QUALITY PERFORMANCE TIERING:
EVOLUTION OF THE SUPPLY CHAIN IN
EMERGING ECONOMIES

Roger Young
Vice President-Asia
Robert Eller Associates LLC
Phone: +64 21 725 745
rogeryoung@robertellerassoc.com
www.robertellerassoc.com

Plastics News Executive Forum
Saddlebrook Resort
Tampa, Florida
March 7-10, 2010
Robert Eller Associates is a 16 year-old global plastics consulting company

- Assist companies in the strategic decision making process by analyzing technical, marketing and economic implications for their business and market sectors
- Focus on TPE's, ETP's, PP Compounds/TPO, Automotive, Compounding and Foams

- Offices in Akron, Ohio (main office), France, China, New Zealand
- Multi-client studies
- Single client studies
- Mergers and acquisitions
GLOBALIZATION EFFECTS

Manufacturing Shift
Supply Chain Relocation

Emerging Economies
Urban Centers

Developed Economies
Empowered Middle Class

Product

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
EMPOWERED MIDDLE CLASS AND SHIFT TO DOMESTIC MARKETS

• In China, the number of urban households with income greater than 40000 RMB/year will triple in the next ten years and by 2025 will represent over 70 % of the forecast 400 MM urban households
• Buying boom is taking off
• Significant driving element of Asian emerging economies
• Driven by urban centers, rural areas are also growing but not as quickly.
• Buying cars, mp3 players, video games, computers, telephones, appliances
• Foreign brands popular and extract premiums over domestic products

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
DURABLE GOODS OWNED PER 100 HOUSEHOLDS IN URBAN CHINA

SOURCE: CHINA NATIONAL BUREAU OF STATISTICS
ROBERT ELLER ASSOC LLC 2010
DURABLE GOODS OWNED PER 100 HOUSEHOLDS IN RURAL CHINA

SOURCE: CHINA NATIONAL BUREAU OF STATISTICS
ROBERT ELLER ASSOCIATES LLC 2010
GLOBALIZATION EVOLUTION TODAY:
CHINA DRIVEN

- RMB currency appreciation
- Labor costs up 65-80% (last four years)
- Property cost escalation
- China position as low cost labor/manufacturing location eroded
- Innovation taking off
  - Original Chinese designs
- Higher value, higher technology industries being targeted with government support vs. the early labor intensive entrants into China: footwear, toys and textiles
- As cost of labor > cost of capital Chinese companies will utilize higher productivity technologies developed in the West (i.e. overmolding vs. 2K molding) which are more capital intense

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
GLOBALIZATION VS. LOCALIZATION

Globalization
- Lowest Global manufacturing cost
- OEM Regulatory/Specification process
- Export driven

Localization
- Low cost raw materials
- Global vs. Local: Products for the local market
  - Chery, Nissan
- Meets local quality and performance needs
- Cell phones: Nokia, Motorola, Samsung vs. TCL/Bird
  - Smaller, fewer features
  - Branding
- Colgate Palmolive: San Xiao

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
PARALLEL SUPPLY CHAIN: FOLLOWING YOUR CUSTOMER INTO NEW ECONOMIES

Nationality Based

<table>
<thead>
<tr>
<th>Compounder Nationality</th>
<th>Fabricator/OEM Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td>American</td>
<td>American</td>
</tr>
<tr>
<td>European</td>
<td>European</td>
</tr>
<tr>
<td>Korean</td>
<td>Korean</td>
</tr>
<tr>
<td>Japanese</td>
<td>Japanese</td>
</tr>
<tr>
<td>Taiwanese</td>
<td>Taiwanese</td>
</tr>
<tr>
<td>Chinese</td>
<td>Chinese</td>
</tr>
</tbody>
</table>

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
## EMERGENCE OF QUALITY/ PERFORMANCE TIERING IN EMERGING ECONOMIES

<table>
<thead>
<tr>
<th>MARKET SEGMENT</th>
<th>PRODUCT/QUALITY DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>Products produced for Global market meeting global quality and performance standards at global pricing</td>
</tr>
<tr>
<td>Glocal*</td>
<td>Products produced for domestic and export markets with near global quality and performance standards with near global pricing</td>
</tr>
<tr>
<td>Local*</td>
<td>Products produced for the local market meeting local performance, quality and price requirements</td>
</tr>
<tr>
<td>Low End*</td>
<td>Products marketed based solely on price, with low concern for quality, and performance</td>
</tr>
</tbody>
</table>

**SOURCE:** ROBERT ELLER ASSOCIATES LLC, 2010

**Note:** * = Have gained share in global recession
BREAKDOWN OF PARALLEL SUPPLY CHAIN: QUALITY/PERFORMANCE BASED TIERING

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
# QUALITY/PERFORMANCE TIERING

<table>
<thead>
<tr>
<th></th>
<th>Quality</th>
<th>Performance</th>
<th>Service</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Glocal</td>
<td>Near Global</td>
<td>Near Global</td>
<td>Moderate</td>
<td>Near Global</td>
</tr>
<tr>
<td>Local</td>
<td>Local standards</td>
<td>Local requirements</td>
<td>Low</td>
<td>Local</td>
</tr>
<tr>
<td>Low End</td>
<td>Low</td>
<td>Low</td>
<td>None</td>
<td>Low</td>
</tr>
</tbody>
</table>

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
THE EVOLVING LEVEL OF QUALITY: DEVELOPED WORLD VS. UNDEVELOPED WORLD

• Developed World vs. Undeveloped World
  – 80% of the opportunity in the Developed World is global/glocal tiers
  – 80% of the opportunity in the Undeveloped World is local/low end tiers

• Japan (1960s), Korea (1990s) are comparable models
  – Low cost, low quality manufacturing cultures evolved to high quality, high productivity, high labor cost global competitors

• Quality importance evolves as manufacturing culture matures
  – Concepts like six sigma and high productivity manufacturing techniques put greater pressure on the supply chain for higher quality, performance and consistency
  – As cost of labor increases, consumers in the undeveloped world will increasingly be willing to pay for reliability and quality until a global quality level is achieved

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
### QUALITY TIERING: SOME CHINA EXAMPLES

<table>
<thead>
<tr>
<th></th>
<th>GLOBAL</th>
<th>GLOCAL</th>
<th>LOCAL</th>
<th>LOW END</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toothbrushes</strong></td>
<td>Colgate Palmolive</td>
<td>San Xiao</td>
<td>San Xiao</td>
<td>One time use like hotel amenities</td>
</tr>
<tr>
<td><strong>Toothbrushes</strong></td>
<td>PolyOne (GLS)</td>
<td>Hotai</td>
<td>TSRC</td>
<td>Not used</td>
</tr>
<tr>
<td><strong>(SEBS Compounds)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Automobiles</strong></td>
<td>Honda</td>
<td>Buick Excelle</td>
<td>Chery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toyota</td>
<td>BYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nissan</td>
<td>SAIC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hyundai</td>
<td>FAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VW</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compounding Extruders</strong></td>
<td>ZSK: Designed and made in Germany.</td>
<td>STS: Designed and parts made in Germany, rest in China. Cost 35-45% of a ZSK</td>
<td>CTE: Designed and made in China. Cost 10-15% of a ZSK</td>
<td></td>
</tr>
<tr>
<td><strong>(Coperion)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SEBS Resin</strong></td>
<td>Kraton</td>
<td>TSRC</td>
<td>Sinopec Baling</td>
<td>Wide spec</td>
</tr>
<tr>
<td><strong>TPV</strong></td>
<td>Santoprene</td>
<td></td>
<td>Dawnprene</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
CHINESE MANUFACTURING COST ADVANTAGES (PLASTIC COMPOUNDING)

– Local raw materials based
– Typically lower wage rate than western companies
– 4-10 times lower capital depreciation
– Greater creativity in raw materials/raw material sourcing
– Lower packaging costs: returnable bags, reuse of bags
– Lower shipping costs
– Government funded institutes provide R&D sources for compounders as advanced material or high technology centers

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
<table>
<thead>
<tr>
<th></th>
<th>Local Quality Extruders</th>
<th>Glocal Quality Extruders</th>
<th>Global Quality Extruders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Quality Raw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glocal Quality Raw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Quality Raw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Increasing Costs**

*Source: ROBERT ELLER ASSOCIATES LLC, 2010*
PRODUCT DEVELOPMENT VS. CAPITAL BASE
.....an example

<table>
<thead>
<tr>
<th>SEBS Resin</th>
<th>Coperion Twin Screw Extruder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CTE</td>
</tr>
<tr>
<td>Kraton</td>
<td></td>
</tr>
<tr>
<td>TSRC</td>
<td></td>
</tr>
<tr>
<td>Sinopec</td>
<td>Lowest Price</td>
</tr>
</tbody>
</table>

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
STRATEGIC COMPETITIVE POSITIONING:
REGIONALISM AND QUALITY/PERFORMANCE TIERING IN CHINA

- What is your footprint?
- Where are your customers positioned?
- Can you supply the right product at the right price and make money?
- What does your competitors’ market space look like?
- How intense is the competition in your space?
- What markets are you best positioned to expand into?

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
QUALITY/ PERFORMANCE SUPPLY CHAIN STRATEGY: REDUCED SERVICE LEVELS

• Dow Corning Xiameter
• LyondellBasell’s Alastian
• “Stripped out bare bones products”
  – No service (pay for any services)
  – Minimum to no technical help
  – No direct sales contact/ e-commerce based
  – Take the costs out
  – Few options
  – Rebranding the role in the supply chain
• Shifting a quality tier: making a product glocal or local?

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
QUALITY PERFORMANCE TIERING: SUPPLY CHAIN CONSIDERATIONS

DOMESTIC CUSTOMER

MANUFACTURER

EXPORT CUSTOMER

- What is the price?
- What is the quality?
- What are the service requirements?
- Where does the end product get consumed (export/domestic)?

- Who are my target customers?
- What quality tier are they in?
- How do I maximize profit?
- What quality do they need (defines the price)?
- What service do they require?
- How do I protect my branding in multi-tiered markets?
- How do I protect my IP?

- Quality expectation match?
- Quality performance requirements met
- Price/ quality requirement
- Good value?
- Acceptable delivery/logistics?
- How is the quality assured?
- How do I insure the quality?
- What service do I require?

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
CONCLUSIONS

• China is the latest of the Asian economies to evolve as being the global low cost producer
  – China losing its position of being the low cost labor location
  – Globalization shift: China → Next generation emerging economies
• Quality is a function of culture, raw materials and plant design (capital cost)
  – Asian manufacturers have the capability and skills to produce global products at high quality levels/ but also reduced quality products at lower costs
• Emerging economies evolve to a quality performance tiering supply chain (from a parallel supply chain) as the domestic market takes off from the empowered middle class purchasing durable goods
• What quality tier are you participating in or targeting?

SOURCE: ROBERT ELLER ASSOCIATES LLC, 2010
Thank You!

Robert Eller Associates LLC

CONSULTANTS TO THE PLASTICS AND RUBBER INDUSTRIES