

PACK4THEFUTURE

Moving from Risk to Resilience in the Paper Packaging Industry

从风险到韧性：纸包装产业的转型之路

2026

canopy

EXECUTIVE SUMMARY

Limited by land-use competition from agriculture and development, and disrupted by escalating wildfires, droughts, and pest outbreaks, responsibly produced wood fibre is an increasingly rare, increasingly sought-after commodity.[1] Businesses that rely on it face intensifying competition, with shortages, supply chain disruptions, and price volatility becoming the new normal. Meanwhile, companies that turn to non-compliant or non-sustainable sources risk legal exposure, loss of market access, and reputational damage with consumers and investors.[2]

The widespread shift away from single-use plastics to paper packaging, called "paperization", is a major driver of increased demand for paper. Without scaling up non-wood Next Generation fibre feedstocks, the paperization trend is posed to replace one environmental challenge with another.

To assess the readiness of the paper packaging industry to address these growing challenges, the Pack4theFuture report evaluated the world's 20 largest producers of packaging-grade paper on their protection of Ancient and Endangered Forests and advancement of Next Generation Solutions (such as fibres made from agricultural residues). The aim was to assess, as a starting point, a baseline of the sector as a whole and its foundational readiness to adapt to meet the needs of the future and to help individual companies identify practical solutions.

Canopy research identifies that while "no deforestation" policies are common, they do not eliminate the risk of degrading critical landscapes. **Policies are not always followed and the actual practices of companies can depart dramatically from stated commitments.** While implementing policies can require time and corrective action to ensure performance, some policy promises are little more than exercises in public relations. Because of this, products derived from Ancient and Endangered Forests may still find their way into the supply chain, subverting the stated intentions of companies and causing profound environmental harm.

Within this context Canopy set out to accurately capture how pulp and paper producers are progressing from setting commitments to implementing, measuring, and reporting on them. **Our scoring structure emphasizes governance infrastructure and performance reporting over policy commitments to give a clearer view to what is being done, not only what is said, in the pulp and paper packaging sector.**



摘要

随着山火、干旱、虫灾等问题日益严峻，农业和地产开发争夺更多土地资源，负责任生产的森林材料正成为日益稀缺、愈发紧俏的商品[1]。供应短缺、供应链扰乱、价格波动逐渐成为新常态，依赖原生森林材料的企业既要面临日益激烈的竞争，还要管控合规风险，尤其是不合规或采购不可持续材料的企业将面临法律风险、丢失市场、破坏消费者和投资者的信任[2]。

用纸包装替代一次性塑料，即"以纸代塑"的浪潮将彻底拉高纸的需求量。此时如果不扩大非木源的下一代原材料，以纸代塑不过是饮鸩止渴，用新的环境问题替代旧的环境问题而已。

为了了解纸包装产业应对可持续挑战的预备性，Pack4theFuture报告评估了全球前二十大包装纸生产商在保护原始濒危森林和推动下一代解决方案（如农业秸秆）方面的表现。此评估旨在初步确认行业的基线状况以及适应未来需求的基本预备性，帮助各家企业找到实际的解决方案。

Canopy研究发现，尽管"零毁林"政策很普遍，但它不能消除关键景观退化的风险。**政策不一定会兑现，企业的实际做法可能与公开承诺大相径庭。**虽然落实政策需要时间，还需逐步纠正行为以确保实际效应，但部分政策承诺不过是公关作秀而已。因此，来自原始濒危森林的产品依然照常进入供应链，这与企业的公开承诺背道而驰，造成严重的环境影响。

在此背景下，Canopy希望能准确呈现浆粕与纸生产商如何从设定承诺逐步推进到兑现承诺、评估与汇报兑现进展。**我们的评估体系重视治理结构、承诺兑现进展的公开报告，而非停留在政策承诺阶段；该报告旨在更清晰地展现浆粕和纸包装行业实际做了什么，而不仅仅是说了什么。**

METHODOLOGY

Developed in alignment with leading practice on forest risk frameworks, the Pack4theFuture report assessed paper packaging producers on two core criteria:

1. Protection of Ancient and Endangered Forests (weighted at 85% of a company's score).

2. Advancement of Next Generation Solutions (weighted at 15% of the score).

We assessed key policies, targets, reporting, and governance, and assigned each company a percentage score. To keep the focus on systemic issues and foster collaboration on solutions, individual company scores were anonymized.

KEY FINDINGS

1. Ratings were low for the sector as a whole, with a median overall score of 39%, an average of 33%, and no company scoring higher than 55%. These results reveal a sector facing serious financial, regulatory, and reputational risk as virgin wood fibre comes under tighter scrutiny and supply pressures.

2. Public policy commitments are not enough: The report analysis identified a major gap between companies' stated policies and practices. Failure to set formal targets or to ensure that those targets are meaningful are a common weak point. For example, although 80% of companies express commitments to increase recycled fibre content, 60% do not specify a target, and 25% have framed their commitments in such a way (using aggregated circular economy targets) that does not assure ambitions above a business-as-usual approach. This leaves companies, including brand customers at potential risk.

3. About 30% of the top 20 producers of packaging-grade paper have already started to integrate Next Gen alternative fibre into paper packaging, but faster scaling up is urgently needed.



方法体系

依照森林风险框架的领先实践，Pack4theFuture报告采用两个核心标准，评估纸包装生产商：

1. 保护原始濒危森林（评分占比85%）

2. 推动下一代解决方案（评分占比15%）

评估范围涵盖关键政策、承诺目标、公开报告、治理结构等，每家企业最终获得百分比评分。为了强调系统性问题并促进合作，各企业的单独评分均作匿名处理。

关键评估结果

1. 整个行业的评分偏低，总体得分中位数为39%，平均值为33%，没有一家公司的得分超过55%。这说明随着原生木浆受到更严格的规管、面临更大的供应压力，该行业正面临严重的财务、监管和声誉风险。

2. 公开政策承诺远远不够：该报告发现企业的公开承诺与实际做法之间存在巨大差距。很多企业没有正式设定政策目标，或没能切实落实政策承诺，这样的问题非常常见。例如，80%的企业声明会提高回收木浆的用量，但60%的企业没有设定目标，25%的企业公开承诺的措辞采用综合性的循环经济目标，无法保证跳出常规运营的框架实现宏远目标。这些短板使得企业和品牌客户面临潜在风险。

3. 前二十大包装纸生产商中，已有30%开始采用下一代、替代性原材料，但我们亟需快速扩大规模。

KEY RECOMMENDATIONS FOR COMPANIES

By acting now, companies will not only protect Ancient and Endangered Forests, they will be better positioned to match their customers' expectations and reduce their reliance on increasingly constrained sources while staying on the right side of environmental, financial, regulatory, and reputational risks.

1. Reduce reliance on virgin wood by maximizing recycled inputs and engaging in scaling of Next Generation Solutions made from agricultural residues. By doing so, companies de-link growth from Ancient and Endangered Forests and reduce exposure to price, supply, and compliance risks associated with continuing to draw so heavily upon virgin wood fibre.

2. Maximize the use of recycled and Next Gen alternative fibre content. If any virgin wood is used, prioritize wood fibre certified by Forest Stewardship Council (FSC) **(See Canopy's certification comparison)**, that is fully traceable, and screened for ecological and social impacts, including the Free, Prior and Informed Consent of Indigenous Peoples and forest-dependent communities. Companies can also use ForestMapper (visit **this page** to learn more) to ensure virgin wood pulp is not sourced from Ancient and Endangered Forests.

3. Take action now to address future shocks by integrating wood-related risks into scenario analysis and by steering capital toward more resilient sourcing options and investment strategies for Next Generation Solutions (such as fibres made from agricultural residues).

4. Work with Canopy and our network of partners to develop solutions that avoid high-risk virgin wood fibre, identify market-ready solutions, and build supply chain resilience through diversification of paper feedstocks.

重点建议

若能立刻行动，企业不仅能保护原始濒危森林，还能更好地契合客户的期望，减少对日益受限的原料来源的依赖，同时更好地管理环境、财务、监管、声誉等方面的风险。

1. 通过最大化回收原料的使用，推动以农业剩余物为原料的下一代解决方案规模化，进而减少对原生木浆的依赖。如此一来，企业就能使增长与原始濒危森林脱钩，并降低因继续大量依赖原生木浆而带来的价格、供应、合规等方面的风险。

2. 最大化回收浆和下一代材料的用量。若不得不使用原生木浆，则优先选择FSC认证的材料（请参考Canopy认证体系说明）。FSC完全可追溯，对生态和社会影响进行筛查，包括原住民和森林社区的自由、事先和知情同意。企业也可使用ForestMapper地图（更多信息请参考该链接），淘汰来自原始濒危森林的原材料。

3. 即刻行动，防患未然。在场景评估中考量木源风险，投资更具韧性的采购方案，部署下一代解决方案的投资战略（例如农业废弃物的纤维），进而防范未来的市场冲击。

4. 与Canopy和我们的伙伴网络合作，开发零高风险木浆的解决方案，寻找可市场化落地的方案，扩充包材原材料类型，增强供应链韧性。



INTRODUCTION:
A PACKAGING PROBLEM WITH A SOLUTION BASED IN RESILIENCE





The pulp industry for paper, packaging, and cellulosic textiles consumes wood fibre equal to approximately five billions trees each year, about three billion of them going into paper packaging,[3] and this figure continues to rise in tandem with e-commerce and as companies seek alternatives to plastic. This "paperization" trend is forecast to continue, driving enormous growth in demand for paper packaging. Demand for wood fibre from other industries, such as energy, construction, and textiles, is also rising rapidly, with bioenergy expected to require over 700 million cubic metres of wood to be diverted from existing uses by 2050,[4] and demand for engineered wood products in the EU alone expected to increase 4.5 times (from 2023 levels) by 2030.[5]

Limited by land-use competition from agriculture and development, and disrupted by escalating wildfires, droughts, and pathogens, responsibly produced wood fibre is an increasingly rare, increasingly sought-after commodity.[6] Businesses that rely on it face intensifying competition, with shortages, supply chain disruptions, and price volatility becoming the new normal. Meanwhile, companies that turn to non-compliant or non-sustainable sources risk legal exposure, loss of market access, and reputational damage with consumers and investors.[7]

In 2025-2026, Canopy and Chronos Sustainability undertook a thorough assessment of the preparedness of the paper packaging industry to address these growing challenges. The result of their collaboration is the Pack4theFuture report highlighting the industry's readiness to manage risks to Ancient and Endangered Forests and to advance Next Generation Solutions[8] across their operations and supply chains. Looking at the world's 20 largest producers of packaging-grade paper, which together account for approximately 36% of the global capacity for packaging-paper production,[9] the Pack4theFuture report provides a snapshot of the largest and most influential companies in the sector, identifying the areas most urgently in need of change, progress to build on, and the opportunities that Next Gen alternative fibres unlock for long-term success.

MARKET RISKS CURRENTLY ASSOCIATED WITH VIRGIN WOOD FIBRE

1. **Rising demand —** Bioenergy, construction, textiles, and paper packaging are just some of the industries competing for access to wood fibre, and all are poised to expand, potentially beyond the capacity of forests to provide. For example, meeting just an additional 2% of global energy demand through wood biomass would require a doubling of current commercial wood harvests.[10]

2. **Paperization —** Driven by consumer preferences, corporate commitments and regulatory mandates, the shift from single-use plastics to fibre-based paper packaging is driving massive increase in wood fibre demand. Replacing just 10% of global plastic flexible packaging with virgin wood fibre would require 20% of the current supply of certified wood pulp.[11] Without strong standards and fibre diversification strategies, companies may inadvertently replace one environmental problem with another.

3. **Threatened supply —** Land-use competition and climate change are two major factors depleting global timber stocks. With an estimated demand for 200 million hectares of additional cropland by 2050[12] and extreme wildfires projected to increase by up to 14% from 2022 levels by 2030,[13] the continuity of existing forestry operations isn't guaranteed.

4. **Compliance costs —** Emerging legislation like the European Union Deforestation Regulation (EUDR) is increasing requirements for due diligence on complex wood fibre supply chains and driving up costs.[14]

5. **Shifting market expectations —** As investors and consumers become increasingly concerned about the extinction and climate crises, companies are subject to increasing scrutiny over the sustainability of their supply chains.

WHAT ARE NEXT GENERATION SOLUTIONS?

Next Generation Solutions are innovative materials and technologies that replace climate-critical forest-derived wood pulp with fibres from agricultural waste to create paper, packaging, and textiles. With millions of tonnes of agricultural residues burned on fields each year, utilizing this material to make Next Gen fibres can reduce air pollution, create new income streams for rural communities, and shape more resilient economies, all while taking pressure off of forests. By harnessing these residues, companies can transform the take-make-waste paper packaging supply chain and reduce financial and operational risk.



ASSESSMENT METHODOLOGY

PERFORMANCE OVER POLICY

Developed in alignment with leading practice on forest risk frameworks,[15] the Pack4theFuture report assessed paper packaging producers on two core criteria: protection of Ancient and Endangered Forests (weighted at 85% of a company's score) and advancement of Next Generation Solutions (weighted at 15% of the score). In relation to each of these core criteria, companies were assessed across seven pillars of performance, covering policy, governance, targets, and reporting (see Figure 1).
To accurately capture how companies progress from setting commitments to implementing, measuring, and reporting on them, the scoring structure emphasized governance infrastructure and performance reporting over policy commitments. For example, the Governance and Management and Performance Reporting pillars for Ancient and Endangered Forests together account for 55% of the total weighted score. Policy and commitments in the Next Gen pillar is weighted higher than in the other pillar because it is at an early stage compared to the many decades over which reversing forest degradation has been a priority. This emphasis on what companies are doing over what companies are intending or promising ensures the assessment accurately reflects the material reality of the industry and its level of preparedness to address wood fibre-related risks. By focusing on the world's 20 largest paper packaging producers , the report provides an overview of the state of the industry as a whole as well as its collective risk to Ancient and Endangered Forests.

WHAT ARE ANCIENT AND ENDANGERED FORESTS?

Ancient and Endangered Forests are defined as intact forest landscape mosaics, naturally rare forest types, that have been made rare due to human activity, and/or other forests that are ecologically critical for the protection of biological diversity. Ecological components of endangered forests are: intact forest landscapes; remnant forests and restoration cores; landscape connectivity; rare forest types; forests of high species richness; forests containing high concentrations of rare and endangered species; forests of high endemism; core habitat for focal species; forests exhibiting rare ecological and evolutionary phenomena.

The framework identifies two broad categories of Ancient and Endangered Forests:

1. **Primary forests**, including intact and old-growth subtypes.
2. **High-value non-primary forests with restoration potential**, including biodiversity-rich, carbon-rich, mature or natural forests, and recently converted or degraded primary forests.

Together, these categories provide a more comprehensive picture of ecologically critical forests than any single dataset or forest definition alone.

FIGURE 1

ANCIENT AND ENDANGERED FORESTS (85%)	
PILLAR	WEIGHTING
Policy and Commitments	15%
Governance and Management	25%
Targets	15%
Performance Reporting	30%

NEXT GENERATION SOLUTIONS (15%)	
PILLAR	WEIGHTING
Policy and Commitments	10%
Governance and Management	3%
Performance Reporting	2%

FORESTMAPPER 2.0



Canopy's ForestMapper tool uses a science-based framework to integrate multiple open-access ecological datasets into a globally consistent approach to identifying the forests most critically in need of conservation.

Companies can now precisely identify Ancient and Endangered Forests with Canopy's updated ForestMapper tool: **https://canopyplanet.org/tools-and-resources/forest-mapper**

PEER-REVIEWED RESEARCH

The Pack4theFuture report assessed company performance across the seven pillars using a list of 32 core questions, applicable to all 20 paper packaging producers, with four additional questions reserved for companies that own or control forestry operations or pulp plantations. (See Appendix: Assessment Criteria for a full list of questions.) Trained assessors then searched publicly available information, such as annual reports and published forest-sourcing policies, for answers, with findings subsequently peer-reviewed. To keep the emphasis on sector performance as a whole and to encourage collaboration, the results were aggregated, and the scores of individual companies were kept anonymous.

COMPARING RESULTS

Based on overall weighted percentage scores, companies were grouped into one of seven performance tiers, with Tier 1 representing industry leaders and Tier 7 representing those companies who have yet to provide evidence of safeguarding Ancient and Endangered Forests or pursuing alternatives to wood fibre (see Figure 3). These tiers provide a way to track sector performance and relative distribution on key issues.

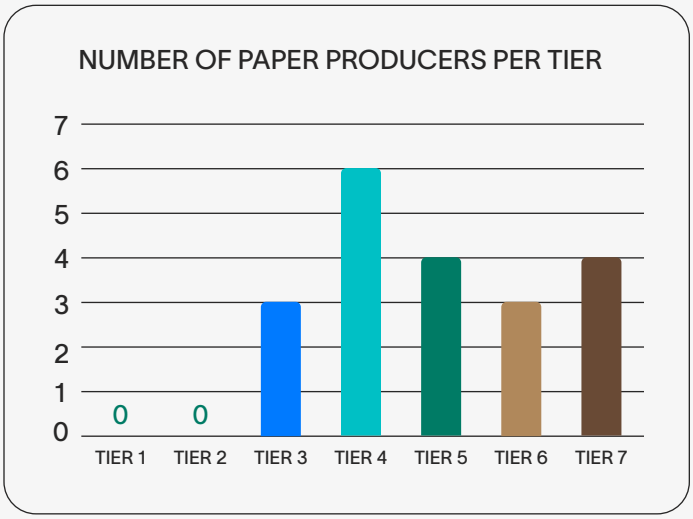
FIGURE 3

TIER	DESCRIPTION	SCORE RANGE
TIER 1	The company has taken a leadership position in safeguarding Ancient and Endangered Forests and accelerating Next Generation Solutions	>85%
TIER 2	The company has made Ancient and Endangered Forests an integral part of its business strategy	70-85%
TIER 3	The company has an established approach to Ancient and Endangered Forests but there is more work to be done	53-70%
TIER 4	The company is taking some steps to safeguard Ancient and Endangered Forests but there is more work to be done	44-52%
TIER 5	The company is making early progress on policies and practices to safeguard Ancient and Endangered Forests	27-43%
TIER 6	Limited evidence of policies and/or practices to safeguard Ancient and Endangered Forests	10-26%
TIER 7	No evidence of safeguarding Ancient and Endangered Forests on the business agenda	<10%

KEY FINDINGS

1. Paper Packaging Producers as a whole have low performance scores

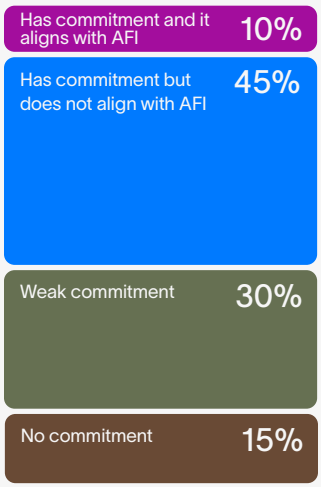
The median performance score of the top 20 paper packaging producers was only 39%, with a handful of poor performers reducing the average score to 33%. With the top two tiers of performance completely empty and no company scoring higher than 55%, it is clear that the paper packaging sector is not addressing the risks inherent in virgin wood fibre supplies, including threats to Ancient and Endangered Forests. As responsibly sourced wood fibre supply is constrained by climate change, competition for supply, and tightening regulations, among other factors, companies relying on it are exposed to financial, regulatory, and reputational risks.



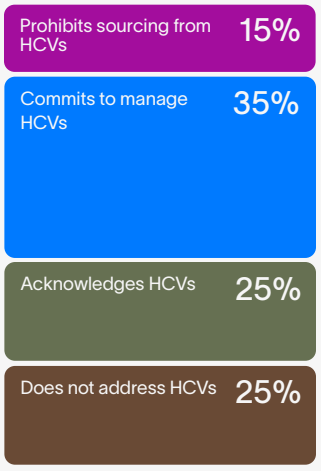
2. Ancient and Endangered Forests remain in jeopardy

While many companies make commitments to address deforestation in vague or general terms, Ancient and Endangered Forests, the most critical forests to protect due to their irreplaceable ecological role, are almost entirely absent from these policies, with only one company stating a clear commitment to prohibit sourcing from any such forests. No companies report on Ancient and Endangered Forests found within their operations. Traditional "no deforestation" policies do not eliminate the risk of degrading these critical landscapes, as such policies are subjectively defined and don't necessarily preclude logging or other economic activities from taking place.[16] In this way, products derived from Ancient and Endangered Forests may still find their way into the supply chain, subverting the stated intentions of companies and causing profound environmental harm. Shifting to circular or Next Generation alternative fibre inputs and using only Forest Stewardship Council (FSC)-certified fibre can help companies mitigate this risk. Weaker certifications such as Programme for the Endorsement of Forest Certification (PEFC) and the Sustainable Forestry Initiative (SFI) do not credibly uphold the conservation values that protect Ancient and Endangered Forests, leaving companies that rely on these certifications open to critique.

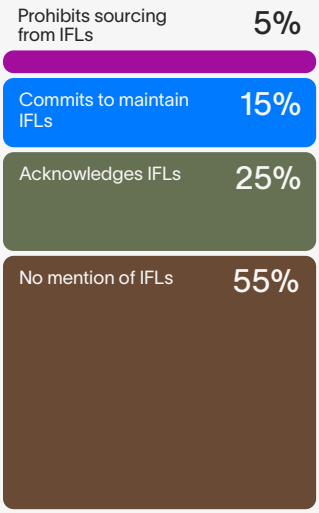
PAPER PRODUCERS WITH NO DEFORESTATION/ NO FOREST CONVERSION COMMITMENTS



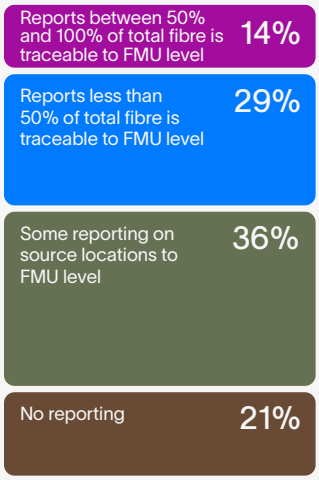
PAPER PRODUCERS WITH COMMITMENT TO PROHIBIT SOURCING FROM HIGH CONSERVATION VALUE (HCV) FORESTS



PAPER PRODUCERS WITH COMMITMENT TO PROHIBIT SOURCING FROM PRIMARY FORESTS/ INTACT FOREST LANDSCAPES (IFLS)



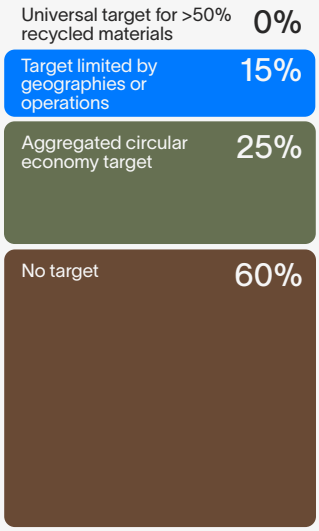
PAPER PRODUCERS REPORTING ON TRACEABILITY TO THE FOREST MANAGAMENT UNIT (FMU)



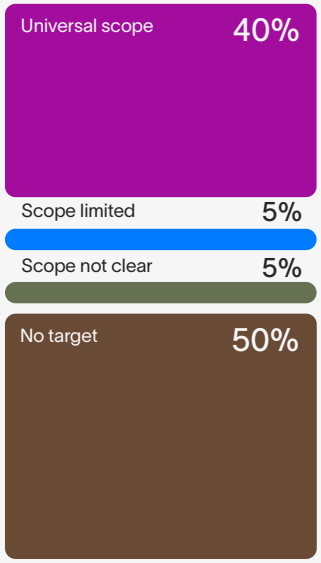
3. Target-setting is a critical weakness

Setting targets for the protection of Ancient and Endangered Forests and implementation of Next Generation Solutions was the weakest performance pillar sector-wide, as compared to policies, governance, and reporting. Companies achieved an average score of just 27% for target-setting to protect Ancient and Endangered Forests. This represents a critical gap: Companies may have policies and even governance structures in place, yet fail to translate these into timebound, quantitative targets, hampering their ability to follow through. Furthermore, although 80% of companies express commitments to increase recycled fibre content, 60% do not specify a target. Notably, 25% frame their recycled fibre commitments so weakly that they do not ultimately require companies to use recycled fibre, but only to create products that are capable of being recycled at the end of their lives. The industry-wide absence of formal targets for fibre basket diversification is alarming when considered against the growing volatility of wood inputs, and presents increasing risk to brands and producers alike.

PAPER PRODUCERS WITH RECYCLED CONTENT TARGET



PAPER PRODUCERS WITH NO DEFORESTATION/ NO CONVERSION TARGET.

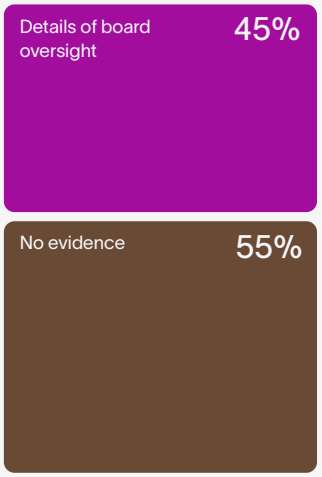


4. Governance is key to performance

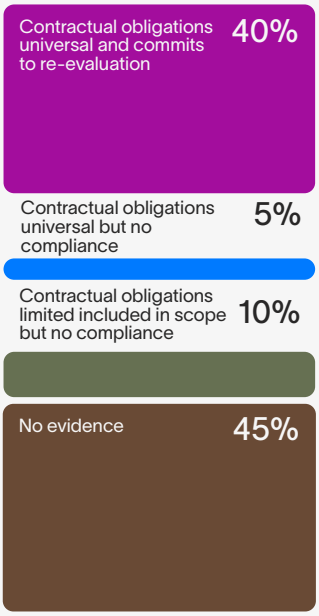
Board-level and operational accountability for deforestation is a strong predictor of company performance in the Pack4theFuture report. This correlation holds true regardless of a company's geographic context or stated policies. Companies that assign responsibility for protecting forests to a specific governing body or team consistently outperform their peers, but only a minority have currently embedded this foundational practice. With appropriate governance structures in place, companies stand a better chance of implementing policies and achieving targets.



PAPER PRODUCERS WITH BOARD/ SENIOR MANAGEMENT WITH RESPONSIBILITY AND OVERSIGHT OF DEFORESTATION AND/ OR CONVERSION



PAPER PRODUCERS THAT COVER DEFORESTATION AND/ OR CONVERSION OF NATIVE HABITAT WITHIN CONTRACTUAL OBLIGATIONS FOR ALL SUPPLIERS



5. Protections for Indigenous Peoples and Local Communities lack follow-through

Despite fair coverage of the topic in policy, companies frequently fail to disclose implementation outcomes or supplier compliance mechanisms when it comes to Indigenous rights and the protection of local communities. For example, while 60% of paper packaging companies assessed include Free, Prior, and Informed Consent (FPIC)[17] language in their policies, only 40% conduct systematic supplier FPIC assessments, without which it is impossible to meaningfully ensure compliance. Meanwhile, 90% of assessed companies do not report on grievance resolution, leaving the door open to potential human rights abuses. Overall, these human rights commitments remain poorly addressed across the sector, despite the fact that they are legally enshrined, ethically imperative, and demonstrably linked to environmental outcomes. To ensure that paper packaging products are made in compliance with Indigenous title and the rights of local communities around the world, companies must develop formal policies on Indigenous Peoples and Local Communities (IPLCs) and systematically screen suppliers for related risks.



PAPER PRODUCERS WITH COMMITMENT TO FREE, PRIOR, AND INFORMED CONSENT (FPIC)

- Commitment aligns with UNDRIP: 20%
- Commitment does not align with UNDRIP: 15%
- Broad commitment: 25%
- Does not address FPIC: 40%

PAPER PRODUCERS ASSESSING SUPPLIERS ON THEIR COMMITMENTS TO FREE, PRIOR, AND INFORMED CONSENT (FPIC)

- Detailed description of supplier assessment: 20%
- Suppliers assessed: 20%
- No evidence of assessment: 60%

PAPER PRODUCERS WITH FORMALIZED AND PUBLICLY AVAILABLE GRIEVANCE MECHANISM IN PLACE WHICH COVERS ITS OPERATIONS

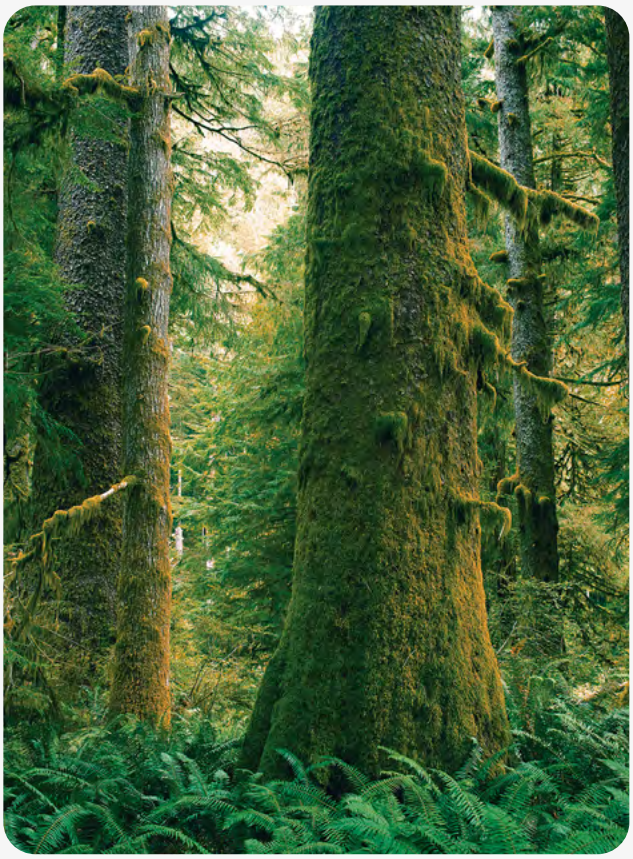
- Reports on the grievances raised and outlines the responses and resolutions with third-party verifications: 0%
- Reports on the grievances raised and outlines the responses and resolutions but not third-party verified: 21%
- Reports on grievances but not outline responses and resolutions: 29%
- No reporting: 50%

6. Not all certifications are created equal, and weaker certifications are being used as a proxy for meaningful action and transparency

While 60% of paper packaging companies assessed disclose the percentage of certified fibre used in their products, only two companies report substantive volumes of fibre that are traceable to the level of the forest management unit (a crucial safeguard for verifying compliance with laws and environmental principles). This lack of transparency undermines the efforts of companies higher up the supply chain to eradicate risk of Ancient and Endangered Forests within their packaging and poses a significant compliance risk for buyers of paper packaging. The lack of disclosure is particularly striking given that 14 of the 20 companies (70%) operate their own forestry operations or plantations and are therefore well-positioned to report on the origins of their products.

Meanwhile, a majority of assessed producers reassure customers about the quality of their virgin fibre by pointing to certifications, with many (45%) relying on weaker certifications such as Programme for the Endorsement of Forest Certification (PEFC) or the Sustainable Forestry Initiative (SFI). However, these weaker certifications are not rigorous enough to ensure meaningful risk mitigation. Forest Stewardship Council (FSC)-certification, which uses a chain of custody system to ensure integrity through the supply chain, is the most credible of these safeguards.[18] By conflating all the certifications as equal, producers fail to provide meaningful assurances to customers and expose themselves to an array of risks.

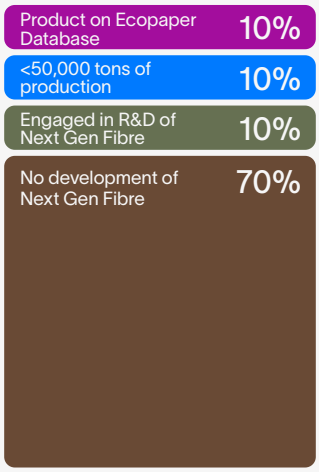
PAPER PRODUCERS WITH PREFERENCE FOR FOREST STEWARDSHIP COUNCIL (FSC)-CERTIFIED VIRGIN FIBRE CONTENT



7. Next Gen alternative fibre innovations have begun, but wider adoption and industry leadership is needed

The sector is beginning to innovate with non-wood fibres, and the next great race for the industry has begun, with a small number of companies beginning to bring commercial-scale Next Gen alternative fibre products to market. At present, only 20% of companies acknowledge Next Gen alternative fibres as a relevant business issue, and no company has a published policy or stated commitment, leaving the field wide open for leadership. However, 30% of companies report that they are in the process of developing commercial-scale packaging containing Next Gen alternative fibres or have listed a Next Gen alternative fibre product, signalling a coming shift in the industry, with early adopters positioned to lead, and others at risk of falling behind.

PAPER PRODUCERS SUPPORTING THE DEVELOPMENT OF COMMERCIAL-SCALE PACKAGING FROM ALTERNATIVE NEXT GEN FIBRE SOURCES







WAYS FOR PAPER PACKAGING INDUSTRY TO BUILD MORE RESILIENCE



The Pack4theFuture report makes it clear that the paper packaging industry must address the issues associated with virgin wood fibre. Fortunately, there are numerous research-backed avenues by which producers of paper packaging can close gaps and future-proof their businesses:

1. Reduce reliance on virgin wood by scaling Next Gen alternative fibre and recycled fibre inputs. By doing so, companies can reduce exposure to a wide array of risks embedded in virgin wood-dependent value chains — including supply constraints, future price increases, and compliance concerns — while keeping critical forest landscapes standing. A growing suite of well-researched, technologically proven, and cost-competitive Next Generation Solutions already exist, and Canopy is available to support companies in taking advantage of the opportunity. To-date, Canopy is in partnership with nearly 1,000 brands that have committed to not using Ancient and Endangered Forest fibres in their textiles or paper packaging and to supporting the uptake of Next Generation Solutions. Canopy offers technical research, connection with vetted suppliers, and pre-competitive brand collaborations in Next Gen product development.

2. Strengthen protections for Ancient and Endangered Forests through robust policies with rigorous mapping, transparency, and enforcement mechanisms. Strong governance is key: Companies must assign board-level and operational accountability for deforestation to see results.

3. Develop ambitious, measurable targets across sustainability commitments, including:

   - No-deforestation, no-conversion targets that address forest degradation and align with the Accountability Framework Initiative (AFi), a roadmap for companies to achieve ethical supply chains that protect forests, natural ecosystems, and human rights. See **https://accountability-framework.org/** for more information.
   - Targets to maximize recycled fibre inputs that are independent of broader circularity goals.
   - Commitments to prioritize FSC-certified materials and to clearly distinguish between certification types when reporting amounts of certified fibre.
   - Use credible certification systems such as the **Roundtable on Sustainable Biomaterials (RSB)** when sourcing agricultural fibres.

4. Increase transparency by providing information on forest of origin for all sourced fibre. This type of reporting, known as Forest Management Unit-level reporting, provides practical, ground-level data and accountability that more general reporting cannot offer and is critical to ensuring that products are free of materials from Ancient and Endangered Forests.

5. Increase protections for Indigenous Peoples and Local Communities (IPLCs), with policies consistent with United Nations declarations and the Accountability Framework Initiative. By ensuring that paper packaging products are made in compliance with Indigenous title and the rights of local communities around the world, paper packaging companies secure their own reputations as ethical players while staying on the right side of legal and compliance risks.



THE BUSINESS CASE FOR NEXT GEN

Canopy commissioned a financial assessment of the cost advantages of integrating Next Gen feedstocks into paperboard packaging. The analysis used an illustrative commercial relationship between a buyer (e.g., a global, high-volume consumer goods brand or paperboard converter) and a China-based integrated pulp and paperboard mill. It estimates the maximum delivered Next Gen fibre pulp price that supports commercially optimal use of at least 5% Next Gen fibre, and up to allowable quality limits, accounting for mill economics, risk, costs, and operational performance of Next Gen fibre use. It tests how this price changes under varying market conditions, including (i) wood price volatility consistent with historical levels, (ii) higher and more volatile wood prices, and (iii) illustrative EU-style policy mechanisms.

The findings show:

1. Replacing 5-10% of virgin wood inputs with Next Gen pulp offers a practical, near-term option to reduce exposure to wood pulp price volatility and prepare for emerging policy requirements.

2. Innovations overcoming technical constraints and/or adjusting product requirements can substantially increase the value of Next Gen pulp by allowing it to replace higher cost virgin wood pulp inputs.

3. A 5-10% inclusion also unlocks scaling opportunities, particularly where qualified feedstock, paper and packaging production, and demand intersect.

Furthermore, additional performance advantages are being discovered, tested and proven including the use of Next Gen fibres to lightweight packaging, reducing transport costs and climate impacts, and to increase the strength of recycled fibre packaging.

For more information, see Canopy's Market Brief **"Seeing the Field and the Forest: Next Gen Fibre in Consumer Paperboard" White Paper, 2026.**

CONCLUSION

The Pack4theFuture report reveals the paper packaging industry does not currently have measures in place to protect Ancient and Endangered Forests or address increasing constraints on responsibly sourced virgin wood fibre. Economic and environmental pressures affecting the world's forests are increasingly affecting the industries that rely on them, causing price volatility and supply disruptions, and exposing paper packaging producers to legal, reputational, and financial risks that threaten the long-term viability of their businesses. The sector is at a critical turning point, and companies must act quickly to adopt new practices or risk falling behind.

Innovations in Next Gen fibre production means there are multiple research-backed solutions to mitigate wood fibre risk and build resilient, future-proof businesses, including maximizing recycled fibre content. This is a moment when new industry leaders have the opportunity to step up. Canopy is confident that the paper industry can substitute virgin fibre from Ancient and Endangered Forests by maximizing recycled content and Next Gen Solutions. Already in partnership with nearly 1,000 brands, Canopy is the solutions architect offering proven brand support and industry-specific knowledge. By working together, we can build a resilient, sustainable future for the paper packaging industry while protecting the world's most vital forest landscapes.



REPORT FOOTNOTES

1. Canopy Planet and Finance Earth, *Paper Thin Comfort: Wood Fibre Risk in a Finite Forest World* (Canopy Planet, 2026), 6, https://canopyplanet.org/news/paper-thin-comfort-wood-fibre-risk-in-a-finite-forest-world

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3. Estimate derived from global wood pulp production volumes reported in the FAOSTAT statistical database based on 2023 data, along with environmental impact conversion ratios following the methodology used by the EPN Environmental Paper Calculator, Version 4.0.

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7. Canopy Planet and Finance Earth, *Paper Thin Comfort: Wood Fibre Risk in a Finite Forest World* (Canopy Planet, 2026), 8–9, https://canopyplanet.org/news/paper-thin-comfort-wood-fibre-risk-in-a-finite-forest-world

8. Next Generation Solutions are the designs, systems, technologies, and alternative fibre feedstocks that reduce pressure on carbon rich forests and enable landscape conservation. They allow fibre diversification for pulp, paper, and packaging as well as man-made cellulosics.

9. Fisher International, FisherSolve Next, Q4-2025 (database), accessed September 28, 2026, https://www.fishersolve.net/

10. Liqing Peng, Timothy D. Searchinger, Jessica Zionts, and Richard Waite, *The Carbon Costs of Global Wood Harvests* (Nature 620 2023), 110–115, https://doi.org/10.1038/s41586-023-06187-1.

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12. Assumes productivity increases by historical (linear) rates since 1960. World Resources Institute, *The Global Land Squeeze: Managing the Growing Competition for Land* (World Resources Institute, 2023), 5, https://doi.org/10.46830/wrirpt.20.00042.

13. Andrew Sullivan, Elaine Baker, and Tiina Kurvits, Editors, *Spreading Like Wildfire: The Rising Threat of Extraordinary Landscape Fires* (UN Environment Programme, 2022), 41, https://www.researchgate.net/publication/358989662_Spreading_like_wildfire_the_rising_threat_of_extraordinary_landscape_fires

14. Unilever PLC CDP Forests Questionnaire 2023 (Unilever, 2023), 126, https://www.unilever.com/files/cdp-forestsquestionnaire-2023.pdf

15. Criteria were mapped against a range of established deforestation and forest-risk frameworks, including The Common Methodology of the Accountability Framework initiative (AFi); Forest500, produced by Global Canopy; the Zoological Society of London's SPOTT assessment for the Timber and Pulp sector; and Forestry and Paper sector metrics from the Taskforce on Nature-related Financial Disclosures (TNFD).

16. Because of the diversity of terminology about forests used by different companies and different certifications, the assessment covered multiple questions, each targeting a different measure, to collectively assess risk to Ancient and Endangered Forests.

17. The right to Free, Prior, and Informed Consent (FPIC) is articulated in the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP) and in the Accountability Framework initiative's (AFi) Operational Guidance on Free, Prior and Informed Consent. Company policies should follow this well-established guidance.

18. https://canopyplanet.org/news/forest-certification-comparison

APPENDIX: ASSESSMENT CRITERIA

Read more here

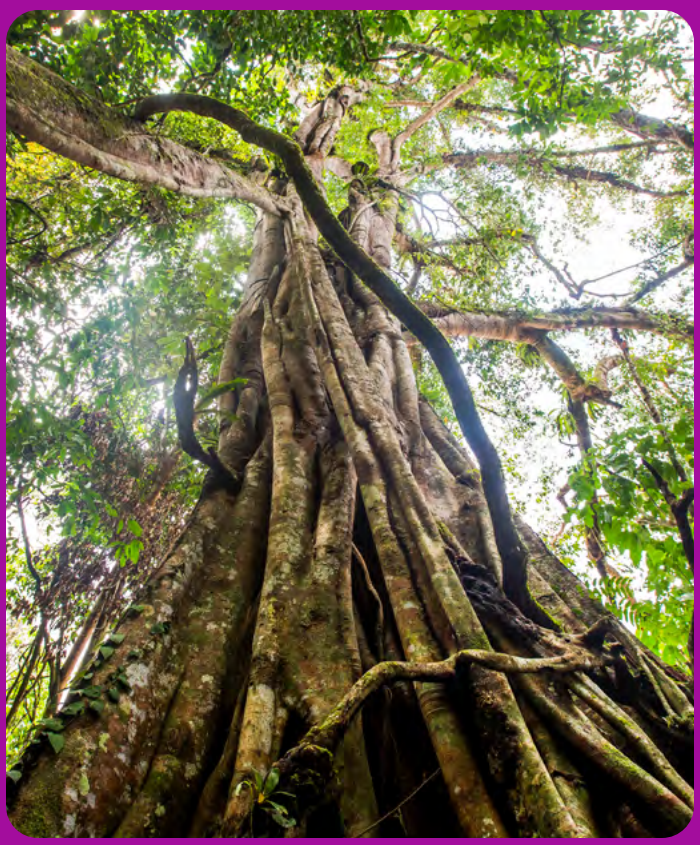
ANNEX

Canopy's definition of Ancient and Endangered Forests is informed by over 25 years of on-the-ground collaborations with front-line forest defenders and Indigenous nations, multi-stakeholder engagements with other environmental non-governmental organizations, and dozens of peer-reviewed publications by leading conservation and biodiversity scientists — all of which collectively provide extensive evidence that keeping these ecologically-critical forests standing is one of the fastest, cheapest, and most effective solutions to mitigating climate change and saving the diversity and abundance of life on Earth.

We align our approach with the following established frameworks and classification of forest conservation values:

- International Union for Conservation of Nature (IUCN): **Policy Statement for primary forests including intact forest landscapes**
- **Global Safety Net**
- **High Conservation Value** (HCV) and **High Carbon Stock** (HCS) Forests

We further rely on the foundational scientific basis supported by:



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- Luyssaert, S., et al. (2008). **Old-growth forests as global carbon sinks.** Nature.

GLOSSARY

A

This glossary is designed as a support tool for the assessors of the Pack4theFuture Benchmark.

ANCIENT AND ENDANGERED FORESTS (AEFS)
Ancient and Endangered Forests are defined as intact forest landscape mosaics, naturally rare forest types, forest types that have been made rare due to human activity, and/or other forests that are ecologically critical for the protection of biological diversity. Ecological components of endangered forests are: intact forest landscapes; remnant forests and restoration cores; landscape connectivity; rare forest types; forests of high species richness; forests containing high concentrations of rare and endangered species; forests of high endemism; core habitat for focal species; forests exhibiting rare ecological and evolutionary phenomena.[1]

For additional information to assess questions related to AEFs, please refer to Annex and the document "Ancient and Endangered Forest Friendly" by Canopy: **https://www.datocms-assets.com/132613/1740614581-aae_forest_friendly_designation.pdf**

B

BIOLOGICAL DIVERSITY (BIODIVERSITY)
The variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part. This includes diversity within species, between species, and ecosystems.[2]

C

CITES (THE CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA)
An international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species. CITES is an international agreement to which states and regional economic integration organizations adhere voluntarily.[3]

CITES Appendix I
Lists all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.[4]

Appendix I species are threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial (**see Article III**), for instance for scientific research. In these exceptional cases, trade may take place provided it is authorized by the granting of both an import permit and an export permit (or re-export certificate).[5]

CONVERSION
Loss of a natural ecosystem as a result of its replacement with agriculture or another land use, or due to a profound and sustained change in a natural ecosystem's species composition, structure, or function.

- Deforestation is one form of conversion (conversion of natural forests).
- Conversion includes severe and sustained degradation or the introduction of management practices that result in a profound and sustained change in the ecosystem's species composition, structure, or function.
- Change to natural ecosystems that meets this definition is considered to be conversion regardless of whether or not it is legal.[6]

CUTOFF DATE
The date after which deforestation or conversion renders a given area or production unit non-compliant with no-deforestation or no-conversion commitments, policies, goals, targets, or other obligations.[7]

D

DEFORESTATION
Loss of natural forest as a result of: (i) conversion to agriculture or other non-forest land use; (ii) conversion to a tree plantation; or (iii) severe and sustained degradation.

- This definition pertains to no-deforestation supply chains that generally focus on preventing the conversion of natural forests. Severe and sustained degradation (scenario iii in the definition) constitutes deforestation even if the land is not subsequently used for a non-forest land use.
- Loss of natural forest that meets this definition is considered to be deforestation regardless of whether or not it is legal.
- The Accountability Framework's definition of deforestation signifies 'gross deforestation' of natural forest where 'gross' is used in the sense of "total; aggregate; without deduction for reforestation or other offset."[8]

E

ENDEMIC SPECIES
Species for which the entire global range is restricted to the site, the region or the country. The level of endemicity must be defined.[9] The IUCN assesses the richness and conservation status of endemic species (where endemicity may be regional or local).[10] Endemic species should be identified using the **IUCN Red List**. However, searches must be conducted specifically for endemic species, as not all of them are classified as threatened, endangered, or vulnerable (RTE) species.

F

FIBRE OPTIMIZATION
A process of efficiency during the packaging paper production and manufacturing stages which aims to reduce waste.

FREE, PRIOR AND INFORMED CONSENT (FPIC)
(as defined by the Accountability Framework Initiative (AFi))
A collective human right of Indigenous Peoples and local communities to give and withhold their consent prior to the commencement of any activity that may affect their rights, land, resources, territories, livelihoods, and food security. It is a right exercised through representatives of their own choosing and in a manner consistent with their own customs, values, and norms.[11]

FREE, PRIOR AND INFORMED CONSENT (FPIC)
(as defined and used in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP))

Article 28

1. Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent.
2. Unless otherwise freely agreed upon by the peoples concerned, compensation shall take the form of lands, territories and resources equal in quality, size and legal status or of monetary compensation or other appropriate redress.

Article 32

1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.
2. States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.
3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

G

GRIEVANCE MECHANISMS
A process through which grievances concerning business-related human rights abuse can be raised and an effective remedy can be sought. In practice, it is a formalized process through which the institution deals with a grievance or complaint. It includes the procedures and systems for receiving complaints of any sort and facilitating their resolution. Resolution may include steps to enable complainants to seek remedy.[12]

H

HIGH CONSERVATION VALUE (HCV)
The High Conservation Value approach is a methodology used to identify, protect, and monitor biological, ecological, social, and cultural values in production landscapes. HCV assessments are required as part of the Forest Stewardship Council (FSC) forest management certification process. Once an assessment has taken place, companies will refer to the presence of HCVs within their operations. Please refer to the Common Guidance for the identification of High Conservation Values for details on the assessment process. There are six categories of HCVs:

- **HCV 1 (Species diversity):** Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
- **HCV 2 (Landscape-level ecosystems, ecosystem mosaics and IFL):** Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- **HCV 3 (Ecosystems and habitats):** Rare, threatened, or endangered ecosystems, habitats, or refugia.
- **HCV 4 (Ecosystem services):** Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
- **HCV 5 (Community needs):** Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous peoples, identified through engagement with these communities or Indigenous peoples.
- **HCV 6 (Cultural values):** Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous peoples, identified through engagement with these local communities or Indigenous peoples.[13]

I

INDIGENOUS PEOPLES
Indigenous peoples have in common a historical continuity with a given region prior to colonization and a strong link to their lands. They maintain, at least in part, distinct social, economic and political systems. They have distinct languages, cultures, beliefs and knowledge systems. They are determined to maintain and develop their identity and distinct institutions and they form a non-dominant sector of society.[14]

INTACT FOREST LANDSCAPES (IFLS)
Forests where industrial logging has not taken place, and that are a minimum of 50,000 hectares (123,500 acres) in size and area.[15]

INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN) RED LIST OF THREATENED SPECIES
Established in 1964, the IUCN Red List of Threatened Species has evolved to become the world's most comprehensive information source on the global extinction risk status of animal, fungus and plant species.[16]

N

NET DEFORESTATION
The difference in forest area between two points in time, taking into account both losses from deforestation and gains from forest regeneration and restoration. Net deforestation is measured with reference to a given geographic area (eg, a district, state, nation, or globe) and a given timeframe.

- The Accountability Framework specifies that net deforestation is not an appropriate metric for characterizing the forest and land-use footprint of company operations, supply chains, or investments. Rather, companies should utilize the concept of (gross) deforestation, as defined by the Accountability Framework, in setting targets and monitoring outcomes.
- This definition is provided here for context and completeness because it sometimes appears in the lexicon. Some have suggested that net deforestation may be a relevant concept for setting targets and informing land-use planning at the landscape, jurisdictional, or national scale, considering all sectors and all land uses together. To the extent that the net deforestation concept is used in these contexts, the AFi advocates that natural forests be distinguished and tracked separately from tree plantations for the purpose of quantifying forest loss and gain.[17]

NEXT GENERATION SOLUTIONS
Next Generation Solutions are the designs, systems, technologies, and alternative fibre feedstocks that reduce pressure on carbon rich forests and enable landscape conservation. They allow fibre diversification for pulp, paper, and packaging as well as man-made cellulosics.

NEXT GENERATION FIBRES
Non-wood agricultural residues and alternative fibres like waste left over after the grain harvest, food industry waste, dedicated crops (those that fix carbon in the soil and don't compete with food crops), and other available feedstocks.

NO-CONVERSION/CONVERSION-FREE/ZERO CONVERSION
Commodity production, sourcing, or financial investments that do not cause or contribute to the conversion of natural ecosystems (as defined by the Accountability Framework).

- No-conversion refers to no gross conversion of natural ecosystems, which the Accountability Framework specifies as the appropriate policy and goal on this topic for companies and supply chains.
- The terms 'no-conversion' and 'conversion-free' are used in favour of 'zero-conversion' because 'zero' can imply an absolutist approach that may be at odds with the need to sometimes accommodate minimal levels of conversion at the site level in the interest of facilitating optimal conservation and production outcomes (see definition for minimal level).[18]

P

PACKAGING PAPER
Packaging paper refers to the product used as raw material for the manufacture of various kinds of packaging made from paper. This category includes cardboard, containerboard, packaging paper, gags and sacks, extensible paper, extensible sack, wrapping paper. This category excludes hygiene products, books, newspaper, stationary, and office paper, and viscose fibres.

POST-CONSUMER WASTE RECYCLED FIBRE
Material that has been used by the end consumer and then discarded into a waste recycling system and recovered at this point for reprocessing.

PRE-CONSUMER WASTE RECYCLED FIBRE
Waste material generated during a manufacturing process that never reaches the end user (e.g. trimming from paper production).

PRIMARY FORESTS
Naturally regenerated forests of native tree species, including mangroves and peat forests, whose structure and dynamics are dominated by ecological and evolutionary processes, including natural disturbance regimes, and where if there has been significant prior human intervention it was long enough ago to have enabled an ecologically mature forest ecosystem to be naturally re-established. Many primary forests are also home to Indigenous peoples and local communities and are the basis of their identity, culture, belief system, traditional knowledge, and livelihoods; a forest that meets the definition above would not be excluded due to the presence of these communities. As used here, primary forest is a broad term which encompasses related terms including: stable forest, intact forest, old-growth, frontier, long-untouched, and virgin forest and is consistent with the ways 'primary forests' are defined by other authorities such as the Convention on Biological Diversity (CBD) and the United Nations Food and Agriculture Organization (FAO). [19]

R

RARE, THREATENED, AND ENDANGERED (RTE) SPECIES
Species identified as being at elevated risk of decline or extinction, or subject to international trade controls due to conservation concerns. This includes:

- All species listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Species assessed by the IUCN Red List as Near Threatened (NT), Vulnerable (VU), Endangered (EN), and Critically Endangered (CR).

RECOVERED FIBRE
Depending on the context this can be another term for recycled fibre or fibre recovered during an optimization process.

RECYCLED FIBRE/ RECYCLED PAPER
Paper/fibre which has been recovered after the manufacturing process to create a product. Recycled fibre can be divided into two main sources: (I) Pre-consumer waste and (II) Post-consumer waste.

S

SEVERE AND SUSTAINED DEGRADATION
Severe and sustained degradation (scenario iii in the AFi's definition of deforestation) constitutes deforestation even if the land is not subsequently used for a non-forest land use.[20]

W

WYE RIVER PRINCIPLES
The Wye Group was established in April 2001 as a forum among a broad ad-hoc group of ENGOs and industry participants to define and identify the characteristics of Endangered Forests, and propose purchaser actions in relation to these forests. Industry only attended initial meetings and we look forward to re-engagement and dialogue. In 2002, the **Wye River Discussion Document on Endangered Forests** was published. This document outlines the six underlying principles of the Endangered Forests Framework. It also describes what it considers to be adequate conservation safeguards:

- "Establishment of a representative protected area system acceptable to all concerned stakeholders including conservation organizations that results from either a multi-stakeholder conservation planning process, or a conservation design process carried out by scientists. In addition, control of illegal logging, and independent third-party certified forest management (FSC or equivalent) are required as adequate conservation safeguards."[21]

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ABOUT CANOPY

Canopy is a global, solutions-driven environmental nonprofit organization helping brands reduce supply chain risk and accelerate progress toward their net zero goals. Working with more than 1,000 global brands, producers, and innovators, we help scale commercially viable Next Gen materials — made from textile waste, agricultural residues, and regenerative crops — for textiles and paper packaging. Next Generation Solutions can help reduce reliance on forest-based fibre and help mitigate the climate and biodiversity impacts of industry.

ABOUT PACK4GOOD

Canopy's Pack4Good initiative collaborates with the world's biggest companies to address the impacts of paper packaging. Since its launch in 2019, the Pack4Good initiative has partnered with 555 of brands representing $534 billion USD in annual revenues.

canopy

CONTACT

PACK4GOOD@CANOPYPLANET.ORG
CANOPYPLANET.ORG

@CANOPYPLANET
LINKEDIN
INSTAGRAM
X