



New Research Predicts End to Silicon Shortage

A Prometheus Institute report forecasts new players and long-time companies will expand worldwide silicon supplies by the end of 2008.

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The three-year competition for silicon between solar and semiconductor companies will end later this year as silicon manufacturers roll out new production lines, according to a new report released Thursday by the Prometheus Institute and Greentech Media.

For decades, silicon has played a starring role in the rise of the chip industry. Its semiconducting properties and relatively cheap price have helped to make it possible to engineer smaller and faster chips to run iPods and laptops.

The vast majority of today's solar panels also rely on silicon to turn sunlight into electricity. The growing worldwide interest in solar energy has pitted solar companies against chip businesses in recent years, particularly because silicon producers couldn't make enough to satisfy both types of customers.

In 2007, solar companies used more silicon than the semiconductor industry, said Travis Bradford, president of the Prometheus Institute, in the report. The solar industry used about 30,000 of 48,900 metric tons of silicon produced worldwide last year.

By 2012, the total silicon-manufacturing capacity could reach more than 261,742 metric tons, according to Bradford's report, "Polysilicon: Supply, Demand and Implications for the PV Industry."

Major silicon suppliers expected to have new plants or expanded production lines ready to go by the end of the year include REC, MEMC, Wacker and Hemlock (see chart below).

Bradford also highlighted two new companies entering the field: China-based LDK Solar, which in April raised \$400 million to construct a 1,000- and a 15,000-metric-ton plant, and DC Chemical, a South Korean firm due to open its 5,000-ton plant this year.

The report forecast an additional source in upgraded metallurgical silicon, which will have to be blended with purer silicon until companies are able to improve the quality of the metallurgical material.

Elkem in Norway, Dow Corning in Brazil and Timminco in Canada are prominent players in the metallurgical silicon business, said the report.

Building and operating a silicon plant isn't an easy task, and many companies have continued to struggle to carry out their plans. China-based Trina Solar, for example, in April backed out of a plan to build a manufacturing center.

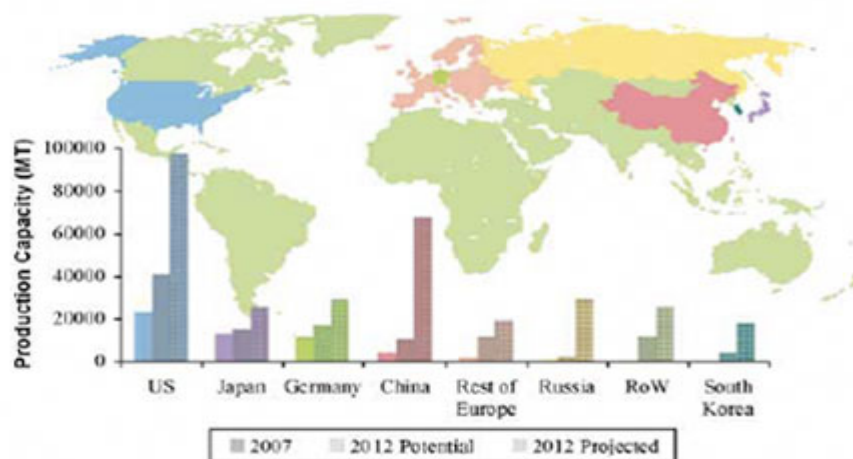
All the new and expanded supplies are good news for solar companies. But Bradford has previously cautioned that the industry could end up with a silicon glut (see [Oversupply of Silicon to Be Worse Than Expected, Analyst Says](#), [Solar Sector Heading for a Shakeout](#), [Solar Margins About to Shrink?](#) and [Panelists Debate When the Silicon Shortage Will End](#)).

		Capacity					
Current Producers		2005	2006	2007	2008E	2009E	2010E
Hemlock	US	7,700	10,000	10,010	14,630	19,000	23,000
Wacker	Germany	5,500	6,500	10,000	14,500	14,500	22,500
Tokuyama	JP	5,300	5,400	5,400	5,600	8,200	8,200
MEMC -Merano (Siemens's)	IT	1,100	1,100	1,600	2,000	2,875	3,000
MEMC -Pasadena (FBR)	US	2,300	2,700	4,400	6,000	8,625	9,000
Dust and recycling		400	600	700	800	900	900
MEMC	US/ IT	3,800	4,400	6,700	8,800	12,400	12,900
REC Group (AsiMi)	US	2,800	3,300	3,500	4,500	4,500	4,500
REC - SG Silicon	US	2,200	2,200	2,200	2,300	2,400	2,500
Fluidized Bed	US	-	-	-	500	6,500	6,500
Internal Expansion	US			300	200	100	6,000
REC	US	5,000	5,500	6,000	7,500	13,500	19,500
Mitsubishi -M-Poly	JP	1,600	1,600	1,800	1,800	2,029	2,232
Mitsubishi -MIPSA	JP	1,250	1,550	1,500	1,500	1,661	1,827
Mitsubishi	JP	2,850	3,150	3,300	3,300	3,690	4,059
Sumitomo	JP	800	900	1,300	1,400	1,400	1,400
Current Producers Total:		30,950	35,850	42,710	55,730	72,690	91,559
New Entrants - Current Technology		2005	2006	2007	2008E	2009E	2010E
Silicium De Provence (SilPro)	FR						4,000
DC Chemical (Siemens)	SKorea			-	5,000	15,000	15,000
Isotofon / Endesa JV (Siemens)	ES					2,500	2,500
Hoku Scientific (Siemens)	US					100	400
M. Setek (Siemens)	JP		200	400	4,200	5,800	10,000
Scheuten SolarWorld	Germany					500	1,000
LDK	CH				6,000	15,000	15,000
Emei	CH		220	370	500	1,300	4,800
CSG	CH					300	1,500

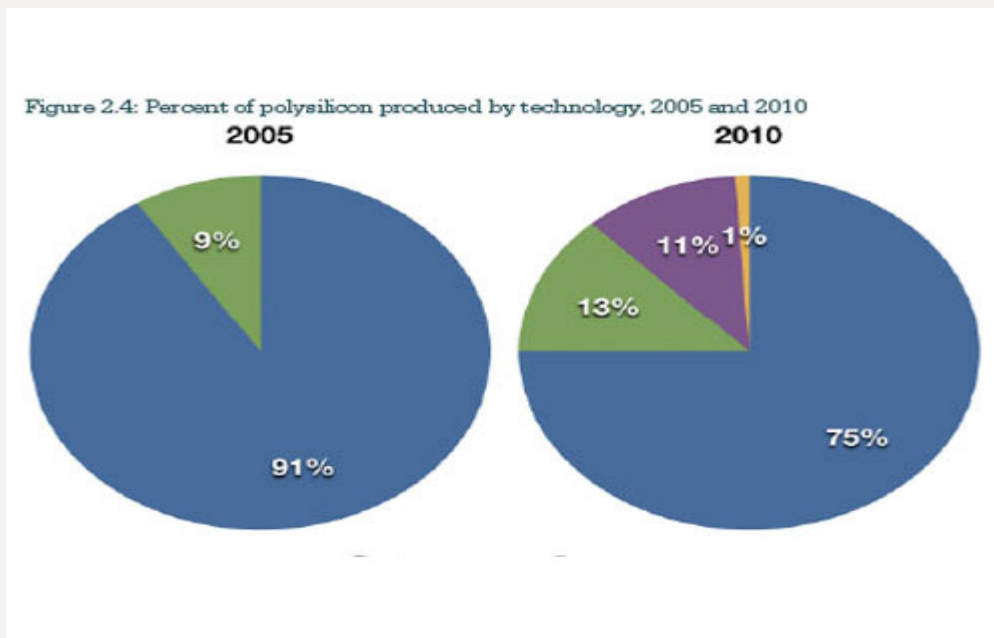
The Prometheus Institute forecasts that manufacturers will have the capacity to produce 261,742 metric tons of polysilicon in 2012, up from 48,900 of capacity in 2007.

The Prometheus Institute

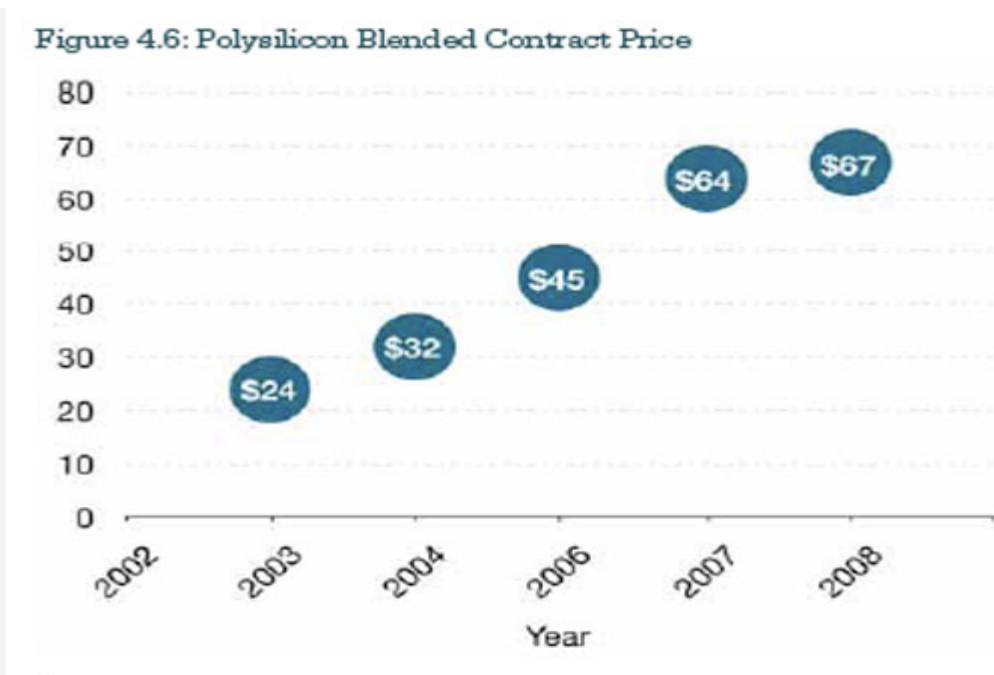
Figure 4.5: Map of production



The Prometheus Institute expects contract prices for silicon to grow more slowly this year, reaching an average of \$67 per kilogram – up 4.7 percent from \$64 per kilogram in 2007, when contract prices jumped 42 percent. Prometheus forecasts that the prices will grow to \$72 per kilogram in 2009, then fall to \$58 per kilogram in 2012.

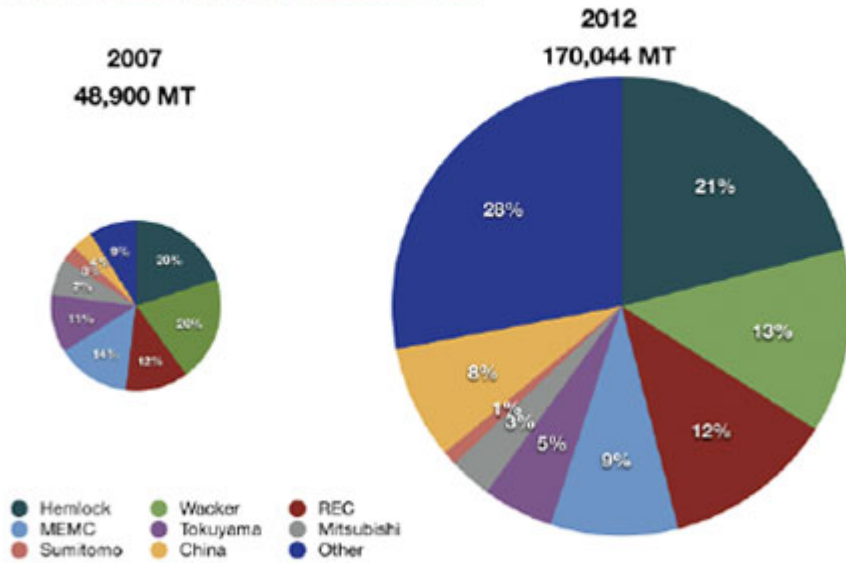


The Prometheus Institute expects that fluidized bed reactor and upgraded metallurgical silicon will make up a larger part of the market in 2010 than in 2005, but that most silicon will still be made using the conventional Siemens process.



The United States is the world's largest producer of polysilicon by far. China is expected to gain market share – but not quite catch up – by 2012.

Figure 6.4: Polysilicon Market Share by producer, 2007-2012



The Prometheus Institute expects Hemlock and Wacker, the largest manufacturers of silicon for the solar industry today, to remain the top two producers in 2012.