European Containerboard Outlook

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What we know

• Demand has been strong since the fourth quarter of 2020

• Supply struggling with the surge in demand

• Growth in exports has contributed to how tight the market has been since the beginning of the year

• Significant production cost inflation since the fourth quarter of 2020

• Containerboard prices have reacted to these circumstances

How we got here
European corrugated shipments, 2020 (percent)

-30 -25 -20 -15 -10 -5 0 5 10 15 20

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

Panic buying
Strict lockdowns
Slow recovery
Less stringent lockdowns, e-commerce * Xmas sales

Germany
Italy
France
Spain
Corrugated demand in Europe in 2021

Strong start to the year driven by ongoing lockdowns and e-commerce growth, demand for goods versus services, low inventories throughout the supply chain.

The second quarter was very strong largely due to a very low base last year.
Consumer spending shifting to goods

Reversal under way?

Lockdowns kept people from spending on services (out of home)

Consumers diverted spending to goods; e-commerce facilitated this development

With the end of strict lockdowns, we expect consumption to return to services; however, the fourth wave of COVID-19 might delay this process

Permanent changes in consumption patterns?

Source: Eurostat.
European economic recovery stronger than anticipated

Slowdown ahead?

Supply limitations slowing economic growth to six-month low in October

Inflation at a record high, mostly because of surge in energy prices and higher transport costs

Services outperforming manufacturing of goods

COVID-19 concerns have resulted in a weaker performance in travel, tourism and recreation
Logistics crisis

Magnitude of the crisis

EU driver shortage of around 400,000 drivers in 2020; the situation in 2021 has only worsened

Most affected countries are Poland, the UK and Germany

COVID-19 having a direct effect on truck availability, especially affecting countries like the UK
European demand is accelerating this year

Drivers

- E-commerce
- Plastic substitution
- Rebound in EU economy
- Pandemic shifting consumption away from services into goods
Plastic substitution will outpace e-commerce in the medium term

Assumptions behind

E-commerce has grown close to 50% in 2020, but its speed of growth will slow down to 20% in 2021 and around 15% to 17% from 2022.

Effect from plastic substitution to grow as we get closer to 2030.

Plastic substitution and e-commerce will account for about half of the containerboard volume growth from 2023 onward.
Net trade

More than 1 million tonnes of growth in net exports in 2020, but trend is reversing

In 2020, 72% net exports were recycled containerboard. However, virgin and recycled contributed equally to the additional export volume growth a year ago.

Year-over-year export growth (thousand tonnes)
Asia is the fastest growing partner for EU exports

PfR import restrictions behind the increased appetite for imports in China.

However, Chinese companies are investing in capacity in other Asia. This will reverse the trend beyond 2022.

Chinese economy slowing down partly because of strict COVID-19 rules. This might result in fewer EU exports to Asia.
Chinese RCCM and fluting imports increased by about 4 million tonnes in 2020

Other Asia (excluding China) accounting for most of the export growth to China

However, they are flat (to slightly down) year to date until August.

Chinese imports from Europe still up 20% from a year ago
Structural change in kraftliner market

Capacity ramping up in Western Europe:
- BillerudKorsnas Gruvön KM7 in 2019-20
- Stora Enso Oulu PM7 in 2021

Fiercer competition ahead
- Klabin Puma II project started in 2021
- US to export more as domestic market cools down
- Capacity increasing in China

Further capacity increases (SCA Obbola) to keep net exporting position going forward
European kraftliner exports to remain competitive

Klabin Puma II – Eukaliner
- The lowest-cost kraftliner producer in the world

Emerging Europe will remain a low-cost producer

Rumors about the possibility for The Navigator Company to enter packaging papers. If it happens, it will most likely enter very low on the cash cost curve.
RCCM exports under growing pressure

Although European mills are well positioned on the global cost curve, high transport costs and long lead times will compromise their position in Asia.

Expanding capacity in Asia will increase competition in other export markets like the Middle East and Africa.

Fiber restrictions might influence Chinese/Asian containerboard production less, as producers get used to the new normal.
Supply in Europe

More than 4 million tonnes of capacity ramping up (starts between the second half of 2020 and 2021)

Production issues reported since the second half of 2020. Producers running at full speed to benefit from surge in demand caused delays in maintenance stops.

Between 550,000 tonnes and 750,000 tonnes of capacity have been lost in 2021 because of delayed maintenance and unplanned stops.
Capacity to outpace production from 2022

- This is total EU containerboard market
- Operating rates close to 96% when including temporary production curtailments in 2021
- Next wave of capacity increases – mostly conversions from graphics – starting in 2023
- Installed capacity to increase by 6 million tonnes between 2022 and 2025
## European capacity starts, 2021-24

<table>
<thead>
<tr>
<th>Company</th>
<th>Mill</th>
<th>Country</th>
<th>Capacity</th>
<th>Date</th>
<th>Installation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mondi</td>
<td>Ružomberok</td>
<td>Slovakia</td>
<td>300,000</td>
<td>Q1 2021</td>
<td>New PM 19</td>
<td>White-top testliner (white kraft top)</td>
</tr>
<tr>
<td>Stora Enso</td>
<td>Oulu</td>
<td>Finland</td>
<td>450,000</td>
<td>Q1 2021</td>
<td>Conversion PM 7</td>
<td>Kraftliner, white-top kraftliner</td>
</tr>
<tr>
<td>Papierfabrik Palm</td>
<td>Aalen</td>
<td>Germany</td>
<td>750,000</td>
<td>Q3 2021</td>
<td>New PM 5</td>
<td>Medium, testliner</td>
</tr>
<tr>
<td>Kipas</td>
<td>Söke</td>
<td>Turkey</td>
<td>720,000</td>
<td>Q3 2021</td>
<td>New PM 2</td>
<td>Medium, TL, white-top TL, coated WT TL</td>
</tr>
<tr>
<td>Mopak Group</td>
<td>Dalaman</td>
<td>Turkey</td>
<td>400,000</td>
<td>Q3 2021</td>
<td>Rebuild PM 3</td>
<td>White-top TL, coated WT TL, CRB &amp; VC</td>
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<td>Papresa</td>
<td>Renteria</td>
<td>Spain</td>
<td>205,000</td>
<td>Q1 2022</td>
<td>Conversion PM 5</td>
<td>Medium, testliner</td>
</tr>
<tr>
<td>Norske Skog</td>
<td>Bruck</td>
<td>Austria</td>
<td>210,000</td>
<td>Q4 2022</td>
<td>Conversion PM 3</td>
<td>Medium, testliner</td>
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<tr>
<td>VPK</td>
<td>Alizay</td>
<td>France</td>
<td>450,000</td>
<td>Q4 2022</td>
<td>Conversion PM 1</td>
<td>Medium, testliner</td>
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<td>Ilim Group</td>
<td>Ust-Ilimsk</td>
<td>Russia</td>
<td>600,000</td>
<td>H2 2022</td>
<td>New PM</td>
<td>Kraftliner</td>
</tr>
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<td>Schumacher</td>
<td>Myszkow</td>
<td>Poland</td>
<td>150,000</td>
<td>2022-23</td>
<td>Rebuild PM 6</td>
<td>Medium, testliner</td>
</tr>
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<td>Metsä Board</td>
<td>Kemi</td>
<td>Finland</td>
<td>40,000</td>
<td>2022-23</td>
<td>Rebuild PM 1</td>
<td>White-top kraftliner, coated WT kraftliner</td>
</tr>
<tr>
<td>Smurfit Kappa</td>
<td>Hoya</td>
<td>Germany</td>
<td>70,000</td>
<td>Q1 2023</td>
<td>Rebuild PM 2</td>
<td>Medium, testliner</td>
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<tr>
<td>SCA</td>
<td>Obbola</td>
<td>Sweden</td>
<td>725,000</td>
<td>Q1 2023</td>
<td>New PM 2</td>
<td>Kraftliner, kraft-top</td>
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<td>Heinzel Group</td>
<td>Laakirchen</td>
<td>Austria</td>
<td>550,000</td>
<td>Mid-2023</td>
<td>Conversion PM 11</td>
<td>Medium, testliner</td>
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<tr>
<td>Modern Karton</td>
<td>Corlu</td>
<td>Turkey</td>
<td>640,000</td>
<td>H1 2023</td>
<td>New PM 6</td>
<td>Medium, testliner</td>
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<td>Volga</td>
<td>Balakhsn</td>
<td>Russia</td>
<td>140,000</td>
<td>H1 2023</td>
<td>Conversion PM 6</td>
<td>Medium, testliner (OCC + TMP based)</td>
</tr>
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<td>Kipas</td>
<td>Söke</td>
<td>Turkey</td>
<td>650,000</td>
<td>Q3 2023</td>
<td>New PM 3</td>
<td>Medium, testliner</td>
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<tr>
<td>Norske Skog</td>
<td>Golbey</td>
<td>France</td>
<td>550,000</td>
<td>Q4 2023</td>
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<td>Mondi</td>
<td>Kuopio</td>
<td>Finland</td>
<td>55,000</td>
<td>Q4 2023</td>
<td>Rebuild PM 1</td>
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<td>Hamburger</td>
<td>Kutahya</td>
<td>Turkey</td>
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<td>2023?</td>
<td>New PM</td>
<td>Medium, testliner</td>
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<tr>
<td>Eren Paper</td>
<td>Shotton</td>
<td>UK</td>
<td>650,000</td>
<td>2023-24?</td>
<td>New PM</td>
<td>Medium, testliner</td>
</tr>
<tr>
<td>Model Group</td>
<td>Sachsen</td>
<td>Germany</td>
<td>620,000</td>
<td>2023-24?</td>
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<tr>
<td>Arkhangelsk Pulp and Paper Mills</td>
<td>Kaluga</td>
<td>Russia</td>
<td>500,000?</td>
<td>2023-24?</td>
<td>New PM</td>
<td>Medium, testliner</td>
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</table>
• Poor performance in graphic paper markets (falling demand) will continue to push producers to convert, mostly to recycled containerboard

• There is a significant number of new machines entering the market, too

• Emerging Europe will account for most of the new machines from 2022
European containerboard prices

Market balances (operating rates) and production costs are the two most influential factors driving prices.

We know markets are currently tight (high operating rates).

Production cost inflation has also been a key factor behind price increases since the fourth quarter of 2020.

OCC  Transport  Energy
European energy crunch adding on to cost inflation

Natural gas prices are about six times higher than at the beginning of the year.

Prognosis indicate prices will remain high for the winter period.

Predictions of a mild, windy winter might keep energy prices from rising further, or even bring them down as we come closer to the end of the year.

Source: ICE-Endex

Bloomberg
Natural gas exposure

Natural gas supplies 67% of energy needs for recycled containerboard, but only 17% for virgin containerboard.
Prices moved up in 2017-18, driven by high operating rates.

Prices moved down in 2019-20 because of declining production costs (OCC prices).

Prices up since the fourth quarter of 2020 because of high operating rates and rapidly escalating production costs.
Take home points

01 Domestic demand performing better than anticipated
   Pandemic accelerated existing trends (e-commerce and plastic substitution)

02 Exports slowing down
   Due to capacity ramping up in Asia and slowdown of Chinese economy

03 Capacity to outpace demand (domestic + abroad)

04 Production cost inflation to remain an issue in the short term
Thank you!