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Piper Jaffray & Co.

Reason for Report:

Initiating Coverage

Changes	Previous	Current
Rating	--	Outperform
Price Tgt	--	\$40.00
FY06E Rev (mil)	--	\$1,388.0
FY07E Rev (mil)	--	\$1,660.9
FY06E EPS	--	\$1.58
FY07E EPS	--	\$2.00

Price:	\$32.85
52 Week High:	\$33.48
52 Week Low:	\$10.85
Price Target:	\$40.00

20x 2007E EPS of \$2.00

Shares Out (mil):	228.3
Market Cap. (mil):	\$7,499.7
Avg Daily Vol (000):	2,783
Book Value/Share:	\$3.40
Cash Per Share:	\$0.67
Debt to Total Capital:	5%
Est LT EPS Growth:	20%
P/E to LT EPS Growth (FY06):	1.0x
Est Next Rep Date:	04/26/2006
Fiscal Year End:	Dec

Rev (mil)	2005A	2006E	2007E
Mar	\$252.6A	\$317.0E	\$376.4E
Jun	\$274.0A	\$328.0E	\$398.9E
Sep	\$280.8A	\$355.0E	\$428.9E
Dec	<u>\$317.3A</u>	<u>\$388.0E</u>	<u>\$456.7E</u>
FY	\$1,124.7A	\$1,388.0E	\$1,660.9E
CY	\$1,124.7A	\$1,388.0E	\$1,660.9E

FY RM	6.7x	5.4x	4.5x
CY RM	6.7x	5.4x	4.5x

EPS	2005A	2006E	2007E
Mar	\$0.20A	\$0.35E	\$0.43E
Jun	\$0.24A	\$0.36E	\$0.47E
Sep	\$0.22A	\$0.41E	\$0.52E
Dec	<u>\$0.34A</u>	<u>\$0.46E</u>	<u>\$0.57E</u>
FY	\$0.99A	\$1.58E	\$2.00E
CY	\$0.99A	\$1.58E	\$2.00E

FY P/E	33.2x	20.8x	16.4x
CY P/E	33.2x	20.8x	16.4x

EPS exclude share-based compensation and reflect 15% cash tax rate

**MEMC Electronic
Outperform****(WFR - \$32.85)
Volatility: Medium****An Unrecognized Catalyst & New Link In Solar
Chain; Initiate At OP w/ \$40 PT****KEY POINTS:**

We expand our coverage of the solar supply chain to WFR, which has a substantial solar opportunity.

- **WFR disclosed more of its solar strategy at the Piper Jaffray Opportunities in Solar & Clean-Tech Symposium on February 21, 2006.** We contend that while the market grasps WFR's improving semiconductor wafer business, the investment community has overlooked WFR's potential longer-term growth opportunity as a leading solar supplier and the associated valuation upside.
- **What is the benefit of solar?** WFR's cyclical semiconductor wafer supply business enjoys a modest 8%-9% CAGR (in line with chip unit growth) and is valued at ~15x earnings. However, we argue that by leveraging the higher growth solar market, WFR can maintain 20% growth for several years, achieve insularity from semiconductors' cyclicalities, and achieve a valuation of 20x-plus EPS, in line with the growth we project. In our opinion, WFR has valuation upside from solar, but not the downside of solar stocks' volatility and/or correlation to oil and energy prices.
- **Strong core semiconductor business:** WFR's share price has increased sharply as the market anticipates rising semiconductor wafer ASPs in 2006 (after years of commodity price erosion), the result of higher chip unit growth and tight industry capacity near term for both polysilicon feedstock and wafer production; WFR has competitive advantages being a vertically integrated polysilicon *and* wafer supplier. WFR also has a longer-term growth opportunity via higher ASPs and widening margins as its mix shifts toward the higher-margin 300mm wafers.

INVESTMENT RECOMMENDATION:

We anticipate WFR can grow its revenue and earnings in excess of IC unit growth as WFR expands its poly and solar wafer capacity. We value WFR at 20x 2007E EPS of \$2.00, in line with our LT EPS growth est. of 20%. We thus initiate WFR with an Outperform rating and a 12-month price target of \$40.

RISKS TO ACHIEVEMENT OF TARGET PRICE:

Risks include, but are not limited to: High degree of cyclicalities in the semiconductor industry; pricing pressures and resultant degradation of gross margins; rapid technology changes and shortened product cycles; decline or reversal of wafer start growth; and reduction of government subsidies for solar.

COMPANY DESCRIPTION:

MEMC Electronic Materials, Inc. (WFR) is a global supplier of advanced semiconductor wafers. Vertically integrated, MEMC manufactures the ultra-pure polysilicon-the essential raw material required for both semiconductor (IC) and solar wafers.

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Company Description

MEMC Electronic Materials, Inc. (WFR) is a global supplier of semiconductor wafers. Vertically integrated, MEMC manufactures the ultra-pure polysilicon—the essential raw material required for both semiconductor (IC) and solar wafers.

- **Competition:** Major IC wafer competitors include SEH (Shin-Etsu Handotai) with a 30% share and growing; SUMCO (Sumitomo Mitsubishi Silicon); Siltronic (Wacker) and Komatsu. Its polysilicon business competes with Hemlock, Wacker, Tokuyama, REC, and Mitsubishi.
- **Customers:** WFR sells to virtually all 25 top IC companies including Samsung (10% of sales), Texas Instruments, and ST Micro. Of its total sales, its top 10 customers make up about 70% and sales outside the U.S. 72%.
- **Large Shareholder:** TPG currently owns about 24.2% of shares outstanding. Although we do not know TPG's strategy regarding solar and its ownership in WFR, we view TPG as a potential strategic partner that could potentially facilitate and accelerate a solar strategy to unlock additional shareholder value.

Investment Risk

General risk factors include but are not limited to:

- High degree of cyclicity in the semiconductor industry;
- Pricing pressures and resultant degradation of gross margins;
- Rapid technology changes and shortened product cycles;
- A decline or reversal of wafer start growth;
- The reduction of government subsidies for solar, especially in Germany;
- A decline in oil and energy prices that could stall solar installations;
- Impact of geopolitical events on foreign operations and sales to overseas markets;
- Uncertainty of future industry growth rates;
- General economic risk.

Company-specific risks include, but are not limited to:

- Highly competitive markets, and market share shifts;
- The loss or decline of major customer(s);
- Material shortages or raw material price increases;
- Problems with manufacturing capacity ramp, efficiency and yield;
- Operational execution missteps, particularly expanding manufacturing capacity and realizing technology potential;
- Inability to protect and maintain proprietary technology and patent litigation/challenges.

Investment Thesis

We expand our solar supply chain coverage to hone in on the WFR opportunity. The investment community has a firm grasp of WFR's improving semiconductor wafer business. However, we argue that the Street has largely overlooked the company's potential longer-term growth opportunity and valuation upside in its solar business. WFR's solar strategy has not yet been fully communicated; we expect WFR to shift and expand its capacity toward the higher growth solar opportunity based on: 1) our industry research and polysilicon shortage data points and 2) superior valuation metrics supported by the higher-growth solar market.

- **Solar—the unrecognized catalyst:** WFR sells ~\$100M of polysilicon and ingot to the solar industry annually (current annual run rate). We contend that the market has largely overlooked WFR's hidden value—its enormous potential as a leading solar wafer manufacturer unrestricted by the polysilicon shortage plaguing the entire solar industry. This forward integration would not only meaningfully bolster WFR's growth and valuation near-term, but also likely alter the entire solar supply chain as other polysilicon suppliers enter the solar wafer and cell market—a shift that could well restrict available polysilicon to existing solar players.
- **Solar would provide sustainable 20% growth:** As a cyclical semiconductor wafer supplier, WFR achieves modest 8%-9% CAGR (in line with chip unit growth) and is valued at ~15x earnings. By leveraging the higher-growth solar market, we believe WFR can sustain 20% growth for several years, partially insulate itself from semiconductor cyclicity, and achieve a valuation of 20x-plus earnings, also in line with growth. In our opinion, WFR has solar valuation upside, but not the downside of solar stock volatility and correlation to the price of oil or energy. We posit that WFR could ramp 100MW of solar wafer capacity in 2006 (~\$150 million revenue in C06) and 150MW (~\$310M in C07) in 2007. An additional 4000 tons of poly would be available in mid-2008 and take solar wafer capacity to ~500MW (solar revenue circa \$1 billion by 2010). Under this scenario, MEMC could maintain 20% top-line growth (and offset semiconductor cyclicity) for the next four-plus years, vaulting it into the ranks of the world's top five solar wafer producers.

Exhibit 1: WFR Semiconductor Vs. Solar Sales (In \$M's)

	2004A	Y/Y	2005A	Y/Y	2006E	Y/Y	2007E	Y/Y	2008E	Y/Y
Semiconductor Wafers	1,028	32%	1,070	4%	1,233	15%	1,351	10%	1,432	6%
Solar Polysilicon/Wafers	0		55	na	155	182%	310	100%	560	81%
TOTAL WFR REVENUE EST.	1,028	32%	1,125	9%	1,388	23%	1,661	20%	1,992	20%

Source: Piper Jaffray Estimates and Company Documents

Solar Discussion

Value shifting to poly/wafer suppliers: The polysilicon shortage and resulting cost spike have shifted value creation from solar cell manufacturers toward solar wafer/polysilicon suppliers. In a typical solar module priced at \$3.50/watt, the polysilicon wafer represents 60% of the cost and mark-up opportunity in the solar supply chain. With polysilicon in short supply, only cell manufacturers with dedicated supply contracts can grow; given rising prices, only those with fixed-price contracts can maintain margins. As an integrated solar wafer (potentially cell) manufacturer (polysilicon > ingot > solar wafer > and potentially solar cell), WFR's output and sales could grow far in excess of the industry's while posting leading margins.

How is WFR leveraged to solar? Today, WFR sells a modest ~\$100 million or so of polysilicon (annual run rate), mostly feedstock and some ingots (largely scrap) to a handful of solar-cell manufacturers including Evergreen Solar (ESLR) and Shell Solar. WFR is consolidating its solar customer base, and is now selling to perhaps six (down from ~10) solar cell companies, focusing its sales to larger strategic relationships. This \$100 million is dwarfed by its \$1 billion in semiconductor wafer sales. However, we posit that WFR's solar sales could approach \$300 million near term as it: 1) allocates more polysilicon capacity to the solar industry, and 2) realizes greater value-add as a solar ingot, wafer and potentially cell manufacturer (not a mere bulk feedstock material supplier). This would allow WFR to exploit substantially higher margins and likely induce higher valuation in the financial markets. MEMC management confirms that each \$1.00 in polysilicon sales equals \$1.50-\$2.00 as an ingot, and \$2.50 as a solar wafer. We believe the wafer total available market of ~\$10 billion in 2005 will likely reach \$15-\$20 billion in 2007 driven primarily by the growth of solar. We contend that WFR's planned 4,000 ton polysilicon capacity expansion could yield solar wafer/cell sales in excess of \$1 billion by 2010, matching or exceeding its current semiconductor sales.

What are MEMC's solar technology strengths? Expertise in ultra pure polysilicon manufacturing and complex semiconductor wafering suggest that WFR also may contribute significant solar technology improvements in electron movement, wafer sawing, etch, cell efficiency, and manufacturing yields. Also, WFR's know how and patents on the use of fluidized-bed granular polysilicon could lend it a competitive advantage.

How can MEMC allocate more poly capacity to solar? WFR is gaining polysilicon capacity near term by eliminating production bottlenecks, but will double its capacity to 8,000 tons over the next three years. We estimate that WFR has 1,000-1,300 tons of polysilicon it can allocate to solar (100MW-150MW). WFR produces an excess 700-800 tons of polysilicon (of 4,000 tons of production) along with scrap that it can reallocate to solar. In addition, MEMC could accumulate/stockpile 500-plus tons from existing contracts with other polysilicon suppliers. WFR makes more polysilicon than it consumes, but has always purchased poly from other suppliers under long-term, fixed-price contract to circumvent any polysilicon plant production problems/emergencies. While the company likely profits in bulk polysilicon sales from these below market long term contracts, this amount will be dwarfed as WFR provides value added solar wafers.

What about polysilicon capacity expansion longer term? MEMC will double its polysilicon capacity to 8,000 tons, but new plants require circa three years lead time. In our opinion, solar demand mitigates any overcapacity risk. We estimate that 4,000 additional tons of polysilicon would equal 400MW of solar wafer/cell production (circa \$800 million of revenue) that MEMC essentially could lock-up under long-term contracts and that MEMC could ramp another 4,000 tons of poly capacity as soon as mid-2008.

What else must WFR do to manufacture solar wafers? While WFR can ramp high-efficiency mono-crystalline solar wafers, it needs more process equipment for multi-crystalline solar wafers. WFR most likely would use some of its trailing-edge, fully depreciated 150mm equipment to produce the mono solar wafers, but would still need to buy more wafering (saw and etch) equipment. We estimate the needed cap-ex at \$1 per watt, or ~\$100 million of cap-ex for about ~\$300 million of annual solar revenue (100MW of solar production at \$3/watt); this could take the form of a joint venture of some kind. Under this scenario, WFR would provide the JV partner with abundant solar wafers (otherwise in short supply) in exchange for cell-processing and solar module manufacturing capability, and sales distribution. At the Piper Jaffray Solar Symposium in New York City on February 21, CEO Nabeel Gareeb stated that WFR's cap-ex target of 15% of sales is ample for a solar initiative near-term. We speculate that while circa 50% of 2006 cap-ex of \$200M will be used for 300mm semiconductor wafers, the polysilicon expansion and solar would represent the bulk of cap-ex from 2007-2009.

Valuation Discussion

How does WFR's pending solar ramp affect valuation? Commodity IC wafer growth moves in lockstep with semiconductor units overall, about a 8%-9% CAGR (plus or minus share shifts and pricing shifts). Solar wafers plug WFR into a 30%-35%-plus growth market where we anticipate demand in excess of supply for two years. The two markets combined would enable 20% annual growth for WFR for the next three or four years.

Twelve-month valuation \$40: A 20x multiple (in line with our long-term EPS growth estimate of 20%) of our 2007 EPS estimate of \$2.00 values WFR at \$40. Longer term we believe further upside is possible using a sum of the parts analysis. Current Solar industry

multiples are ~6.4x 2007 sales. We believe WFR's solar business can surpass sales of \$1B by 2010.

Exhibit 2: Solar Industry Valuation Multiples

Company	Symb	Price US\$	Calendar P/E					Calendar Rev			MC / Rev			EV / Revenue		
			Mkt Cap	EV	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
Solar Energy Tech Ind																
US																
Energy Conversion	ENER	\$45.24	1,330	1,262	NM	NM	59.5	86	154	209	15.4	8.6	6.4	14.6	8.2	6.0
Evergreen Solar	ESLR	\$14.50	887	851	NM	NM	NM	43	97	225	20.5	9.2	3.9	19.7	8.8	3.8
SunPower	SPWR	\$37.53	2,346	2,196	NM	NM	64.7	79	222	298	29.8	10.6	7.9	27.9	9.9	7.4
Suntech Power	STP	\$36.78	5,425	5,130	NM	54.1	NA	226	430	720	24.0	12.6	7.5	22.7	11.9	7.1
DayStar	DSTI	\$13.15	80	65	NA	NA	NA	-	-	-	NA	NA	NA	NA	NA	NA
MEMC (Solar Only)	WFR	NA*	NA	NA	NA	NA	NA	55	155	310	NA	NA	NA	NA	NA	NA
Peer Group Mean					NA	54.1	62.1				22.4	10.2	6.4	21.2	9.7	6.1

* Solar only public valuation not available

Source: Piper Jaffray Estimates, Baseline, Thomson, Bloomberg

IC Consumables Peers: Valuation Multiples

Shares of WFR currently trade at 16x our C07 EPS estimate of \$2.00; peer IC consumable material suppliers trade at 18.6x C07 EPS. Peers include foreign public pure-play IC wafer suppliers (SUMCO), and U.S-listed IC consumable material suppliers (ATMI, ENTG, CCMP.) MEMC currently trade at a discount to IC consumables peers as many investors still think MEMC as a commodities IC wafer supplier who cannot grow in excess of IC unit growth of ~8% per annum. However, we believe driven by solar industry growth, MEMC can growth in excess of its IC consumables peers at 20% LT EPS growth over the next several years.

Exhibit 3: IC Consumables Valuation Multiples

Company	Symb	Price	52 Week			Mkt Cap	Calendar EPS			Calendar P/E		
		\$USD	Hi	Low	2005		2006	2007	2005	2006	2007	
		2/22/2006										
Wafer Consumables												
ATMI Inc.	ATMI	\$30.00	34.42	21.95	1,112	0.85	1.15	1.42	35.3	26.1	21.1	
Cabot Microelectronics	CCMP	\$34.41	38.27	25.50	838	1.44	1.59	1.95	23.9	21.6	17.6	
Entegris Inc	ENTG	\$10.52	12.00	8.22	1,423	0.30	0.43	0.65	35.1	24.5	16.2	
SUMCO (Japan)	3436 JP	\$46.39	58.70	31.37	5,552	1.49	2.06	2.39	31.1	22.5	19.4	
MEMC Electronics	WFR	\$32.85	33.00	10.85	7,381	0.99	1.58	2.00	33.2	20.8	16.4	
Group Mean									31.7	23.1	18.2	
Mean ex-WFR									31.3	23.7	18.6	

Source: Piper Jaffray Estimates, Baseline, Thomson, Bloomberg

Semiconductor Business Overview

Core Semiconductor Business Strong: Shares of WFR have increased sharply on anticipated higher semiconductor wafer ASPs in 2006 (versus years of commodity price erosion). Rising ASPs are the result of higher chip unit growth and tight industry capacity near-term for both polysilicon feedstock and wafer production; WFR has competitive advantages as a vertically integrated polysilicon and wafer supplier. WFR also has a longer-term opportunity to expand ASPs and margin as its mix shifts toward higher-margin 300mm wafers.

WFR has 300mm capacity starting up in Taiwan: WFR is ramping its 300mm facility in Taiwan to service the Asian foundries (TSMC), planning 150,000 wafers per month (wpm). Its facility in Japan is at 200,000 wpm capacity for 300mm. Both SEH and SUMCO (recent IPO in Japan) are rapidly expanding 300mm capacity under massive cap-ex plans. MEMC is the only wafer supplier with 300mm in Taiwan, a potential competitive advantage given proximity to Taiwanese foundries.

The 300mm generation multiplies revenue and margin: WFR's ASP for 200mm is \$1.00/square inch (~\$50 per wafer); 300mm wafers are priced at an exponential \$2.25/sq. in. (~\$250 per wafer). The ASP goes up 2.2x, but not costs. Thus, a growing mix of 300mm will profoundly affect WFR's revenue, gross margin, and profitability. We estimate that from 15%-18% of total wafer sales, 300mm will rise to 25% over the next two years. Certain WFR 300mm customers are running an abundance of lower-margin test and

monitor wafers; as they validate the 300mm processes, the mix of these prime wafers will increase. On average, the prime wafer mix is circa 70%.

Higher ASPs for semiconductor wafers: As a vertically integrated polysilicon and wafer supplier, MEMC has a competitive advantage. Industry manufacturing capacity utilization is high; WFR is at 92%. We perceive the greatest capacity constraints at 200mm and 300mm wafers, and thus these nodes will see the greatest price increases overall. MEMC has stated that 40% of its contracts renew January 1, 2006. Although solar wafer ASPs are 1/4x that of semiconductor wafers, solar throughput is substantially higher. Additionally, solar wafer would not require OPEX, where the semiconductor wafer requires substantial sales, marketing, and R&D expense. We posit that solar and five-inch semiconductor wafers may offer the same operating margins.

Financial Discussion

Semi and solar industry fundamentals bode well for MEMC financially: Robust IC unit demand in 2H05 were driven by consumer (MP3 & gaming), communications (wireless handsets), and PCs (notebook). For the IC wafer industry, higher demand resulted in higher capacity utilization and firming wafer ASP.

Furthermore, the rapid growth of the solar industry resulted in substantially higher polysilicon and ingot prices (up >50% Y/Y) that allowed MEMC to capture high gross margin sales for its excess poly/ingot capacity. We see the solar industry to drive near-term and long-term revenue & EPS growth beyond IC unit growth, and provide a counter-cyclical cushion to MEMC's business (thus reducing cyclicity/volatility), as MEMC will be able to shift its production to solar during semiconductor downturns.

We foresee near- and long-term solar industry growth beyond IC unit gains as a counter-cyclical cushion for MEMC (less cyclicity/volatility), allowing it to shift production to solar during semiconductor downturns.

- **First-quarter 2006 outlook:** For Q106, MEMC guided revenue of \$315-\$320 million, up 3%-5% from proforma Q405's \$305 million (excludes \$12.5 million of deferred solar revenue). We model a 200-basis-point gross margin expansion to about 40% on firming IC wafer ASPs and growing solar revenue (at a 40% gross margin). We estimate revenue of \$317 million and EPS of \$0.35 (reflecting 15% cash tax rate).
- **Full-year 2006 outlook:** Management guided full year revenue of \$1.3-\$1.5 billion with EPS of \$1.40-\$1.70. We estimate revenue of \$1.4 billion, up 23% year over year on higher IC wafer shipments and an increasing percentage of solar revenue. Note that we estimate only 8% IC revenue growth for 2006. We estimate 40.5% gross margin for the year, and EPS of \$1.58 on net income of \$370 million.
- **Our 2007 outlook:** We estimate revenue of \$1.7 billion (up 20% year over year), a 41% gross margin, and Street-high EPS of \$2.00 vs. consensus EPS of \$1.83.

Strong cash flow generation, healthy balance sheet, and rationalized cap-ex: In 2005, MEMC generated EBITDA of \$340 million and operating cash flow of \$300 million on sales of \$1.1B. After \$159 million of cap-ex (mainly to expand 300mm wafer capacity), MEMC generated some \$140 million in free cash flow, of which it used about \$90 million to reduce debt. Year-end 2005 cash balance stood at \$154 million, up \$62 million year over year. Total debt had been reduced to only \$40 million (from \$140 million for 2004), for a net cash balance of \$110 million. We note that the \$40 million debt is a low-interest foreign note that carries an interest rate of ~3%. Management guides rationalized cap-ex at 15% of sales; we estimate \$195 million of cap-ex in 2006, primarily to increase production of both 300mm wafers (etch, metrology and wafering equipment) and polysilicon. We estimate operating cash flow of ~\$380 million in 2006 on higher sales and earnings, and free cash flow of ~\$180 million (~13% of sales.)

Polysilicon Primer

2005 witnessed higher polysilicon costs: The rapid increase in solar cell production in 2004 (thanks to expanding subsidies worldwide), and rising IC unit volumes triggered a polysilicon shortage forcing solar manufacturers to pay higher prices to secure silicon supply in 2005. The contract price of polysilicon at \$60/kg in 2005 doubled from \$30/kg in 2003. For companies using traditional mono- or polycrystalline silicon wafers in modules (91% of industry), the polysilicon feedstock represents 25% of the module BOM (bill of material) in 2005. Despite higher prices, only 80%-90% of planned production was met in 2005.

For 2006, anticipate limited growth and margin degradation: For 2006 and into 2007 we believe the greatest risk to the solar industry remains the polysilicon shortage and resulting price increases that may limit growth and/or degrade margins beginning in 2H06. Only companies that have secured allocation can grow; only those that have fixed price contracts will maintain margins. The situation should intensify into 2007. Our supply chain checks confirm that polysilicon contracts are sold out through 2007. Contract prices are anticipated to reach \$80/kg by 2007, and the spot price will remain >\$100/kg. We anticipate that polysilicon feedstock will rise from 25% of BOM to 40% by 2007. Only 60%-65% of planned production will likely be met.

The shortage is most pronounced in 2006, and will cap solar industry growth at 9%: We estimate that solar manufacturers met 80% to 90% of its 2005 production plans due to polysilicon stock piles from 2001/2002, resulting in 33% solar industry growth from 2004 to 1676MW in 2005. But the picture is bleak for 2006 given that stockpiles are depleted – we estimate only 14,000 metric tons of polysilicon will be available for solar cell production. Despite advances in technology that increases cell efficiency and reduced polysilicon use, the 14,000 metric ton translates to a mere ~1,560 MW of crystalline solar cell production. Thus, we believe the solar industry overall will only grow 9% in 2006 to ~1828MW of total solar cell production. We have detailed our polysilicon feedstock production estimates with several polysilicon/wafer/cell manufacturers and industry consultants. All agreed with a realistic scenario of feedstock CAGR of ~13% through 2007. The shortage bodes well for MEMC, as MEMC will be able to extract the most value out of its polysilicon production plants in Pasadena, TX, and Merano, Italy. We have detailed our assumptions in the exhibit below.

Exhibit 4: Piper Jaffray Global Polysilicon Capacity Forecast (Metric Tons)**Piper Jaffray Global Capacity of Polysilicon Forecast (Metric Tons)**

Company	2004 Capacity	2005 Capacity	2006 Capacity	2007 Capacity	2008 Capacity
Hemlock	7,000	7,400	10,000	10,000	11,000
Wacker	5,000	5,500	6,200	6,500	9,000
Tokuyama	4,800	5,200	5,400	5,400	8,400
REC (ASiMI)	2,600	3,000	4,000	4,000	4,000
REC (SGS)	2,200	2,500	2,700	4,000	7,500
MEMC (Pasadena, TX)	2,700	2,700	3,000	3,200	6,500
MEMC (Italy)	1,000	1,000	1,000	1,000	1,000
Mitsubishi Materials	1,600	1,600	1,600	1,600	1,600
Mitsubishi Polysilicon	1,200	1,200	1,200	1,200	1,200
Sumitomo Titanium	700	700	700	700	700
LSCS	30	30	300	600	3,000
Sichuan Xinguang	-	-	300	600	1,250
ESM	100	100	100	100	100
JSS	-	50	100	800	800
New Industry Consortium (expected)	-	-	-	-	1,500
Total	28,930	30,980	36,600	39,700	57550

Source: Company Documents, Rare Metal News, Photon International, PJC Estimate

Exhibit 5: Piper Jaffray Solar Industry Production Estimates, 2003-2010E

Year	Poly Capacity (Metric Ton)	Poly Demand IC / Semi	Residual Poly for Solar*	Poly Surplus from Past Productions	Total Poly Available for Solar	Wafer c-Si Production (MW)	Other Solar Production (MW)	Solar Production (MW)
2003	26,700	17,000	9,700	11,000	20,700	671	80	750
2004	28,800	19,350	9,450	11,700	21,150	1,142	114	1,256
2005E	30,980	20,627	10,353	7,118	17,471	1,500	176	1,676
2006E	36,600	22,277	14,323	-	14,323	1,565	263	1,828
2007E	39,700	24,639	15,061	-	15,061	1,697	399	2,096
2008E	57,550	27,103	30,447	-	30,447	3,324	573	3,897
2009E	59,277	27,645	31,632	-	31,632	3,561	718	4,279
2010E	61,055	28,474	32,581	-	32,581	3,790	898	4,687

Source: Rare Metal News, PJC Estimate

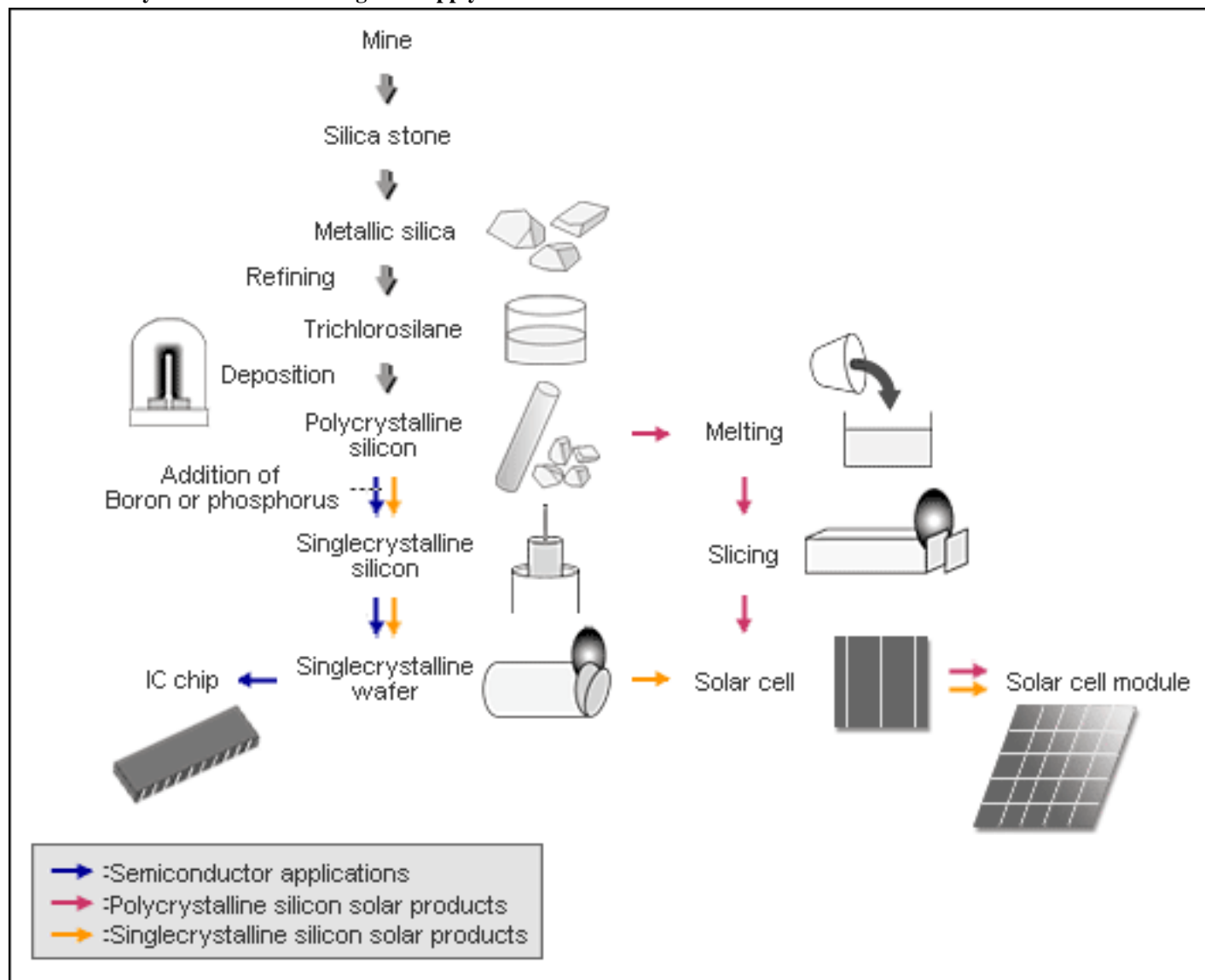
Polysilicon Background

Approximately 94% of solar cells are manufactured using crystalline silicon as the primary raw material. For companies using traditional mono- or polycrystalline silicon wafers in modules (91% of industry), this is essentially the same ultra-pure silicon material used to manufacture ICs. Historically, the solar industry has purchased off-spec material that is rejected by the IC industry, as semiconductors require much higher purity silicon. However, as the solar industry has grown, its demand has surpassed the off-spec silicon production. As a result, the solar industry has been forced to buy IC grade silicon. Currently, SGS is the only producer of solar grade silicon in substantial volumes.

The polysilicon manufacturing process is highly capital intensive and requires investments of \$200-\$250 million for a 3,000 metric ton capacity that takes twenty four months to ramp. Five major manufacturers constitute 88% of the world's polysilicon production. These are Hemlock, Tokuyama, Wacker, REC (subsidiary SGS and ASiMI), and MEMC. The world capacity is estimated at 31,000 metric tons in 2005.

In 2004, about 65% of the polysilicon production was used to manufacture semiconductors, with the balance being consumed by solar cells. Due to the semiconductor down cycle in 2001 that saw polysilicon prices decline below cost to \$24/kg, polysilicon manufacturers have been unwilling to add capacity without purchase agreements.

Exhibit 6: Polysilicon manufacturing and supply chain



Source: Tokuyama

Polysilicon R&D and Capacity Expansion

The polysilicon industry is enjoying record industry profits. Additionally, for the first time solar manufacturers are prepaying for supply (thanks to recent IPOs) and thus funding poly capacity expansion that should eliminate the shortage in 2008. Wacker, Tokuyama, and REC have launched programs to develop processes for manufacturing granular silicon (fluidized bed reactor for Wacker and REC and vapor to liquid deposition (VLD) reactor for Tokuyama). Tokuyama is building a 200 ton half commercial VLD pilot plant in Japan, while Wacker already has a 100 ton FBR pilot plant in Germany. REC is also looking to build a 200 ton pilot plant in Moses Lake, WA. In terms of capacity expansion, Wacker is currently expanding its facility in Germany, Hemlock is adding 3,000 ton of capacity; Tokuyama is expanding 400 tons in Japan, while REC has a goal to increase SGS to 2,500 ton per year. However, most production will not come online until 2008.

The Raw Polysilicon Feedstock Manufacturing Process

The process for making polysilicon feedstock is commonly referred to as the Siemens Process using a CVD reactor and silane or trichlorosilane gas. The entire industry uses this CVD process with the exception of MEMC in Pasadena, Texas, which uses a silane fluid bed reactor that produces granular polysilicon. (REC at Moses Lake, WA and Wacker in Germany are both working on fluid bed reactors as is Schumacher Technology). Granular polysilicon, which fluid bed reactors produce, is desirable since it can be easily melted to top off the crystal growing crucible, allowing a longer silicon ingot crystal without the need to shut down the furnace. Furthermore, granular poly may enable innovations in high-speed, high-volume solar cell and module manufacturing.

The Case for "Virtual" Integration

While PV manufacturers are accelerating manufacturing process cost improvements to mitigate rising raw material costs, we believe that the greatest cost improvement for the PV industry can be attained by ensuring a consistent, low-cost supply of polysilicon. We suggest an industry consortium that would mitigate risk in constructing new PV poly capacity. The latest manufacturing techniques for polysilicon production are fluid bed reactors including tribromosilane (SiHBr_3) fluid bed reactors and continuous substrate fabrication such as the continuous melt replenishment (CMR) process. According to industry sources, a \$200 million investment could generate 3,000t of Electronic Grade polysilicon per annum, and supply polysilicon at \$20 per kilo. Furthermore, any excess production could be sold into the IC wafer supply chain. We believe that a select few solar wafer manufacturers will adopt a virtual integration approach by investing proceeds from recent financings. In our opinion, this will enable a sustained competitive advantage.

Piper Jaffray
MEMC Electronic Materials (WFR)
Income Statement (\$Mil.)
Updated: 2/22/06

FY Ending December:	2004A	1Q05A	2Q05A	3Q05A	4Q05A	2005A	1Q06E	2Q06E	3Q06E	4Q06E	2006E	1Q07	2Q07	3Q07	4Q07	2007E
Revenues	1,028.0	252.6	274.0	280.8	317.3	1,124.7	317.0	328.0	355.0	388.0	1,388.0	376.4	398.9	428.9	456.7	1,660.9
COGS	658.5	163.1	175.8	187.1	189.6	715.7	190.8	196.8	210.5	228.1	826.3	225.8	235.4	250.5	264.9	976.6
Gross Profit	369.4	89.5	98.2	93.7	127.7	409.0	126.2	131.2	144.5	159.9	561.7	150.5	163.6	178.4	191.8	684.3
Operating Expenses	108.9	29.5	31.6	30.9	31.9	50.6	31.0	31.3	31.7	32.0	52.7	32.1	32.2	32.7	32.7	54.4
SG&A	71.9	17.8	18.3	18.2	18.9	73.2	18.0	18.3	18.5	18.5	73.3	18.6	18.7	19.0	19.0	75.3
R&D	38.0	11.7	13.2	12.7	13.0	50.6	13.0	13.0	13.2	13.5	52.7	13.5	13.5	13.7	13.7	54.4
Restructuring and other charges	(1.0)															
Operating Profit , EBIT	260.5	60.0	66.6	62.8	95.8	285.2	95.2	99.9	112.8	127.9	435.7	118.4	131.4	145.7	159.1	554.6
EBITDA	304.6	73.4	81.0	77.5	111.1	343.0	110.7	115.6	128.8	144.2	499.2	135.4	148.4	162.7	176.1	622.6
D&A	44.1	13.3	14.4	14.7	15.3	57.8	15.5	15.7	16.0	16.3	63.5	17.0	17.0	17.0	17.0	68.0
Non Operating Expenses (Interest/F-eX)	0.6	1.284	1.496	1.531	1.4	5.7	(0.4)	(0.4)	(0.4)	(0.4)	(1.6)	0.3	0.3	0.3	0.3	1.3
Interest Expense	13.5	1.9	1.9	1.7	1.7	7.3	0.5	0.5	0.5	0.5	2.1	0.5	0.5	0.5	0.5	2.1
Interest Income	(5.0)	(0.7)	(1.0)	(0.9)	(1.6)	(4.2)	(1.7)	(1.7)	(1.7)	(1.7)	(6.9)	(1.0)	(1.0)	(1.0)	(1.0)	(4.0)
Other Exp (Gain)	(8.0)	0.1	0.6	0.7	1.2	2.6	0.8	0.8	0.8	0.8	3.2	0.8	0.8	0.8	0.8	3.2
Pretax Income	259.9	58.7	65.1	61.2	94.4	279.5	95.6	100.3	113.2	128.2	437.3	118.1	131.0	145.4	158.8	553.3
Income tax Expense (Benefit)	44.2	13.2	10.3	10.5	13.7	47.7	14.3	15.0	17.0	19.2	65.6	17.7	19.7	21.8	23.8	83.0
Equity in income (loss) of JV	(1.7)															
Minority Interest	10.7	1.8	2.0	1.5	2.4	7.7	2.0	2.0	2.0	2.0	8.0	2.0	2.0	2.0	2.0	8.0
Net earnings	205.0	43.8	52.873	49.3	78.3	224.2	79.2	83.2	94.2	107.0	371.7	98.4	109.4	121.6	133.0	470.3
EPS Operating	\$0.92	\$0.20	\$0.24	\$0.22	\$0.34	\$0.99	\$0.35	\$0.36	\$0.41	\$0.46	\$1.58	\$0.43	\$0.47	\$0.52	\$0.57	\$2.00
Special Charges & Tax Reversals	(22.9)	(17.0)	0	(40.5)	(56.5)	(114)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional GAAP Tax (Book Rate @ 25%)							0.0	0.0	0.0	0.0	0.0	11.8	13.1	14.5	15.9	55.3
Restructuring	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stock Comp Expense							2.3	2.3	2.3	2.3	9.2	2.3	2.3	2.3	2.3	9.2
NI Reported	226.2	60.8	52.9	89.8	134.8	338.2	76.9	80.9	91.9	104.7	354.5	84.3	94.0	104.7	114.8	397.8
EPS Reported	\$1.02	\$0.27	\$0.24	\$0.40	\$0.59	\$1.49	\$0.34	\$0.35	\$0.40	\$0.45	\$1.54	\$0.37	\$0.41	\$0.45	\$0.49	\$1.72
Shares Outstanding	207.7	208.8	209.2	214.7	221.2	213.5	221.3	221.4	221.5	221.6	221	221.7	221.8	221.9	222.0	222
Diluted Shares Outstanding	221.4	223.9	224.7	227.1	228.3	226.0	228.8	229.3	229.8	230.3	230	230.8	231.3	231.8	232.3	232

Margin																
COGS	64.1%	64.6%	64.2%	66.6%	59.8%	63.6%	60.2%	60.0%	59.3%	58.8%	59.5%	60.0%	59.0%	58.4%	58.0%	58.8%
Gross Margin	35.9%	35.4%	35.8%	33.4%	40.2%	36.4%	39.8%	40.0%	40.7%	41.2%	40.5%	40.0%	41.0%	41.6%	42.0%	41.2%
EBITDA	29.6%	29.0%	29.6%	27.6%	35.0%	30.5%	34.9%	35.2%	36.3%	37.2%	36.0%	36.0%	37.2%	37.9%	38.6%	37.5%
R&D	3.7%	4.6%	4.8%	4.5%	4.1%	4.5%	4.1%	4.0%	3.7%	3.5%	3.8%	3.6%	3.4%	3.2%	3.0%	3.3%
SG&A	7.0%	7.0%	6.7%	6.5%	6.0%	6.5%	5.7%	5.6%	5.2%	4.8%	5.3%	4.9%	4.7%	4.4%	4.2%	4.5%
EBIT	25.3%	23.8%	24.3%	22.4%	30.2%	25.4%	30.0%	30.5%	31.8%	33.0%	31.4%	31.5%	32.9%	34.0%	34.8%	33.4%
Pretax Income	25.3%	23.3%	23.8%	21.8%	29.8%	24.9%	30.1%	30.6%	31.9%	33.1%	31.5%	31.4%	32.8%	33.9%	34.8%	33.3%
Net Earnings	19.9%	17.3%	19.3%	17.5%	24.7%	19.9%	25.0%	25.4%	26.5%	27.6%	26.8%	26.1%	27.4%	28.3%	29.1%	28.3%
Effective tax rate	17.0%	22.5%	15.7%	17.2%	14.5%	17.1%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%

Y/Y Growth																
Total Revenue	31.6%	10.4%	7.2%	2.0%	18.2%	9.4%	25.5%	19.7%	26.4%	22.3%	23.4%	18.7%	21.6%	20.8%	17.7%	19.7%
Gross Profit	58.7%	22.0%	12.7%	-15.4%	30.0%	10.7%	41.0%	33.6%	54.3%	25.2%	37.3%	19.3%	24.7%	23.5%	20.0%	21.8%
EBITDA	75.4%	28.3%	15.2%	-18.4%	35.2%	12.6%	50.9%	42.7%	66.1%	29.8%	45.6%	22.4%	28.3%	26.3%	22.2%	24.7%
EBIT	82.6%	27.1%	11.0%	-24.9%	37.5%	9.5%	58.6%	49.9%	79.7%	33.5%	52.8%	24.5%	31.5%	29.2%	24.5%	27.3%
Net Earnings	75.8%	21.9%	49.8%	-17.5%	8.2%	9.4%	81.0%	57.5%	91.2%	36.7%	65.8%	24.2%	31.4%	29.0%	24.3%	26.5%
EPS	72.2%	20.9%	47.3%	-20.0%	5.3%	7.9%	77.2%	54.3%	89.0%	35.5%	59.9%	23.1%	30.2%	27.9%	23.2%	26.0%

Q/Q Growth																
Revenue		-5.9%	8.5%	2.5%	13.0%		-0.1%	3.5%	8.2%	9.3%		-3.0%	6.0%	7.5%	6.5%	
Gross Profit		-8.8%	9.8%	4.6%	36.3%		-1.2%	4.0%	10.1%	10.6%		-5.8%	8.7%	9.1%	7.5%	
EBITDA		-10.7%	10.4%	-4.3%	43.3%		-0.4%	4.5%	11.4%	11.9%		-6.0%	9.5%	9.7%	8.3%	
EBIT		-13.8%	11.0%	-5.8%	52.6%		-0.6%	5.0%	12.9%	13.4%		-7.4%	10.9%	10.9%	9.2%	
Net Earnings		-39.5%	20.8%	-6.8%	58.9%		1.2%	5.1%	13.2%	13.6%		-8.1%	11.2%	11.1%	9.4%	
EPS		-40.0%	20.4%	-7.8%	58.1%		1.0%	4.8%	12.9%	13.4%		-8.3%	10.9%	10.9%	9.2%	

For up-to-date disclosure info on this company, please visit
<http://www.piperjaffray.com/researchdisclosures>

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MEMC Electronic Materials (WFR)

Quarterly Balance Sheet (\$Mil.)

Updated: 2/22/06

FY Ending December:	1Q04A	2Q04	3Q04A	4Q04A	1Q05A	2Q05A	3Q05A	4Q05A	1Q06E	2Q06E	3Q06E	4Q06E
Cash and cash equivalents	141	129	103	92	116	101	143	154	173	198	258	329
Accounts Receivable, net	119	139	152	141	127	129	124	118	139	144	156	170
Inventory	123	113	120	128	137	136	132	122	136	140	145	158
Prepaid expenses & Other current assets	32	16	20	30	27	24	35	40	40	41	44	48
Total Current Assets	414	397	395	390	408	389	435	433	488	523	603	705
Property and equipment, net	362	393	387	445	476	504	510	504	561	605	629	648
Deferred tax assets, net	22	46	44	120	125	130	176	199	199	199	199	199
Other assets	54	61	55	55	55	53	52	51	51	51	51	51
Total Assets	852	897	881	1,010	1,064	1,076	1,173	1,187	1,299	1,378	1,483	1,603
Accounts Payable	92	101	99	124	133	105	104	105	125	119	127	138
Accrued liabilities	39	43	32	38	24	27	15	30	29	30	30	31
Accrued wages and salaries	22	20	22	19	24	23	28	22	22	22	22	22
Deferred Revenue & Customer Deposits	11	8	5	0	0	0	13	1	0	0	0	0
Income taxes payable	2	6	9	10	19	23	5	11	11	11	11	11
Short term borrowings & current portion of LT debt	87	57	22	24	23	22	15	5	5	5	5	15
Total Current Liabilities	254	237	189	216	224	200	181	175	193	187	195	217
Long Term Debt	128	125	121	116	113	108	107	35	35	35	35	35
Pension and similar liabilities	130	127	112	116	115	112	107	109	110	110	110	110
Other liabilities	45	47	61	72	61	64	81	38	38	38	38	38
Minority Interests	67	65	44	46	48	50	52	54	54	55	57	58
Total Shareholders' Equity	229	296	354	443	503	541	645	777	869	953	1,048	1,146
Total Liabilities and Shareholders' Equity	852	897	881	1,010	1,064	1,076	1,173	1,187	1,299	1,378	1,483	1,603

LIQUIDITY

Current Ratio	1.6	1.7	2.1	1.8	1.8	1.9	2.4	2.5	2.5	2.8	3.1	3.3
Quick Ratio	1.0	1.1	1.3	1.1	1.1	1.1	1.5	1.6	1.6	1.8	2.1	2.3

LEVERAGE

Debt/Capital	48%	38%	29%	24%	21%	19%	16%	5%	4%	4%	3%	3%
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MANAGEMENT

Sales/ Fixed Assets	2.5	2.6	2.8	2.4	2.1	2.2	2.2	2.5	2.3	2.2	2.3	2.4
Sales/ Total Capital	2.6	2.4	2.3	1.9	1.6	1.7	1.5	1.6	1.4	1.3	1.3	1.3
Inventory Turns	5.3	5.7	5.7	5.5	4.9	5.2	5.6	6.0	5.9	5.7	5.9	6.0
Days Inventory	68	64	64	66	74	71	65	61	65	65	63	63
Days Receivable	44	46	48	50	48	43	41	35	40	40	40	40
Days Payable	55	52	56	60	72	62	51	50	60	55	55	55
Cash Cycle Days	58	58	57	56	50	52	55	46	45	50	48	48

PROFITABILITY

Return on Assets	17%	16%	27%	29%	16%	20%	17%	26%	24%	24%	25%	27%
Return on Capital	40%	34%	50%	52%	28%	33%	26%	39%	35%	34%	35%	36%
Return on Equity	63%	48%	67%	65%	35%	39%	31%	40%	36%	35%	36%	37%
Return on Invested Capital (34% Tax Rate)	30%	31%	38%	28%	22%	23%	20%	29%	28%	27%	29%	32%
Return on Invested Capital (Ex Goodwill)	35%	35%	42%	15%	24%	55%	21%	31%	29%	28%	30%	33%

PER SHARE DATA

Book Value	1.03	1.34	1.61	1.99	2.24	2.41	2.84	3.40	3.80	4.16	4.56	4.98
Tangible Book Value	0.79	1.06	1.36	1.75	2.00	2.17	2.61	3.18	3.57	3.93	4.34	4.75
Cash	0.63	0.59	0.47	0.42	0.52	0.45	0.63	0.67	0.76	0.86	1.12	1.43
Cash Earnings/Share	\$0.16	\$0.16	\$0.27	\$0.33	\$0.20	\$0.24	\$0.22	\$0.34	\$0.35	\$0.36	\$0.41	\$0.46

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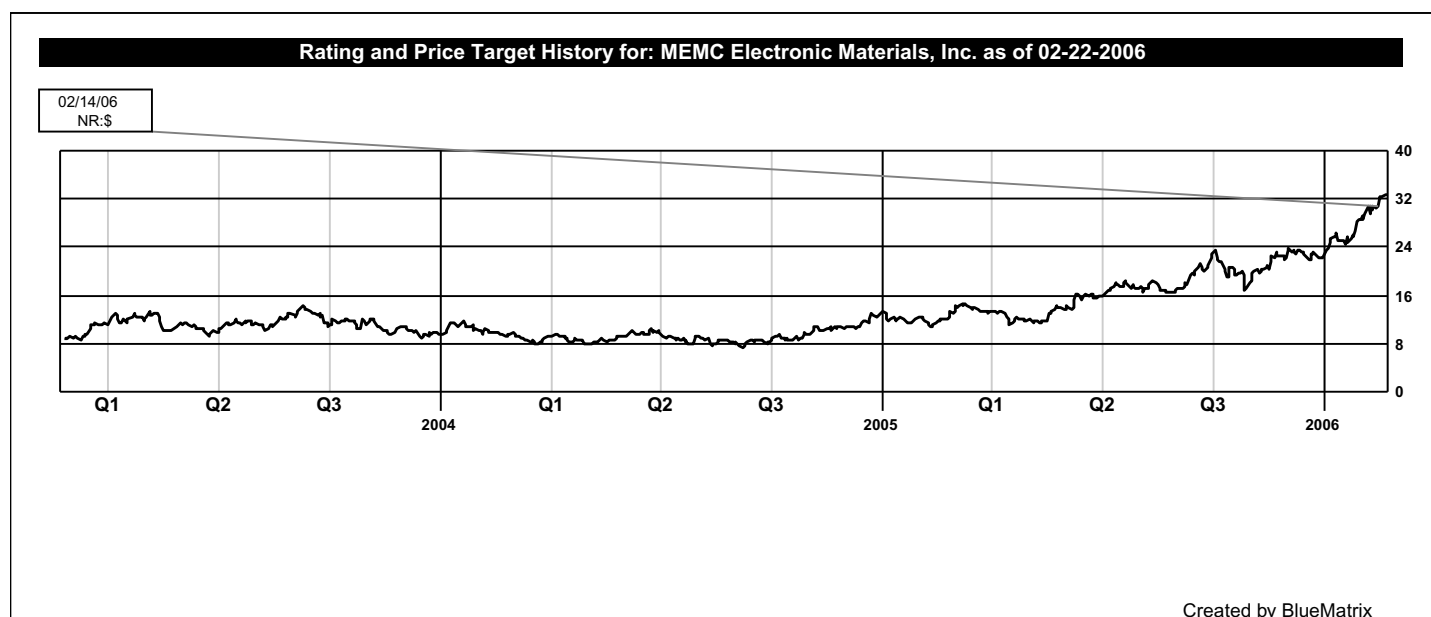
MEMC Electronic Materials (WFR)

Quarterly Statement of Cash Flows (\$Mil.)

Updated: 2/22/06

FY Ending December:	2004A	1Q05A	2Q05A	3Q05A	4Q05A	2005A	1Q06E	2Q06E	3Q06E	4Q06E	2006E
Net Income Continuing Ops	203.3	43.8	52.9	49.3	78.3	224.2	79.2	83.2	94.2	107.0	371.7
Depreciation & Amortization	44.1	13.3	14.4	14.7	15.3	57.8	15.5	15.7	16.0	16.3	63.5
Deferred Taxes, Other	22.9	17.0	0.0	40.5	59.1	116.6	0.0	0.0	0.0	0.0	0.0
Cash Flow Before Working Capital	270.3	74.1	67.2	104.5	152.7	398.6	94.7	98.9	110.2	123.3	435.2
Changes in Working Capital	12.7	(0.8)	(21.4)	(29.4)	(43.7)	(95.2)	(14.8)	(14.3)	(10.1)	(17.1)	(56.4)
Cash Flow From Operations	283.0	73.3	45.9	75.1	109.1	303.4	79.9	84.6	100.1	106.2	378.8
Capital Expenditures	(149.8)	(54.4)	(51.2)	(32.3)	(21.2)	(159.1)	(60.0)	(60.0)	(40.0)	(35.0)	(195.0)
Free Cash Flow	133.2	18.9	(5.3)	42.8	87.9	144.3	19.9	24.6	60.1	71.2	183.8

Important Research Disclosures



Notes: The boxes on the Rating and Price Target History chart above indicate the date of the Research Note, the rating, and the price target. Each box represents a date on which an analyst made a change to a rating or price target, except for the first box, which may only represent the first Note written during the past three years.

Legend:

I: Initiating Coverage

D: Discontinuing Coverage

S: Suspending Coverage

R: Resuming Coverage

T: Transferring Coverage

SB: Strong Buy (effective 01/12/04, Equity Research eliminated the SB rating)

OP: Outperform

MP: Market Perform

UP: Underperform

NA: Not Available

UR: Under Review

GP On: Listed on one of the Guided Portfolios maintained by Piper Jaffray

GP Off: Removed from the Guided Portfolios maintained by Piper Jaffray

Distribution of Ratings/IB Services				
Piper Jaffray				
Rating	Count	Percent	IB Serv./Past 12 Mos.	
			Count	Percent
BUY [OP]	310	53.17	75	24.19
HOLD [MP]	256	43.91	31	12.11
SELL [UP]	17	2.92	3	17.65

Note: Distribution of Ratings/IB Services shows the number of companies in each rating category from which Piper Jaffray and its affiliates received compensation for investment banking services within the past 12 months. NASD and NYSE rules require disclosure of which ratings most closely correspond with "buy," "hold," and "sell" recommendations. Accordingly, Outperform corresponds most closely with buy, Market Perform with hold, and Underperform with sell. Outperform, Market Perform and Underperform, however, are not the equivalent of buy, hold or sell, but instead represent indications of relative performance. See Rating Definitions below. An investor's decision to buy or sell a security must depend on individual circumstances.

Important Research Disclosures

Analyst Certification — Jesse W. Pichel, Sr Research Analyst

The views expressed in this report accurately reflect my personal views about the subject company and the subject security. In addition, no part of my compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this report.

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Piper Jaffray has received compensation for investment banking services from or has had a client relationship with MEMC Electronic Materials, Inc. within the past 12 months.

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Rating Definitions

Investment Opinion: Investment opinions are based on each stock's return potential relative to broader market indices, not on an absolute return. The relevant market indices are the S&P 500 and Russell 2000 for U.S. Companies and the FTSE Techmark Mediscience index for European companies.

- **Outperform (OP):** Expected to outperform the relevant broader market index over the next 12 months.
- **Market Perform (MP):** Expected to perform in line with the relevant broader market index over the next 12 months.
- **Underperform (UP):** Expected to underperform the relevant broader market index over the next 12 months.
- **Suspended (SUS):** No active analyst opinion or no active analyst coverage; however, an analyst investment opinion or analyst coverage is expected to resume.
- **Volatility Rating:** Our focus on growth companies implies that the stocks we recommend are typically more volatile than the overall stock market. We are not recommending the "suitability" of a particular stock for an individual investor. Rather, it identifies the volatility of a particular stock.
- **Low:** The stock price has moved up or down by more than 10% in a month in fewer than 8 of the past 24 months.
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