Trends in Global Markets for Corrugated Packaging

FPPA 16th Annual Convention

March 4, 2013

Dick Storat, President, PSSMA & President, RSA, Inc.
Paper Shipping Sack Manufacturers’ Association (PSSMA)

- National trade association of multiwall sack and bag producers.
- Members represent over 90% of US production
- Industry sales of $1.2 Billion
- Comprehensive statistical program
- Strong Associate & International Member Program
- Visit www.pssma.org

- Economic consulting services for the paper packaging and allied industries
  - Focus on industry level analysis of
    - Containerboard and corrugated
    - Kraft paper and multiwall sacks
  - Support Trade Associations in statistical programs and analysis
- Publish **Scoring Boxes™**, a monthly analysis of containerboard markets
  - Timely delivery of key industry statistics
  - Extensive graphs highlight current industry trends
  - Quick-read incisive analysis of market conditions
  - Tools to make informed decisions
Scoring Boxes™

Scoring Boxes™ February 21, 2013

A monthly perspective on conditions in the corrugated and containerboard industry

Monthly Change in Containerboard Flows
December 2012 = January 2013

Box Plant & Mill Containerboard Inventory

Containerboard Flows – January 2013

Box Plant Shipping Days

Linerboard Production for Export

Unidentified Uses of Containerboard

PSSMA. Multiwall, The Natural Packaging Choice
Agenda

- Global Corrugated Market Profile and Growth Projections
- US Corrugated Market Trends
Global Corrugated Production Shares by Area

- N. America: 21%
- Europe: 24%
- China: 25%
- Rest of Asia: 9%
- Pacific Rim: 10%
- C & S America: 6%
- Other Regions: 5%

Source: ICCA

2011 Production = 203 Billion Square Meters

PSSMA Multiwall, The Natural Packaging Choice
Asia ex. China Corrugated Production by Weight

9% of World Total or 18 billion square meters

- Indonesia: 23%
- India: 32%
- Thailand: 19%
- Malaysia: 9%
- Vietnam: 8%
- Philippines: 5%
- Singapore: 2%
- Pakistan: 2%

Source: ICCA

PSSMA...Multiwall, The Natural Packaging Choice
Top 15 Country Ranking by Corrugated Output 2010

- China: 24
- USA: 19
- Japan: 7
- Germany: 5
- Italy: 3
- India: 3
- France: 3
- Brazil: 3
- South Korea: 3
- Spain: 2
- Indonesia: 2
- UK: 2
- Thailand: 2
- Poland: 2
- Canada: 2

Source: ICCA

Top 1 = 25% of Global Production
Top 3 = 50% of Global Production
Top 15 = 80% of Global Production
Factors Affecting Global Corrugated Demand

- Economic Growth
- Industrial Production
- Population Growth
- Per Capita Income and Growth
- Per Capita Corrugated Consumption
- Corrugated Construction (Basis Weight)
EU vs. U.S. Real GDP Percent Change from Previous Year
1996 (Q1) - 2012 (Q3)

Source: Eurostat and U.S. Bureau of Economic Analysis
http://appsso.eurostat.ec.europa.eu and bea.gov
Includes 27 EU countries. Seasonally adjusted.
2013-02-07

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World and Regional GDP Growth

Source: RSA, Inc.

North America: 2% (2011), 2.2% (2013)
Europe: -0.4% (2011), 0% (2013)
Pacific Rim: 0.2% (2011), 1.2% (2013)
China: 9.3% (2011), 7.9% (2013)
Rest of Asia: 4.3% (2011), 4% (2013)
C & S America: 4.5% (2011), 4.2% (2013)
World: 2.7% (2011), 2.4% (2013)
Industrial Production vs. Corrugated Production (2005-2010)

Source: ICCA
2010 Population - Millions

- China
- India
- Africa
- Mid East & Central Asia
- USA
- S. Am. ex Brazil
- Indonesia
- Brazil
- Pakistan
- Russia
- Japan
- Mexico
- Philippines
- Vietnam
- Germany

Source: RSA, Inc.

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5 Year Projected Population Growth (2010-2015)

- Africa
- Philippines
- Pakistan
- India
- Brazil
- Mexico
- WORLD
- Indonesia
- Vietnam
- USA
- China
- Japan
- Russia

Source: World Bank, RSA, Inc.

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Population Growth 2010-2015 - MILLIONS

- Africa
- India
- China
- Mid East & Central Asia
- Brazil
- S. Am. Ex Brazil
- Pakistan
- USA
- Indonesia
- Philippines
- Mexico
- Vietnam
- Turkey
- Central America

Source: World Bank, RSA, Inc.

World Population Growth = 361 Million
Gross National Income per capita

<table>
<thead>
<tr>
<th>Country</th>
<th>2010</th>
<th>2006</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>3.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>2.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>8.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>20.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>14.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>16.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>12.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>14.3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: RSA, Inc.

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Per Capita Annual Corrugated Consumption
(Square Meters)

- USA
- Pacific Rim
- Canada
- Europe
- China
- Brazil
- Mexico
- C & S America
- Russia
- Vietnam
- Rest of Asia
- Other Regions
- India

Africa = 2)

Source: ICCA, RSA Inc.
Global Corrugated Production Shares by Area

- **China** *(25%)*
  - Forecast Production in 2016 = 241 Billion Square Meters
- **Rest of Asia** *(9%)*
- **C & S America** *(6%)*
- **Europe** *(24%)*
- **N. America** *(21%)*
- **Pacific Rim** *(10%)*
- **Other Regions** *(5%)*

*Source: ICCA*

*2011 shares*
Global & Regional Corrugated Production Growth

Average Percent per Year

<table>
<thead>
<tr>
<th>Region</th>
<th>2006-2011</th>
<th>2011-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. America</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Europe</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Pacific Rim</td>
<td>0.5</td>
<td>1.3</td>
</tr>
<tr>
<td>China</td>
<td>11.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>5.3</td>
<td>7.2</td>
</tr>
<tr>
<td>C &amp; S America</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Other Regions</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>World</td>
<td>2.8</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Source: ICCA
Projected Top 15 Country Corrugated Growth (% Share of Total World Growth)

China
India
USA
Indonesia
Vietnam
South Korea
Germany
Brazil
Turkey
Poland
Thailand
Mexico
Italy
France
Russia

Top 15 Countries account for 91% of Total Projected World Growth

Source: ICCA
Projected Top 15 Country Corrugated Growth
(Average Annual Growth Rate, Percent)

Top 15 Countries account for 91% of Total Projected World Growth

Source: ICCA
2011 Corrugated Consumption Share by End Use Market

- FMCG Markets: 44%
- Industrial and Machinery: 22%
- Durables: 21%
- Fresh Foods/Produce: 8%
- Others: 5%

Source: ICCA
2011-2016 Corrugated Growth Share by End Use Market

Total Projected Growth = 37.8 Billion Square Meters

- Processed Foods: 22%
- Drinks: 13%
- Non Food Consumables: 10%
- Fresh Foods/Produce: 6%
- Domestic Appliances and Electrical Goods: 10%
- Durable Goods and Clothing: 10%
- Industrial and Machinery: 22%
- Others: 5%

Source: ICCA
2011-2016 Corrugated Growth Share by End Use Market (Developed Nations)
Total Projected Growth = 7.7 Billion Square Meters

- Processed Foods: 32%
- Non Food Consumables: 15%
- Fresh Foods/Produce: 7%
- Domestic Appliances and Electrical Goods: 4%
- Durable Goods and Clothing: 6%
- Industrial and Machinery: 12%
- Drinks: 9%
- Others: 15%

Source: ICCA
2011-2016 Corrugated Growth Share by End Use Market (Developing Nations)

Total Projected Growth = 30.2 Billion Square Meters (80% of Total)

- Processed Foods: 19%
- Drinks: 14%
- Non Food Consumables: 9%
- Fresh Foods/Produce: 6%
- Domestic Appliances and Electrical Goods: 14%
- Durable Goods and Clothing: 11%
- Industrial and Machinery: 24%
- Others: 3%

Source: ICCA
Global Corrugated Trends Summary

- Per capita corrugated output will grow by 30-35% in Asia, but marginally elsewhere
- Better packaging productivity and environmental awareness will drive more packaging reduction
- Corrugated’s share of packaging should not change significantly
- Global corrugated demand will grow at an average annual rate of 3-4%, compared to 2.8% average growth over the past 5 years.
- China holds a 25% share of global corrugated output and will contribute half of global corrugated growth.
- Retail Ready Packaging will grow share of corrugated packaging
- Microflute continues to offer above average growth potential
- Decorative print will grow faster than the overall rate of corrugated packaging

Source: RSA, Inc., ICCA
Factors Affecting US Corrugated Markets

✓ Economic Activity
✓ Consumption of Nondurable Goods
✓ Manufacturing Activity
✓ Containerboard Consumption
✓ Inventory Changes
US GDP by Component & Total

Source: BEA & RSA, Inc.
Consumer Spending
Year-over-Year Percentage Change

Source: BEA
Personal Consumption Expenditures by Category

- Services: 66%
- Durable Goods: 12%
- Nondurable Goods: 22%

Source: BEA
Consumer Spending
Durable Goods

Index (2002 = 100)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Source: BEA

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Consumer Spending
Nondurable Goods

Index (2002 = 100)

Source: BEA

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Industrial Production
Nondurable Consumer Goods

Index (2007 = 100)

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

2011  2012  2013  Percent change 2013-to-date

Source: US Federal Reserve
Inventory/Sales Ratios

Source: US Census Bureau

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Purchasing Managers' Index

Above 50 shows manufacturing expansion

Below 50 shows manufacturing contraction
Below 42.7 shows economic recession

Source: Institute for Supply Management
New Orders - Inventories: Proxy for Future Production

Source: Institute For Supply Management, RSA
Containerboard Flows – January 2013

(000 Tons)

Mill Inventory: 53
Imports: 57
Other Sources (Imputed): 66

Capacity: 3,067
Unmade: 89
Production: 2,979
@97.1% Op. Rate

Liner: 2,122
Medium: 857

Made for Export: 365
Made
Exported
Jan Dec
Liner 323 371
Medium 43 49

Box Plant Inventory: 256
Consumption: 2,533
Corrugators
January Box Plant & Mill Containerboard Inventory Changes

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons</th>
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<tbody>
<tr>
<td>08</td>
<td>202</td>
</tr>
<tr>
<td>09</td>
<td>-57</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>11</td>
<td>163</td>
</tr>
<tr>
<td>12</td>
<td>121</td>
</tr>
<tr>
<td>13</td>
<td>203</td>
</tr>
<tr>
<td>5 Yr Avg</td>
<td>102</td>
</tr>
<tr>
<td>10 yr avg</td>
<td>104</td>
</tr>
</tbody>
</table>

Source: AF&PA, FBA

PSSMA: Multiwall, The Natural Packaging Choice
Monthly Change in Containerboard Flows
December 2012 → January 2013
(000 Short Tons)

Change in US Mill Shipments = Change in Exports + Change in Imputed Other Uses + Change in Box Plant Domestic Receipts

1 Box Plant Domestic Receipts = Corrugator Consumption + Inventory Accumulation - Imports

Source: RSA, Inc.
THANK YOU

✓ Thank you for the opportunity to participate!
✓ What are your questions and feedback?

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