

Paper Industry Commentary

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Why Did Folding Boxboard Production Grow So Quickly in Europe?

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There are four main coated paperboard products produced in North America and Europe — Folding Boxboard (FBB), Coated Recycled Board (CRB), Solid Bleached Sulphate (SBS), Solid Unbleached Kraft (SUK) — and production of coated paperboard has increased 0.9 million tonnes (8.8%) in Europe and 0.3 million tonnes (3%) in North America over the last seven years.

CAGR of Coated Paperboard (Europe and North America 2011 – 2018)

Grade	Region	CAGR
SBS	North America	0.97%
FBB	Europe	4.77%
CRB	Europe	-2.04%
SUK	North America	0.45%
CRB	North America	-0.62%
SBS	Europe	0.60%
SUK	Europe	-3.24%
FBB	North America	-4.70%

Source: FisherSolve Next™
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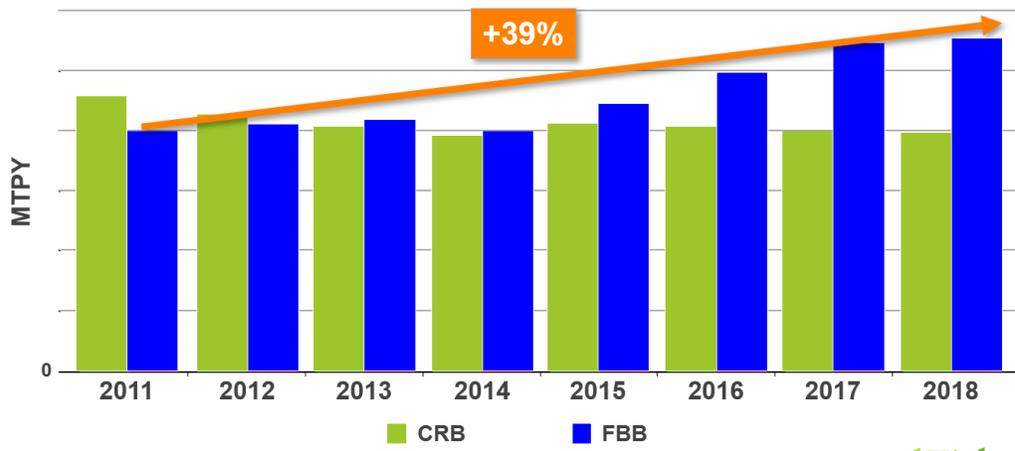
Figure 1

FBB is the most common paperboard produced in Europe with almost 50% share. In North America, SBS is the most common with around 55% share.

Figure 1 shows a compound annual growth rate (CAGR) in North America and Europe of each grade between 2011 and 2018, and what stands out is the rapid growth of FBB in Europe against the very different trajectories of the other grades. Why has FBB in Europe done so well?

Production in 2011 of FBB in Europe was less than of CRB, but seven years later FBB production was around 40% more than CRB as shown in Figure 2.

European FBB and CRB Production Capacity (2011-2018)



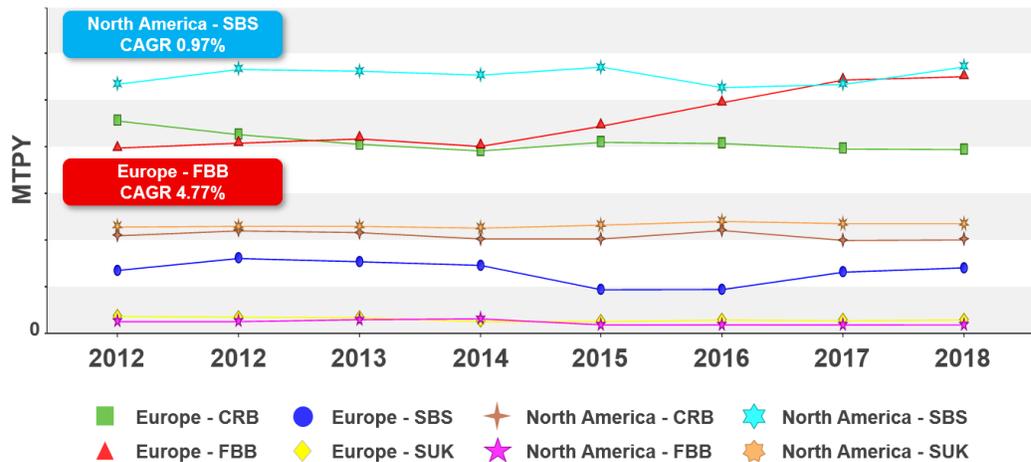
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Figure 2

During the same period, production of SBS in North America grew only slightly while FBB production in Europe grew so much (39%) that it achieved the same volume as SBS in North America. The development of the production is shown in Figure 3.

Coated Paperboard Production Changes (2011-2018)



Source: FisherSolve Next™
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Figure 3

FBB capacity growth in Europe occurred mainly in integrated virgin mills: a new FBB machine at Metsä Board Husum (Sweden), and grade changes at BillerudKorsnäs Gävle (Sweden) and Kotkamills (Finland).

FBB production also increased at twenty other existing machines in Europe. One example is Metsä Board Simpele which managed to almost double its production over a ten year period with a few major rebuilds like an extended nip calender.

Reasons for FBB Production Growth in Europe

A few factors stand out when analyzing the growth of FBB production in Europe: mineral oil migration, fiber-based packages substituting for plastic, and exports from Europe, especially to North America. There are also a few other more minor reasons for growth, for example e-commerce and an overall strong economy.

1. Mineral Oil Migration

The mineral oil migration issue in packaging popped-up around nine years ago. Swiss studies showed that paperboard boxes like CRB made from environmentally friendly recycled fibers can contain significant portions of mineral oil originated from printing ink. If food had direct contact with such paperboard boxes, it was possible that increased amounts of mineral oils could migrate from the paperboard to the foodstuff and present health risks.

It was recommended that recycled paperboard should be replaced with virgin fiber-based paperboard such as FBB. This caused a lot substitution of FBB for CRB, for example in cereal packages, like muesli and corn flakes, where food is in direct contact with the paperboard.

Today, there are no regulations on the minimum accepted amount of migrated mineral oil in packaging in Europe. There has been debate, studies, and a draft mineral oil ordinance by the German Federal Ministry of Food and Agriculture which recommended the use of a barrier in order to protect the food.

Some European CRB producers, especially Mayr-Melnhof, have developed functional barrier coatings to get renewed food industry product safety acceptance. But the perception of many food packaging paperboard users is that FBB offers better product safety and purity than CRB.

2. Fiber-Based Packages as Substitute for Plastic

FBB, as well as all paperboard products, is an environmentally sustainable alternative for plastic packaging. Unlike plastic, paperboard is renewable, recyclable and, in some cases, even biodegradable and industrially compostable. The growing desire, especially in Europe, to reduce plastic pollution in the oceans has awakened demand for paperboard packaging.

There are already a few plastic packaging bans in Europe. France was the first country in the world to ban disposable plastic cups and plates in 2016. The European Parliament decided in 2018 on a complete ban on a range of single-use plastic products across the union. Many companies have announced changes from plastic to paperboard, for example in vegetable packaging.

FBB producers have managed to develop lighter FBB without sacrificing strength properties to save on raw material costs. There is a trend to move from 100% plastic packaging to combined paperboard and plastic packaging like yogurt jars.

There are new innovations like single-use coffee cups without any plastic which Kotkamills is producing. Normally the cup must include a barrier layer made from plastic, which prevents absorption of liquids and greases, but this new innovation contains coating instead of plastic.

3. Export from Europe to North America

FBB exports from Europe to North America and Asia Pacific have grown almost 215,000 tonnes from 2011 to 2017 (Figure 4). This represents about 15% of the total growth between 2011 and 2017. FBB exports represent about 7% of total FBB production in Europe.

European FBB Exports

FBB Net Export	2011 (MT/Y)	2017 (MT/Y)
From Europe to North America	6,000	183,000
From Europe to Asia Pacific	150,000	187,000
Total FBB Export from Europe	156,000	370,000

Source: UN Comtrade
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Figure 4

Figure 4 also shows that North America has become a new market area for European FBB. It has succeeded in meeting the rising trend of lighter packaging materials with the same stiffness of North American SBS. Non-integrated converters in North America have also increased the FBB demand while searching for alternatives to SBS.

Will FBB Continue to Grow in the Future?

There are indications that FBB growth in Europe will continue with market growth as well as with substitution. The biggest growth potential for FBB is plastic substitution for packaging and continually growing e-commerce.

The mineral oil migration issue will also probably increase demand for FBB, although CRB producers will most likely use more backside barrier to avoid further share losses. The legislation, as well as consumer's opinion, will play a big role in this battle.

Surprisingly, when comparing the costs of coated paperboard grades per machine in Europe and North America (Figure 5), it is clear that producing FBB in Europe is on average the more expensive paperboard.

But, this is not the whole truth with competitiveness because FBB producers have managed to sell FBB by the square meter instead of per ton, capitalizing on the superior yield of FBB.

The market apparently assigns value to the quality and lightness of FBB. Customers will decide how they value the attributes of FBB versus alternatives.

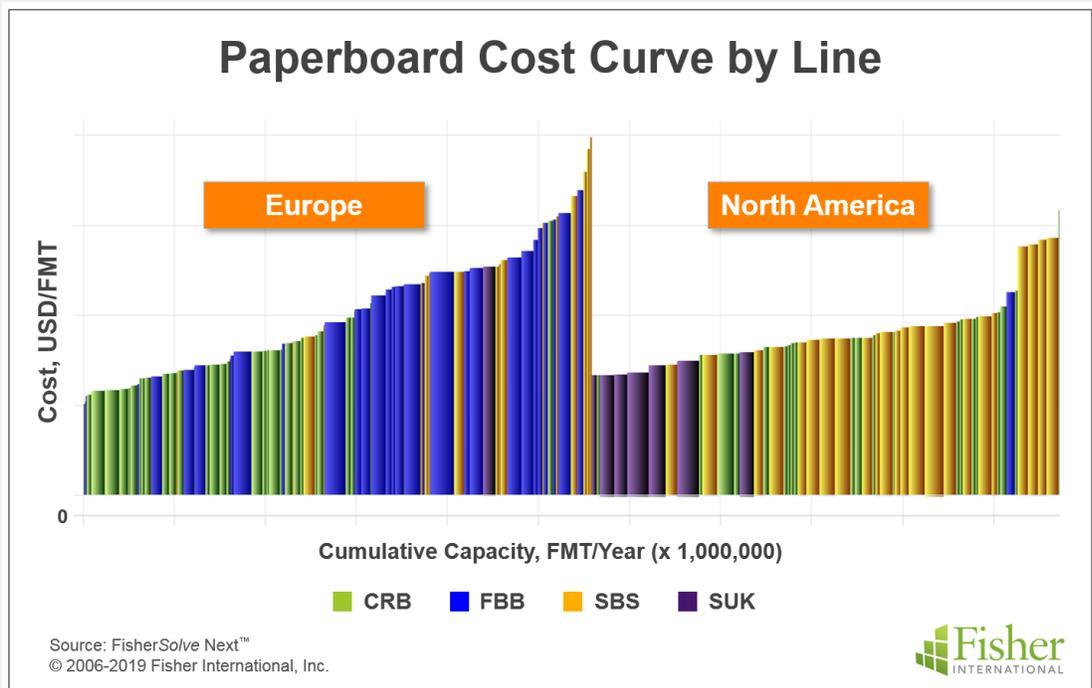


Figure 5

Basic Information of Different Coated Paperboard Products

- **FBB** has mechanical pulp in between two layers of chemical pulp. The top layer is of bleached chemical pulp with coating. FBB is a low-density board and it has lower strength than the other boards. It has a slightly yellow color due the mechanical pulp, which also gives a high bulk. Folding capabilities is the best among board, and it has good printing properties. The major end-uses are health and beauty products, frozen, chilled and other foods, confectionaries, pharmaceuticals, graphical use, and cigarettes.
- **CRB** is similar to FBB, but there is a recycled fiber layer between 2 chemical pulp layers. Because of its recycled content it is grey from the inside. The main end use is for packaging of frozen or chilled food, cereals, shoe boxes and toys.
- **SBS** is made purely from bleached chemical pulp with coated top side. It has very good printability and moderate strength. The major end uses are similar to FBB; food, pharmaceuticals, cigarettes, cosmetics and frozen food packaging.
- **SUK** is made of unbleached kraft pulp with coated top side, but natural brown backside. It has good printability, but highest strength among paperboards. The heavy-duty packaging and beverage carriers are the main applications.

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Fisher International, by virtue of its deep expertise in the pulp and paper industry, provides insights, intelligence, benchmarking, and modeling across myriad scenarios. By arming companies with the knowledge that will help them gain a better understanding of their strengths and help identify weaknesses, Fisher is helping businesses stave off challenges and better position themselves for long-term growth.

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