

Sustainability at Metsä Board

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INTRODUCTION:

Sustainability has become an increasingly prevalent “buzz word” today. Initiatives like reducing water use, mitigating carbon emissions, and having more efficient operations are a must for the packing and packaging materials industry moving forward. Thus, the concept of sustainability must also be applied to every step of the paper and paperboard industry, as well as the life cycle of its products.

Sustainably managed forests

First, wood fibre must be sourced from sustainably managed forests that are certified according to globally well-known, reputable forest certification standards, from forests that are always regenerated after harvesting. In sustainably managed forests, trees are replenished at a higher rate than they are used, which also increases the amount of carbon these forests can sequester. In Finland, the annual growth of forests is 108 million m³ and harvesting of roundwood amounts to 73 million m³. Sustainable forest management does not result in deforestation.

Forest certifications

Forest certifications are important to ascertain because they represent proof of legal and sustainable use of forests. If a forest is certified, that means sustainable practices are enforced, biodiversity of forest habitats are safeguarded, water is protected, workers' welfare is considered, and the rights and needs of the local population are also considered. The major international forest certification schemes are PEFC™ (Programme for the Endorsement of Forest Certification) and FSC® (Forest Stewardship Council) Chain of Custody. Globally, only some 10% of forests are certified, but in Finland, around 90% of forests are certified, which is the highest share of certified forests in all of Europe.

Traceability

The forest certifications also ensure 100% traceability of the wood back to its origins. This tracing process, or Chain of Custody (CoC), enables accurate and verifiable claims on the content of certified material in products. At Metsä Board, our wood supply is managed by one of our associated companies, Metsä Forest, which helps us easily verify the origins of our raw materials. Also, all of the wood fibre we use comes from either our own pulp mills or from the mills at Metsä Fibre, another one of our associated companies. We set goals to continuously increase the share of certified fibre in our products. We have already achieved 100% traceability for the wood we use.

Raw material efficiency

Raw material and resource efficiency should be executed at the highest level possible and continuously improved upon. Every part of a tree should always be used for the most valuable end-use possible to achieve circularity and avoid creating waste. The thickest part of the tree should be used for the manufacture of wood products used on building construction, for example. The thinner parts of tree trunks and the younger trees harvested during thinning operations can be used to generate pulp and paperboard products. Bark and branches should be utilised in the production of bioenergy.



Figure 1: Sustainably managed forests.

At Metsä Group, our target is to have 100% of our waste and side-streams reused – and today we are already at a level of 99.3%. We have also employed the use of artificial intelligence at our mills to improve production efficiency by reducing the amount of waste generated and the consumption of energy and raw materials.

Water

Considering global water scarcity when water is used for industrial processes is important. Fresh water is a key asset in the paperboard packaging industry, as water is needed at every stage of pulp, board, and paper production. At Metsä Board, we recycle water in our paperboard mills 12 to 14 times on average, and in our BCTMP mills as many as 30 times. When the used water is finally returned to nature, it must be carefully purified first.



Figure 2: At all Metsä Board paperboard mills, water recycling is of the utmost importance.



Figure 3: Folding boxboard rolls at Metsä Board Husum mill.

Energy/emissions

From the perspective of paperboard’s climate impact and carbon footprint, the energy used in production carries the most relevance. Paper and paperboard companies mostly use renewable bioenergy produced from the wood-based side streams of their processes, such as black liquor, bark, and logging residue. Companies in this industry have begun setting targets for reducing their fossil fuel use. Metsä Board has committed to fossil-free production and energy purchases by 2030.

It is relevant to note that wood is a renewable raw material, so fibre-based packaging materials offer a more ecological alternative to fossil-based packaging materials (e.g., plastic). At Metsä Board, we have made significant efforts to reduce our carbon footprint and environmental impact.

Lightweighting

The product, paper or paperboard, should be produced using the minimal amount of renewable raw materials in its composition without compromising quality. Using the minimal amount of materials means less energy, water, and raw material consumed during production, reducing both scope 1 and 2 emissions. The product will also be lighter in weight. Enabling light-weighting allows both financial as well as environmental benefits to the packaging producers, and it also reduces transportation emissions which positively influences our scope 3 emissions. Lighter weight packaging reduces emissions across the entire value chain. Metsä Board’s folding boxboard production capacity is 1.3 million tonnes annually. If all of that were used to produce pharmaceutical packages weighing seven grams each, it would be enough to make 430 million packages a day. Cutting the paperboard weight by just 1% would save the amount of natural resources needed to produce 4.3 million packages a day. It also results in the generation of less waste once the product is disposed. By further optimising the materials and design structure of packaging, the packaging industry can provide its customers with even more sustainable and high performing packaging solutions.

Fresh Fibres

In many countries around the world, recycled paperboard is considered the more ecological choice when compared to fresh fibres. The thought process is that utilising recycled paperboard for new products mitigates deforestation and reduces waste. While this sounds logical, it does not take into account many important factors. Recycled fibres contain traces of ink and other impurities that may end up in the packaged product and be harmful to human health. Fresh fibre paperboards are the safest choice of fibre

packaging for sensitive end uses like direct food contact. Fresh fibres also contribute to the circular economy because they provide a good starting point for the recycling of packaging materials. To keep recycling loops ongoing, new, pure fibre is needed for recycling. Wood fibre is estimated to circulate, on average, 3.6 times in a year in Europe, but it deteriorates with each recycling round. Injecting fresh fibre into the recycling loop provides much needed, strong fibres that can be used to produce quality recycled paper and paperboard products.

Many studies show that fresh fibre paperboard yields a lower carbon footprint than recycled board. A primary reason being that fresh fibre paperboards are usually produced using renewable energy. The carbon footprint of packaging made from Metsä Board’s fresh fibre paperboard can be more than 50% smaller than that of packaging of an equivalent stiffness made from recycled fibre board.

Recyclability/compostability

Paper/paperboard is also very easy to recycle after product use. Fibre-based packaging materials have the highest recycling rates of all packaging materials. The recycling rate of paper and paperboard packaging is 83% in the European Union (EU28 –2018) and 81% in the US (EPA) which keeps the wood fibres in circulation as long as possible. Biodegradability of the paper/paperboard is also very beneficial – especially in the case of contamination (by food, drink, chemicals, etc.), which rules out recyclability.

Sustainable products

An historical problem with food service board is that plastic must be used as a barrier to insulate a cup, tray, or plate. For many food packaging end-uses where barrier properties are required, there are now fibre-based materials with barriers available to replace plastics. The new recyclable and compostable barrier boards that provide a barrier against grease and moisture are safe and can be recycled in standard paper/paperboard waste streams. Dispersion barrier coated paperboard, such as those produced at Metsä Board, helps reduce the use of plastics in end uses such as food service, fresh food, dry food, and frozen food.



Figure 4: New recyclable and compostable barrier boards are perfect for food packaging and can help replace plastics.



Figure 5: In September of 2020, Metsä Board launched a state-of-the-art Excellence Centre to accelerate paperboard and packaging innovation.

Figure 6: (Below) Metsä Board Kyro quality check.



Sustainability commitments

Finally, sustainability is a concept that should be taken more into account in the overall value chain; be enhanced and shared between material producers, converters and brand owners/retailers; and its implementation should be actively encouraged. Organisations with robust sustainability programmes should share their expertise with their customers and industry partners to find new solutions with lower environmental impact.

Collaboration is key to sustainability

In September of 2020, Metsä Board launched a state-of-the-art Excellence Centre. The centre aims to bring this collaboration together to accelerate material and packaging innovation and provide a platform for customers and technology partners globally.

The Excellence Centre concept enables paperboard and packaging solutions that look at the entire value chain, and not just at its separate parts.

The centre includes R&D facilities, a packaging design studio, and a state-of-the-art laboratory providing more than 100 different measurement methods and analytics.

The centre also features a virtual store and a computer-aided engineering (CAE) tool to allow sophisticated simulation and analysis of packaging performance. This model is designed to combine Metsä Board’s own expertise in fibre-based solutions with that of various experts and partners, such as material suppliers, technology providers, start-up companies, universities, and research companies.

One recent example of such an innovation is a long-term collaboration between Finnish start-up company, The Paper Lid Company, and Metsä Board, which has led to the development of a 100% recyclable paperboard lid for use with takeaway cups. The lid, which is made from fully recyclable dispersion barrier board, is suitable for use with both hot and cold beverages. It uses a novel technology developed by The Paper Lid Company that makes it possible to form the paperboard into the desired shape. The result is a one-piece lid that clicks firmly in place and offers performance that is comparable to that of a traditional plastic lid. Paperboard made from renewable fresh fibre is, by its nature, a sustainable raw material. The carbon footprint of a paperboard lid is more than 50% lower than that of a plastic lid and it is fully recyclable.

SUMMARY

As the world continues to suffer increasingly severe impacts of climate change, consumers expect private companies to play a pivotal role in mitigating further damage. Paperboard packaging companies should consider implementing the suggestions laid out in this article to show they are listening to consumers and that they can keep up with change in the industry. The blueprint has been established, it is up to industry members to follow it.