Global Containerboard Dynamics
*Trends and Issues*

ACCCSA

July 9, 2019
Fisher International

Fisher International is an information services and management consulting firm offering pulp and paper businesses better performance through the strategic use of business intelligence.

What We Believe
Every Company Should Have the Best Possible Business Intelligence.

Our Vision
To enable pulp and paper businesses worldwide to make informed decisions precisely, fast, broadly, and efficiently.
We Help Clients Make Significant and Enduring Improvements to Their Performance

**THE** industry leader in strategic data-informed decision making

**Integrated solutions** that increase our customers’ decision making

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Deep domain knowledge promoted via **Thought Leadership**

**Best-in-class** digital product development and product innovation

**Expert consulting**, coaching and training from industry leaders
What We’ll Talk About Today

• Why are global containerboard issues important to ACCCSA corrugators?
• Some facts about the global containerboard market
• Some facts about the Latin American containerboard market
• Big issues over the next several years that will impact the containerboard markets:
  – China’s banning of recycled fiber
  – E-commerce
  – New capacity expansions (even as demand is now slowing)
  – Anti-plastic
But first, why should ACCSA members care about global containerboard markets?
First, the Obvious: Paper Costs Are 70%+ of the Costs of a Corrugated Sheet

U.S. Corrugated Sheet Costs by Cost Type, 2019

...but what might not be so obvious...
Why Should Latin American Corrugators Care About Global Containerboard Markets?

Kraftliner Prices 2007 to 2018 by Region

Why Should Latin American Corrugators Care About Global Containerboard Markets?

Kraftliner Prices 2007 to 2018 by Region

R = 0.88

Why Should Latin American Corrugators Care About Global Containerboard Markets?

Global Kraftliner Prices 2007 to 2018 by Region

R = 0.57

Why Should Latin American Corrugators Care About Global Containerboard Markets?

Global Kraftliner Prices 2007 to 2018 by Region

R = 0.92

Globally, Linerboard Market Dynamics Are Well Connected

Global Kraftliner Prices 2007 to 2018 by Region

Worldwide events impact the business of ACCCSA members

Facts about the global containerboard market
What Grades Make Up “Containerboard”? 

Global Containerboard Capacity by Finished Product

- **Linerboard**
  - Bleached Kraftliner
  - Recycled White Top Liner
  - Kraftliner
  - Virgin Corrugating Medium
  - Kraftliner

- **Corrugated Medium**
  - Recycled Corrugating Medium
  - Recycled Liner
  - White Top Kraftliner

What Types of Fiber Are Containerboard Made From?

Global Containerboard Capacity by Grade by Furnish

- **Linerboard**
  - Chemical
  - Mechanical
  - Recycled
  - Other

- **Corrugated Medium**
  - Chemical
  - Mechanical
  - Recycled
  - Other

Where Is Containerboard Made?

The largest markets are Asia, North America, then Europe.

Where Is Containerboard Made?

- **North America:** 18%
- **Latin America:** 5%
- **Europe:** 20%
- **Middle East:** 1%
- **Africa:** 1%
- **Asia Pacific:** 53%

**TOTAL:** 207,873,653 FMT
Where Is Virgin Liner and Medium Made?

However, virgin linerboard is made where the fiber is
Two Big Cycles in the History of Global Containerboard Capacity

The Capacity Boom in Asia Has Made it the World’s Largest Containerboard Market

Global Capacity Evolution by Region by Year

Asia now has ~50% of the world’s containerboard supply

Worldwide, Containerboard Consumption Grows Closely with Wealth (GDP / Person)

As countries GDP grows, so does containerboard demand

Globally, There Are 960 Companies that Make Containerboard – The Top 5 Account for 21%

Global Containerboard Capacity Share by Company

- **All Other**: 64%
- **Nine Dragons**: 5%
- **WestRock**: 4%
- **Smurfit Kappa**: 3%
- **Lee & Man**: 3%
- **DS Smith**: 2%
- **Shanying**: 2%
- **PCA**: 2%
- **G-P**: 2%
- **SAICA**: 1%
- **Long Chen**: 1%
- **Oji Materia**: 1%
- **Mondi**: 1%
- **SCG Packaging**: 1%

**TOTAL: 207,873,653 FMT**

Worldwide, containerboard is a fragmented market
Global Containerboard Supply Is Most Consolidated in North America; Least in Asia (But That Will Change, Soon)

Global Containerboard Capacity by Company, by Region

Globally, Linerboard and Medium Dynamics Are Well Connected

Global Liner and Medium Prices 2007 to 2018

Containerboard manufacturing costs
Fiber, Followed by Energy, Labor, and Materials, Are the Largest Drivers of Containerboard Costs

Global Average Cost Structure of Containerboard Producers

- Raw Material Fiber
- Pulps
- Chemicals
- Energy
- Labor
- Materials
- Overhead
- Credits

Though Costs Can Vary Widely by Region, Country (and Company, Even)

Global Container Cost Curve by Region, 2019 Q1

Region
- Africa
- Asia Pacific
- Europe
- Latin America
- Middle East
- North America

A word about cost curves and their importance— a trip back to your Economics class
In Classical Economics, the Price is Determined by the Intersection of Supply and Demand
A “Cost Curve” Defines the Shape of the Supply Curve for Containerboard

Global Containerboard Cost Curve, by Country, 2018

A “Cost Curve” Defines the Shape of the Supply Curve for Containerboard
What Cost Curves Can Tell Us

• “Minimum price” for a given commodity – say linerboard and medium, in down cycles when demand falls
• High cost mills or companies which may be at risk for closure
• Lowest cost countries for exporting a given containerboard product
• As a buyer, when you are getting a “good deal” on a given containerboard product → is it cost competitive?
Take the Last Downturn, for Example…

Global Liner and Medium Prices 2007 to 2018

Take the Last Downturn, for Example...

Global Liner and Medium Prices 2007 to 2018

Prices seem to reach a bottom in certain markets, before turning up.
We Can See the Same “Bottoms” in Latin American Prices...

Kraftliner Prices 2007 to 2018 by Region

The last “bottom” was just under $600 / mt

…Which Are Accurately Predicted by the Cost Curve for Linerboard

Global Kraftliner Costs Delivered to Ecuador

Region
- Africa
- Asia Pacific
- Europe
- Latin America
- Middle East
- North America

Facts about the ACCCSA containerboard market
Containerboard Imports by Major Latin American Countries in 2018

Countries represented by the ACCCSA imported 1.7 MM tonnes in 2018
The United States Is the Largest Exporter (by Far) to Latin American Corrugators – Brazil Is Second
ACCCSA Countries Are Net Importers of Linerboard – 1.6 MM MT / Year and Growing
Brazil Is the Largest Market for Containerboard in Latin America
In ACCCSA Countries, Brazil is by far the largest producer of containerboard, and the largest source of virgin fiber.
Latin American Containerboard Machines (Yellow) Tend to Be Smaller and Slower Than European and North American Machines
New, Big Capacity Announcement Made by Klabin this Spring

- ~1,000,000 MT of capacity of low-cost linerboard
- First of two machines starts up in 2022, the second machine starts in 2024
- Will sell to Latin American and global markets
Brazilian Containerboard Is Low Cost to Some Latin American Markets

Kraftliner Delivered to Argentina

...But Not All Markets!

Kraftliner Delivered to Ecuador

Will Klabin’s New, Low Cost Capacity Pressure Higher-Cost Latin American Containerboard Mills?

Klabin’s new, big, low cost production could pressure at-risk mills.
And, as We Saw Earlier, Prices for Containerboard in Latin America Follows Global Markets

How could global containerboard issues impact Latin America?
Four big issues over the next several years that will impact global containerboard markets
Big Issue #1: China’s recovered fiber problem
China, the World’s Largest Containerboard Market, Has Needed Recycled Fiber (Old Corrugated Containers)

Fibers Used to Make Containerboard – China and the United States
And, the Rise of China Shaped the Global Recycled Fiber Market for the Last 20 Years as China Grew Rapidly
Prior to 2018, China 50% of the Global Demand for Traded Recycled Fiber (and Virgin Market Pulp, Too)

Recycled Furnish Consumption by Country (Shaded) and % of Total Imports

Changes in China have outsized impact on the world’s fiber markets…with ripple effects everywhere
China’s Wastepaper Restrictions of 2017 Have Changed the World Recycled Fiber Markets

1. Imports of unsorted waste paper (H.S. 4707900090) banned for 2017 for a period, government began issuing permits to certain producers.

2. Oct. 2017, those applying for import permits of RCP should have a production capacity over 50,000 tons/y and have related pulping and papermaking machines. This means traders and small mills cannot get permits.
So What Happened After the Ban?

Monthly Chinese OCC Imports

Regulations Imposed

So What Happened After the Ban?
Big Price Gap Between American and Chinese OCC Creates Disruption

Chinese American and Local OCC Prices, $ / st

Regulations Imposed

Source: SC099
So What Happened After the Ban?
Surge in containerboard imports fueled price increases globally

Source: UN Comtrade
The Abundance of Recycled Material in North America and Europe Is Creating Large Problems (Or Opportunities?)

Some Seattle-area recycling dumped in landfills as China’s restrictions kick in

Originally published March 29, 2018 at 6:00 am | Updated March 29, 2018 at 2:07 pm

Source: Seattle Times
And OCC Prices Have Fallen Dramatically in North America and Elsewhere, Lowering Containerboard Costs
China’s Containerboard Market Is (Was?) Very Fragmented
China's Containerboard Structure if OCC Import Permits Consolidate as Issued in 2018 and 2019

Chinese regulators are deciding who the winners will be.
The Largest Users of RCP in China Are Experiencing Record Earnings as a Result of the Regulations

- **Nine Dragons' Net Sales Jumped 35%, Income Soared 79% In 2018 Fiscal Year** 9/21/2018
  (China) Nine Dragons Paper has reported net sales of CNY 52.8 billion for the year to 30 June 2018, up 34.8% from 2017. Its operating income for the year was CNY 10.4 billion, up 59.1%. Its net income was CNY 7.84 billion, up 79%.

- **Lee & Man Paper's Net Sales Jumped 43%, Income Soared 36% In H1 2018** 8/1/2018
  (China) Lee & Man Paper Manufacturing has reported net sales of HK$16.4 billion for the first six months in 2018, up 43.1% from H1 2017. Its net income was HK$2.98 billion, up 35.9%.

- **Shanying International Holdings Net Sales Up 60%, Income Nearly 40% In Q1 2018** 5/21/2018
  (China) Shanying International Holdings has reported net sales of CNY 5.36 billion for the first quarter of 2018, up 60.2% from Q1 2017. Net income was CNY 605 million, up 39.7%.

- **China Sunshine Paper Financial Results**
  **China Sunshine Paper Net Sales Up 35%, Income 217% In 2017 (Thursday, April 12, 2018)**
  (Hong Kong) China Sunshine Paper Holdings has reported net sales of CNY 3.63 billion in the fourth quarter of 2017, up 40.2% from Q4 2016. Net income was CNY 268 million, up 283%. Its full-year sales were CNY 6.67 billion in 2017, up 35.1% from 2016. Its net income was CNY 457 million, up 217%.

Large producers are doing well under the import restrictions
…And Some of the Money Is Being Used to Buy Overseas Assets in Search for Fiber

Chinese company Nine Dragons buys Catalyst Paper mills in US for US$175 million

There are no plans for lay-offs at the mills, which employ about 610 workers in Rumford, Maine, and 380 workers in Biron, Wisconsin

ND Paper buys Resolute Forest Services mill in Fairmont, WV, for $62 million, in bid to boost production
How Might It Impact Latin America?

- Latin America (specifically, portions of Brazil and South America) have some of the lowest virgin fiber costs in the world.
- Future shortfalls in China could create demand for more virgin fiber from Brazilian pulp mills, or provide opportunities for linerboard mills to export to China (this is what Klabin stated in their announcement).
- New capacity to service export markets will be low-cost, which could eventually pressure higher cost mills in the region.
Big Issue #2: E-Commerce
E-Commerce: A Rapidly Growing Segment with Big Impacts on Containerboard
And, Global E-Commerce Growth Penetration Is Still Low, Latin America Countries Expected to Grow 20%+

Global eCommerce penetration averaged 8% of total retail sales

China and India are expected to be the most important contributors to about 17% global eCommerce growth

Source: Euromonitor, iResearch, METI

Source: Goldman Sachs Global Investment Research

E-commerce has had lower penetration than in China, U.S.
Growth Has Been Focused in Durable Goods, But That Is Changing…

E-Commerce Share of Retail by Segment

- Total Non-Travel
- Office Supplies
- Books & Magazines
- Consumer Electronics
- Computer Software
- Apparel & Accessories
- Furniture, Appliances, etc.
- Sports & Fitness
- Consumer Packaged Goods

Source: Goldman Sachs Global Investment Research
In the Beginning, E-Commerce Created Huge Consumption Due to Packaging Inefficiency
But, How Much Growth Will There Really Be?...As E-Retail Grows, Customers Will Drive for Cost Reductions

Amazon Corrugated Shipment Economics
(Per Typical Box-Shipped Order)

Who will drive efficiencies in packaging....suppliers or customers?
E-Commerce Grows Share of Retail, but …

E-Commerce Share of Total U.S. Retail
(Historical and Forecast)

Amazon Sets Deadline For CPG Brands To Overhaul Packaging

The Biggest North American Corrugated Customer Will Drive Market Preferences

Frustration Free Packaging
• Reduce waste
• Lower costs
• 100% recyclable
• Protective against damage

Tiers 1 and 2 Ship In Own Containers (SIOC)

August 2019 Deadline for Compliance
Amazon Is Improving How You Get Your “Stuff”

Delivering on Goals

- 2008 – 19 products certified
- 2018 – 775,000 products certified
- Significant waste reduction of 305 million boxes, which contributes to the overall reduction of 16% or ..........

244,000 tons of packaging

Source: Amazon, CPC Strategy
“Traditional” Methods Are Already Reducing Intensity in the United States and Elsewhere
New Technologies May Reduce Intensity Further

Ship in Own Box  Box on Demand  Drones
Reductions in E-Commerce Box Intensity Could Actually Cause the Containerboard Market in Some Regions to Decrease

North American Containerboard Demand by Scenario

- Status Quo Growth
- Box Intensity Falls to Equal Retail
- Box Intensity Falls Below Retail

What might happen in developing markets like Latin America?
As Seen in Other Industries, Developing Markets Adopt the Latest Technologies

**Land Line Telephones Per 100 People**

- Developed
- Developing

"Old Tech" is Flat!

**Mobile Phones Per 100 People**

New Tech Growth

Source: The World Bank
Latin America (and Other Developing Economies) Will NOT Use as Many Corrugated Boxes for E-Commerce as the U.S. Did

Amazon rolls out 'Scout' delivery robots
- Amazon is latest to use autonomous delivery to get meals or other goods to customers without a human driver.

The Yellow Delivery Storm

Box On Demand becomes part of WestRock

IF IT VARIES...

A CUSTOM BOX.

THE RIGHT SIZE.

EVERY TIME.
…But, in Some Cases, Packaging Design Changes May Result in Even More Demand for Paper
Packaging Can Be the Confirmation That a Customer Made the Right Choice

“The package becomes the symbol that implies favorable or unfavorable meaning about the product”

*Underwood, et al, 2001*
Or, In More Common Lingo…

Cool

...Not Cool
E-Commerce Take-Aways

• E-Commerce will continue to grow its share of retail – 20%+ CAGR projected in developing economies

• …However, don’t expect “as much” corrugated brown box demand growth as was experienced in the United States
  – Companies will adopt the latest technologies to optimize packaging

• …However, big opportunities as retail and shipping packaging merge
  – Driven by behemoths like Amazon who wish to minimize waste
  – Driven by new companies who want to establish unique brands
Big Issue #3: New capacity expansions….even as demand is slowing
Storm Clouds on the Horizon?
→ Last year, things “looked good”
Storm Clouds on the Horizon?
→ Last year, things “looked good”

Global Purchasing Activity, April 2018

Source: Bloomberg, 2019
Currently, Global Prices for Containerboard are Falling – Example, China, the World’s Largest Market

Chinese Linerboard Weekly Linerboard Prices (January 2016 = 100)

Prices are down 35% since last summer

Still, More Containerboard Capacity Is Scheduled to Come Online – Especially in Europe, Asia, and Latin America

Containerboard Capacity Change Over Trend

Yearly Change Versus Long Term Trend

-6% -4% -2% 0% 2% 4% 6% 8% 10%


Asia Pacific  Europe  Latin America  North America

There Will Be Global Shake-out of Capacity — Especially in Areas with Steeply Sloped Cost Curves

European Linerboard Manufacturing Costs

At risk mills!
Big Issue #4: Anti-plastic
Plastic, Plastic, Everywhere…
(Maybe you’ve heard about this?)

The patch mostly consists of
plasticastics, formed from
plastic bags, plastic water
bottles, bottle caps and
styrofoam. Plastic does not
biodegrade, the sun breaks
those down into smaller and
smaller pieces through
photodegradation, which is
why it is so difficult to judge
the size of the patch, since
these pieces are not visible
from satellites or planes.

Cleanup of the patch is difficult
due to the size of these patches
and that the areas of high
concentration are constantly
shifting, along with prohibitive
operating costs, and that no nation
will take responsibility for it.

Water skater insects (Kalabrates
Sorurale) lay their eggs on and
between barnacles, purple
seaweed and sea urchins
and their eggs are important
to the marine food chain. The accumulating
microplastic has caused them to alter
their mating habits and are now
laying their eggs on the floating
plastic carrying them out of
their natural ecosystem.

40% of the garbage
floating in the Earth’s oceans
is plastic. Less than 5% of
all plastic is recycled.

There are actually 5 main gyres
in the world’s oceans. A gyre
is where currents of the ocean
meet and form a whirlpool system. Most of the
dirt in the ocean winds up in one of these.

These patches also contain chemical
sludge and other debris and the plastic
can absorb organic pollutants from the
seawater. Fish and other birds eventually
eat the plastic once it has broken down to
small enough pieces, which nucleate then eat.

10 percent of the world’s
average 20 billion pounds
of plastic produced winds
up in the ocean.

The size of the patch is
unknown and estimated
as anywhere from 0.41% to
0.11% of the size of the
Pacific Ocean. Most scientists estimate
it to be twice the size of
Texas.

In many of the
sampled areas,
plastic concentration
was 7 times
higher than
that of
zooplankton
algae.

Estimated Decomposition Rates:

- Cardboard Box: 2 Months
- Cigarette Butt: 1.5 Years
- Plastic Grocery Bag: 10-20 Years
- Styrofoam Cup: 50 Years
- Foam Cup: 50 Years
- Tin Can: 200 Years
- Aluminum Can: 200 Years
- 6 Pack Rings: 400 Years
- Plastic Bottle: 400 Years
- Plastic Bag: 400 Years
- Glass Bottle: Unknown

A typical 3,000 passenger cruise ship
prosecures over 8 tons of solid waste a
week, much of which ends up
in the ocean.

Sources:
- Scripps Research Institute
- Wikipedia.org (Great Pacific Garbage Patch)
- NOAA (National Oceanic and Atmospheric Administration)
- SEAPLEX (Scripps Environmental Accumulation of Plastic Expedition)
It’s an Old Story, but the Level of Global Interest and Innovation Are Decidedly New

Encouraging new drivers for change:

• Legislation and regulation
  – Globally, many restrictions around single-use plastics

• Public (consumer) awareness
  – Google trend interest (plastic waste) quadrupled 2016 → 2019
  – 64% of Americans say they prefer paper food packaging over plastic…

• Brand owner and retail trends
  – Apple’s comprehensive paper and packaging strategy reduced plastic content in the iPhone 7 package by 84% over the previous model
  – Samsung has committed to replace plastic with paper and renewable materials, even if those materials are higher cost

State of Maine, most recently…
Plastic Packaging Material Flow Is Largely Linear
95% of the Value Is Lost After First Circulation

Ellen MacArthur: “There Will Be More Plastics Than Fish in the Oceans by 2050”
Our Headline Two Months Ago: Europe Leads Today, but North America Will Follow

UK's May pledges to cut all avoidable plastic waste by 2042

Iceland announces aim for plastic free own brand by 2023

“Lidl UK to remove black plastic from its entire fruit and vegetable range by the end of November 2018, from meat, fish & poultry by August 2019”
…We Were Right, Just a Little Sooner Than We Expected (Last Month’s News)

*Canada Plans to Ban Single-Use Plastics, Joining Growing Global Movement*
Innovation Is Occurring throughout Our Industry, from New Technologies to Alternative Construction

Frugal Cup (Frugalpac)

Coffee cup made of recycled paperboard with a food grade plastic liner that separates readily to facilitate recycling with other papers

2017 stats from the UK alone…

2.5 billion cups used every year

ONLY 1 in 400 recycled
Sustainability Benefits Outweigh Cost and Shelf Life Compromises for ConAgra Brand

Powerbowl (ConAgra)
“Drop-in” plastic bowl replacement with a proprietary fiber bowl made from plant-based material; completely compostable and recyclable

75% of Millennials are willing to pay more for sustainable products, as compared with roughly 50% of Baby Boomers (Nielsen)
What’s the Impact Going to Be on Our Industry?

- There are 250 billion fiber-based cups produced annually and 500 billion plastic cups
- Global production of plastic bottles is 200 billion annually
- There are 250 billion fiber-based cups produced annually and 500 billion plastic cups
- Global production of plastic bottles is 200 billion annually
- One challenge is that paper isn’t the only solution…
  - Push for plastic reduction could advance packaging efficiency
  - Single-use products may shift to multi-use products
  - Costs are often significantly higher (sometimes 10x higher)

Fisher estimates a 5% replacement of plastic packaging with paper in the U.S. and Europe would consume 1.5 MM MT of paper annually
Containerboard impacts?
Stakeholders Have Distinct Goals and Aspirations Around the “4 Rs”

Governments
- Reduce
  - Less packaging overall

Brand Owners
- Reuse
  - Less packaging overall, plastic is more likely to be reused

Retailers
- Replace
  - Paper based more likely to win

Consumers
- Recycle
  - Increased preference for paper based on higher recyclability vs plastics
Stakeholders Have Distinct Goals and Aspirations Around the “4 Rs”

Governments

Brand Owners

Retailers

Consumers

Reduce

Reuse

Replace

Recycle

The million dollars question:

“What is the impact on corrugated box demand overall?”
Plastic Reusability and Lightweight Attributes Are the Main Selling Points Versus Corrugated Boxes
Disruptors

How does it work?

1. Shop in the Loop Store
   Browse products from your favorite brands, designed in upgraded reusable packaging.

2. Receive your order in a reusable Loop Tote
   No more cardboard boxes - the Loop Tote has been specially engineered to be durable and safely transport your items.

3. Request a free pick up
   Once you’ve used up your items, simply place the empty packaging into the Tote, schedule a free pick up, and Loop takes care of the rest.

4. We clean and refill
   Loop hygienically cleans and replenishes what you returned, so you never run out of your favorites.
So...what does the future hold for containerboard?
Both Uncertainties and Opportunity Ahead for Containerboard Markets...

- China (the biggest story in the last few years) continues to disrupt global fiber markets and its slowdown earlier this year has softened containerboard
  - Chinese companies are searching outside of Asia for expansion, both to secure fiber and growth: will Latin America see foreign investments like the U.S. has?
- ...coupled with a capacity glut in containerboard worldwide, points to a shakeout ahead, particularly in Europe
- ...big capacity announcements in Latin America could also pressure local suppliers
Both Uncertainties and Opportunity Ahead for Containerboard Markets...

• E-commerce won't likely drive growth as rapidly as it has the last 2-3 years, but opportunities still abound
  – Companies will look for suppliers that can provide packaging that merges industrial and consumer packaging features
  – Amazon is driving this (and it will be adopted elsewhere)...its new enforcement takes effect this summer

• Anti-plastic may help corrugated (and containerboard) in some spaces, but possible that "the movement" presents more risks if end-users conclude that the best answer is less / no packaging
Fisher International is an information services and management consulting firm offering pulp and paper businesses better performance through the strategic use of business intelligence.

NORTH AMERICA • LATIN AMERICA • EUROPE • NORDICS • ASIA

Matt Elhardt
Senior Vice President
Business Development North America and Corporate Strategy
Fisher International, Inc.
melhardt@fisheri.com

Corporate Headquarters
50 Water Street
Norwalk, CT 06854 USA
T +1 203.854.5390
www.fisheri.com