Technology, Media & Telecom: Semiconductor Manufacturing

Important disclosures may be found on the last two pages of the report.

MEMC ELECTRONIC MATERIALS, INC. (WFR: $19.68*)

St. Peters, MO
October 24, 2005

Underperform
Price Target $15.00
Update

STOCK DATA

52 Week Range	$23.75-$8.72
ADTV - 3 Month	3.1
Market Cap	$4,121.0
Shares Outstanding (Diluted)	224.7

EARNINGS DATA

EPS (FD Operating)

Dec.	2004A	2005E	2006E
1Q	$0.16	$0.23A	$0.25
2Q	0.19	0.26A	0.28
3Q	0.27	0.28	0.32
4Q	0.27	0.30	0.33
FY	$0.89	$1.07	$1.18
P/E	14.8x	18.5x	16.6x

FY	2004A	2005E	2006E
Revenue	1,028.0	1,117.5	1,213.1

FINANCIAL DATA

	2Q05
Cash & Equivalents	101.0
Accounts Receivable	132.1
Inventories	134.9
Current Assets	395.2
Total Assets	1,079.5
Total Current Liabilities	199.9
Long-Term Debt	108.2
Total Debt	129.9
Total Stockholder Equity	563.6

Financial Values In Millions

WFR: Sufficient Raw Wafer Capacity in '06; Poly Revenues Limited to Less than 5% of Total--Reiterate Underperform

Summary and Recommendation

We are glad to see a series of reports by our competitors since our downgrade on Oct 13, discussing the prospects of earnings upside for MEMC and why WE are wrong with our thesis. We believe such debates are necessary and benefit investors as they further increase their understanding of the wafer industry intricacies (which ultimately impacts MEMC's earnings prospects). To that end, and as a follow up to our downgrade report, we are providing our proprietary wafer supply model, as well as an in-depth analysis of the polysilicon market, that helped construct the basis of our downgrade. Net/net, our analysis illustrates: 1) there will be enough 300-mm wafer capacity in '06 to keep the 300-mm utilization rate around 90% (while overall utilization rates are kept around 80%), prohibiting a significant ASP increase; 2) a poly manufacturing bottleneck at MEMC is estimated to keep the poly-related revenue mix to less than 5%; 3) If MEMC were to increase its poly capacity, it would need to increase cap-ex significantly, thus reducing free cash flows; 4) higher poly prices have a big impact on solar but not semi. To that end, we encourage investors to use any rally to take profit as industry fundamentals, in our opinion, won't support significant upside to our '06 EPS estimate of $1.18.

Key Points

- **Our bottom-up analysis illustrates that there will be enough 300-mm raw wafer capacity available (by '06) that will mitigate ASP increases.** Although Perfect Silicon/Epi wafers may demand higher ASPs, we believe that the blended ASP for the industry won't increase in '06 as much as the bulls may like it to.
- **MEMC's poly capacity is not enough to provide significant opportunities.** Our detailed analysis illustrates that unless MEMC were to add capacity, the sale of poly into the spot market will account for only 2% of our '06 revenue estimate.
- **And if MEMC were to add poly capacity, future free cash flows (which, in our view, are the right metric to value the stock) will be reduced.** To that end, we believe the shares are overvalued and encourage investors to sell into any rally.

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Raw Wafer Industry Capacity: The Myths versus Facts

We find it prudent at this juncture to publish our bottom-up wafer industry capacity model to better help investors evaluate the industry capacity as well as pricing trends. We note that this analysis is based on repetitive conversation and company visits to the top five largest manufacturers over the past several months, and also utilizing Gartner's estimates to verify the historical figures.

Below, we have provided both 300mm as well as 200-mm raw wafer capacity (both polished and Epi) for the largest ten wafer manufacturers worldwide. There are a couple of observations here that should be noted:

1. We note that due to the consolidation in the industry since early this decade, and lack of insufficient capital for capacity expansion, the top five wafer manufacturers account for at least 95% of total 300-mm wafer capacity while the same mix accounts for at least 80% of the 200-mm wafer capacity.

2. 300-mm raw wafer capacity (in MSI) will account for 21% of the industry raw wafer capacity by '06, up from 9% in '04, or up nearly 150%. The 200-mm raw wafer capacity is expected to remain unchanged during the same period.

3. Given the current capex budgets and capacity plans, SUMCO, in our opinion, is expected to increase its share of 300-mm capacity from 15% in '04 to 29% in '06. This illustrates how significant the IPO news from SUMCO a few weeks ago was. Additionally, Komatsu is also expected to increase market share form 1% in '04 to 6% in '06. MEMC's 300mm market share is expected to increase from 13% in '04 to 18% in '05 and remaining unchanged at 18% in '06. However, given Shinetsu's current capacity plans, its 300-mm market share will decline from 50% in '04 to 32% in '06. This, in our view, could put further pressure on Shinetsu to increase capacity above and beyond current plans to retain its 300mm market share.

4. And finally, since Siltronic's IPO plans (in Europe) are still unknown, we have conservative estimates for their capacity plans (verified from our recent conservation with the company). To that end, we expect Siltronic's 300-mm market share to decline from 19% in '04 to 13% in '06. Therefore, if they are successful in their IPO offering, they could also increase their capacity above and beyond current plans to retain their market share.

Figure 1: 300-mm & 200-mm Industry Wafer Capacity (KPM), '02-'06E

Rank	Company		2002	2003	(KPM) 2004	2005E	2006E	CAGR 02-'06
1	Shinetsu							
		300mm	45	180	330	386	528	85%
		200mm	1200	1200	1400	1400	1400	4%
2	SUMCO							
		300mm	38	100	100	188	475	89%
		200mm	1,500	1,500	1500	1500	1500	0%
3	MEMC							
		300mm	1	19	83	188	293	291%
		200mm	620	664	850	900	900	10%
4	Siltronic							
		300mm	1	63	125	173	223	265%
		200mm	900	800	730	730	730	-5%
5	Komatsu							
		300mm	0	0	6	41	94	292%
		200mm	250	250	300	300	300	5%
6	LG Siltron							
		300mm	0	0	4	28	30	166%
		200mm	450	485	485	485	485	2%
7	Toshiba Ceramics							
		300mm	0	6	17	25	25	61%
		200mm	480	480	480	480	480	0%
8	Okmetic							
		300mm	0	0	0	0	0	N/M
		200mm	100	100	100	100	100	0%
9	Wafer Works							
		300mm	0	0	0	0	0	N/M
		200mm	100	100	100	100	100	0%
10	Episil							
		300mm	0	0	0	0	0	N/M
		200mm	50	50	50	50	50	0%
	Total 300mm (300mm eq)		85	367	666	1,027	1,666	110%
		% of Total	1%	6%	9%	14%	21%	
	Total 200mm (200mm eq)		5,650	5,629	5,995	6,045	6,045	2%
		% of Total	42%	39%	38%	36%	33%	
	Total < 200mm (200mm eq)		7,667	7,917	8,333	8,333	8,333	2%
		% of Total	57%	55%	53%	50%	46%	

Source: Gartner, Company reports, FBR Research

Figure 2: % 300-mm & 200-mm Market Share for the Top 10 Largest Raw Wafer Manufacturers, '02-'06E

Rank	Company	(KPM)	% Market Share 2002	2003	2004	2005E	2006E
1	Shinetsu						
		300mm	53%	49%	50%	38%	32%
		200mm	21%	21%	23%	23%	23%
2	SUMCO						
		300mm	44%	27%	15%	18%	29%
		200mm	27%	27%	25%	25%	25%
3	MEMC						
		300mm	1%	5%	13%	18%	18%
		200mm	11%	12%	14%	15%	15%
4	Siltronic						
		300mm	1%	17%	19%	17%	13%
		200mm	16%	14%	12%	12%	12%
5	Komatsu						
		300mm	0%	0%	1%	4%	6%
		200mm	4%	4%	5%	5%	5%
6	LG Siltron						
		300mm	0%	0%	1%	3%	2%
		200mm	8%	9%	8%	8%	8%
7	Toshiba Ceramics						
		300mm	0%	2%	3%	2%	2%
		200mm	8%	9%	8%	8%	8%
8	Okmetic						
		300mm	0%	0%	0%	0%	0%
		200mm	2%	2%	2%	2%	2%
9	Wafer Works						
		300mm	0%	0%	0%	0%	0%
		200mm	2%	2%	2%	2%	2%
10	Episil						
		300mm	0%	0%	0%	0%	0%
		200mm	1%	1%	1%	1%	1%
	Total 300mm (200mm eq)						
		% of Total	1%	6%	9%	14%	21%
	Total 200mm (200mm eq)						
		% of Total	42%	39%	38%	36%	33%
	Total < 200mm (200mm eq)		-	-	-	-	-
		% of Total	57%	55%	53%	50%	46%

Source: Gartner, Company reports, FBR Research

How Does the above Raw Wafer Capacity Compares to Demand

The figures above illustrate our analysis and consequently our expectations for the industry's 200-mm and 300-mm raw wafer capacity. We now shift gears and try to relate such capacity to the demand for both 200-mm and 300-mm raw wafers. We remind investors that the net takeaway here is determining the pricing power that wafer manufacturers would gain as demand increases (especially on the 300mm), helping increase the utilization rates, which in turn, helps with pricing power.

As illustrated below (in the two figures provided), the net/net takeaway here is that our calculations illustrate that the overall wafer capacity utilization rate remains in the low 80% range, down from 87% in ’04 because of the increased capacity of 300mm raw wafers.

Additionally, when evaluating the supply and demand environment for the 300mm raw wafer specifically, we agree with the bull argument that that demand is currently growing faster than supply (helping the 300-mm raw wafer capacity utilization rate to increase from 71% in ’04 to 83% in ’05), although we still expect a more balanced supply and demand environment by ’06, as capacity becomes available (illustrated in the figures above). Therefore, although there will be strong demand for 300-mm wafers (growing by 225% from ’04 to ’06), there will be enough capacity that will be coming online to keep the 300-mm raw wafer utilization rate in the low 90% range in ’06 (see tables below).

Figure 3: Supply & Demand for Wafer Industry (i.e. Utilization Rate), 2002-2006E

	2002	2003	2004	2005E	2006E
Total (MSI)	8,050	8,473	9,272	9,777	10,616
% of Capacity Never Used	*20%*	*20%*	*20%*	*20%*	*20%*
Effective Raw Wafer Capacity (MSI)	6,440	6,779	7,418	7,821	8,493
% Y/Y		5%	9%	5%	9%
Raw Wafer Demand (by fabs)	4,783	5,292	6,419	6,497	6,963
% Y/Y		11%	21%	1%	7%
Wafer Industry Utilization Rate	74%	78%	87%	83%	82%

Source: Gartner, Company reports, FBR Research

Figure 4: 300-mm Wafer Supply & Demand, 2002-2006E

	2002	2003	2004	2005E	2006E
300mm Wafer Supply (MSI)	251	498	903	1,393	2,260
% Y/Y		99%	81%	54%	62%
300mm Wafer Demand (MSI)	96	265	642	1,150	2,089
% Y/Y		177%	143%	79%	82%
% of Total Demand	2%	5%	10%	18%	30%
300mm Wafer Industry Utilization Rate	38%	53%	71%	83%	92%

Source: Gartner, Company reports, FBR Research

Analyzing the Polysilicon Factor: We Believe There Is a Polysilicon Manufacturing Bottleneck at MEMC

Given the limited polysilicon manufacturing capacity at MEMC and forecasted higher ‘06 wafer capacity (up 50$-60% YOY in ’06) and, consequently, wafer sales (which will result in higher poly consumption due to increased wafer capacity), we believe that MEMC is extremely limited in its capability to manufacture excess poly for sale into the solar industry. Therefore, MEMC will not be able to capitalize on increasing poly prices unless it expands its poly capacity significantly and quickly. Below we detail our assumptions and calculation methodology that leads us to believe that MEMC’s current poly infrastructure can only manufacture enough of excess poly in 2006 equivalent to 2% of our estimated 2006 revenue.

Based on our research, we believe that around 55% of polysilicon input into the crystal growth process ends up as single crystal ingots. The remaining waste material includes the ends of the ingots, leftover silicon in the crucible, and material ground-off during the shaping of ingots. In addition, we believe that roughly 55% of single crystal ingots end up as final wafers. Material lost during the wafering process includes silicon dust (kerf) generated while cutting the ingot into wafers and silicon particles washed away by the slurry during the lapping and polishing process steps.

Using the Above Estimates, We Conclude the Blended Conversion Efficiency (from Polysilicon to Wafers) of Nearly 30%

This means that, on average, 1 kg of pure polysilicon material ultimately becomes 0.3 kg of wafers, and the remaining 0.7 kg is waste material, not useable in the manufacturing of *semiconductor* wafers. We believe the reject silicon material is either: 1) not recovered, 2) sold to other industries, or 3) used in solar cell manufacturing. Needless to say, the semiconductor wafer manufacturing process is not an efficient one (on a material basis). We will address this inefficiency issue later in our report as it applies to the polysilicon shortage issue.

To test our assumptions, we attempted to determine the overall polysilicon conversion efficiency rate of the wafer industry by comparing the overall weight of electronic grade polysilicon production to the total weight of semiconductor wafers produced. We have assumed 24,000 metric tons of electronic-grade polysilicon available to the wafer industry in '05 (per SEMICON West 2005 presentation). We have also used Gartner Dataquest's estimates regarding wafer demand (~ 6,500 million sq inches of Si wafers in '05 with a 300-mm/200-mm/150-mm-and-below mix of 18%, 43%, and 39%, respectively). Given these assumptions and if the polysilicon industry is, indeed, operating at **full capacity**, our calculation shows that the poly conversion efficiency rate for the industry is, indeed, around 30%, confirming our assumptions from above. The calculation is summarized in the figure below.

Figure 5: Derivation of 30% Conversion Efficiency Rate of Poly to Wafer Process

Electronic grade poly available to the semi wafer industry in 2005 (metric tons)	***24,000***
Total Industry M sq in Si (semi wafers) shipped 2005E	6,500
M sq in Si 300mm shipped in 2005E (18% of total)	1,170
M sq in Si 200mm shipped in 2005E (43% of total)	2,795
M sq in Si 150mm and below shipped in 2005E (39% of total)	2,535
Conversion Efficiency (ingot and wafer manufacturing)	30%
Poly weight (kg) per 300mm wafer - with waste included	0.435
Poly weight (kg) per 200mm wafer - with waste included	0.181
Poly weight (kg) per 150mm-and-below wafer - with waste included	0.095
Total 300mm weight poly (kg)	4,650,049
Total 200mm weight poly (kg)	10,419,166
Total 150mm and below weight poly (kg)	8,930,488
Total poly weight due to semi wafers (metric Ton)	24,000
% of total poly capacity used for wafer manufacturing	100%

Source: Hemlock, Wacker – SEMICON West 2005, Gartner Dataquest and FBR Research

Given the 30% efficiency rate of the industry, we have appropriately assumed that MEMC's ingot/wafer operations are similar. We believe that MEMC's current poly manufacturing capability is around 3,700 metric tons/year (2,700 from Texas and 1,000 from Italy). Given these assumptions, Gartner's forecast for wafer demand, our estimated market share and mix calculations for MEMC, a 100% utilization rate at MEMC's poly plants and MEMC's comment that more than 90% of its wafers are made from internally made poly, we believe that, in the least, 90% of MEMC's existing poly manufacturing capability is utilized for its semi-grade wafer manufacturing. Therefore, using our conservative methodology, we believe that at most 10% of MEMC's poly-manufacturing capacity in '05 is available for sale into the solar or semi poly markets. Our calculations are summarized in the table below.

Figure 6: MEMC's 2005 Poly Capacity - Breakdown of Utilization

MEMC poly capacity (metric ton/yr)	***3,700***
Total Industry M sq in Si shipped 2005E	6,500
MEMC Market Share (Si area) 2005E	15%
MEMC total M sq in Si shipped 2005E	982
MEMC M sq in Si 300mm shipped in 2005E (32% of total)	314
MEMC M sq in Si 200mm shipped in 2005E (50% of total)	491
MEMC M sq in Si 150mm and below shipped in 2005E (18% of total)	177
Conversion Efficiency (ingot and wafer manufacturing)	30%
Poly weight (kg) per 300mm wafer - with waste included	0.435
Poly weight (kg) per 200mm wafer - with waste included	0.181
Poly weight (kg) per 150mm-and-below wafer - with waste included	0.095
Total 300mm weight poly (kg)	1,248,280
Total 200mm weight poly (kg)	1,829,412
Total 150mm and below weight poly (kg)	622,386
Total poly weight due to semi wafers (metric Ton)	3,700
Metric ton of poly used to make 90% of wafers (rest of poly from others)	***3,330***
% of total poly capacity used for MEMC semi wafer manufacturing	90%
% of total poly capacity available for excess poly manufacturing	10%

Source: FBR Research, Gartner Dataquest, Company reports

In addition to the estimated 10% of available poly capacity (370 metric tons/yr), we believe that 15% of the waste materials from ingot/wafer manufacturing (breakage, ingot ends, and leftover crucible poly) are ultimately recycled for solar cell manufacturing. Using these assumptions, we believe that MEMC has a maximum of 700 metric tons of excess poly available to sell into solar manufacturers in ‘05. Assuming a spot price for solar poly of $60/kg, we believe the maximum revenue that MEMC can obtain in ‘05 from excess poly sales is $42 million, or 4% of our estimated ‘05 revenues for the company. The calculation is summarized in the figure below.

Figure 7: Our Estimate of MEMC 2005 Revenue Opportunity in Excess Poly Sales to the Solar Industry

% of total poly capacity available for excess poly manufacturing		10%
Metric tons of excess poly available from MEMC facilities		***370***
Metric tons of poly available from manufacturing scraps (15% of waste)		332
Total poly available to MEMC for solar applications		701
Average spot price/kg solar poly for 2005E	$	60
1 metric ton of solar poly incremental revenue ($)	$	60,000
Revenues derived from excess poly sales ($M)	***$***	***42***
MEMC 2005E Revenues ($M)	$	1,118
Maximum % of 2005E MEMC revenues from excess poly sales		4%

Source: FBR Research, Gartner Dataquest, Company reports

Given the limitation of poly-manufacturing capacity at MEMC and the forecasted ‘06 expanding wafer sales (therefore, higher poly consumption for semi wafers), we believe that MEMC is limited in its capability to manufacture excess poly for sale to the solar industry. Therefore, MEMC will not be able to capitalize on increasing poly prices unless it expands its poly capacity significantly and quickly.

We have repeated the same calculation, yet this time for ‘06. We have again assumed 100% poly factory utilization, used Gartner estimates for overall Si demand, and our estimates for MEMC’s market share and mix. Assuming a spot price for solar poly of $65/kg, we believe the maximum revenue that MEMC can obtain in ‘06 from excess poly sales is $28 million, or 2% of our estimated ‘06 revenues for the company.

The calculation is summarized in the figure below.

Figure 8: Our Estimate of MEMC 2006 Revenue Opportunity in Excess Poly Sales to the Solar Industry

MEMC poly capacity (metric ton/yr)		***3,700***
Total Industry M sq in Si shipped 2006E		7,000
MEMC Market Share (Si area) 2006E		15%
MEMC total M sq in Si shipped 2006E		1,057
MEMC M sq in Si 300mm shipped in 2006E (45% of total)		476
MEMC M sq in Si 200mm shipped in 2006E (45% of total)		476
MEMC M sq in Si 150mm and below shipped in 2006E (10% of total)		106
Conversion Efficiency (ingot and wafer manufacturing)		30%
Poly weight (kg) per 300mm wafer - with waste included		0.435
Poly weight (kg) per 200mm wafer - with waste included		0.181
Poly weight (kg) per 150mm-and-below wafer - with waste included		0.095
Total 300mm weight poly (kg)		1,890,424
Total 200mm weight poly (kg)		1,773,122
Total 150mm and below weight poly (kg)		372,368
Total poly weight due to semi wafers (metric Ton)		4,036
Metric ton of poly used to make 90% of wafers (rest of poly from others)		***3,632***
% of total poly capacity used for MEMC semi wafer manufacturing		98%
% of total poly capacity available for excess poly manufacturing		2%
Metric tons of excess poly available from MEMC facilities		***68***
Metric tons of poly available from manufacturing scraps (15% of waste)		362
Total poly available to MEMC for solar applications		429
Average spot price/kg solar poly for 2006E	$	65
1 metric ton of solar poly incremental revenue ($)	$	65,000
Revenues derived from excess poly sales ($M)	***$***	***28***
MEMC 2006E Revenues ($M)	$	1,213
Maximum % of 2006E MEMC revenues from excess poly sales		2%

Source: FBR Research, Gartner Dataquest, Company reports

MEMC's Capex Spending as a Percentage of Revenues Needs to Be Raised or Opportunities Will Be Missed

Using the same methodology as above, and assuming that MEMC can raise it's poly production by 1500 metric tons per year in 2006 (a 40% increase, at a conservative estimated price of over $100 million based on Wacker's past announcements of poly expansion and other sources), we believe the company could produce enough excess poly to generate $125 million in revenues for 2006, or 10% of our 2006 revenue estimate. We also estimate the capital expenditure needed for this capacity expansion could be much higher if the added capacity is to be from a new plant, rather than merely an extension of MEMC's existing poly facilities. Additionally, we remind investors that it would take at least 18 months to ramp this capacity and we have not heard from the company as of yet regarding a significant investment in its poly manufacturing facility to meet future demand. Therefore, we find the investment highly unlikely.

Given that MEMC has already spent 63% (or $106 million) of its estimated '05 capex ($168 million in total, 15% of '05E revenues) and its commitment to spend a maximum of 15% of revenues on capex in both '05 and '06, we find the magnitude of this capital investment difficult (if not impossible) given the company's 300-mm wafer expansion plans for '06 and the company's commitment to SOI.

We believe investors should be asking how MEMC plans to meet its capex commitment of 15% of revenues in 2006 if it to:

1. Invest in polysilicon manufacturing (or miss out on the solar ramp),

2. Invest in 300-mm wafer expansion (or lose 300mm wafer market share),

3. Invest in solar wafer manufacturing,

4. Invest in new material technologies (SOI), all at the same time.

We believe either capex spending at MEMC needs to be higher than 15% of revenues (therefore, impacting free cash flow negatively) or the company will miss out on significant revenue opportunities, which our competitors have baked into their estimates for the coming years. Therefore, in our opinion, the consensus estimates need to either come down, or MEMC needs to increase its capex spending, or both.

Polysilicon Feedstock--A History Lesson

As is widely known, due to the recent rise in solar cell manufacturing demand and the continued growth of semiconductor demand, both semi and solar poly-manufacturing capacity must be put in place to meet future poly demand. Increasing demand for polysilicon and the lack of supply over recent years has caused solar polysilicon prices to go from around **$9/kg** in ‘00 to **$25/kg** in ‘03 and to **$60/kg** in ‘05.

Although, what might be lesser known is that an undersupply situation has occurred previously in the polysilicon industry, similar to the one that is happening today. During the 90s, nearly all of the silicon for solar cell production was derived from the rejected material of semi-grade wafer manufacturing. This arrangement worked well until ‘95, when a shortage of polysilicon (driven by semi demand) began to drive up the price of polysilicon and limit the growth of the silicon based solar cell industry. According to our research, in ‘96, the price of semi-grade polysilicon was **$60-$70/kg** (we note not far from today’s pricing) and solar grade was **$25/kg.** Electronic grade poly pricing began to fall in ‘98 to $50/kg.

To meet the anticipated demand, the polysilicon industry built out its manufacturing capability, although the semiconductor industry continued to be cyclical in nature and the overall anticipated amount of silicon ultimately shipped was under initial expectations. What ensued was an over-build of poly capacity that resulted in an extreme oversupply situation. Due to the oversupply situation, prices fell dramatically during the late 90s for both solar and semi-grade polysilicon. With such a large excess capacity in place, polysilicon suppliers were happy to sell electronic-grade silicon for solar cell production at $25/kg, therefore enabling solar cell producers to lower their prices. Simply put, solar cell manufacturers have avoided poly shortages in recent years due to the oversupply of polysilicon to the semi industry.

During the ‘00-‘03 timeframe, polysilicon producers experienced very low returns, leaving no incentive to add additional capacity. We believe only large poly manufacturers with fully depreciated manufacturing facilities remained profitable during this period. Polysilicon manufacturing has recently been a low margin business due to high capital intensity and the low price of polysilicon. Today, we believe that given the capital expenditures required to build a new polysilicon manufacturing plant, poly producers will require a price of at least $40/kg for electronic-grade and $30/kg for solar grade to provide returns that justify the capital expenditures required.

Given the historically volatile pricing of polysilicon and the large capital expenditures required to build new polysilicon facilities, we believe investors should be asking if MEMC can/will make a significant investment into the polysilicon business. If one believes that current poly price trends will stay intact, then yes. But given the historical under/over supply of polysilicon in the past, we question whether or not history will repeat itself and another polysilicon oversupply situation will arise that will drive both spot and LT contract silicon pricing lower, therefore making an investment that appears to be a good one today into a bad one tomorrow. Can MEMC generate long-term solar poly contracts that support their margin model? Is MEMC a poly supplier or a wafer-manufacturing company? Is poly production for resale really a business that MEMC should enter for the long term?

We Believe Higher Poly Prices Have a Big Impact on Solar But Not Semi

The current polysilicon undersupply situation is threatening to put the brakes on the 30% annual growth rate of the solar industry. Although, we continue to believe that the recent price inflation of poly will have little/no impact of the semiconductor manufacturing industry.

Poly makes up, at most, 10% of the cost of a “semi” wafer. Meanwhile, silicon makes up over 40% of a “solar” wafer’s cost. In addition, we believe that the solar industry is very elastic in nature. Therefore, if solar cell manufacturers increase the price of solar modules due to poly price increases, there will be a significant slowdown in the world’s consumption of solar cells. This, in turn, will decrease overall electronic grade poly consumption (that is being used currently for solar), therefore helping to curb the supply/demand imbalance in the semi poly market.

In our opinion, polysilicon will not act as a bottleneck to the semiconductor industry due to the elastic nature of solar industry and the high-volume, long-term contracts that semi wafer manufacturers have negotiated with poly manufacturers (for semi grade poly). We believe there is adequate semi-grade poly production being put in place and solar wafer makers would need to pay more than semi wafer makers for polysilicon in order for a poly bottleneck to be created in the semiconductor industry. Given the relative high silicon content per dollar sold of solar compared to semiconductor, we find a bottleneck situation in the semi industry highly unlikely.

We believe that a majority of MEMC’s top competitors in the industry have polysilicon supply, either through facilities of their own or through long-term contracts with existing suppliers. We would argue that the spot price of polysilicon has very little impact on the price in which MEMC’s primary competitors have to pay for raw polysilicon, now or in the longer term. If MEMC’s smaller competitors (at most, 2-3) do not have long-term contracts for poly, they will merely need to pay the cost to acquire the poly (not a good thing for them long term, but they are not going away anytime soon due to this issue). Is the small wafer supplier business model going to be hurt by this? We believe yes, but that does not necessarily help MEMC on a competitive or valuation basis. Given our forecasted poly capacity bottleneck at MEMC, does the increased price of polysilicon also impact MEMC negatively?

We find it very interesting that a 200-mm wafer (with a $45selling price) corresponds to a selling price of over $820 per kg of poly (a 200-mm wafer contains about 54 g of polysilicon). Compared to $50/kg for electronic grade polysilicon (LT contract), it is easy to see that the wafer-manufacturing process adds considerable value to the starting material of polysilicon.

We believe that small wafer manufacturers (~15%-20% of the industry) can absorb the near-term semi poly price hikes, as only a small percentage of their final product’s value is attributed to the raw polysilicon material.

We are relatively sure that the chip makers will have a hard time accepting higher wafer pricing (given the above-mentioned process inefficiencies), unless 1) it is pushed to them across the board (from all of the wafer suppliers) or 2) if a wafer supplier can provide a differentiated product in comparison to its peers. We believe that it takes only one major wafer supplier to try and take market share through the acceptance of lower margins (by not increasing their prices in the face of higher raw material costs), and the idea of passing along the spike in poly prices falls apart. As a reminder, other large players in the wafer industry are either a division within a larger public company or are privately held (SUMCO is about to go public). We believe the ownership structure of MEMC’s competitors adds complexity to the situation, and it is not a simple economic story of passing along higher material costs to the consumer.

We do not believe that poly price hikes can be passed along to IC manufacturers. We continue to believe that any wafer-pricing trends in the semi wafer industry is more attributable to the commodity nature of the business, silicon wafer factory utilization, volume of shipments, and wafer quality/size.

Is the Polysilicon Shortage Due Only to the Lack of Supply? We Believe There Is More Poly Out There than You Think

As we illustrated above, the manufacturing of wafers (solar or semi) is an extremely inefficient one with regards to the consumption of polysilicon. When the solar industry was able to buy cheap, scrap silicon, there was no real incentive to be more efficient. But with 1) more polysilicon material lost in manufacturing than what is actually in the final product and 2) polysilicon becoming the limiting factor on the solar industry's growth, one can conclude that the motivation is now in place. We find it hard to believe that industries (solar and semi) that pride themselves on superior technology and innovation are unable to reduce the amount of polysilicon that is lost in the overall manufacturing process, especially with the financial motivation in place.

The demand of polysilicon can be reduced significantly through: 1) the thinning of wafers used in solar cells, 2) the conversion/purification of the approx. 30% of silicon lost from wafer-cutting operations (kerf loss) of semiconductor-grade polysilicon into solar-grade polysilicon, 3) the reduction of polysilicon lost during the wafer-cutting process through the use of thinner blades/alternate cutting technologies, and 4) the adoption of alternate solar technologies (thin film and ribbon).

We believe that efficiencies are being put in place by solar manufacturers today. For example, by thinning its solar cells, Sharp has been able to increase the number of wafers produced by a single ingot by 50% since 2001, reducing its polysilicon use per solar cell drastically. In addition, we believe that Sharp and many other manufacturers are accelerating the development of their thin-film technologies. We therefore believe the long-term demand of polysilicon can be reduced significantly through the effective use of available polysilicon materials and the development of new technologies.

Risks

The microelectronics business is highly cyclical, with occasional periods of extreme imbalance between supply and demand.

We expect the overall semiconductor market to continue to improve into 2006. Current risks to this thesis are the following: 1) global GDP weakens unexpectedly; 2) overall semiconductor demand falls below our expectations; and 3) overall capex equipment installations (and thus supply) come in below our current expectations.

Although Texas Pacific Group's (TPG) ownership in MEMC has been reduced from 34% to its current level of about 25%, we believe that this is still an overhang on the stock that has nothing to do with fundamentals. We expect further reduction in TPG's ownership going forward.

Although the industry has consolidated, mitigating the risk of wafer supply overcapacity, we believe that the risk of overcapacity remains as Japan-based competitors, with deep pockets, could flood the market with 300mm capacity aimed at increasing market share, although such increased in supply is not expected to fully materialize until 2H06.

Company Profile

Incorporated in 1984, MEMC Electronic Materials, Inc. is engaged in the design, manufacture, and sale of electronic-grade wafers for the semiconductor industry. The company provides wafers in sizes ranging from 100 millimeters (4 inches) to 300 millimeters (12 inches), including three general categories of wafer: prime polished, epitaxial, and test/monitor. Its principal customers are semiconductor device manufacturers, including major memory, microprocessor, and application-specific integrated circuit (ASIC) manufacturers and foundries. MEMC's wafers are used as a starting material for the manufacture of various types of semiconductor devices, including microprocessor, memory, logic, and power devices. The company operates manufacturing facilities in Europe, Malaysia, Japan, South Korea, the United States, and Taiwan.

(FY DEC) 23 Oct 05	MAR04A	JUN04A	SEP04A	DEC04A	FY04	MAR05A	JUN05A	SEP05E	DEC05E	FY05	MAR06E	JUN06E	SEP06E	DEC06E	FY06
REVENUE	228.8	255.5	275.3	268.4	1,028.0	257.9	275.4	286.4	297.9	1,117.5	283.0	297.1	314.9	318.1	1,213.1
% Change Y/Y	21.5%	33.2%	40.5%	30.9%	31.6%	12.7%	7.8%	4.0%	11.0%	8.7%	9.7%	7.9%	10.0%	6.8%	8.6%
% Change Q/Q	11.6%	11.7%	7.7%	-2.5%		-3.9%	6.8%	4.0%	4.0%		-5.0%	5.0%	6.0%	1.0%	
TOTAL COGS	155.4	168.4	164.5	170.2	658.5	164.6	175.0	181.1	186.5	707.1	182.8	188.3	192.0	192.8	755.9
GROSS PROFIT	73.3	87.2	110.7	98.2	369.4	93.3	100.4	105.3	111.3	410.4	100.2	108.8	122.9	125.3	457.2
% Total Revenue	32.1%	34.1%	40.2%	36.6%	35.9%	36.2%	36.5%	36.8%	37.4%	36.7%	35.4%	36.6%	39.0%	39.4%	37.7%
R&D	8.9	9.3	9.4	10.4	38.0	11.4	11.0	11.0	10.5	43.9	10.0	10.5	11.0	11.1	42.7
% Total Revenue	3.9%	3.6%	3.4%	3.9%	3.7%	4.4%	4.0%	3.8%	3.5%	3.9%	3.5%	3.5%	3.5%	3.5%	3.5%
SG&A	17.2	17.8	17.8	19.2	71.9	18.2	18.3	18.5	20.3	75.3	19.8	21.4	22.7	22.9	86.8
% Total Revenue	7.5%	7.0%	6.5%	7.1%	7.0%	7.0%	6.7%	6.5%	6.8%	6.7%	7.0%	7.2%	7.2%	7.2%	7.2%
OPERATING PROFIT	47.2	60.0	83.6	68.6	259.5	63.7	71.1	75.8	80.6	291.2	70.4	77.0	89.2	91.3	327.8
% Total Revenue	20.7%	23.5%	30.4%	25.6%	25.2%	24.7%	25.8%	26.5%	27.1%	26.1%	24.9%	25.9%	28.3%	28.7%	27.0%
% Change Y/Y	44.4%	78.2%	128.9%	72.9%	81.9%	34.9%	18.4%	-9.3%	17.4%	12.2%	10.4%	8.3%	17.7%	13.2%	12.6%
% Change Q/Q	19.0%	27.1%	39.2%	-17.9%		-7.2%	11.5%	6.7%	6.3%		-12.7%	9.3%	15.9%	2.3%	
OTHER	6.5	(9.1)	(0.4)	2.4	(0.6)	(1.3)	(1.5)	(1.0)	(1.0)	(4.8)	(1.0)	(0.8)	(0.5)	(0.5)	(2.8)
PRETAX PROFIT	53.7	51.0	83.2	71.1	258.9	62.4	69.6	74.8	79.6	286.4	69.4	76.2	88.7	90.8	325.1
% Total Revenue	23.5%	19.9%	30.2%	26.5%	25.2%	24.2%	25.3%	26.1%	26.7%	25.6%	24.5%	25.6%	28.2%	28.5%	26.8%
% Change Y/Y	83.2%	47.5%	70.9%	64.0%	66.1%	16.2%	36.5%	-10.0%	12.0%	10.6%	11.1%	9.5%	18.6%	14.0%	13.5%
% Change Q/Q	24.0%	-5.1%	63.1%	-14.6%		-12.1%	11.4%	7.5%	6.4%		-12.8%	9.8%	16.4%	2.3%	
TAXES	13.4	12.7	20.8	10.6	57.6	9.4	8.7	10.2	10.8	39.0	10.4	11.4	13.3	13.6	48.8
Tax Rate	25.0%	25.0%	25.0%	15.0%	22.2%	15.0%	12.4%	13.6%	13.6%	13.6%	15.0%	15.0%	15.0%	15.0%	15.0%
OTHER AFTER TAX	1.7	(17.5)	-	(11.0)	(26.8)	(25.0)	-	-	-	(25.0)	-	-	-	-	-
MINORITY INTERESTS	2.7	3.0	2.7	2.4	10.7	1.8	2.0	2.0	2.0	7.8	2.0	2.0	2.0	2.0	8.0
NET INCOME - CONT OPS	35.9	43.1	59.7	59.0	197.7	51.3	58.9	62.6	66.8	239.6	57.0	62.8	73.4	75.1	268.3
% Total Revenue	15.7%	16.9%	21.7%	22.0%	19.2%	19.9%	21.4%	21.9%	22.4%	21.4%	20.1%	21.1%	23.3%	23.6%	22.1%
% Change Y/Y	81.9%	57.9%	69.7%	71.4%	69.5%	42.9%	36.8%	4.9%	13.2%	21.2%	11.0%	6.6%	17.2%	12.5%	12.0%
% Change Q/Q	4.4%	20.0%	38.6%	-1.2%		-13.0%	14.8%	6.3%	6.6%		-14.7%	10.2%	16.9%	2.4%	
NET INCOME - TOTAL	35.9	60.6	59.7	70.0	226.2	76.3	58.9	62.6	66.8	264.6	57.0	62.8	73.4	75.1	268.3
% Total Revenue	15.7%	23.7%	21.7%	26.1%	22.0%	29.6%	21.4%	21.9%	22.4%	23.7%	20.1%	21.1%	23.3%	23.6%	22.1%
% Change Y/Y	81.9%	122.2%	69.7%	103.4%	94.0%	112.5%	-2.8%	4.9%	-4.6%	17.0%	-25.3%	6.6%	17.2%	12.5%	1.4%
% Change Q/Q	4.4%	68.8%	-1.5%	17.2%		9.1%	-22.8%	6.3%	6.6%		-14.7%	10.2%	16.9%	2.4%	
SHARES	222.1	221.0	220.4	222.1	221.4	223.9	224.7	225.1	225.5	224.8	225.9	226.3	226.7	227.1	226.5
EPS - CONT OPS	$ 0.16	$ 0.19	$ 0.27	$ 0.27	$ 0.89	$ 0.23	$ 0.26	$ 0.28	$ 0.30	$ 1.07	$ 0.25	$ 0.28	$ 0.32	$ 0.33	$ 1.18
% Change Y/Y	72.5%	55.6%	72.3%	72.1%	67.5%	41.8%	34.5%	2.7%	11.5%	19.4%	10.1%	5.8%	16.3%	11.8%	11.1%
% Change Q/Q	4.8%	20.6%	39.0%	-2.0%		-13.7%	14.4%	6.2%	6.4%		-14.8%	10.0%	16.7%	2.2%	
EPS - TOTAL	$ 0.16	$ 0.27	$ 0.27	$ 0.32	$ 1.02	$ 0.34	$ 0.26	$ 0.28	$ 0.30	$ 1.18	$ 0.25	$ 0.28	$ 0.32	$ 0.33	$ 1.18
% Change Y/Y	72.5%	118.9%	72.3%	104.2%	91.7%	110.8%	-4.4%	2.7%	-6.0%	15.2%	-26.0%	5.8%	16.3%	11.8%	0.6%
% Change Q/Q	4.8%	69.6%	-1.2%	16.3%		8.2%	-23.1%	6.2%	6.4%		-14.8%	10.0%	16.7%	2.2%	

WFR Cash Flow Model

($ Millions)	1Q04A	2Q04A	3Q04A	4Q04A	1Q05A	2Q05A	3Q05E	4Q05E	1Q06E	2Q06E	3Q06E	4Q06E
Net Income from Operations	35.91	60.60	59.72	69.97	76.31	58.91	62.65	66.77	56.97	62.78	73.41	75.14
Depreciation & Amortization	9.92	10.24	11.44	12.53	13.34	14.30	15.00	16.00	16.00	16.00	15.75	15.90
(Incr) Decr in Accounts Receivable	(16.23)	(19.61)	(13.01)	11.15	10.19	(1.57)	(9.13)	(5.65)	7.34	(6.98)	(8.79)	(1.55)
(Incr) Decr in Inventories	(13.56)	10.49	(7.22)	(7.79)	(7.70)	0.41	(9.53)	(5.78)	7.51	(7.13)	(12.44)	(5.11)
(Incr) Decr in Other Current Assets	(9.40)	10.10	1.32	(9.61)	1.50	0.96	0.00	0.00	0.00	0.00	0.00	0.00
Incr (Decr) in Current Liab. (Excl. debt)	40.86	10.51	(6.26)	30.96	(20.31)	(27.10)	0.00	0.00	0.00	0.00	0.00	0.00
=Cash from Operations	47.50	82.33	46.00	107.22	73.34	45.91	58.99	71.34	87.82	64.67	67.92	84.39
(Incr) Decr in Other Non-Current Assets	(54.32)	(2.39)	0.01	0.01	(0.03)	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Capital Spending (Net of sales)	(29.00)	(44.00)	(25.50)	(51.73)	(54.40)	(51.20)	(34.03)	(28.00)	(45.27)	(45.00)	(46.00)	(46.00)
=Cash from Investing	(83.32)	(46.39)	(25.49)	(51.72)	(54.43)	(51.18)	(34.03)	(28.00)	(45.27)	(45.00)	(46.00)	(46.00)
Incr (Decr) in Non-curr Liab. (Excl. debt)	(23.55)	(7.57)	(1.17)	(7.57)	5.05	9.56	0.00	0.00	0.00	0.00	0.00	0.00
Additional Debt	83.42	(31.94)	(40.19)	(78.90)	(4.08)	(6.46)	0.00	0.00	0.00	0.00	0.00	0.00
Common Stock/Other Equity	(0.18)	5.78	0.60	18.06	1.31	(15.03)	(0.00)	0.00	0.00	0.00	0.00	0.00
=Cash from Financing	59.68	(33.73)	(40.75)	(68.41)	2.28	(11.93)	(0.00)	0.00	0.00	0.00	0.00	0.00
=Increase/(Decrease) in Cash	23.87	2.20	(20.25)	(12.91)	21.19	(17.20)	24.96	43.34	42.55	19.67	21.92	38.39
+Beginning Cash	130.70	140.62	129.49	103.31	92.31	116.32	101.00	125.96	169.30	211.85	231.52	253.44
+Adjustment	(13.94)	(13.33)	(5.93)	1.91	2.81	1.88	0.00	0.00	0.00	0.00	0.00	0.00
=End Cash	140.62	129.49	103.31	92.31	116.32	101.00	125.96	169.30	211.85	231.52	253.44	291.83
FREE CASH FLOW												
Quarterly	18.50	38.33	20.50	55.49	18.94	(5.29)	24.96	43.34	42.55	19.67	21.92	38.39
% Y/Y	96%	452%	919%	133%	2%	-114%	22%	-22%	125%	-472%	-12%	-11%
% Q/Q	-22%	107%	-47%	171%	-66%	-128%	-572%	74%	-2%	-54%	11%	75%
FY-End				$ 133				$ 82				$ 123
% Y/Y				214.8%				-38.3%				49.5%
FCF Margin	8%	15%	7%	21%	7%	-2%	9%	15%	15%	7%	7%	12%
YE-FCF Margin				13%				7%				10%
ASSETS												
Cash & equivalents	140.62	129.49	103.31	92.31	116.32	101.00	125.96	169.30	211.85	231.52	253.44	291.83
Acounts receivable, net	119.25	138.86	151.87	140.73	130.53	132.11	141.24	146.89	139.55	146.52	155.31	156.87
Inventories, net	123.05	112.56	119.78	127.56	135.27	134.85	144.38	150.15	142.65	149.78	162.22	167.32
Other current assets	31.54	16.44	20.12	29.72	28.22	27.26	27.26	27.26	27.26	27.26	27.26	27.26
Total Current Assets	414.45	397.36	395.08	390.33	410.34	395.21	438.83	493.60	521.30	555.08	598.23	643.28
PPE	361.55	392.71	387.28	444.67	476.34	503.86	522.89	534.89	564.16	593.16	623.41	653.51
Other non-current assets	76.06	106.74	98.94	147.54	181.29	180.47	180.47	180.47	180.47	180.47	180.47	180.47
Total Assets	852.06	896.81	881.29	982.54	1,067.97	1,079.55	1,142.19	1,208.96	1,265.93	1,328.71	1,402.11	1,477.26
LIABILITIES & SHAREHOLDERS' EQUITY												
Short term debt	86.90	57.45	21.87	24.40	23.06	21.71	21.71	21.71	21.71	21.71	21.71	21.71
Other current liabilities	166.88	179.12	167.63	191.23	200.71	177.20	177.20	177.20	177.20	177.20	177.20	177.20
Total Current Liabilities	253.78	236.57	189.50	215.62	223.76	198.91	198.91	198.91	198.91	198.91	198.91	198.91
Long term debt	127.61	125.12	120.51	116.08	113.35	108.23	108.23	108.23	108.23	108.23	108.23	108.23
Other non-current liabilities	241.33	239.40	217.22	208.76	211.15	208.81	208.81	208.81	208.81	208.81	208.81	208.81
Total Liabilities	622.72	601.08	527.24	540.46	548.26	515.96	515.96	515.96	515.96	515.96	515.96	515.96
Total Shareholders' Equity	229.34	295.73	354.05	442.08	519.71	563.59	626.24	693.01	749.98	812.75	886.16	961.30
Total Liabilities & Shareholders' Equity	852.06	896.81	881.29	982.54	1,067.97	1,079.55	1,142.19	1,208.96	1,265.93	1,328.71	1,402.11	1,477.26
LIQUIDITY RATIOS												
Current Ratio	1.63	1.68	2.08	1.81	1.83	1.99	2.21	2.48	2.62	2.79	3.01	3.23
Quick Ratio	1.02	1.13	1.35	1.08	1.10	1.17	1.34	1.59	1.77	1.90	2.05	2.26
Net Working Capital	$ 161	$ 161	$ 206	$ 175	$ 187	$ 196	$ 240	$ 295	$ 322	$ 356	$ 399	$ 444
Long-term Debt/Equity	0.56	0.42	0.34	0.26	0.22	0.19	0.17	0.16	0.14	0.13	0.12	0.11
Total Debt/Equity	94%	62%	40%	32%	26%	23%	21%	19%	17%	16%	15%	14%
Operating Income/Assets Ex Cash	5%	6%	8%	7%	5%	6%	6%	6%	5%	6%	6%	6%
Operating Income/Assets Ex Cash (12 mo	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
BOOK & CASH VALUE												
Book Value Per Share	$1.03	$1.34	$1.61	$1.99	$2.32	$2.51	$2.78	$3.07	$3.32	$3.59	$3.91	$4.23
Tangible Book Value/Share	$1.03	$1.34	$1.61	$1.99	$2.32	$2.51	$2.78	$3.07	$3.32	$3.59	$3.91	$4.23
Cash Per Share	$0.63	$0.59	$0.47	$0.42	$0.52	$0.45	$0.56	$0.75	$0.94	$1.02	$1.12	$1.29
Net Cash Per Share	($0.33)	($0.24)	($0.18)	($0.22)	($0.09)	($0.13)	($0.02)	$0.17	$0.36	$0.45	$0.54	$0.71

IMPORTANT INFORMATION CONCERNING FRIEDMAN, BILLINGS, RAMSEY & CO., INC.

Company Specific Disclosures

Specific disclosures are applicable to tickers indicated.

MEMC ELECTRONIC MATERIALS, INC. (WFR) http://www.fbrcorp.com/d.asp?GVKEY=060992&IID=01

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Buy (Outperform)	49.2 %	19.1 %
Hold (Market Perform)	44.7 %	7.2 %
Sell (Underperform)	6.0 %	2.3 %

(1) As of midnight on the business day immediately prior to the date of this publication.
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