THE TPE MARKET IN INDIA:
AN EMERGING MARKET OF GIANT PROPORTIONS

PRESENTED BY:
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• Robert Eller Associates, Inc. is a 15 year-old global plastics consulting company helping companies analyze technical, marketing, and economic implications for their business to facilitate management in strategic decision making.
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• Asia: Active in China (70%), India (20%), Middle East (10%)
• 5 Key Focus Areas: TPEs, ETPs, automotive, compounding, and foams
• Multiclient studies:
  – China TPE Market: 2006
  – N. America/Europe TPE: 2006
  – Automotive Soft Trim: 2004
  – Automotive Nonwovens: 2004
• Single-client studies
• Mergers and acquisitions:
  – Complete management service for small acquisitions
  – Due diligence
  – Technical advisors
Specialty Thermoplastic Elastomers . . . Markets, Economics, Intermaterials Competition, and Industry Structure in China

A Multiclient Industry Analysis

2006

Robert Eller Associates, Inc.
CONSULTANTS TO THE PLASTICS AND RUBBER INDUSTRIES

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USA · EUROPE · CHINA · JAPAN · SOUTH AMERICA
OBJECTIVES TODAY

• Contrast China vs. India
  – What is the status of the Indian markets?
  – What can be learned from the China model?
  – What will be different?
  – How can we apply the lessons?
  – What are the implications for TPEs?

• The India TPE Industry Structure
  – Domestic players
  – MNCs
# CHINA vs. INDIA COMPARISONS

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CHINA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEMOGRAPHICS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POPULATION, i.e., POT'L. MKT.</td>
<td>1.306BN</td>
<td>1.080BN</td>
</tr>
<tr>
<td>POPULATION GROWTH RATE</td>
<td>0.6%/YEAR</td>
<td>1.4%/YEAR</td>
</tr>
<tr>
<td>LANGUAGE</td>
<td>MANDARIN</td>
<td>HINDI/ENGLISH</td>
</tr>
<tr>
<td>MEDIAN AGE</td>
<td>32.3 YEARS</td>
<td>24.7 YEARS</td>
</tr>
<tr>
<td>ADULT LITERACY RATE</td>
<td>90.9%</td>
<td>59.5%</td>
</tr>
<tr>
<td><strong>GOVERNMENT:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORM OF GOVERNANCE</td>
<td>AUTOCRACY</td>
<td>DEMOCRACY</td>
</tr>
<tr>
<td>PLANNING</td>
<td>CENTRALIZED, FOCUSED</td>
<td>DECENTRALIZED, WAVERING</td>
</tr>
<tr>
<td>OFFICIAL CORRUPTION</td>
<td>PREVALENT, NARROW</td>
<td>PREVALENT, BROAD</td>
</tr>
<tr>
<td>TAXES</td>
<td>HIGH</td>
<td>HIGH --</td>
</tr>
<tr>
<td>NON-UNIFORM</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TRANSPORTATION:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROADS</td>
<td>FAIR IMPROVING RAPIDLY IN INDUSTRIALIZED AREAS</td>
<td>POOR MAJOR IMPROVEMENTS</td>
</tr>
<tr>
<td>AIR TRANSPORT (INFRASTRUCTURE QUALITY)</td>
<td>EXCELLENT</td>
<td>FAIR MAJOR IMPROVEMENTS</td>
</tr>
<tr>
<td><strong>COMMUNICATIONS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TELEPHONE ACCOUNTS (LAND AND MOBILE)</td>
<td>532MM</td>
<td>75MM</td>
</tr>
<tr>
<td>INTERNET ACCOUNTS</td>
<td>94MM</td>
<td>19MM</td>
</tr>
</tbody>
</table>

**SOURCE:** ROBERT ELLER ASSOCIATES, INC., 2007
## CHINA vs. INDIA COMPARISONS

<table>
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<tr>
<th>CATEGORY</th>
<th>CHINA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECONOMIC TOPICS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOREIGN INVESTMENT (DIRECT &amp; INDIRECT)</td>
<td>HIGH (15X)</td>
<td>LOW</td>
</tr>
<tr>
<td>INVESTMENT AS % GDP</td>
<td>46%</td>
<td>24%</td>
</tr>
<tr>
<td>TARIFFS</td>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td>INTELLECTUAL PROPERTY PROTECTION</td>
<td>POOR</td>
<td>GOOD</td>
</tr>
<tr>
<td><strong>GENERAL PLASTICS MARKETS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PER CAPITA COMMODITY PLASTICS DEMAND</td>
<td>22 KG</td>
<td>4 KG</td>
</tr>
<tr>
<td>PLASTICS PRODUCTS</td>
<td>US$47.4</td>
<td>US$8.5</td>
</tr>
<tr>
<td><strong>OPERATIONS COSTS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELECTRICAL INFRASTRUCTURE</td>
<td>AVERAGE</td>
<td>FAIR</td>
</tr>
<tr>
<td>POWER FAILURES/MONTH</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>LABOR COST</td>
<td>LOW, RISING RAPIDLY</td>
<td>VERY LOW, STABLE</td>
</tr>
<tr>
<td><strong>GENERAL MANUFACTURING:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCT QUALITY</td>
<td>IMPROVING, VARIABLE</td>
<td>EMERGING, POOR</td>
</tr>
<tr>
<td>DOMESTIC MACHINE &amp; TOOL CAPABILITIES</td>
<td>IMPROVING RAPIDLY</td>
<td>IMPROVING</td>
</tr>
<tr>
<td>SUCCESSFUL BUSINESSES</td>
<td>MANUFACTURING, AUTOMOTIVE, MEDICAL, ELECTRONICS</td>
<td>SERVICE CENTERS, SOFTWARE, LABOR COST-SENSITIVE MFG.</td>
</tr>
</tbody>
</table>

SOURCE: ROBERT ELLER ASSOCIATES, INC., 2007
POPULATION LIVING IN EXTREME POVERTY

CHINA
S. ASIA(b)
SUB SAHARAN AFRICA

NUMBER OF PEOPLE, MILLION

SOURCE: ROBERT ELLER ASSOCIATES, INC., 2007
2005-2010 COMPARISON OF PURCHASING POWER OF HOUSEHOLDS IN INDIA

ANNUAL HOUSEHOLD INCOME ($US)

PERCENT OF POPULATION

DATA SOURCE: ROLAND BERGER, 2007

bob/mydox/chindia/charts
INDIA WILL GROW RAPIDLY DUE TO UNSTOPPABLE DEMOGRAPHIC DRIVERS

• Population: 1.08BN, growing at 1.44% p.a.

• Age Profile: 35% of Indians are below the age of 15, and 50% are below 25; age group 25-34 is the second largest group - most educated among adult groups – high income earning potential

• Per Capita Income: has grown at 10.5% CAGR for last 10 years, while peak personal tax rates are down from 50% to 30%

• Demand Growth: for consumer and convenience goods is causing local Manufacturing Economy to be created (consumer durables, FMCG, auto/transportation, water etc.)

• Change in Social Norms: Breaking down of family system, boosting demand for housing and consumer durables
### CONSUMPTION OF COMMODITY MATERIALS BY REGION (PER CAPITA)

<table>
<thead>
<tr>
<th>REGION</th>
<th>DEMAND, KG/CAPITA</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. AMERICA</td>
<td>90</td>
</tr>
<tr>
<td>W. EUROPE</td>
<td>65</td>
</tr>
<tr>
<td>CHINA</td>
<td>22</td>
</tr>
<tr>
<td>LATIN AMERICA</td>
<td>18</td>
</tr>
<tr>
<td>E. EUROPE</td>
<td>10</td>
</tr>
<tr>
<td>S.E. ASIA</td>
<td>10</td>
</tr>
<tr>
<td>INDIA</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>219</strong></td>
</tr>
</tbody>
</table>

*SOURCE: ROBERT ELLER ASSOCIATES, 2007*
## ROLE OF INDIA IN GLOBAL COMMODITY PLASTICS MARKET

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>GLOBAL</th>
<th>ASIA</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPACITY ('000 kT)</td>
<td>168</td>
<td>73</td>
<td>4.6</td>
</tr>
<tr>
<td>PRODUCERS</td>
<td>140</td>
<td>64</td>
<td>47</td>
</tr>
<tr>
<td>OPERATING RATE (%)</td>
<td>86</td>
<td>87</td>
<td>102</td>
</tr>
<tr>
<td>DOLLAR VALUE ($B)</td>
<td>150</td>
<td>66</td>
<td>5</td>
</tr>
<tr>
<td>CONSUMPTION PER CAPITA</td>
<td>22</td>
<td>17</td>
<td>4</td>
</tr>
</tbody>
</table>

SOURCE: RELIANCE INDUSTRIES, 2006
IMPACT OF CHINA’S GROWTH

• China is pushing up global prices of oil, steel, copper, chemicals – everything it consumes

• China is driving down global prices of textiles, tools, appliances, and toys – everything it produces

• China is a major purchaser of U.S. Treasuries – funding the U.S. deficit and consumption

• China’s domestic TPE compounders typically have a 30% cost advantage to foreign competitors
TOOTHBRUSH MANUFACTURING: CHINA 6X INDIA

GLOBAL TOOTHBRUSH PRODUCTION HISTORY

- N. AMERICAN PRODUCTION
- EUROPEAN PRODUCTION
- INDIAN PRODUCTION
- CHINESE PRODUCTION

SOURCE: ROBERT ELLER ASSOCIATES, INC., 2007
GLOBAL WET RAZOR PRODUCTION HISTORY

- N. AMERICAN PRODUCTION
- EUROPEAN PRODUCTION
- INDIAN PRODUCTION
- CHINESE PRODUCTION

RAZORS: CHINA 3.5X INDIA

SOURCE: ROBERT ELLER ASSOCIATES, INC., TPE MULTICLIENT STUDY, 2006
Manufacturer: Gillette
Product Name: Mach 3, Grip
TPE Type: SEBS
Bond Type: Physical
Mfr. Location: China
Note: Grip and head with different TPEs

Manufacturer: Gillette
Product Name: Venus 3
TPE Type: SEBS
Bond Type: Chemical
Mfr. Location: Poland
GLOBAL POWER TOOL PRODUCTION HISTORY

POWER TOOLS: CHINA >20X INDIA

SOURCE: ROBERT ELLER ASSOCIATES, INC., TPE MULTICLIENT STUDY, 2006
INDIA, CHINA, AND U.S. CELL PHONE USE (MM PEOPLE)

CELLULAR PHONE USERS

- **INDIA**
- **CHINA**
- **USA**

**SOURCE:** ROBERT ELLER ASSOCIATES, INC., 2007
PASSENGER CAR MARKET IN INDIA (2006-2012)

DATA SOURCE: ROLAND BERGER, 2007

bob/mydox/chindia/charts
TPV DEMAND IS GROWING, BUT STILL A SMALL MARKET

• Global TPV Vehicle Usage:
  – 2005: 2.1 kT/vehicle
  – 2010: 2.6 kT/vehicle

• India Auto Demand 2010 -- 5.5 kT

• Automotive in N. America/Europe approx. 50% of TPV demand

• China < 4MM cars, TPV demand 30%, changing rapidly in 2006/2007 as auto demand increased past 6MM cars

• Total India TPV demand 2010 – 15-16 kT
TPE MARKETS: AN EMERGING MARKET STATUS REPORT

TPE Markets

• Auto:
  - TPV will dominate demand
  - Seals will be a driver
  - Airbag doors
  - Large-part soft touch for door panels and inst. panels
  - Low cost A/B car demand will be high (PP and TPO intensive)
• Footwear: much smaller than China (< 5 kT compound)
• Stationery/Personal Care: rapid growth
• Electrical/Electronics: will require increased rate of manufacturing shift
• Wire/Cable
• Medical: small, evolving applications
### Domestic Indian TPE Compounders

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>TPE-S</th>
<th>o-TPV</th>
<th>TPU</th>
<th>TPO</th>
<th>NOTES</th>
</tr>
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<tbody>
<tr>
<td>BAYER</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HYDRO S&amp;S</td>
<td></td>
<td>X (p-TPV)</td>
<td></td>
<td></td>
<td>AGENTS FOR SANTOPRENE (f-TPV)/ COMPOUNDER FOR p-TPV</td>
</tr>
<tr>
<td>MACHINO-BASELL INDIA (MBI)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SYNERGY MULTIBASE</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYNOPRENE POLYMERS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TECHNOVINYL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TIPCO</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>MITSUI RELATIONSHIP ADVANCED TPEs FROM AMF POLYMERS</td>
</tr>
<tr>
<td>ZYLOG</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** ROBERT ELLER ASSOCIATES, INC., 2007
ENTRANCE OF MNCs INTO INDIA

• Slower movement from N. America/Europe (China is the current larger target)

•Entrants:
  – Japan: India a preferred option?
  – NA/Europe: PolyOne, Noveon, Merquinsa
  – Asia: SPC
  – Domestic: Supreme?
  – Large material suppliers positioning themselves (Dow, BASF, GE)
ASIA GROWTH

• Asia Pacific, led by India and China, will see robust economic growth through at least the next decade.
  - Domestic demand key, not just exports
  - China significantly ahead in manufacturing, but India will close the gap

• Growth is not restricted to India and China; ASEAN and ANZ have healthy growth rates.

• It is a global world. Manufacturing will operate in an internationally competitive environment: low cost producer meeting local quality needs will ultimately be the survivors.

• Understanding Asia is important for all producers, regardless of their position in the value chain.
Thank You!

Robert Eller Associates, Inc.
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