

The Solar Photovoltaic Market Research Report Ed 3 2006

Introduction

- This report consists of data on production and installed capacity to 2004
- With estimated data for Japan and the USA to 2005 (latest data available at time of publication)
- Planned production capacity to 2007 shows huge leap
- Corporate highlights and significant developments in 2005/2006, expansion and consolidation of three leaders, withdrawal of two leading players
- Survey of cell and module producers
- Reports on silicon feedstock production and producers, and future projected capacity
- Report on feedstock shortage which is now threatening production
- Outline of alternative feedstock materials in pipeline
- Survey of silicon recycling, with analysis of companies involved

Key Findings

- Consolidation of Japan and Germany as leaders, with the USA challenging again
- The dramatic emergence of China as a world player, with ambitious expansion plans for Solar PV
- Is China set to become the most powerful competitor in the global market?
- The sudden withdrawal of Shell Solar and RWE from the solar PV sector
- Continued entries of large Japanese corporations into the solar market
- Big plans for these Japanese companies, with large production expansion
- At least five companies have plans to become the “world leader”
- Takeover of Shell Solar and partnership with REC silicon producer positions Solar World for a prime strategic position

Reasons to buy

- Gain insight in to this rapidly expanding global market
- Understand how to position your business in this developing market
- Look at opportunities in a market of consolidation and dramatic change

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'100,000 Rooftops Solar Electricity Programme' with favourable feed-in tariffs guaranteed for PV electricity exported to the grid under the Renewable Energy Sources Act (EEG). However in 2004 the EEG was adjusted and now provides a reasonable feed-in tariff for systems in the MW class, hence there is a movement in the German market towards ground mounted PV power stations.

Vertically integrated companies

A number of companies have historically produced ingots and wafers and also processed them into cells and wafers. The most important of these integrated companies are Kyocera, BP Solar, Shell Solar and Photowatt. RWE Schott produces silicon ribbon (trademark EFG) in the USA and Germany.

Table 4.2: PV industry production in 2004 by world region

		Japan	USA	Europe	Rest	Total
Silicon feedstock	tonnes					
Ingots	sc-Si, tonnes					
	mc-Si, tonnes					
Wafers	sc-Si, MW					
	mc-Si, MW					
Cell production	All types, MW					
Cell Production Capacity	MW / year					
Module production	sc-Si, MW					
	mc-Si, MW					
	a-Si, MW					
	Undefined, MW					
	Other, MW					
	Total MW					
Module Production Capacity	MW / year					

Source: IEA PPSP

Table 6.1: World Solar PV installed generating capacity, 1990 to 2004

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Europe			32.4	42.6	52.0	62.6	77.7	98.4	119.8	146.1	205.0	306.7	416.0	630.4	1,040.6
Austria															
Belgium															
Cyprus															
Czech Republic															
Denmark															
Estonia															
Finland															
France															
Germany															
Greece															
Hungary															
Ireland															
Italy															
Latvia															
Lithuania															
Luxembourg															
Netherlands															
Norway															
Poland															
Portugal															
Slovakia															
Slovenia															
Spain															
Sweden															
Switzerland															
United Kingdom															
Africa Mahgreb															
Egypt															
Morocco															
Sub-Saharan Africa															
Kenya															
South Africa															
Zimbabwe															
Middle East															
Israel															
Asia															
China, PRC															
India															
Indonesia															
Japan															
Korea South															
Laos															
Malaysia															
Nepal															
Philippines															
Sri Lanka															
Thailand															

Vietnam															
Pacific															
Australia															
New Zealand															
Latin America															
Argentina															
Brazil															
North America															
Canada															
USA															
Mexico															
World															

Source: IEA, ABS Renewable Energy Generating Capacity Database Ed 2 2005

much smaller in the start-up years as manufacturing lines come on-line. The national production capacity levels are probably smaller than the sum of the individual reports.

Table 8.1: Solar cell production capacity of the leading manufacturers, 2002 to 2007, MW

	2002	2003	2004	2005	2006	2007
SolarWorld Deutsche Solar						
Sharp						
Kyocera						
Mitsubishi Electric						
Mitsubishi Heavy Industries						
Kaneka						
BP Solar						
Q-Cells						
MSK						
Sanyo						
RWE Schott						
Isoton (Spain)						
Shell Solar (ex Siemens US)						
Evergreen						
Photowatt (France)						
Tatung GT Solar						
Total Energie France						
Sunpower Philippines						
ATS Canada						
Soltech						
Solar-Manufaktur						
Motech Solar (Taiwan)						
E-Ton Solar Tech (Taiwan)						
Green Energy (Taiwan)						
Baoding Yingli New Energy Resources (PRC)						
Suntech (PRC)						
Other German						
Others						
Total						

Source: Company announcements and reports

11. Government and Industry Support Programmes

A wide variety of strategies is being pursued in the countries promoting the use of solar PV technology. These have been initiated by central, regional or state, and local governments. As with wind power, these initiatives are playing a major part in bringing the technology to market and promoting it. The purpose of this section of the report is to outline the extent of government and industry support worldwide.

The following table summarises the budgets voted by governments in support of solar PV and it demonstrates clearly the commitment of three governments; German, Japanese and the US. It is no coincidence that these three countries lead the world in the solar PV industry.

Budgets for government support for solar PV development, 2004 (in euro and USD)

Annual Budget in € million and US\$ million								
Country	R&D		Demonstration and field trials		Market stimulation		Total	
	€	US\$	€	US\$	€	US\$	€	US\$
Australia	2.5	3.1	0	0	9.6	11.9	12.1	15.0
Austria	0	0	0	0	~7.6	~9.4	~7.6	~9.4
Canada	4.9	6.0	1.1	1.4	0.12	0.15	6.2	7.6
Switzerland	9.8	12.1	1.0	1.2	1.0	1.3	11.8	14.6
Germany	24.5	30.3	0	0	250.0	308.6	274.5	338.9
Denmark	3.4	4.2	0.7	0.8	0	0	4.1	5.0
France	7.6	9.4	0	0	18.9	23.3	26.5	32.7
United Kingdom	4.6	5.7	8.3	10.2	0	0	12.9	15.9
Israel	0.16	0.2	0	0	0	0	0.16	0.2
Italy	4.8	5.9	0.2	0.3	23.0	28.4	28.0	34.6
Japan (METI)	49.0	60.5	83.3	102.8	39.4	48.6	171.7	211.9
Korea	5.6	6.9	12.2	15.0	4.5	5.5	22.3	27.4
Mexico	0.7	0.8	0.0	0.0	0.3	0.4	1.0	1.2
Netherlands	12.7	15.7	0.15	0.19	> 1.0	> 1.2	13.9	17.1
Norway	0.6	0.7	0	0	0	0	0.6	0.7
Portugal	-	-	-	-	-	-	-	-
Sweden	2.5	3.1	0.11	0.14	0	0	2.6	3.2
Switzerland	9.8	12.1	1.0	1.2	1.0	1.3	11.8	14.6
USA	69.7	86.0	8.5	10.5	145.8	180.0	224.0	276.5

Source: IEA

US Federal and State incentives

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