0	470
Japan	1,392	2,230	1,008	3,086	1,323	179	372	9,590
South Korea	598	1,844	1,214	2,159	1,403	571	0	7,789
Taiwan	780	1,926	1,212	2,540	1,494	138	0	8,090
Other Asia	403	542	311	633	1,654	33	0	3,577
Western Europe	760	1,441	318	48	237	187	49	3,040
North America	323	1,776	542	25	188	165	0	3,019
Central & South America	72	42	1	0	1	0	0	116
Global Total	6,687	23,025	8,951	9,127	10,708	1,495	426	60,418

Notes:

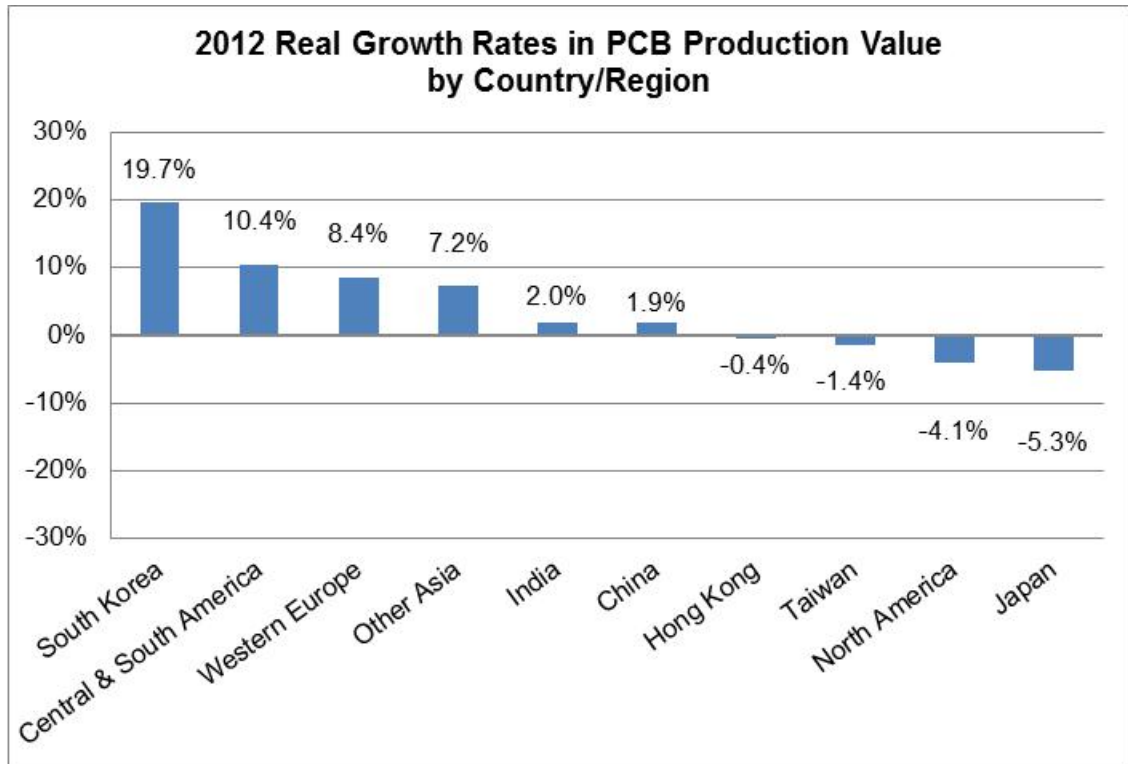
1. Flexible circuit and rigid flex estimates may include some assembly revenue.
2. The "Others" product category includes security and lighting.
3. The revenue estimates in this report are nominal and have not been adjusted for inflation.
4. Other Asia includes Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Other Asia data were provided by JPCA and are reported in Japanese yen. Japanese companies account for more than 70 percent of PCB production in Other Asia.
5. North American data are reported in U.S. dollars.
6. Central & South America data, provided by IPC, are reported in Brazilian real, as Brazil was the primary location of PCB production in this region.
7. Please see the appendix on exchange rates to determine the impact on amounts in specific currencies.
8. Totals may vary slightly from the sums of the numbers in the table due to rounding.

Industry Growth

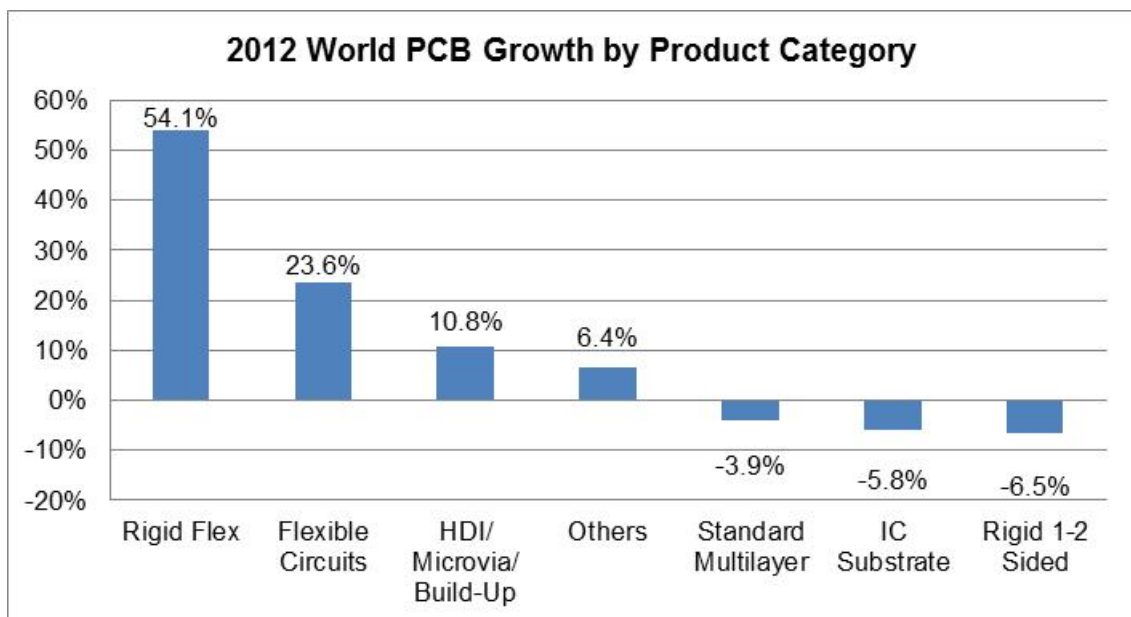
A comparison of 2011 and 2012 PCB production data reported by the WECC member associations shows that PCB production in 2012 increased in China, South Korea and Other Asia. Production growth was flat in Western Europe and Hong Kong, and it declined in Japan, India and the Americas. These values are nominal and were not adjusted to factor out the impact of exchange rates.



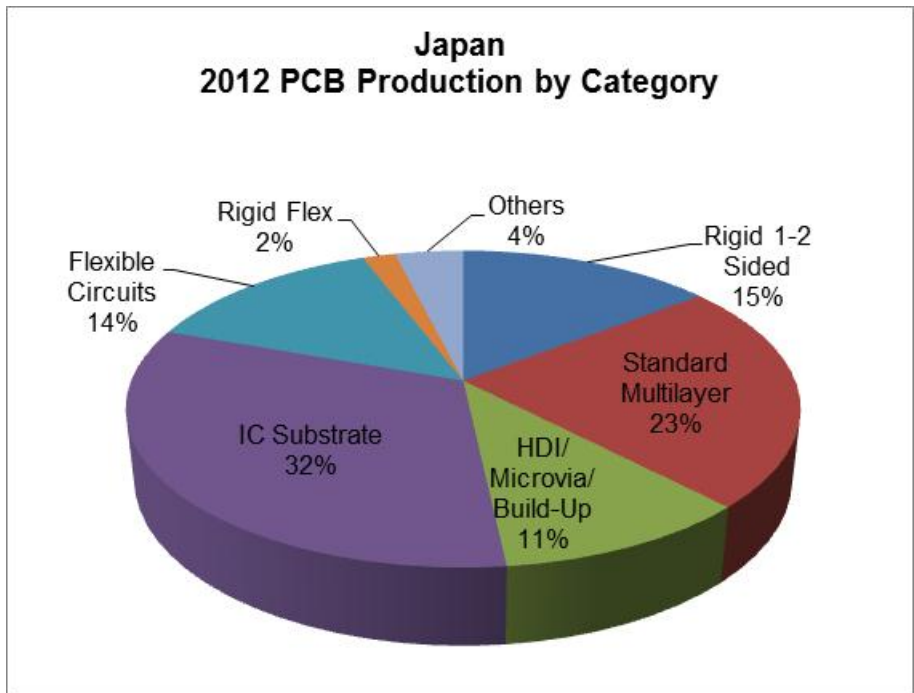
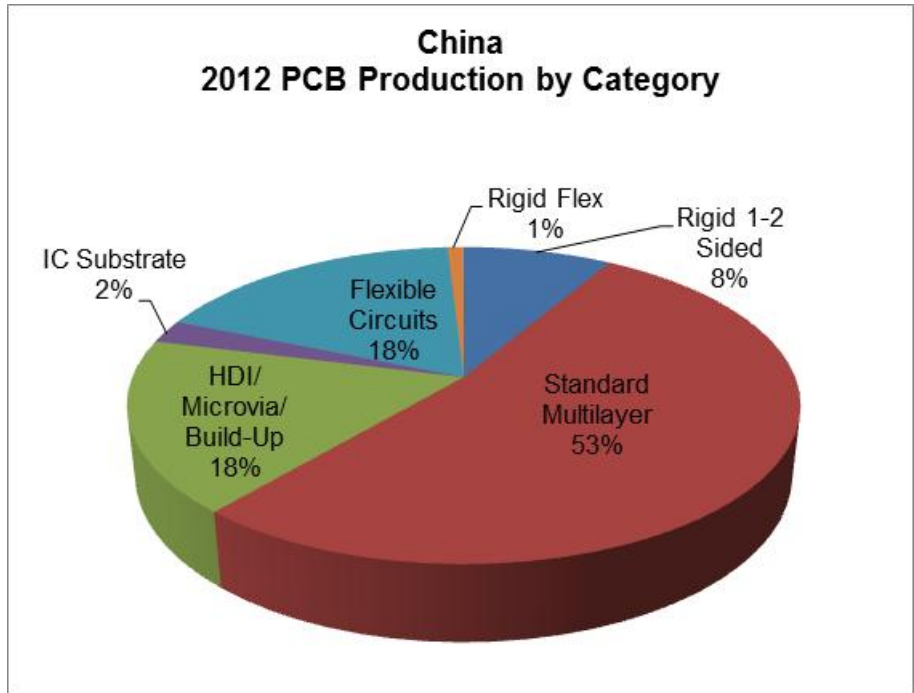
Based on a comparison of the 2011 and 2012 estimates from the WECC PCB production surveys in local currencies, worldwide PCB production increased 2.5 percent from 2011 to 2012. South Korea had the highest growth in PCB production of nearly 20 percent in real terms.

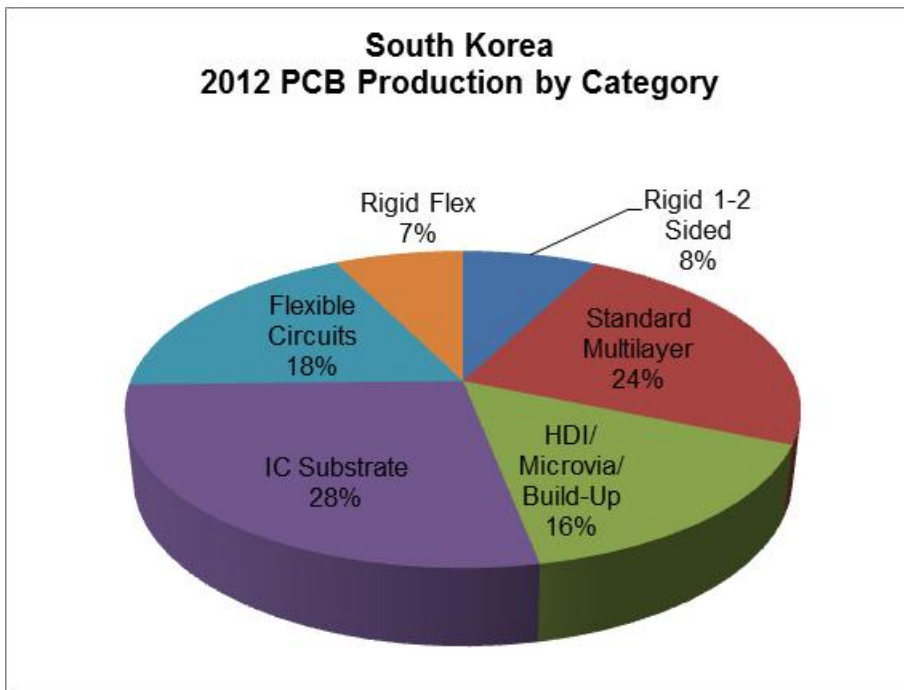
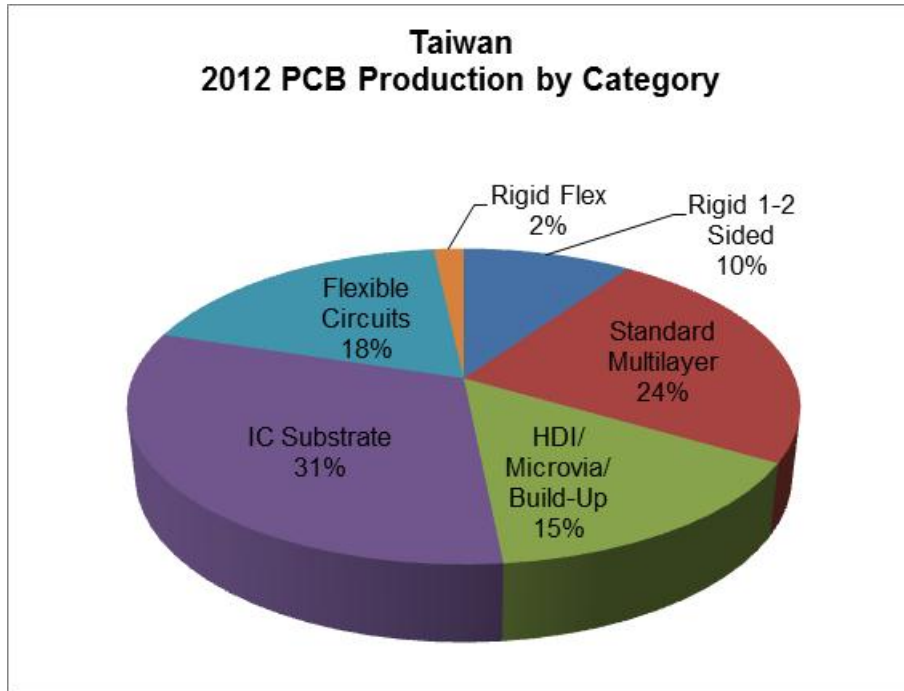


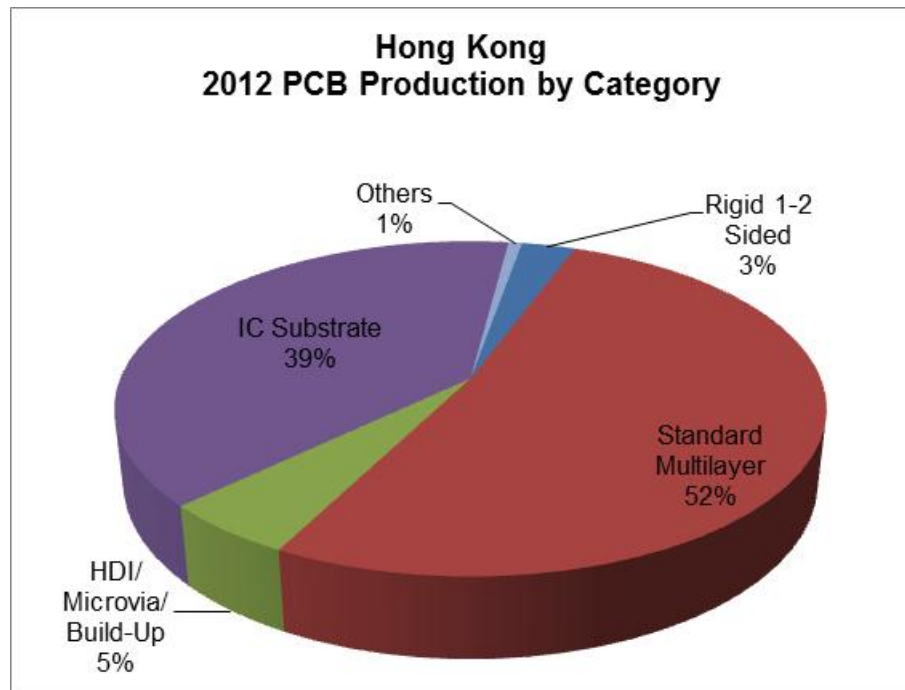
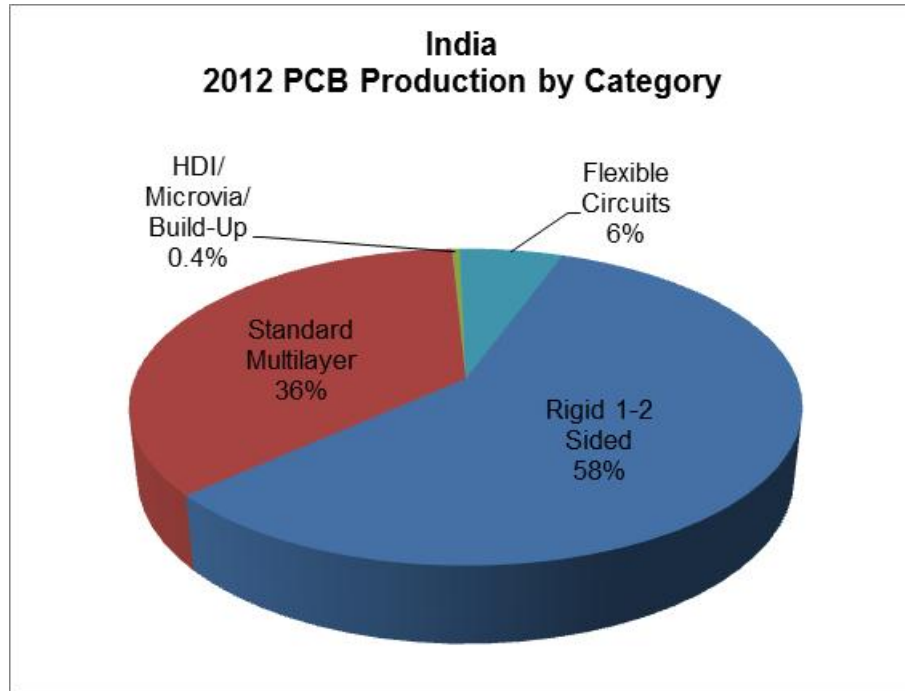
PCB production growth was highest in 2012 for rigid flex and flexible circuits. In 2011, rigid flex experienced a significant decline. It is the most volatile product segment as regards growth.

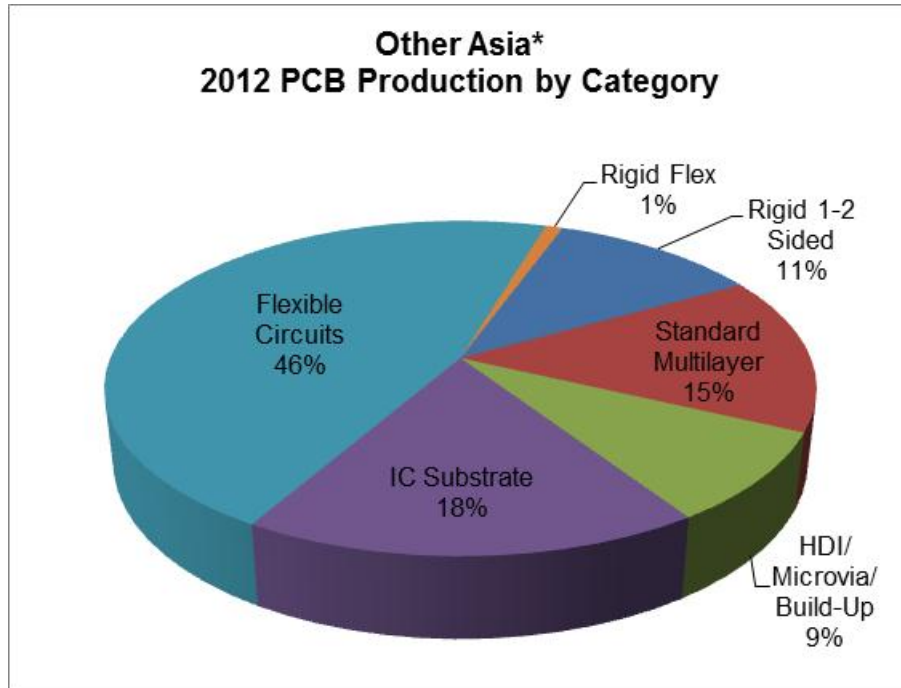


Product Profiles of Major PCB-Producing Countries and Regions

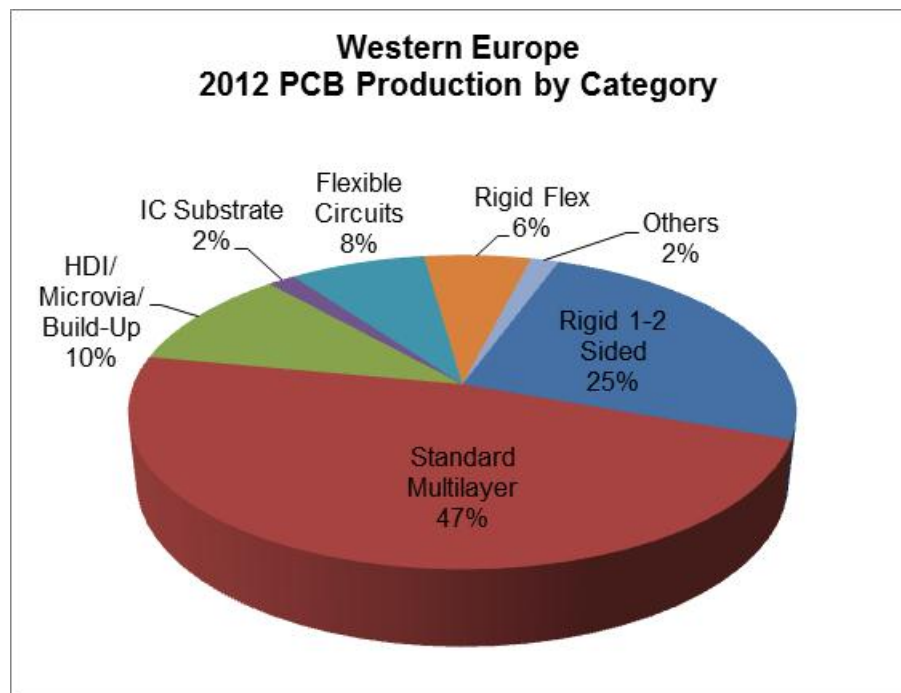


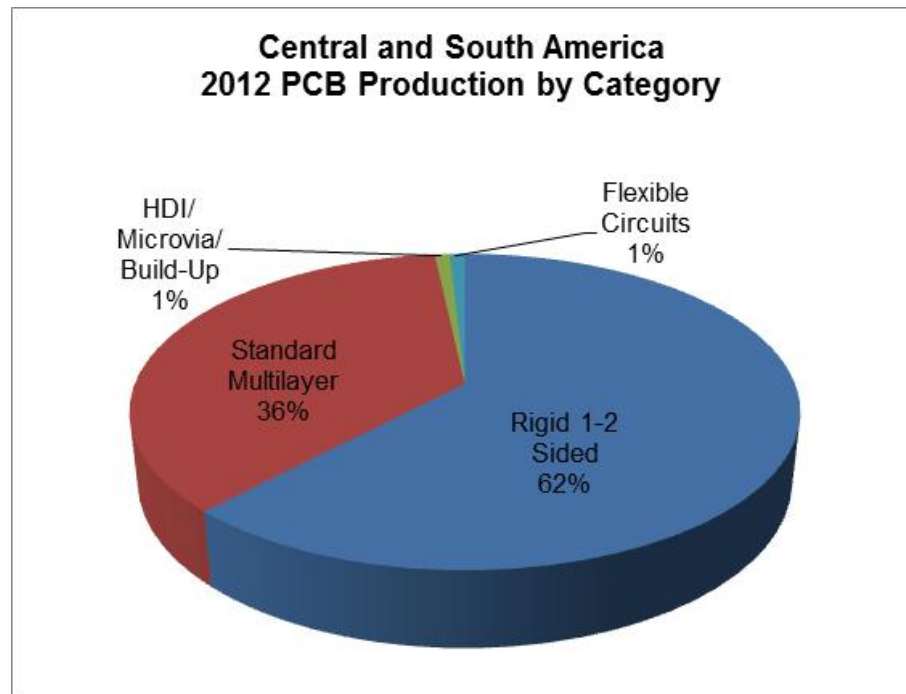
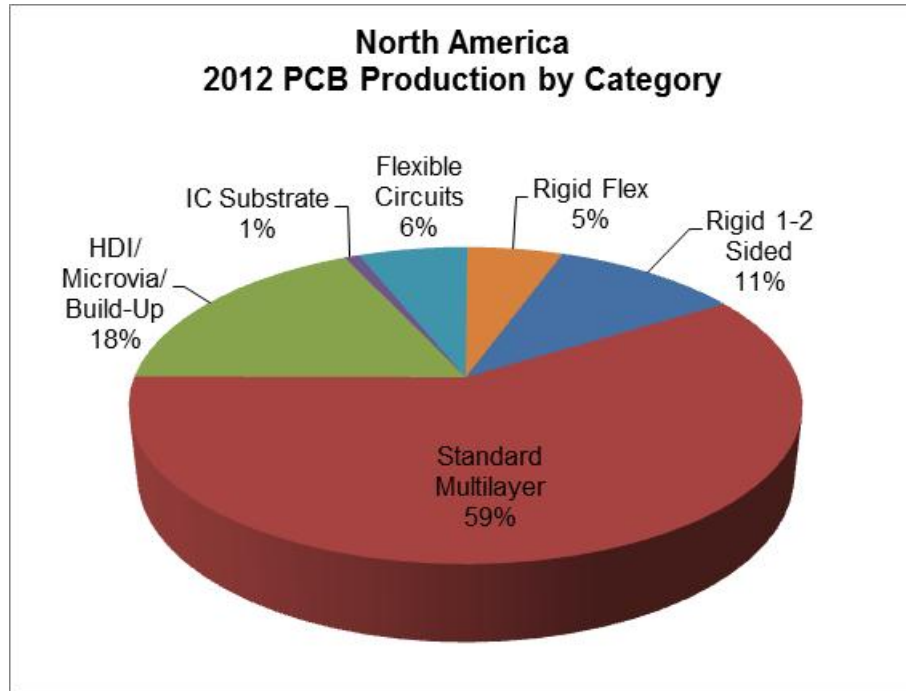




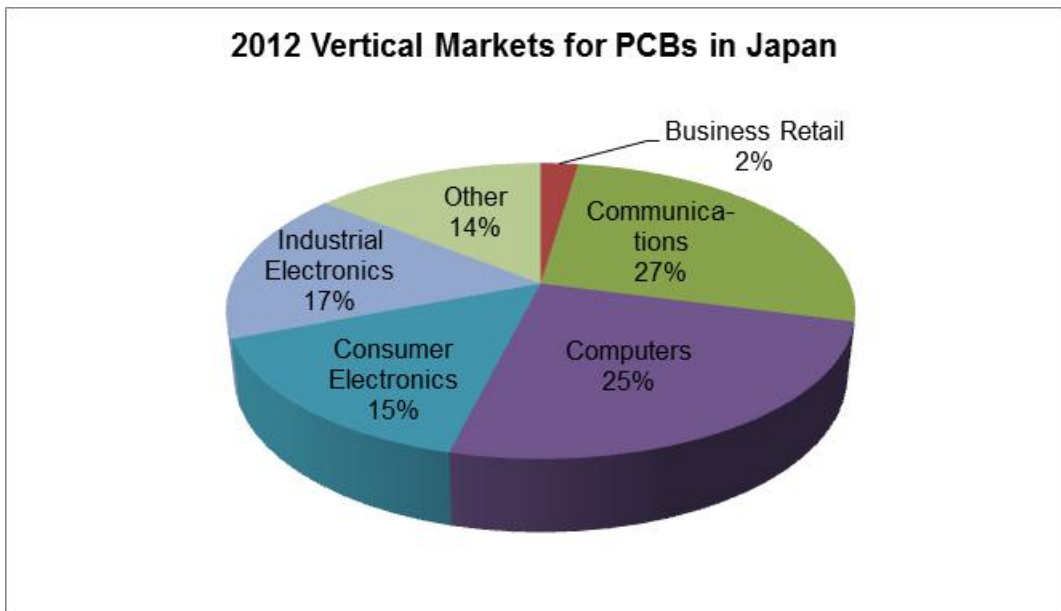
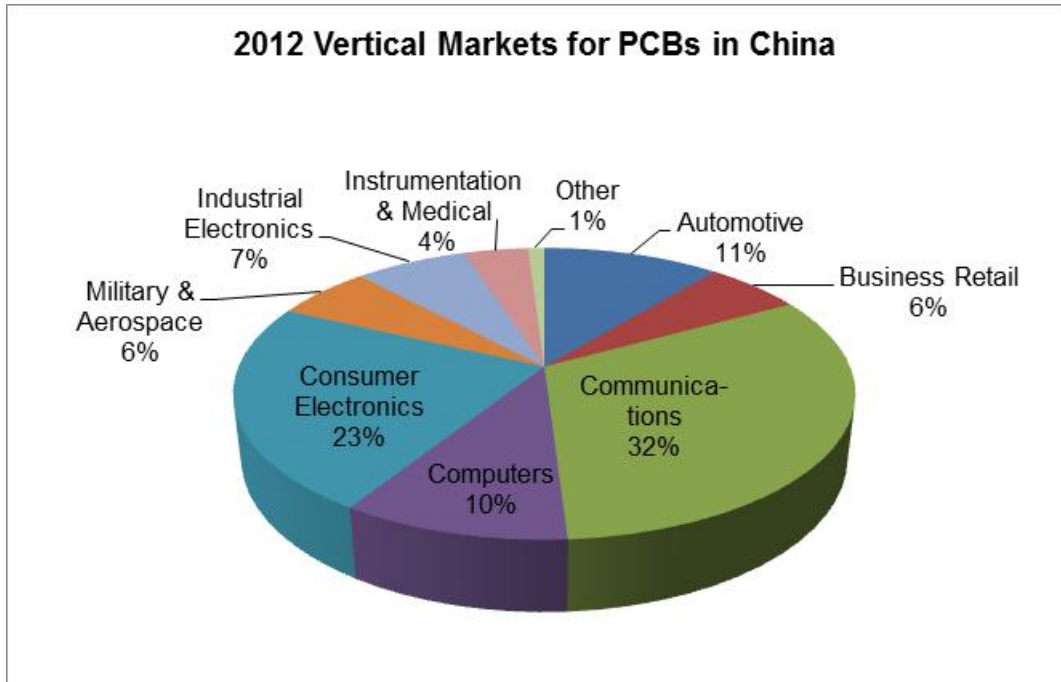


* Other Asia includes Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

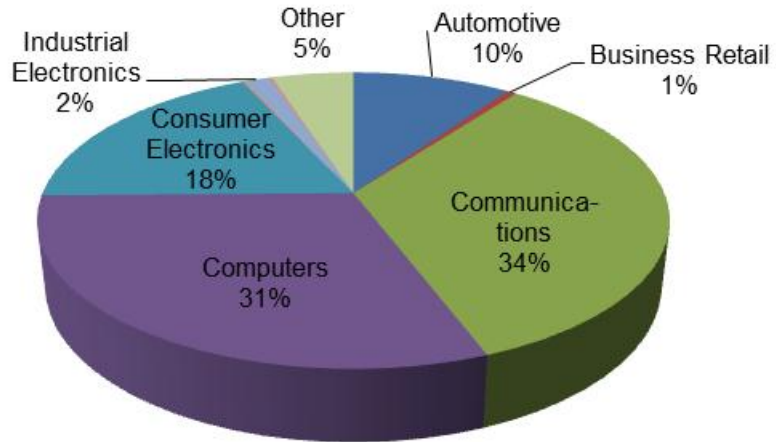




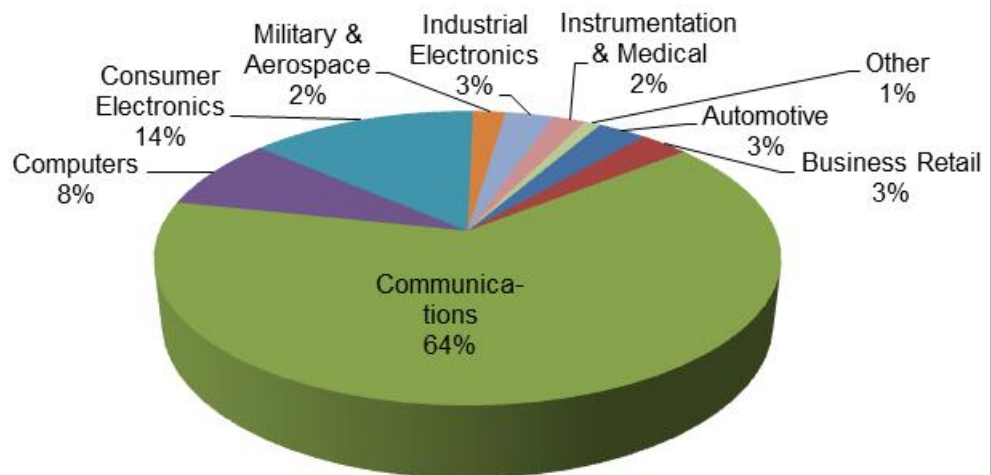
Vertical Markets for PCBs by Country/Region



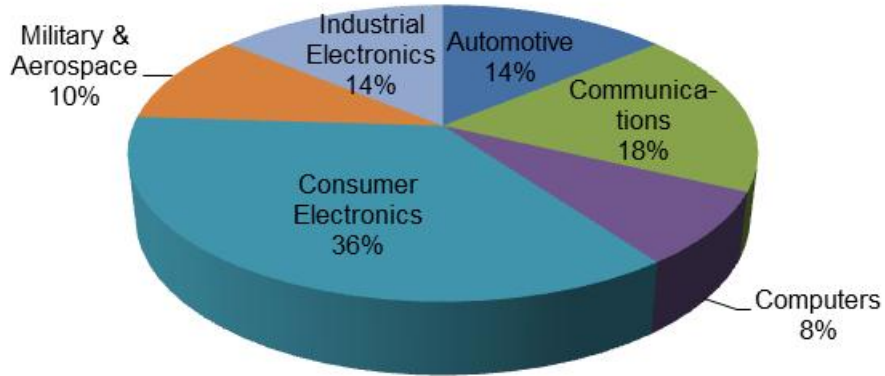
2012 Vertical Markets for PCBs in Taiwan



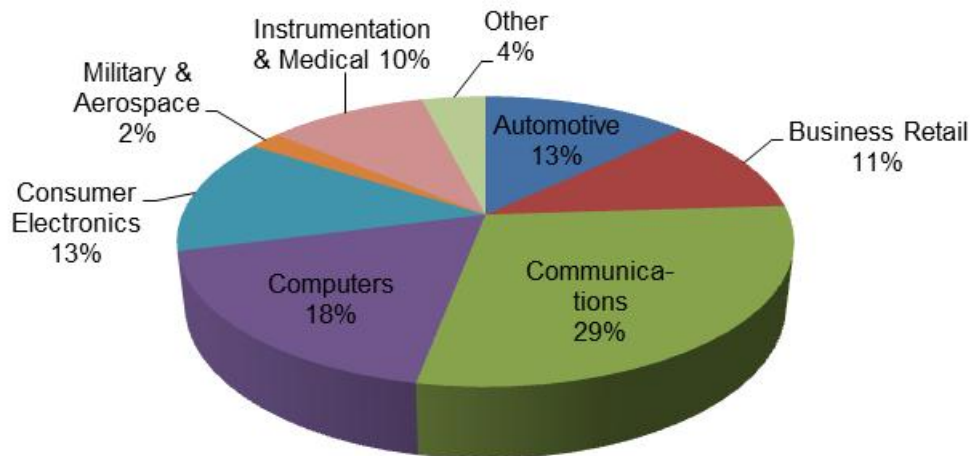
2012 Vertical Markets for PCBs in South Korea



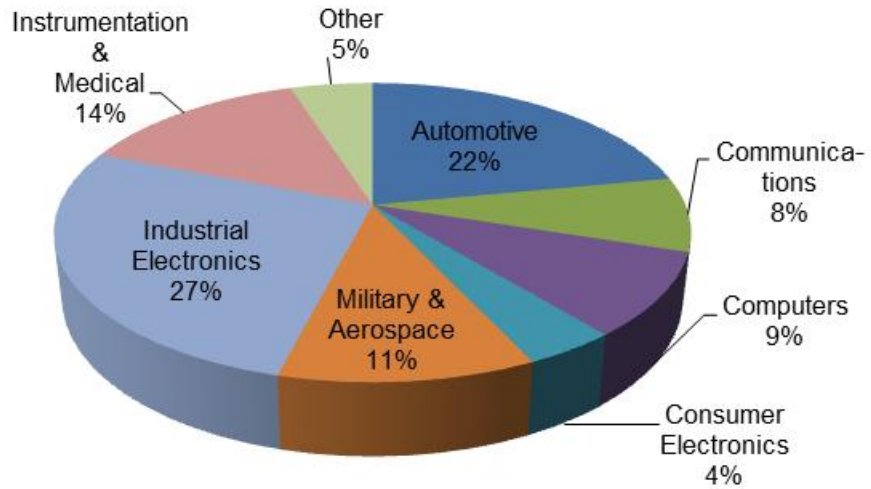
2012 Vertical Markets for PCBs in India



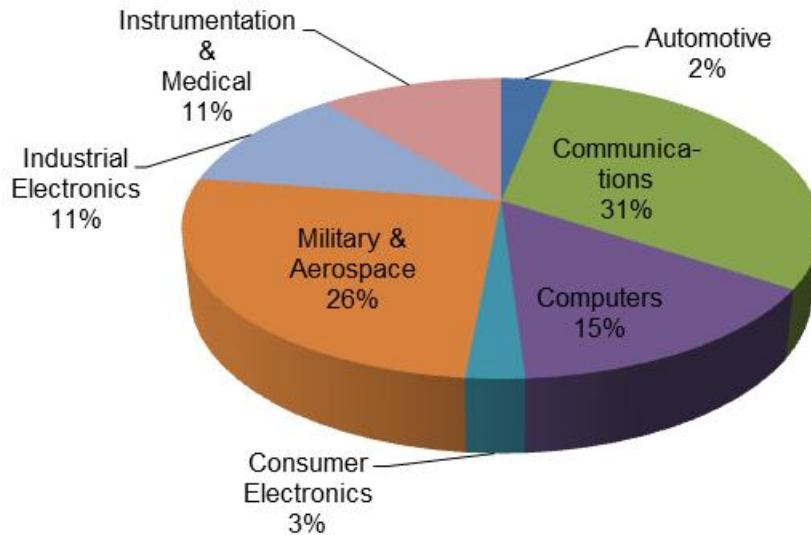
2012 Vertical Markets for PCBs in Hong Kong



2012 Vertical Markets for PCBs in Western Europe



2012 Vertical Markets for PCBs in North America



Questions and Trends

The contributors to this report identified some technology and market issues that manufacturers should watch, and that they believe will affect the PCB industry's future. Some food for thought:

- How will traditional PCB producers respond to the shift from traditional electronics like computers, notebooks and consumer electronics development to multi-functional mobile devices such as phones and tablets?
- The development of any-layer HDI.
- Is Window 8.1 having an impact on the computer market?
- Do Asian companies now consider China their primary or secondary manufacturing location?
- As the biggest electronics companies in China become bigger, how do they impact the PCB industry?
- The growth of embedded technology.
- The decline of the photo-voltaic market in Europe.
- The future impact of advanced safety electronics and electro-mobility on the automotive market.
- Industrial electronics is strong in Europe, mainly for equipment export.
- Fast growth of illumination using aluminium-based material.
- Investment in capacity additions for mid-to-high technology PCB Manufacturing (HDI).
- Is there a trend toward backward integration? How will it affect the PCB market?
- PCB demand is outpacing supply in India.
- 3D packaging – how will it change PCB manufacturing?
- Forecasts of printed electronics market growth vary widely. These depend on projected end-use applications. What end-use applications for PE can we realistically expect to see in the next 10 years?

Appendix: Average Exchange Rates for 2011 and 2012

		2011 Average Exchange Rate (=1.00 USD)	2012 Average Exchange Rate (=1.00 USD)	Currency (ISO Code)	% Change
ASIA/PACIFIC	Australia	0.97	0.97	AUD	-0.3%
	China	6.46	6.30	CNY	-2.4%
	Hong Kong	7.78	7.76	HKD	-0.4%
	India	46.74	53.46	INR	14.4%
	Indonesia	8717.94	9329.20	IDR	7.0%
	Japan	79.73	79.79	JPY	0.1%
	Malaysia	3.05	3.08	MYR	0.9%
	New Zealand	1.26	1.23	NZD	-2.3%
	North Korea	135.00	135.00	KPW	0.0%
	Pakistan	85.61	92.60	PKR	8.2%
	Philippines	43.17	42.10	PHP	-2.5%
	Singapore	1.26	1.25	SGD	-0.5%
	South Korea	1104.95	1123.07	KRW	1.6%
	Taiwan	29.25	29.49	TWD	0.8%
Thailand	30.28	30.91	THB	2.1%	
Vietnam	20452.00	20692.70	VND	1.2%	
EUROPE	Austria	0.72	0.78	EUR	8.4%
	Belgium	0.72	0.78	EUR	8.4%
	Czech Republic	17.62	19.55	CZK	11.0%
	Denmark	5.35	5.79	DKK	8.3%
	Finland	0.72	0.78	EUR	8.4%
	France	0.72	0.78	EUR	8.4%
	Germany	0.72	0.78	EUR	8.4%
	Hungary	200.04	224.83	HUF	12.4%
	Ireland	0.72	0.78	EUR	8.4%
	Italy	0.72	0.78	EUR	8.4%
	Netherlands	0.72	0.78	EUR	8.4%
	Norway	5.59	5.82	NOK	4.0%
	Poland	2.95	3.25	PLN	10.1%
	Portugal	0.72	0.78	EUR	8.4%
	Russia	29.29	30.99	RUB	5.8%
	Slovakia	0.72	0.78	EUR	8.4%
	Spain	0.72	0.78	EUR	8.4%
	Sweden	6.48	6.77	SEK	4.5%
Switzerland	0.89	0.94	CHF	5.9%	
Turkey	1.67	1.80	TRY	7.5%	
United Kingdom	0.62	0.63	GBP	1.3%	
THE AMERICAS	Canada	0.99	1.00	CAD	1.1%
	Mexico	12.39	13.15	MXN	6.1%
	USA	1.00	1.00	USD	0.0%
	Argentina	4.12	4.54	ARS	10.1%
	Brazil	1.67	1.95	BRL	17.0%
	Chile	481.03	486.39	CLP	1.1%
	Venezuela	4289.69	4287.30	VEB	-0.1%

Source: www.oanda.com/convert/fxhistory



World Electronic Circuits Council