IBM Business Overview and Power Technology Challenges

Rob DiMarco
October 2009
Agenda

- Organization Overview
- 3Q Financial update
- Power Spend & Strategy
- Environment & Power Technology Challenges
Organization Overview
Organization Overview - STG

IBM Senior Vice President & Group Executive STG

Rod Adkins - Acting

Senior Vice President Development & Manufacturing
Rod Adkins

General Manager System z Platform
Thomas Rosamilia

General Manager Power Systems Platform
Ross Mauri

General Manager System Software
Helene Armitage

General Manager Global Markets STG
Jim Stallings

General Manager Global Business Partners
Rich Hume

General Manager System x Platform
Adalio Sanchez

General Manager Storage Platform
Curtis Tearte

General Manager Retail Store Solutions
Steven Ladwig

Vice President Marketing, Communications, & Sales
Mark Shearer

Vice President Customer Fulfillment
Barbara Martin

Vice President & Chief Procurement Officer
John Paterson

General Manager Sales & Operations, Japan
James Stallings, Jr

Vice President Supply Chain Operations ISC
Timothy Carroll

© 2008 IBM Corporation
Integrated Supply Chain

Global Production Procurement Platform Sourcing Organization

CPC Manager Platform Sourcing Philip Cheng Acting
Fang, Ping
Feng, Jessie
Luo, Robert T
Peng, Christina
Qiu, David Wj
Tao, Golden
Zhang, Cici S
Zhou, Kanie Hz

Global Manager Power/Cooling & Interconnect Mario Monaco
Eirish Jr, Charles
Monaco, Gerald P.
Cohn, Laurie S.
De Santis, Paul M.
Dempsey, Karen M.
McMaster, Joan M.
Potter, Robert J. (Rob)
Severson, Paul S.
Sullivan, Christie P.
Thompson, Mark E.
Van Wagener, Michael A.
Zephr, Lorraine

Global Manager Mechanical Sourcing Philip Cheng
Chen, Steel
Cheng, Yi Ling
Li, Cindy W
Li, Effie Ji
Ma, Nellie
Meng, David G
Xiao, Gloria
Young, Adam
Zhang, Ivy
Zhou, Sandy

Manager Hungary Platform Sourcing Emese Czimbalmos
Bayomi, imre
Juhasz1, Ferenc
Kertesz, Peter
Kertesz, Zoltan
Vajai, Marta

NA Manager Mechanical Sourcing Duane Ruff
Christianson, Christopher
Famiglietti, Eric
Hinton, Denise W.
Johnson, Richard J.
Keefer, Patrick L.
Shaw, Michael
Speltz, Randy J.

Platform Mexico
Montero Santos, Gerardo Cipriano
Wario Romo, Ruben Alberto
Gonzalez Montoya, Gustavo

1 GR opening

Platform Cost Lead
Robert Haskins

Platform Bus Ctrls & Diversity Lead Ramela Ren

Taiwan Platform Lead Chilli Hsu

Indirect support:
Vui Hwe (VH) Tan
(Singapore)
Marie Chevallier (Montpelier)
3Q Financial Update
IBM Company Profile – 3Q09

IBM delivers on-demand solutions through the following business segments:

- **Global Technology Services**
  - Revenue: $9.4 billion
  - Percentage: 40%

- **Global Business Services**
  - Revenue: $4.3 billion
  - Percentage: 18%

- **Software**
  - Revenue: $5.1 billion
  - Percentage: 22%

- **Systems & Technology**
  - Revenue: $3.9 billion
  - Percentage: 17%

- **Global Financing**
  - Revenue: $0.5 billion
  - Percentage: 2%

- **Enterprise Investments/Other**
  - Revenue: $0.4 billion
  - Percentage: 1%

**Total IBM Revenue** = $23.6 billion

3Q09 Financials from Continuing Operations:

- **Revenue**: $23.6 billion
- **Net Income**: $3.2 billion
- **Gross Profit Margin**: 45.1%
- **Earnings Per Share**: $2.40
- **Number of employees**: 386,558 (2008)
- **Number of registered stockholders**: 585,572 (2008)

---

**Expect EPS of at least $9.85 in 2009**

*forward looking statement*

**Strategic Investments in Smarter Planet solutions, Business Analytics, and Next Generation Data Centers**

---

Incorporated in 1911 as the Computing-Tabulating-Recording Company (C-T-R)

In 1924, C-T-R became International Business Machines Corporation

- Punch cards
- Tabulating Machines
- Mainframe Computers
- Personal Computers
- Networking e-Business
- e-business

Business Process Transformation Services

© 2008 IBM Corporation
IBM Power and Cooling Spend
2009 Power/Cooling

Power / Cooling Spend - $460M Total
$361M Power Spend

- 48.9% Power
- 14.9% Mainframe
- 21.7% System x
- 11.1% Storage
- 3.2% RSS
- 0.1% GES

$99M Cooling Spend

- 41.9% Power
- 36.6% Mainframe
- 17.6% System x
- 3.7% Storage
- 0.1% GES

Strategy Points:

- Supplier Consolidation - Common supply base across all HW brands
  - Globalization and Emerging Market Supplier development
  - Leveraging industry solutions
- Leading edge performance / power pushing technology limits

- E-2-E – Optimized Supply Chain Solutions
  - Drive consolidation at commodity level
  - Reduce Costs
  - Increase focus on Risk Management

- Continue to leverage Co-Development partnerships
  - Early Supplier Involvement

- Lead Technology Enablement
  - Proactive and Influential to Brand Development teams
  - Enable differentiation & Customer value from our competition

- Quality - Product Excellence & Execution - Introduction to EOL
Environment

- Compressed GA Schedules – “Shift Left”
  - i.e. 30% reduction in Development cycle generation to generation
  - Very large EUH volumes required

- Supply Chain Risk Management

- Stacked Program General Availability (GA) Dates

- Development Engineering & Capital Investment vs. Value (Savings)

- Speed, Flexibility to evaluate and enable Technology Differentiators in our Server Platforms
  - Idea to Solution

- Differentiators centered around Performance & Efficiency & Reliability
Power Converter Efficiency Improvements

Figure 1: A typical Power System showing AC – DC Regulator and Point of Load Regulators

Figure 2: Typical Plug to Processor Efficiency = 76.5 % in year 2007

Figure 3: Plug to Processor Efficiency Target = 90% in year 2010 and beyond
## Power Technology – Industry Trends

<table>
<thead>
<tr>
<th></th>
<th>Year 2009</th>
<th>Year 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC – DC</strong></td>
<td>DC - DC</td>
<td>AC - DC</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>94%</td>
<td>95%</td>
</tr>
<tr>
<td><strong>Packaging</strong></td>
<td>Standard Components - Toroids, EE Cores Etc.</td>
<td>VRD / VRM</td>
</tr>
<tr>
<td><strong>Semiconductors</strong></td>
<td>MOSFETS SiC- Silicon Carbide IGBTs</td>
<td>1 mohm /30V FETs-</td>
</tr>
<tr>
<td><strong>Power Density</strong></td>
<td>25 W/in³</td>
<td>50-100W/in³</td>
</tr>
<tr>
<td><strong>Power Architecture</strong></td>
<td>Full Bridge - LLC Architecture - Two Switch Interleaved Forward</td>
<td>Multiphase Buck Quasi-resonant</td>
</tr>
<tr>
<td><strong>PDU’s</strong></td>
<td>Smart PDUs – Voltage, Current, Power Monitoring features, Remote ON/OFF feature</td>
<td>Monitor, Measure and manage</td>
</tr>
<tr>
<td><strong>Control, Monitoring</strong></td>
<td>Analog Control, Voltage, Current Power, Power ON Hours, ON/OFF incidents Monitoring, Fault Monitoring</td>
<td>Analog /Digital Control, I2C/PM Bus Communication</td>
</tr>
</tbody>
</table>

VRD = Regulators on mother board, LLC = Inductor – Inductor Capacitor Power Architecture, IGBT = Insulated Gate Bipolar Transistor, SiC = Silicon Carbide MOSFETs in enhancement mode (60mohm)
Power Challenges

- Improve Efficiency all the way down to 10% rated load
- Idle power Efficiency
- Rightsizing the Power System capacity to the load
- Distribution losses and high current densities
- Cooling Solutions @ System & Component level
- Better Packaging and Interconnect Solutions
- Shift from Sn/Pb solder to Pb-free solder (by 2014 for Server products)
- Sulfur resilient power designs

Power Solutions

- IBM requires assistance and partnering with our suppliers to help resolve these challenges which we, as a team, face to provide industry Leading, Product Differentiated and Customer Valued Solutions
THANK YOU!