

Urethane Phoenix Rising

CMP Pads & Conditioners

Techcet CMP Consumables
2010 Market Update

Michael A. Fury, Ph.D.

Techcet Group LLC

July 14, 2010

The logo for Techcet, featuring the word "TECHCET" in a bold, blue, sans-serif font. The letters are slightly 3D and have a white-to-blue gradient.

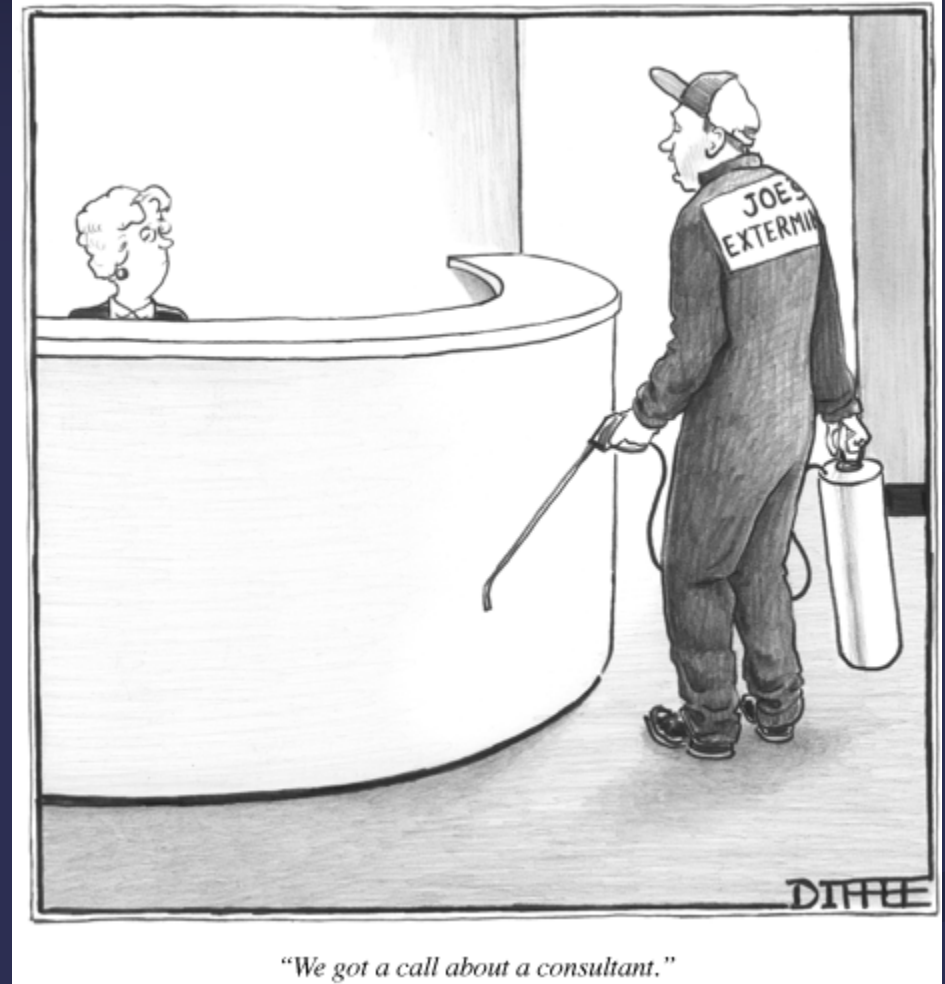
Techcet Group, LLC

MFury@Techcet.com 415-395-6945

www.techcet.com

Outline

- * The Business
- * The Players
- * The Buzz
- * The End



CMPUG July 2009



The Business of Business

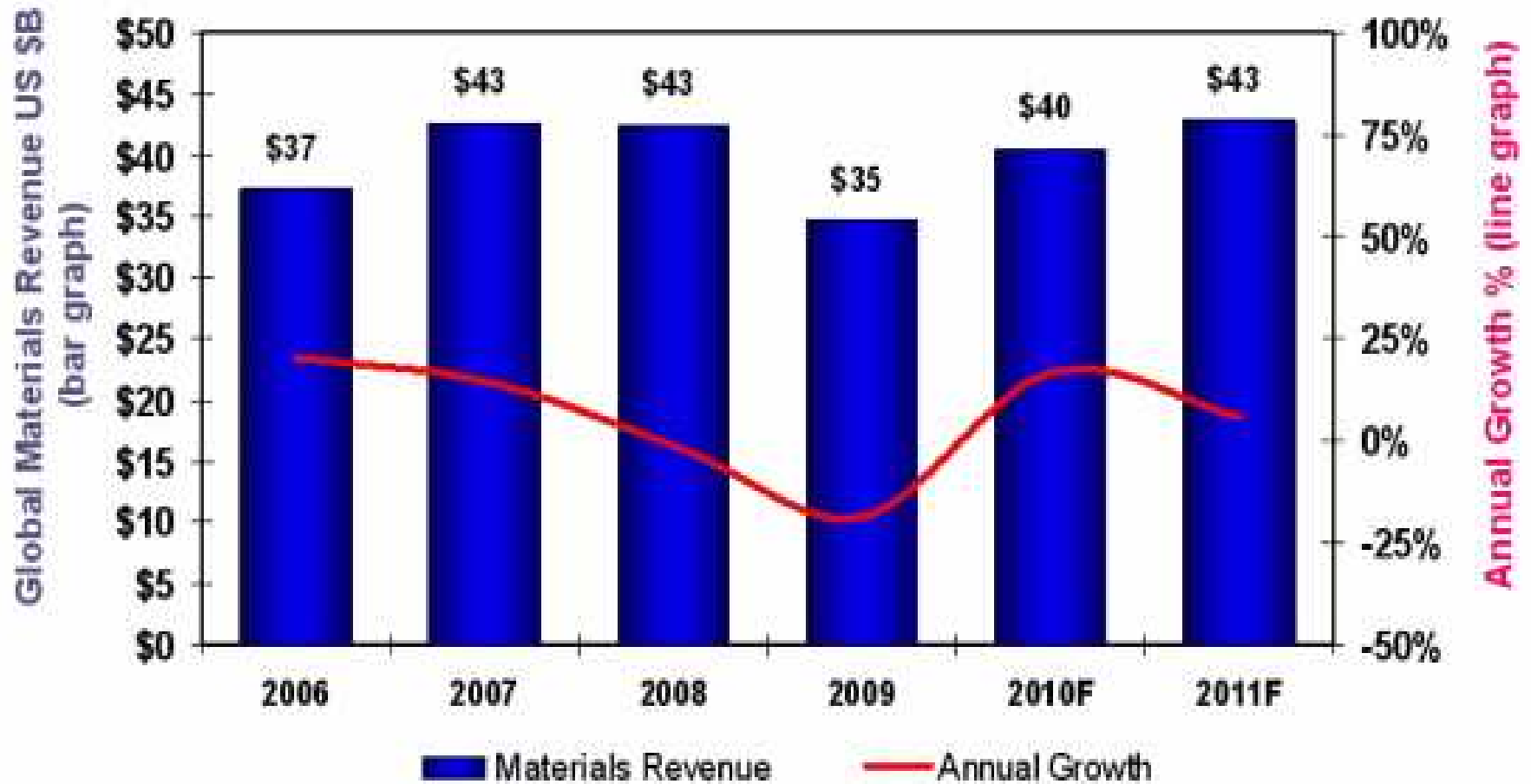
Worldwide Semiconductor Revenues Year-to-Year Percent Change



Source: WSTS

The Business of Business

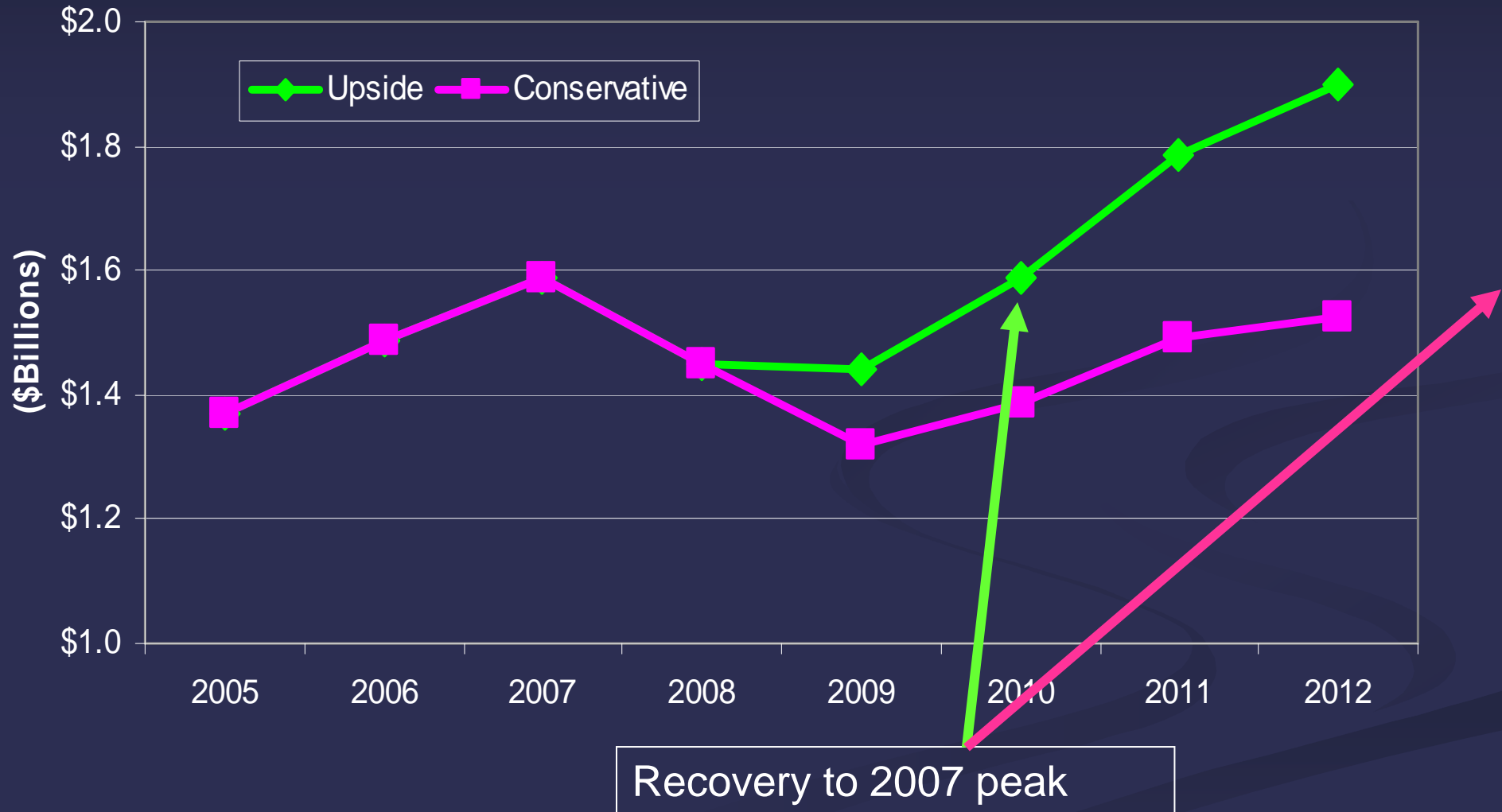
Semiconductor Material Cycles



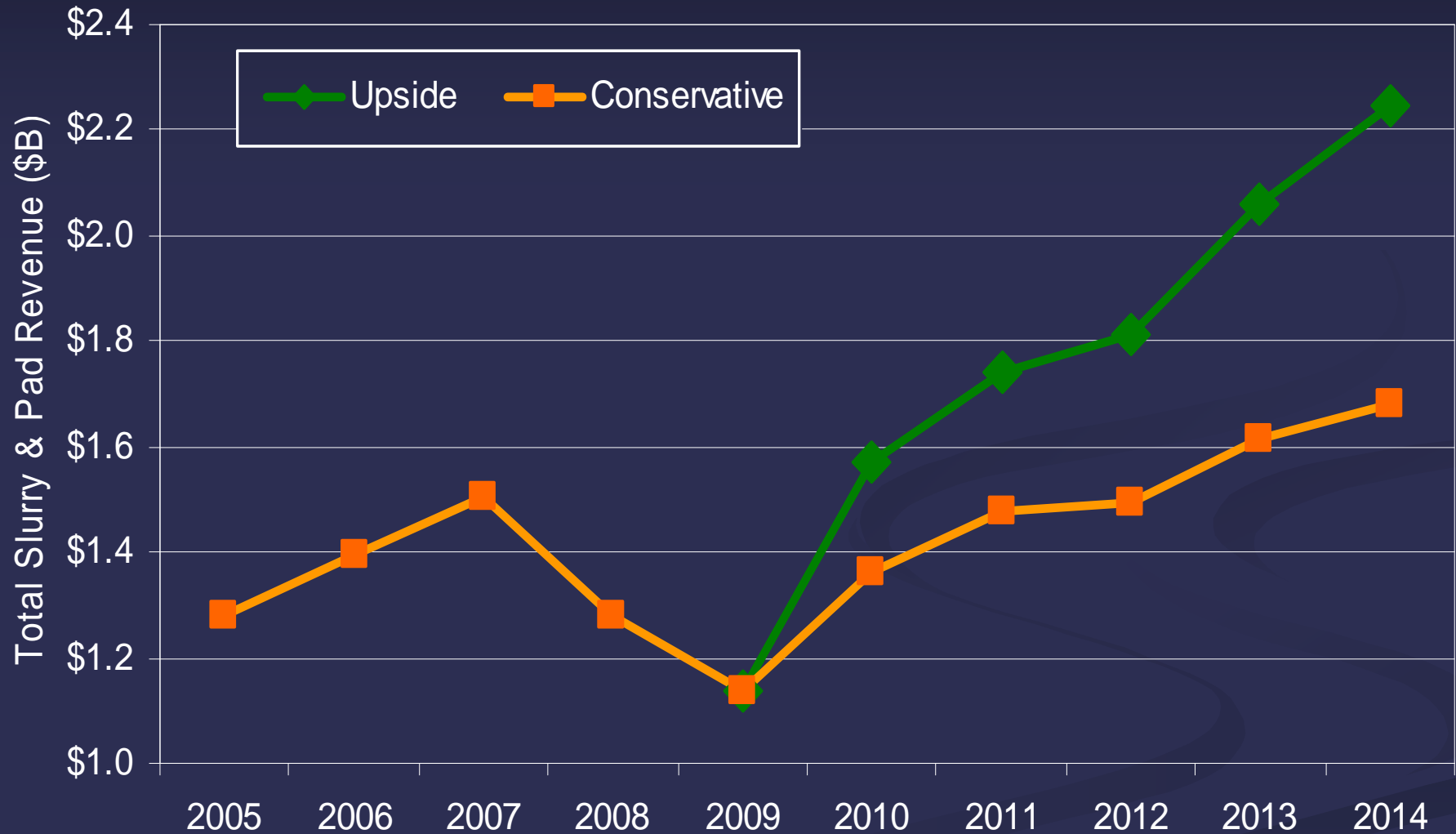
Source: SEMI Industry Research and Statistics, July 2010

The Business of CMP - 2009

CMP Slurry & Pad Revenue (2009)



The Business of CMP - 2010



The Business of Business



The Business of CMP

- * Pad market ~\$709M
 - ✦ 3 year CAGR 8–9%
 - ✦ Outlook last year was 5.5%

- * Pad Conditioner market ~\$200M
 - ✦ Tracks pad market pretty well

The Players - Pads

- * Dow still dominates with 78% share
- * Measurable shares: *table for 4, please*
 - ✦ Cabot, Thomas West, JSR, innoPad
 - ✦ 3–5% share each; 7% Other
- * Investor confidence: new funding rounds
 - ✦ innoPad \$6M, April 2009
 - ✦ NexPlanar \$3.5M, March 2010
- * No departures in 2009

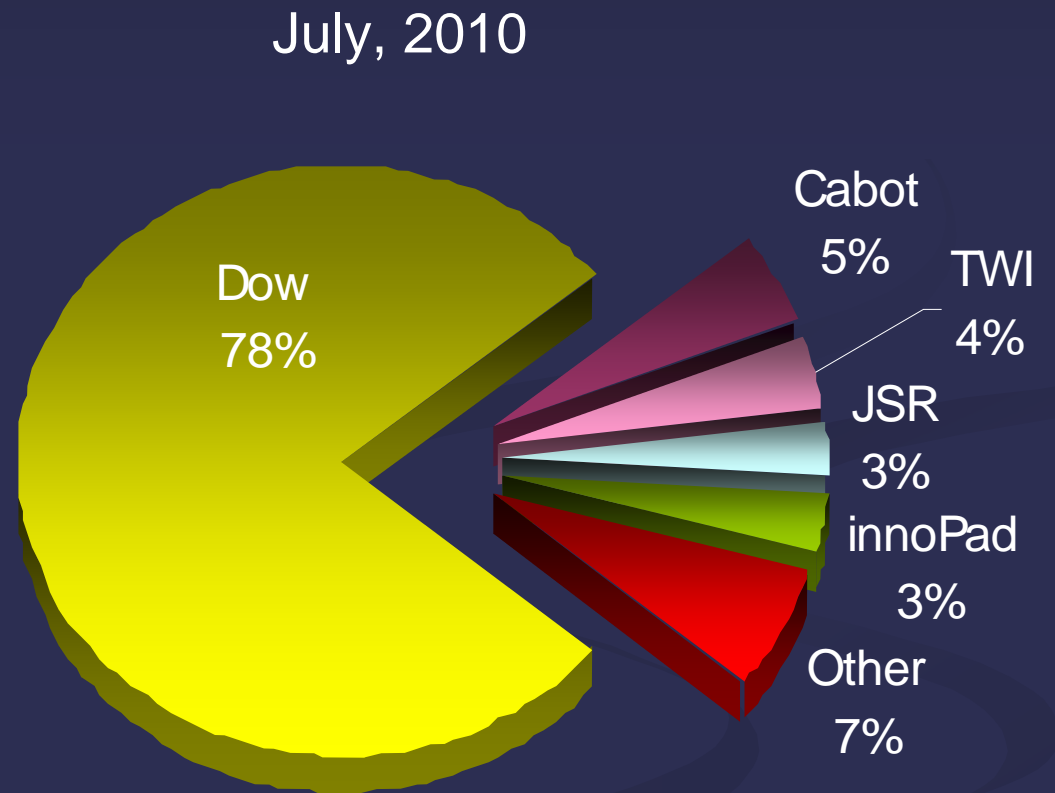
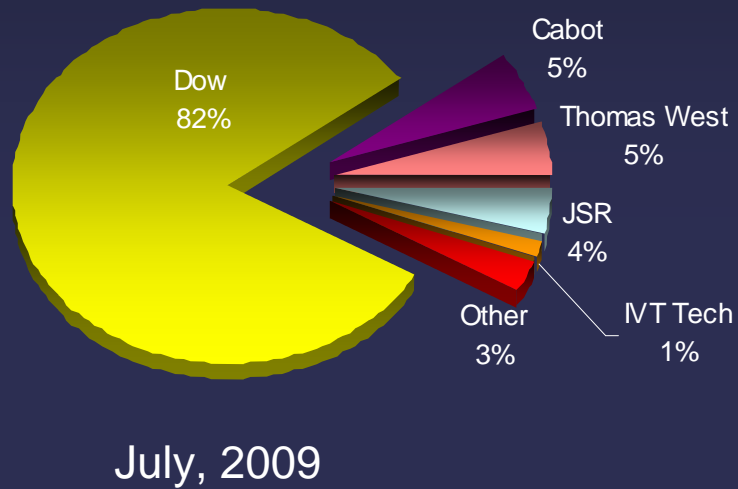
The Players - Pads

- * Dow market share vulnerability is process-specific
 - ✦ ILD: Praxair (AMAT), innoPad, Toyo
 - ✦ S-STI: 3M
 - ✦ W: TWI, CCMP, innoPad
 - ✦ AMAT Cu: JSR, Fujibo
 - ✦ Ebara Cu: CCMP, Fujibo

The Players - Pads

- * Pad manufacturing portfolio continues to expand
 - ✦ Skived from a polyurethane cake
 - ✦ Individually molded
 - ✦ Molded grooves
 - ✦ Punched from cast sheet
 - ✦ Porosity on demand
 - ✦ Independent buttons

The Players - Pads



Techcet estimates of market share

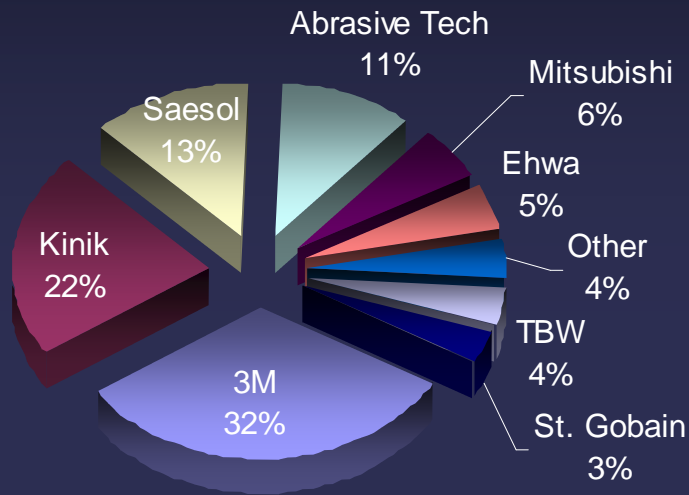
The Players – Pad Conditioners

- * 3M & Kinik dominate with 55% share
 - ✦ A dozen other players with 0%–13%
 - ✦ Strong regional variations
 - ✦ Entegris Planargem™ unveiled March, 2010
- * Manufacturing methods & materials continue to evolve
 - ✦ Microreplication
 - ✦ Non-random diamond placement
 - ✦ Ceramics, polymers replace metals

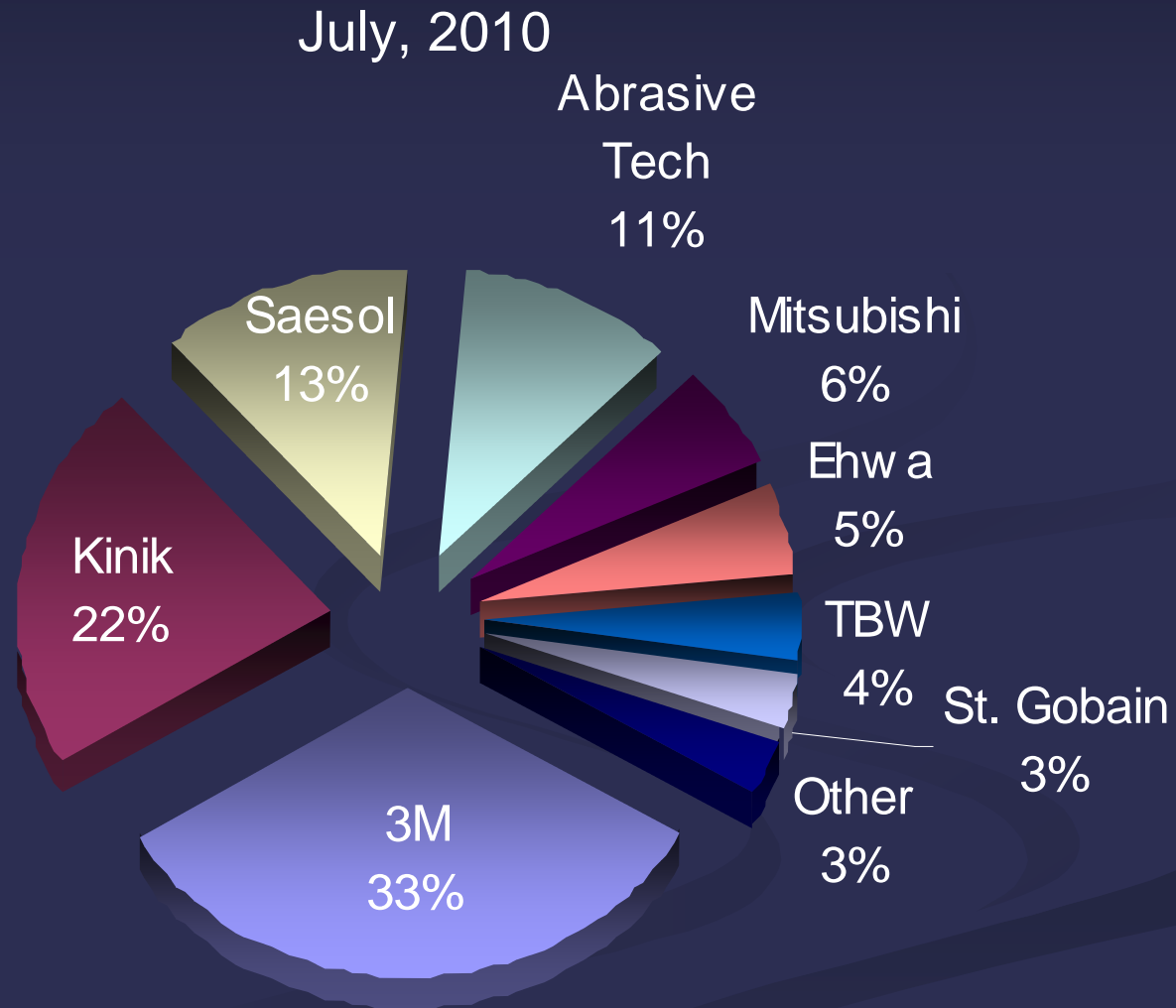
The Players – Pad Conditioners

- * Pad conditioning paradigm shift
 - ✦ Startup: Confluense LLC (TBW)
 - ✦ Debris removal → defect reduction
 - ✦ Slurry dilution → replacement mode
 - ▲ 50% reduction in slurry consumption
 - ✦ Continuous pad cleaning
 - ▲ Less aggressive pad conditioning
 - ▲ >2x pad life, >2x conditioner life
 - ▲ Shorter rinse cycles
 - ▲ 50% reduction in water consumption

The Players – Pad Conditioners



July, 2009



July, 2010

Techcet estimates of market share

The Buzz – The Biz

- * CMP Pad Market Dynamic Has Evolved
 - ✦ More evidence of ‘normal’ competitive behavior
 - ✦ CCMP pad presence regarded as both credible and sustainable
 - ✦ Investors more confident in startups
 - ✦ Influence of Dow acquisition
 - ✦ Gearing up for greater process-specific customization
 - ✦ Co-suppliers working more with pad startups

The End

- * CMP recovery is ahead of expectations
 - ✦ CMP consumables revenue will surpass 2007 peak levels by 2011 if not late this year
 - ✦ No residual impact beyond 2010
- * CMP applications continue to increase along *evolutionary* trajectories

The Techcet Group, LLC

- * Karey Holland, Ph.D.
- * Steven Holland, Ph.D.
- * John Housley
- * Lita Shon-Roy
- * Michael Fury, Ph.D.
- * Jiro Hanaue
- * Maggie Lee
- * Larry Thompson, Ph.D.
- * Allan Wiesnoski



The Techcet Group, LLC

* 2010 CMP Report Orders

✦ Lita Shon-Roy

▲ 925-413-9373

▲ LShonRoy@Techcet.com

▲ www.Techcet.com