2018 Global Molded Pulp Market Outlook

IMFA – Annual Conference:
Sheraton San Diego Hotel & Marina

Friday, April 20, 2018
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  - Packaged Facts – Consumer Trends
  - Simba – Education & Publishing
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- **Custom Research Services**
Freedonia has been analyzing and reporting on the global molded pulp industry since 2009 and the North American market since 1995.

- Global economic outlook
  - North America
  - Europe
  - Asia/Pacific
  - Rest of the World
- Growth outlook for key markets
  - Foodservice
  - Food and beverage production
  - E-commerce
- Demand for molded pulp
  - By type
  - By market
  - By region
- North American molded pulp demand
- Rest of the World molded pulp demand
- Key trends impacting the molded pulp industry
  - Competitive substrates (foam, plastic, other-paper)
  - Regulatory environment
  - Other key industry trends
- Keeping up with the industry
The global economy largely strengthened over the past two years and should continue to grow about 3.5% annually over the next four years.

- The US economy has expanded for 104 straight months since June 2009 – the end of the great recession.
  - This will be the second longest economic expansion in US history and would break the record (120-month expansion from 1991 to 2001) in mid-2019.
Momentum in the global economy is trending upwards, and most market watchers have noted a broad-based strengthening over the past year.

Most economic forecasts for 2018 and 2019 have edged up 10-30 basis points over the past six to nine months, suggesting that most global regions are poised to grow steadily over the next few years.

In many areas – Central and South America, Africa and Europe – geopolitical risks are lessening or abating, resulting in renewed business confidence.

– OECD business confidence index rose from 99.8 in January 2016 to 101.4 in February 2018.
Key markets for molded pulp products will grow steadily in North America from 2017 to 2022 but at a slight slower rate than over the past seven years.

<table>
<thead>
<tr>
<th>Item</th>
<th>2010</th>
<th>2017</th>
<th>2022</th>
<th>17/10</th>
<th>22/17</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North America Key Market Indicators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foodservice (billion US$)</td>
<td>725</td>
<td>980</td>
<td>1,200</td>
<td>4.4%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Food MVA (billion US 2016$)</td>
<td>318</td>
<td>345</td>
<td>361</td>
<td>1.2%</td>
<td>0.9%</td>
</tr>
<tr>
<td>E-Commerce (billion US$)</td>
<td>285</td>
<td>555</td>
<td>815</td>
<td>10.0%</td>
<td>8.0%</td>
</tr>
<tr>
<td><strong>United States Real GDP</strong></td>
<td>1,439</td>
<td>1,675</td>
<td>1,830</td>
<td>2.2%</td>
<td>1.8%</td>
</tr>
<tr>
<td><strong>Canada Real GDP</strong></td>
<td>1,910</td>
<td>2,295</td>
<td>2,600</td>
<td>2.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Mexico Real GDP</strong></td>
<td>16,471</td>
<td>19,050</td>
<td>21,110</td>
<td>2.1%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Source: Freedonia Custom Research

- The US and Canada are set for a “soft patch” in their economic outlooks in the 2019-2020 timeframe.
- Very few economists are predicting a recession over the next few years.
  - That said, the US and Canada could see a period of a few weak quarters of growth in late 2019 and into early 2020.
- Key molded pulp markets will see steady growth, albeit a pace that slightly underperforms the growth rates achieved in the 2010-2017 period.
Gradually strengthening economies and solid growth in foodservice markets and e-commerce will anchor demand for molded pulp products in Europe.

Despite Brexit, the United Kingdom should lead the big economies of Western Europe with 1.7% real growth per year between 2017 and 2022.

France is expected to follow close behind with 1.6% annual real GDP growth over the same period, while Germany is likely to rise only 1.2% per annum through 2022.

The Russian economy is forecast to increase a real 1.6% per year over this period, reversing the past two years of virtual stagnation.

Foodservice revenues should accelerate over the next five years, and e-commerce growth will remain robust, anchoring demand for molded pulp products.
Foodservice and food production should buoy demand for molded pulp, while e-commerce will decelerate due to a maturing Chinese market.

The Chinese economy is expected to expand by close to 6% per year in real terms from 2017 to 2022, while e-commerce in China will average over 15% annual growth over the same period.

The Indian economy is forecast to grow in excess of 7% per year through 2022.

As the region’s economies (excluding China and Japan) strengthen over the next five years, rising levels of wealth will lead to strong gains in the foodservice sector.

E-commerce is also expected to grow above 10% per year in India, Thailand and Indonesia.

<table>
<thead>
<tr>
<th>Item</th>
<th>2010</th>
<th>2017</th>
<th>2022</th>
<th>CAGR 17/10</th>
<th>CAGR 22/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia/Pacific Market Indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foodservice (billion US$)</td>
<td>985</td>
<td>1,600</td>
<td>2,300</td>
<td>7.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Food MVA (billion US 2016$)</td>
<td>715</td>
<td>983</td>
<td>1,217</td>
<td>4.7%</td>
<td>4.4%</td>
</tr>
<tr>
<td>E-Commerce (billion US$)</td>
<td>135</td>
<td>450</td>
<td>800</td>
<td>18.8%</td>
<td>12.2%</td>
</tr>
<tr>
<td>China Real GDP</td>
<td>13,743</td>
<td>22,900</td>
<td>30,430</td>
<td>7.6%</td>
<td>5.9%</td>
</tr>
<tr>
<td>India Real GDP</td>
<td>5,850</td>
<td>9,285</td>
<td>13,120</td>
<td>6.8%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Other Asia/Pacific Real GDP</td>
<td>100.0</td>
<td>127.6</td>
<td>150.9</td>
<td>3.5%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

Source: Freedonia Custom Research
Emerging markets should see strong economic growth over the 2017-2022 period, leading to increased demand for molded pulp products.

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<th>2010</th>
<th>2017</th>
<th>2022</th>
<th>CAGR</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17/10</td>
</tr>
<tr>
<td><strong>Rest of the World Key Market Indicators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foodservice (billion US$)</td>
<td>180</td>
<td>300</td>
<td>450</td>
<td>7.6%</td>
</tr>
<tr>
<td>Food  MVA (billion US 2016$)</td>
<td>365</td>
<td>448</td>
<td>522</td>
<td>3.0%</td>
</tr>
<tr>
<td>E-Commerce (billion US$)</td>
<td>25</td>
<td>60</td>
<td>100</td>
<td>13.3%</td>
</tr>
<tr>
<td><strong>Middle East &amp; North Africa Real GDP</strong></td>
<td>8,654.0</td>
<td>10,868</td>
<td>12,873</td>
<td>3.3%</td>
</tr>
<tr>
<td>Sub-Saharan Africa Real GDP</td>
<td>3,086</td>
<td>3,962</td>
<td>4,787.0</td>
<td>3.6%</td>
</tr>
<tr>
<td>C&amp;S America Real GDP</td>
<td>6,813</td>
<td>7,465</td>
<td>8,520</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Source: Freedonia Custom Research

- Freedonia anticipates that Central and South America has turned the corner, as both Brazil and Argentina begin to grow steadily again.
- Economic growth should also accelerate in the Middle East, North Africa and Sub-Saharan Africa.
- Rising incomes are spurring strong growth in the foodservice sector across these emerging markets.
- South Africa, Argentina and Brazil should all see e-commerce grow by more than 10% per year over the forecast period.
Recycled fiber remains the dominant raw material in global molded pulp products.

2017 Molded Pulp Demand by Fiber Type

- Recycled fiber remains the dominant raw material in global molded pulp products.
- The use of recycled fiber should continue to outpace the use of virgin fiber in most molded pulp products and in most markets of the world.
- Recycled fiber will comprise approximately 86% of the market for molded pulp by 2022.

2017 Molded Pulp Demand by Fiber Type

- Recycled Fiber: 85%
- Virgin Fiber: 15%

CAGR 2022/2017

- Global: 5.4%
- Recycled Fiber: 5.8%
- Virgin Fiber: 3.6%

The following figures are based on CAGR (Compounded Annual Growth Rate) and approximate figures for 2017:

- Recycled Fiber: ≈$2.8 billion
- Virgin Fiber: ≈$500 million
Developing economies account for more than half of global demand for molded pulp products and represent the largest growth opportunities.

Global Molded Pulp Demand By Region

- 24% in North America
- 23% in Europe
- 41% in Asia/Pacific
- 12% in Rest of the World

Global Molded Pulp Demand By Region

$3.4 billion

CAGR 2022/2017
- Global: 5.4%
- North America: 4.6%
- Europe: 3.0%
- Asia/Pacific: 6.8%
- Rest of the World: 5.6%

- The North American and European markets are roughly the same size, with food packaging representing the single largest market in both regions.
- By 2022, the global molded pulp market will be nearly $4.4 billion
The largest single segment for molded pulp demand is food-oriented packaging – eggs, fruits, berries and other fresh produce.

Global Molded Pulp Demand by Market

- Protective Packaging: 22%
- Food Packaging: 48%
- Foodservice: 29%
- Other: 1%

E-commerce is driving strong growth in molded pulp demand for protective packaging applications, and the growing foodservice industry is buoying demand for food and beverage trays and other disposable molded pulp items.

CAGR 2022/2017

- Global: 5.4%
  - Protective Packaging: 6.6%
  - Food Packaging: 3.9%
  - Foodservice: 6.5%
  - Other: 4.6%

$3.4 billion
The North American molded pulp market is anticipated to grow 4.6% per year over the 2017-2022 period.

- The North American molded pulp market is dominated by packaging for fruits, berries and vegetables. Bulk carry trays, egg cartons and berry/mushroom tills are the preponderance of this demand.
- E-commerce is driving strong gains in protective packaging, which utilizes molded pulp in select consumer goods and electronic shipments.
Growth in molded pulp demand in emerging markets will be driven by strong gains in protective packaging and foodservice products.

- Rising standards of living, urbanization and steady economic growth will underpin demand for molded pulp related to e-commerce markets, particularly in Asia, and foodservice packaging products.
- Asia is anticipated to exceed 8% annual growth in molded pulp usage in both protective packaging and foodservice products.
- Central and South America should see the strongest growth in molded pulp in foodservice packaging products.
Molded pulp products will continue to face competition from plastic, other paper substrates and foam in each market segment.

- In each key market category, molded pulp faces competition from alternative substrates:

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Growth Outlook (2022/2017 CAGR)</th>
<th>Market Drivers</th>
<th>Key Players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pillows and bubble wrap</td>
<td>• Protective packaging</td>
<td>7-10%</td>
<td>• E-commerce</td>
<td>Sealed Air, Pregis, Storopack, DS Smith</td>
</tr>
<tr>
<td>Paper-fill and dunnage</td>
<td>• Protective packaging</td>
<td>~6%</td>
<td>• E-commerce</td>
<td>Signode, Tianjin Newtrans, Ranpak</td>
</tr>
<tr>
<td>EPS foam</td>
<td>• Protective packaging</td>
<td>4-6%</td>
<td>• E-commerce</td>
<td>Numerous players in each region</td>
</tr>
<tr>
<td></td>
<td>• Food packaging</td>
<td></td>
<td>• Environmental factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Foodservice</td>
<td></td>
<td>• Food production</td>
<td></td>
</tr>
<tr>
<td>Rigid plastics (PET)</td>
<td>• Food packaging</td>
<td>4-5%</td>
<td>• Food production</td>
<td>Numerous players in each region</td>
</tr>
<tr>
<td></td>
<td>• Foodservice</td>
<td></td>
<td>• Foodservice revenues</td>
<td></td>
</tr>
<tr>
<td>Paperboard</td>
<td>• Foodservice</td>
<td>4-5%</td>
<td>• Foodservice revenues</td>
<td>BillerudKorsnas, International Paper, Metsa, Georgia-Pacific</td>
</tr>
<tr>
<td></td>
<td>• Food packaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Protective packaging</td>
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</tbody>
</table>

Source: Freedonia Custom Research
Molded pulp stands to gain in some markets due to environmental concerns that are discouraging use of foam-based products.

- Approximately a dozen US cities – including New York, Seattle and Washington, DC – have banned or taxed the use of polystyrene single-use products such as clams shells, cups, and other food and foodservice packaging.

- Europe has recently laid out a EU-wide strategy to curb the use of single-use plastic items that seems likely to discourage the use of foam in a variety of food and foodservice packaging – A European Strategy for Plastics in a Circular Economy (January 2018).

- Major brand-owners are moving away from the use of EPS foam products. For example, McDonald’s announced in January 2018 that it would “eliminate foam packaging from our global system by the end of 2018”.

- In Asia, cities in Malaysia, India, Vietnam and the Philippines have also banned the use of polystyrene foam products, which is changing the preferred substrates used in the food packaging and foodservice industries.

- The risk to molded pulp may be that the foam industry retreats from the food packaging and foodservice markets and re-focuses its marketing efforts on protective packaging, where the product’s recyclability could be better messaged and made more operationally viable.
The molded pulp industry continues to innovate to enhance the product’s value proposition.

- Other notable trends within the industry:
  - Advances in bio-based coatings to enhance moisture resistance and printability
  - R&D efforts in energy efficiency have led to advances in pulping and drying methods that are reducing costs
  - 3D printed mold tooling can reduce tool cost and “solutioning” procurement timeframe
  - Increased use of non-wood fibers (bamboo, sugarcane, palm, etc)
  - Printing options and vibrant colors have opened up new options for molded pulp products
  - Freedonia anticipates more PoP displays and other niche uses of molded pulp to gain wider acceptance
Questions?

Additional information can be found in Freedonia Industry Studies:


www.freedonia.com

On-Time ● On-Target ● On-Budget

Daniel Meges
Sr. Director, Client Solutions
Freedonia Custom Research –division MarketResearch.com
dmeges@freedonia.com
+1.440.684.1261 ext. 339