RECYCLABILITY OF NEXT GEN

Can paper packaging made from alternative non-wood fibres be considered recyclable? **Yes!**

2024

canopy

KEY TAKEAWAYS FROM THIS BRIEF:

- **Packaging made from alternative non-wood fibres can be just as recyclable as packaging made from wood fibre.**
- **Alternative non-wood fibres are already routinely recycled in the conventional paper stream** and do not require additional infrastructure or technology.
- Canopy found no widespread evidence that packaging made from alternative fibre is challenging recycling systems based on its feedstock.
- **Many alternative fibre packaging formats have been tested and passed credible recyclability testing protocols.**

- Of the government regulations and 'design for recycling' guidelines Canopy reviewed, almost all indicate that testing to credible protocols can prove recyclability claims, even in cases where alternative fibres are characterized as not yet proven to be recyclable.
- Recyclability challenges are often primarily related to design rather than feedstock.
- **Brands should be encouraged to obtain testing for any new packaging formats, including alternative fibres, to verify recyclability.**

INTRODUCTION

As consumer awareness of the impact of the products we buy continues to grow, increased concern over plastic pollution has led to increased demand for paper packaging. While paper packaging is often considered a more desirable option to plastic in terms of recyclability and reduced end-of-life concerns, this uptick in demand poses a threat to the world's forests, including the world's Ancient and Endangered Forests — critical for climate and biodiversity health.

The planet needs at least 50% of existing natural ecosystems to be conserved to provide climate stability through carbon storage, oxygen production, fresh water, habitat for plant and animal life, and other functions vital to a livable environment.[1]

Demand for paper packaging drives about **a tenth of total logging** pressure on the world's forests[2], amounting to an estimated **3.1 billion trees cut down annually.**[3]

Paper packaging accounts for about a third of the global packaging market, which is on par with plastics.[4] According to a Canopy analysis, Ancient and Endangered Forest fibre can be eliminated from global supply chains by 2033, but it requires rapid scaling of low impact alternatives to replace the demand, including over 40 million tonnes of recycled fibre and 60 million tonnes of non-wood fibres such as wheat straw or bagasse.[5][6]

These alternative fibres, when made from waste material or on-purpose crops that don't compete with food or increase land use, are what Canopy refers to as Next Generation Solutions. Based on a Canopy analysis of a series of lifecycle assessments, compared to conventional wood fibres, alternative non-wood fibres an offer 88–100% lower land use, five times lower impact on biodiversity, and produce approximately 4 tonnes less carbon emissions per tonne of product.[7]

Currently, there are approximately **5.8 million tonnes of commercial-scale non-wood pulp** produced globally for paper and paper packaging.[8]

At a time when we face the twin crises of climate and biodiversity, and increasing industry regulation, it is imperative that brands adopt a comprehensive approach to packaging that addresses not only waste management but reducing land use pressure. This strategy should include maximising recycled fibre, exploring novel solutions such as reuse, and trialing, researching and maximising the use of Next Generation, forest-free alternatives.

Many large consumer goods companies have adopted sustainable packaging targets, such as aiming to have 100% of total packaging recyclable, compostable, or reusable. And increasing regulations require brands to take responsibility for ensuring that the packaging they use and market as recyclable is actually collected, sorted and ultimately reprocessed, as many formats of single-use packaging placed on the market are not functionally recycled.[9]

As brands explore integrating and introducing novel materials, like alternative fibres, into their portfolios, questions around recyclability of specific packaging formats have arisen, and many industry guidelines have falsely classified alternative fibres as not recyclable, leading to confusion. **This brief aims to answer questions brands have about the potential recyclability of paper packaging made from alternative non-wood fibre and encourage brands to explore these options in their responsible packaging approach.**

Disclaimer: Canopy does not provide legal advice, and none of the information in this brief shall be construed as legal guarantees; it is up to individual brands and marketers to secure legal and regulatory assessment of their packaging types.

How Recyclability is Determined

Whether a product can be recycled depends primarily on its design and how successfully a packaging item can be collected, sorted, and ultimately reprocessed. This is true for paper packaging made from virgin wood, recycled wood, or alternative fibre. That said, it is important to understand the difference between *technical recyclability* and *recyclability at scale*; these concepts are related but draw upon different data and definitions.

WHAT DOES 'TECHNICALLY RECYCLABLE' MEAN?

'Technical recyclability' reflects the potential to recycle a product and how many times a product can be recycled, based on testing a sample in a lab or pilot facility. Once a packaging format has been successfully tested to a specific testing protocol, it can be certified as recyclable to that standard. Each test typically has two parts: 'repulpability', a bench test to indicate how much fibre is available for recycling, and 'recyclability,' a pilot-scale test that indicates if the fibre is of good quality for reuse. While protocols vary, these tests evaluate the extent to which the fibres can be separated, visual appearance, strength, and level of rejects or disruptions from non-fibre components, for example, plastic coatings, foils, or adhesives.

Two common protocols for testing paper packaging for recyclability include the Voluntary Standard for Repulping and Recycling Corrugated Fibreboard developed by the Fibre Box Association (FBA)[10] and the CEPI Recyclability Test Method developed by the Confederation of European Paper Industries (CEPI).[11] The Sustainable and Alternative Fibres Initiative (SAFI), housed at North Carolina State University, is a collaborative effort aimed at advancing the use of sustainable and alternative fibres in various industries, including the paper and packaging sectors. They have performed research and testing on a variety of alternative fibres for several stakeholders and companies, and can test packaging to the Fibre Box Association protocol.[12]

WHAT DOES 'RECYCLABLE AT SCALE' MEAN?

'Recyclable at scale' means that, in a given market, sufficient capacity exists for a particular packaging format to be successfully collected, sorted into waste streams, and directed to end markets for reprocessing, that is proven in practise for the majority of consumers in that market. Technical recyclability is often an indicator that an item could potentially be recyclable at scale. However, many common recycling challenges, primarily related to packaging design, may prevent this from being the case. For example, small packaging formats or elements that can be lost in the sorting process, packaging formats made of multiple materials that may be separately recycled on their own, but are not always able to be separated and diverted into separate streams, and packaging formats that have little value in end markets, as is the case with certain types of plastic.

For plastic packaging, the differentiation between technical recyclability and recyclable at scale is extremely important, as many types of plastic are technically recyclable, but the majority of single-use plastic packaging has generally low rates of recycling in most regions. Definitions around recyclability at scale are thus becoming more important, as with regulations around greenwashing and Extended Producer Responsibility (EPR), or commitments such as the Ellen MacArthur Foundation Global Compact.

Determining recyclability at scale often requires using and understanding local and/or regional data about the different recycling stages. To guide compliance and understanding of which packaging is recyclable at scale in what markets,regionally specific classifications are determined using multiple sources. For example, regional material recovery facilities (MRFs) can inform whether specific packaging formats present challenges to sortation and baling in their systems. Surveys of paper mills can identify packaging formats that may present problems in a mill, such as non-paper closures or multi-material formats. Industry trade groups are also a data source for these guidelines; for example, on paper packaging recycling, the Sustainable Packaging Coalition's (SPC) How2Recycle consults with groups such as the Carton Council and, for alternative fibre specifically, the Recycled Paperboard Technical Association.[13]

Trade industry associations have also developed various guidelines to inform choices around materials and design components, and How2Recycle has developed a voluntary consumer-facing labelling system to harmonise with regulations in the U.S. and Canada.[14] To obtain this label, brands submit packaging specifications to How2Recycle for specific evaluation based on data on collection, sortation, reprocessing, and access to end markets. The packaging can then be labeled with consumer instruction: "widely recycled", "check locally", or "not yet recyclable." [15]

How To Determine If Alternative Fibre is Characterized As Recyclable By Various Definitions?

In our analysis to determine how alternative fibre can be considered recyclable, we considered both definitions: 'technical recyclability' and 'recyclable at scale'. To determine if alternative fibre can be proven to be technical recyclable, we drew from various sources to understand the likelihood that alternative fibres have of passing technical recycling tests. To determine how alternative fibres may be considered recyclable at scale in various contexts, we reviewed 13 regulations regarding recyclability (including EPR and anti-greenwashing regulations), and four 'design guideline' documents, written by associations largely representing the paper industry.

We found that:

1. Many alternative fibre packaging formats are routinely tested to be technically recyclable in the conventional paper recycling processes.

2. There are two EPR regulations we reviewed for which material assessments for packaging formats have been developed; only one (Australia) differentiates between wood and non-wood fibres in its classification. These guidelines characterize non-wood fibres as not recyclable, but also emphasizes that technical recycling can overcome this determination.

3. 'Truth in labelling' laws we reviewed allow for technical tests to stand as proof of recyclability.

4. Even the several industry-led design guidelines that classify alternative fibre as not recyclable allow for credible testing to overcome that designation.

Thus, we find that brands needing reassurance that alternative fibre is recyclable should be encouraged to test specific packaging as they would any other novel packaging formats.

Is Alternative Fibre Packaging Technically Recyclable?

Based on the evidence Canopy reviewed on the current landscape of alternative fibres, packaging made from alternative non-wood fibres is just as potentially recyclable as conventional or recycled paper packaging, all design elements being equal.

In paraticular, SAFI has tested "thousands of pounds" of alternative agricultural fibres including wheat straw-fibre-based, to rigorous recycling standards in its lab facilities and has...

> "...successfully demonstrated that these fibres are recyclable on a technical level using the same process as virgin wood-fibre."[16]
>
> Importantly, SAFI confirms that packaging made of **non-wood fibres are recycled in the conventional paper stream.**[17]

Several specific producers of non-wood fibre packaging have successfully tested and certified packaging to a recyclability testing protocol. For example, PaperWise which produces paper bags in the EU from various agricultural residues (blends of barley, wheat or rice straw, or sugarcane bagasse) recently had its bags tested by the German testing centre, Papiertechnische Stiftung (PTS), which demonstrates adherences to CEPI's Recyclability Laboratory Test Method Version 2 standard.[18]

Genera, one of North America's largest producers of Next Generation pulp,[19] recently had a molded fibre food service container (made of 70% grass fibre) successfully tested to the Western Michigan University Old News Print Equivalency (WMU ONP-E) testing protocol.[20]

Is Alternative-Fibre Based Packaging Considered Recyclable At Scale?

Regulations we reviewed

	How is non-wood fibre characterized?	Encourages testing of non-wood fibres?
The Australian Packaging Covenant	Does not specifically adress non-wood fibre in the regulation, but design guidelines characterizes non-wood fibres as "avoid"	Testing is required for alternative non-wood fibres
The European Union's Packaging and Packaging Waste Regulation (PPWR)	Does not specifically address alt fibres in the regulation	N/A
Extended Producer Responsibility regulations/pending regulations in the US: California, Colorado; Maine, Maryland; Oregon	Do not specifically address non-wood fibres in the regulations. California does not differentiate between paper made from wood and non-wood in the covered materials list, so any packaging in the 'potentially recyclable' list should be acceptable regardless of feedstock. Other States have not yet finalized material classifications.	N/A
Extended Producer Responsibility legislation/pending regulation in Canada: British Columbia, Manitoba; Ontario, Quebec	Do not specifically address non-wood fibres in the regulations	N/A
Canada's Competition Act	N/A	Recycling claims can be substantiated by technical testing
The US Federal Trade Commission "Green Guides"	N/A	Recycling claims can be substantiated by technical testing

Design Guidelines we reviewed

	Overall characterization ('banner' headline) of non-wood fibres	Encourages testing of non-wood fibres to be recyclable?
4evergreen, *Circularity by Design Guidelines*	"A subject of ongoing investigation" and "manufacturers are encouraged to use wood fibres."	YES
American Forest and Paper Association (AF&PA), *Design Guidance for Recyclability*	6 of 8 of alternative fibre packaging formats pose no recycling challenges to surveyed paper mills; 2 of the 8 pose challenges to 33% of the surveyed mills	Does not address testing. Does mention that being recycling-challenged does not make something not recyclable
Confederation of Paper Industries (CPI), *Design for Recyclability Guidelines*	"A subject of ongoing investigation" and "The UK Paper Industry supports the use of fibre derived from trees."	YES
How2Recycle: The specific assessments for consumer-oriented on-pack label	"Not yet recyclable"	YES

Is Alternative-Fibre Based Packaging Considered Recyclable at Scale Under Various Regulatory Frameworks?

To assess whether any regulations have determined recyclability for alternative fibre paper packaging, Canopy reviewed 13 regulations regarding single-use packaging and recyclability — 11 Extended Producer Responsibility regulations, and two related to recyclability marketing claims.

EPR REGULATIONS

As many EPR regulations are in the early stages of development, most have not yet assessed the recyclability of specific packaging types in those markets. Still, **no EPR legislation Canopy reviewed specifically requires non-wood fibre paper to be evaluated separately from wood fibre paper,** although Colorado does specifically note that paper can be made with "other cellulosic fibres."[21]

California has a complete material assessment, which can offer insight into what materials pose recycling challenges to most California consumers. The methodology was determined through the prior "Truth in Recycling" Act, which banned "chasing arrows'" symbol on items that were not regularly collected or processed for recycling in the state.[22] Of the 21 material forms listed in the Paper and Fibre category, the majority (14) are assessed as 'potentially recyclable,' including paper, paperboard, Kraft paper with and without plastic components, molded fibre without plastic components, and cardboard without plastic components.[23] Paper items that are 'not potentially recyclable' include waxed cardboard, multi-material laminates, and molded fibre with plastic components. **These distinctions among types of paper packaging underscore that, in California, recyclability challenges are most attributable to the design — e.g., plastic coatings on paper fibre — rather than the underlying feedstock.**

Only one jurisdiction in this review, Australia, has packaging regulation that utilise design guidelines that specifies alternative fibres, classifying them in the "avoid" category, even though this guide also indicates that testing is required to assess local curbside recyclability of alternative fibre-based packaging.

REGULATIONS ON MARKETING CLAIMS AND RECYCLABILITY

We also reviewed two regulations relating to labelling and greenwashing to assess how recyclability is proven to be compliant with marketing claims: The Federal Trade Commission (FTC), which regulates marketing claims about sustainability in the US, and Canada's Competition Bureau and Competition Act. The FTC's Green Guides stipulate that packaging may only be labelled as "recyclable" if 60% or more of US households can recycle that packaging format.[24] FTC requires marketers to substantiate their claims, **and recyclability testing is an accepted form of substantiation.**[25] [26] Similar to the FTC, Canada's Competition Act forbids companies from making false or misleading claims about a product unless the marketer can prove that "the claim is based on an adequate and proper test." [27]

Is Alternative-Fibre Based Packaging Characterized As Recyclable At Scale in Various Design Guidelines?

Canopy reviewed four commonly-encountered recyclability design guidelines and organisations that represent or include representation from the paper industry. How2Recycle (an initiative of the Sustainable Packaging Coalition, whose membership includes major paper manufacturers[28]), assesses specific formats of packaging submitted by brands for the purpose of on-pack labelling; we reviewed How2Recycle Guidelines for Use and other informational material on How2Recycle's website. Three other organisations also publish informational guidelines to design for recyclability: 4evergreen, an initiative of the Confederation of European Paper Industry (CEPI), the American Forestry & Paper Assocation, and the Confederation of Paper Industries (CPI), which describes its guidelines as "the preferred position of the UK Paper Industry, based on expert opinion and CPI's experience in this industry." [29]

Three of these 4 organisations classify alternative fibres as not recyclable or indicate caution (two note it as a subject of "ongoing investigation" [30]) however, they also simultaneously indicate that testing is required for individual packaging formats. Similar to the APCO design guidelines, these guidelines can appear to, at least visually, prioritise the 'not yet recyclable' headline designation over the role of testing in determining recyclability, **which may present a confusing or broadly discouraging view of non-wood fibres.**

How2Recycle's *Guidelines for Use* include charts for recyclability categories for the US and Canada that designate non-wood fibre as "not yet recyclable," [31] even while having a separate slide instructing brands to have their products tested. [32] How2Recycle does not explain in the *Guidelines for Use* why non-wood fibre has this designation, however How2Recycle's *2020 Recyclability Insights* report, as well as the 4evergreen and CPI guidelines, explain that the concern with alternative fibre is that paper mills were set up to accommodate fibre from trees.[33]

In contrast, the American Forest and Paper Association (AF&PA) reflects a more optimistic story for alternative non-wood fibres. In 2021, the AF&PA polled paper recycling mills to identify packaging formats, components, or feedstock types that may present recycling challenges to mills.[34] Non-tree fibres were included for various packaging types. The analysis showed that of all mills surveyed, **non-tree fibres did not adversely affect the recyclability** of six of the eight formats: corrugated packaging, recycled/unbleached boxboard (coated/uncoated), carrier stock cartons (unbleached Kraft paperboard), kraft paper bags, or molded fibre containers. There were only two packaging types for which 33% or more of the surveyed mills rated non-tree fibres as "challenging" in recycling mills: bleached paperboard cartons and multi-wall shipping sacks.[35] The AF&PA itself also repeatedly stresses in this report that "being a challenge does not make something not recyclable." [36]

The cautious banner designation some organisations use for alternative fibres appears inconsistent with their own instruction that testing prevails over any given guideline, and even appears inconsistent with results from the AF&PA survey, suggesting that where present, challenges with alternative fibres do not appear to be universal. The concerns about recycling processes are also inconsistent with SAFI's observation that alternative fibres are recycled using the same processes as wood fibre. [37]

CONCLUSION

As regulations tighten and consumers demand increased responsibility for packaging, it is imperative that brands reduce pressure on the world's forests through responsible packaging choices, including maximising recycled content as well as researching, trialing, and maximising the use of alternative non-wood fibres. Brands are right to be cautious about introducing novel materials into the waste stream and should look to all available data sources to understand the impacts of their packaging can be just as recyclable—both technically and at scale—as conventional paper packaging.

Despite some concerns raised by some in the conventional paper industry that the recycling system is not set up to process alternative fibres, there is evidence that many mills are not challenged by alternative fibres, that testing to accepted protocols can determine recyclability, and that recyclability claims can be substantiated by appropriate testing to comply with anti-greenwashing regulations.

Importantly, evidence illustrates that alternative fibre-based paper packaging that is being tested routinely passes credible recyclability testing protocols, and that determinations of recyclability primarily revolve around packaging design, not fibre feedstock.

Canopy strongly recommends brands not let design guidelines indicating non-recyclability deter them from researching and trialling alternative fibre-based packaging. Instead, we encourage brands and producers to have their alternative fibre packaging tested for recyclability. As brands increase the testing and use of alternative fibres, we are optimistic that increased data will yield even more clarity and confidence in the recyclability of packaging made from alternative forest-free fibres.

FOOTNOTES

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