The Book Chain Project

2022-2023 Environment Report

BOOK CHAIN PROJECT

Contents

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Produced by

The Book Chain Project, an initiative run by SLR (Previously Carnstone Partners Ltd).[1]

BOOK CHAIN PROJECT

SLR

[1] Carnstone Partners Ltd was acquired by SLR Consulting in May 2023 and fully integrated in June 2024

Introduction

What is the Book Chain Project?

The Book Chain Project (BCP) is a collaboration of 28 leading publishers, over 400 paper mills and over 550 first-tier suppliers to make the supply chains of printed books and journals more sustainable.

It operates as a platform where paper mills, printers and other suppliers can share information with publishers and work together to drive social and environmental responsibility in product supply chains.

It started life in 2006, partly in response to the Greenpeace report *'The Paper Trail'* which cast a light on the potential impacts of the publishing industry on global deforestation. Together, we built relationships with paper mills to gather tree species and country of origin data for each fibre used in every brand of paper and board.

Since then, our work has expanded into three workstreams:

Chemicals & Materials

This workstream aims to simplify how chemical safety information is shared between publishers and their print suppliers, helping publishers to comply with safety legislation and stay ahead of new developments. We also focus on how to make more sustainable material and design choices.

Forest Sourcing

The Forest Sourcing workstream collects and analyses the origins of tree fibres used in paper and board, helping publishers identify responsible forest sources for their books. We hold data on over 4,000 paper and board brands from 400 paper mills around the world. We engage with paper mills around forest sources, environmental performance, and responsible sourcing, covering forestry, trade, biodiversity and species risks.

Labour & Environment

This workstream sets publishers' expectations on labour practices and environmental management for suppliers globally. It enables printers and other suppliers to share information about the labour and environmental practices they have at their sites. We gather data on suppliers' environmental performance; set expectations through our industry Code of Conduct; facilitate audit sharing; and collaborate on topics that are important for the industry such as responsible recruitment and health & safety.

Publishers use the Book Chain Project to make informed buying decisions. Across the three workstreams, we are able to capture information on the 'full story of the book'.

Environmental Questionnaire (EQ)

One way that publishers are responding to climate change and demands for circularity through BCP is via EQs. This is a self-assessment questionnaire that mills and suppliers complete on the BCP system to establish their environmental performance and share this information with publishers. The questions cover policies, management systems, energy use, greenhouse gas emissions, water use, wastewater treatment, material use and waste disposal.

Each completed questionnaire is assigned a maturity level, based on a maturity ladder which ranks sites from Beginner through to Learning, Advanced, and Leading. This gives publishers and the site itself an idea of where they are in their journey to environmental leadership.

Based on the site inputs, the system calculates intensity metrics such as:

Energy intensity

- MWh/tonne of paper produced for mills
- MWh/tonne of paper used for printers

Greenhouse Gas (GHG) intensity

- tonnes Scope 1&2/tonne of paper produced for mills
- tonnes Scope 1&2/tonne of paper used for printers

Water intensity

- m3/tonne of paper produced for mills
- m3/tonne of paper used for printers

These intensity metrics are then evaluated against internal and external benchmarks. Publishers can use these intensity metrics to evaluate and compare sites' environmental performance, and to calculate their own Scope 3 emissions from the production of the paper they have used in their books, as well as the printing of their books.

The BCP EQ was updated on 7th May 2024 to include improved guidance and new sections on refrigerants used onsite and Forest, Land Use and Agriculture (FLAG) emissions. The information captured in this report will not include this, as these updated questionnaires are not yet in our data pool. We expect to be able to include insights on refrigerants and FLAG-related emissions in our next Environmental Report, due in 2026.

Context for the report

Why climate change is important for the publishing industry

The negative environmental impacts of rising greenhouse gas (GHG) emissions are becoming increasingly evident. The UN Secretary-General, Antonio Guterres, has said that now is the 'moment of truth' for climate action. New data from the EU's Copernicus Climate Change Service has found that the past 12 months have been the hottest on record, with temperatures more than 1.6°C above the pre-industrial era. While this does not mean that the world has broken the 1.5°C limit for global warming, which was the degree of warming determined by the Paris Agreement, it gives us an insight into what breaching that limit would look like and shows the window of opportunity to prevent that breach is closing. A new report published by the World Meteorological Organisation (WMO) predicts that there will be more record-breaking temperatures over the next five years.

Paper production is heat-intensive, and therefore energy intensive, mainly due to the large amounts of water needing to be evaporated when drying pulp and paper. According to the International Energy Agency, the pulp and paper sector was responsible for just under 2% of all emissions from industry in 2022. As total paper production is projected to increase to 2030, greater efforts must be made to reduce the emissions intensity of production.

In response to these environmental pressures, publishers are facing mounting calls from consumers, regulatory bodies, and investors to minimise their carbon footprint and adopt sustainable practices, such as the setting of Science-Based Targets. Climate reporting and disclosure is becoming increasingly mainstream with increasing expectations of data assurance.

Why this report

Transparency regarding GHG emissions plays a crucial role in mitigating negative environmental impacts. Calculating an environmental footprint establishes a baseline for progress measurement and offers the opportunity to devise a carbon reduction strategy.

There is also an expanding landscape of regulations that mandate disclosure of GHG emissions and necessitate enhanced transparency and accountability from the publishing industry. Examples of these include:

- **EU Corporate Sustainability Reporting Directive (CSRD):** Effective from January 2023, the CSRD requires companies in the EU to provide detailed information on their Scope 1, 2 and 3 GHG emissions and broader environmental, social, and governance (ESG) impacts. This directive mandates third-party assurance of sustainability data to ensure consistency and comparability.
- **U.S. SEC Climate Disclosure Rule:** In March 2024, the SEC adopted new rules that will require publicly traded companies in the U.S., including publishers, to disclose climate-related risks and Scope 1 and 2 GHG emissions. It aims to provide investors with reliable information to assess climate-related risks.
- **UK Streamlined Energy and Carbon Reporting (SECR):** Introduced in April 2019, the SECR regulation mandates that large UK companies report their energy use and Scope 1 and 2 GHG emissions. This initiative seeks to increase transparency and encourage energy efficiency.
- **Task Force on Climate-related Financial Disclosures (TCFD):** The TCFD provides a framework for companies to disclose climate-related financial risks and opportunities. Many jurisdictions are adopting or aligning with TCFD recommendations, making it a de facto standard for corporate climate disclosure, including GHG emissions reporting. TCFD recommends companies disclose Scope 1, 2 and 3 (if a material share of the overall footprint) emissions.

Complying with GHG disclosure regulations entails documentation of emissions associated with various stages of the supply chain, including paper production and printing processes. Publishers must now integrate comprehensive carbon accounting practices, encompassing direct emissions (Scope 1), indirect emissions from purchased electricity (Scope 2), and other indirect emissions from supply chains and product use (Scope 3) (see figure on page 5). This necessitates collaboration with suppliers and partners to obtain accurate data and implement strategies to reduce overall emissions.

Calculating Scope 3 emissions can be particularly challenging as it requires collecting data from supply chains, where data coverage and quality can vary. There is considerable disparity in data reporting maturity among mills and suppliers, resulting in frequent gaps in GHG data reported in EQs. In light of these challenges, the objectives of this Environment Report are as follows:

1.

Assist publishers to more accurately calculate their Scope 3 emissions by providing proxy emissions data.

2.

Enable publishers who do not have access to BCP to estimate their Scope 3 footprint.

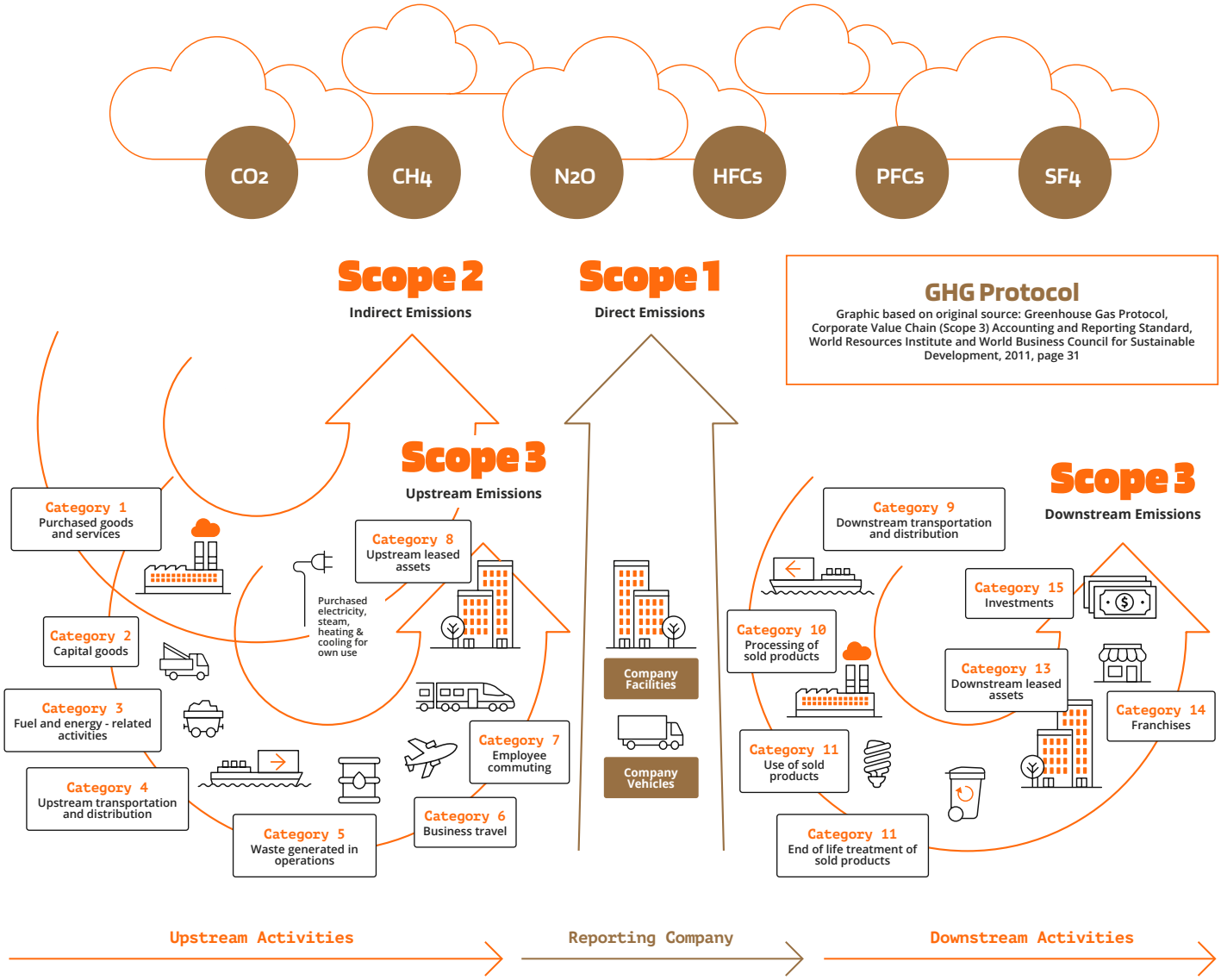
3.

Share best practices of mills and suppliers in environmental management.

Forest, Land, and Agriculture (FLAG)

Agriculture, forestry and other land use (AFOLU) represent 22% of global greenhouse gas emissions. However, until the publication of The FLAG Guidance and Tool in September 2022, there was no scientific, standardised approach on how companies could account for and report these emissions.

The Science-Based Targets initiative (SBTi) are now requiring companies with significant FLAG-related emissions (>20% of total footprint) to include FLAG targets as well as Energy/ Industry targets. Although publishers fall out of the SBTi sectors that are required to set a FLAG target (publishers are under the Media sector, as defined by SBTi), we know that emissions from paper (including the paper production process), often accounts for a large (>20%) part of publishers' overall carbon footprint. To assist with these developments and help publishers (re) calculate their footprint to include FLAG emissions, from May 2024 FLAG is included in BCP EQs.



Methodology

Data gathering process through the EQ

Mills and suppliers are encouraged to submit an EQ on the Book Chain Project system annually. This is the first year we have seen a real divergence in submission numbers. Mills are down 10% on the numbers of submissions between 2022 and 2023, although they are bucking that trend in the first quarter of 2024, with submissions increasing. On the other hand, suppliers were up more than 20% on submissions between 2022 and 2023. We are working closely with mills and suppliers to encourage as many robust submissions as possible.

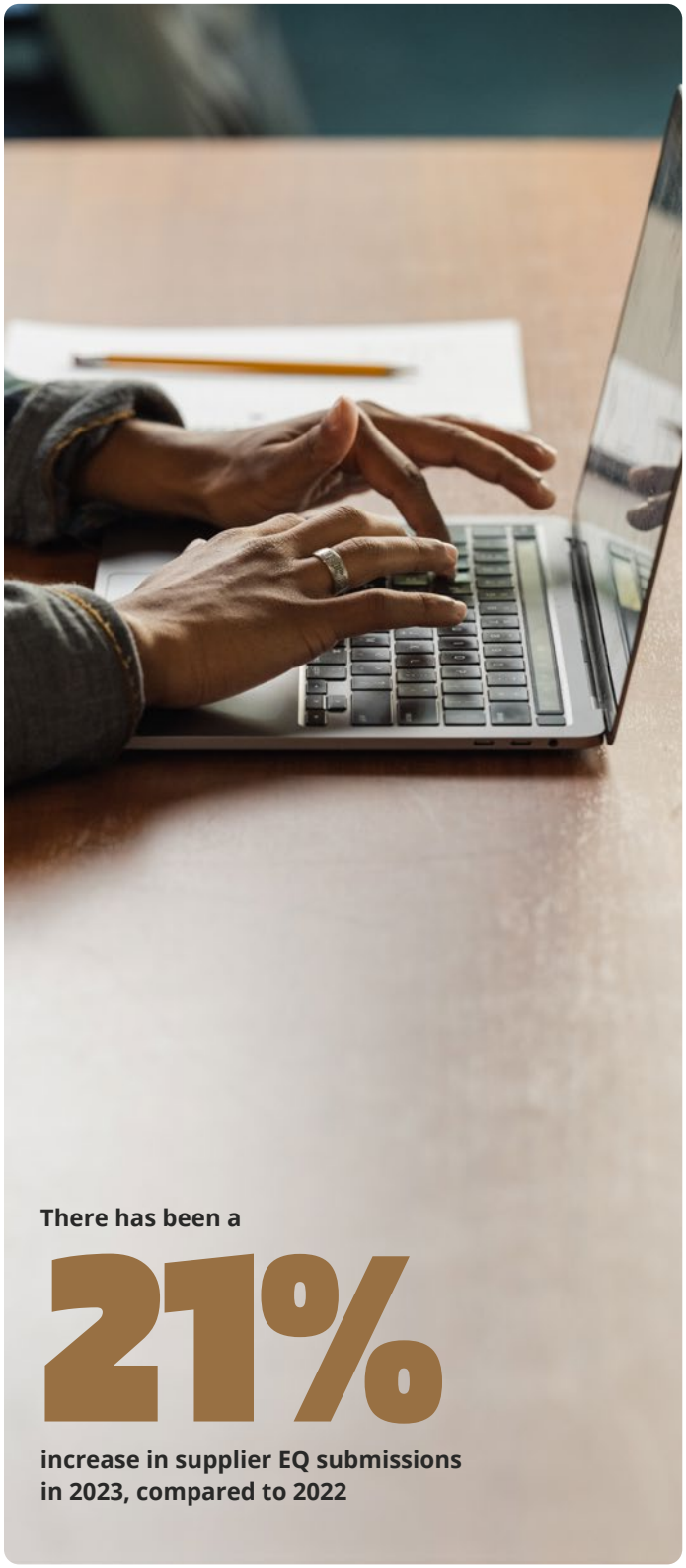
Data check and review

All EQs that are submitted onto the system go through a multi-step review process to check the quality and robustness of the data submitted. This review process consists of three steps:

- The **BCP system** automatically checks the following:
  - Breakdowns match total: fossil fuels; renewable energy generated; Scope 3 emissions; water sources; water use (process/non-process); waste generated (hazardous/non-hazardous)
  - Certain values cannot be 0: weight of paper produced / used / product produced; reporting period; emission target base year & end year; % reduction target; waste materials produced (if 'yes' selected)
- The data is also reviewed by **BCP admins**. Every mill and supplier is assigned a BCP admin who act as the first port of call for managing engagement on the system. BCP admins are on hand to support with any queries and are also responsible for sense checking data that is submitted by mills and suppliers, including EQs. BCP admins follow a set list of questions/ check points for consistency. For example, this includes cross-referencing information reported in the energy use and GHG emissions sections, and re-calculating GHG emissions based on energy use using internationally accepted emission factors. If any issues are identified, the admins will contact the mill or supplier to check the data or get further information.
- Once the EQ has been accepted by the admin, it is **reviewed** by an experienced BCP colleague who has deep expertise in environmental data. The EQ will then either be accepted on to the system or returned to the mill or supplier to follow up with further questions.

GHG Protocol and CDP

The EQ was developed in accordance with the GHG Protocol and Climate Disclosure Project (CDP), which provide best-practice self-reporting guidance and standards. This ensures that the data gathered through the EQ is appropriate for reporting purposes. In 2020, the EQ underwent significant revisions to enable more standardised reporting and to place greater emphasis on GHG emissions and climate impacts. We continue to identify emerging areas of concern to reduce the environmental footprint of the global paper and pulp industry.



There has been a

21%

increase in supplier EQ submissions in 2023, compared to 2022

Report Methodology

This report includes data from the following reporting periods:

2022

(EQs with a start date between **01/04/2021-31/03/2022**)

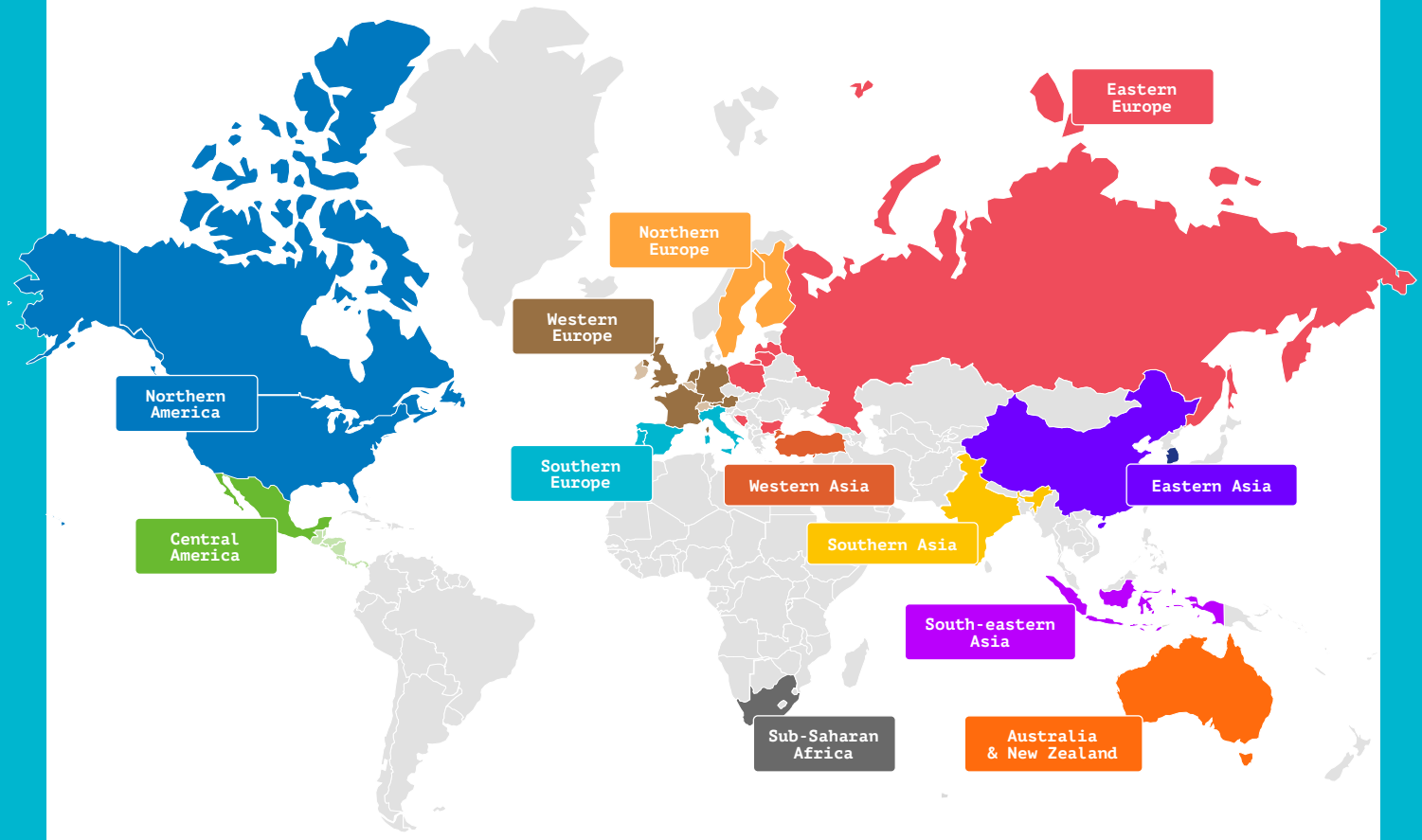
2023

(EQs with a start date between **01/04/2022-31/03/2023**)

The data from any EQs submitted after 25/04/2024 has not been included within this report.

In line with the previous Environmental Report, the emissions data in this report has been provided at three levels: country, sub-region and region. A data point is shared where there are at least two EQs for that geography (country, sub-region and region) for that year. There are instances throughout the report where not all countries, sub-regions or regions have data points available. This is because suppliers and mills do not always provide data for every element of the EQ. More information on the data points can be found in the Appendix.

We would like to note that the sample of mills and suppliers included in the 2022 and 2023 datasets are not the same and therefore, year-on-year comparisons should not be made. This is also the case for making comparisons between the data provided in the previous Environment report. Year-on-year comparisons can only be made by reviewing site-specific data which is available on the BCP system.



The bold colours signify that a country's data has been used to inform the sub-regional averages.

GHG emission factors for the publishing industry

This report contains emission factors at the country, sub-region, region, and global level. When choosing which emission factor to use, we suggest that the hierarchy outlined to the right is followed. This is aligned with recommendations from the GHG Protocol, whereby companies should select emission factors that are most representative in terms of time (temporal representativeness) and geography (geographical representativeness).

Site	1.	Site-specific emission factors from the EQ
Country	2.	Country-specific emission factors from this report
	3.	Country-specific emission factors from 2022 report
Sub-region	4.	Sub-region specific emission factors from this report
	5.	Sub-region specific emission factors from 2022 report
Region	6.	Region specific emission factors from this report
	7.	Region specific emission factors from 2022 report
Global	8.	Global emission factor from this report
	9.	Global emission factor from 2022 report

Mills

Scope 1 and 2 emission factors for mills

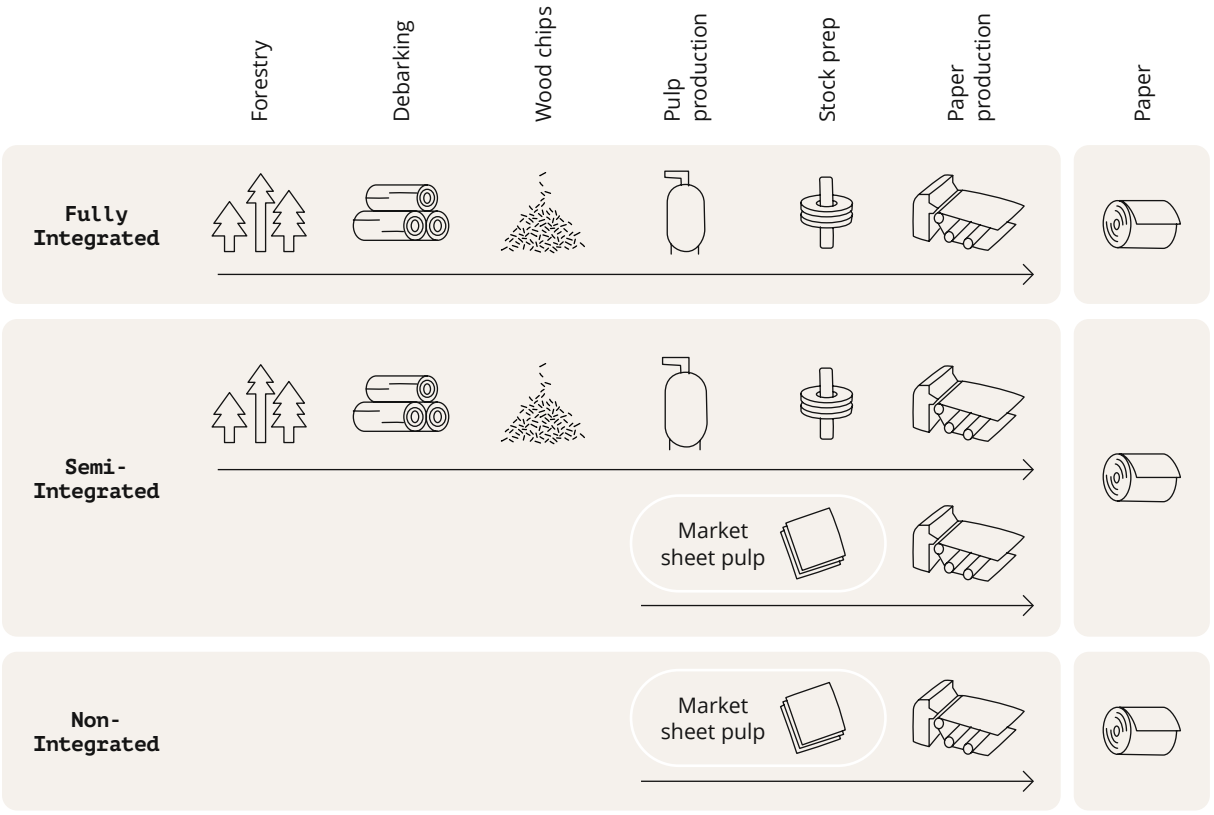
The EQ asks mills to provide information on their emissions. This data is broken down into the following:

Scope 1
Fossil fuels used in direct operations

Scope 2
Purchased or generated electricity / renewable electricity

Scope 3
Activities in the supply chain

We are beginning to see more mills providing us with Scope 3 data, however geographic coverage remains patchy. Therefore, at a country, sub-region and regional level we are only providing Scope 1 and 2 emission factors. However, we have enough quality Scope 3 data to provide a global average for Scope 3 as a share of total emissions (%), which can be used to estimate a Scope 3 figure.



We would expect to see higher direct (Scope 1 and 2 emissions) for fully-integrated mills as they are accounting for the pulp production process, whereas those emissions would partially sit in Scope 3 for semi-integrated and non-integrated mills. However, there are still some instances where the emission factors are higher for non-integrated or semi-integrated mills. This was also found to be the case in the 2022 Report, although the mills within the sample differed. This variation is most prominent in the 2023 dataset between Chinese mills. Unsurprisingly, the non-integrated mills with higher emissions intensities also had higher energy intensities compared to fully-integrated and semi-integrated mills. There was also a smaller proportion of non-integrated mills which had implemented energy reduction projects. This suggests that the variation is largely driven by less investment in energy reduction/ efficiency measures within non-integrated mills compared to fully-integrated and semi-integrated mills within the sample.

Scope 3 as a share of total emissions

The reporting and quality of Scope 3 data is improving year-on-year, and a number of mills have reported a comprehensive Scope 3 footprint including the most relevant categories of the Greenhouse Gas Protocol.

For mills, we'd expect the most relevant categories to include:

- category 1 (purchased goods and services) due to the purchasing of raw material and/or pulp
- category 3 (fuel and energy-related activities) given the energy intensity of the production process
- category 4 (upstream transportation and distribution) due to the transportation of raw materials and distribution of products
- category 9 (processing of sold products) due to the processing of paper and board.

Mills providing data on the most relevant categories have been included within the Scope 3 as a share of total emissions calculation. This calculation can be used to estimate the Scope 3 intensity factor per tonne of paper produced, based on the more precise Scope 1 and 2 emission factors that have been calculated for the different geographies.

Scope 3 intensity factor (per tonne of paper produced) calculation

There are two stages to this calculation.

Step 1 Calculating the total Scope 1, 2 and 3 intensity:

whereby x is the **Scope 1 and 2 intensity factor**

$$x/(1-y)$$

y is the **Scope 3 share of the total carbon footprint**

Step 2 Calculating the Scope 3 intensity factor:

whereby z is the **Scope 1, 2 and 3 intensity factor** (from the calculation above)

$$z-x$$

and x is the **Scope 1 and 2 intensity factor**

Worked example

Using the emissions figures provided on page 11 for a fully-integrated mill located in Southern Europe the total Scope 1, 2 and 3 intensity would be calculated as follows:

Emission Factors:

Scope 1 and 2 emissions factor for a fully integrated mill in Southern Europe: **0.49**
Global Scope 3 as share of total emissions (%) for a fully integrated mill: 76% **(0.76)**

Calculation:

Step 1 Calculating the Scope 1, 2 and 3 intensity factor:

0.49 / (1-0.76) = **2.04 tonnes CO_2e per tonne of paper produced**

Step 2 Calculating the Scope 3 intensity factor:

2.04 - 0.49 = **1.55 tonnes CO_2e per tonne of paper produced**

GHG emissions

Benchmarked against the carbon intensity per year under a Below 2 Degree scenario, from the Transition Pathway Initiative, Paper Industry Pathways

Green = CO_2e intensity is below the carbon intensity per year under a Below 2 Degree scenario.
Red = CO_2e intensity is above the carbon intensity per year under a Below 2 Degree scenario.

2022: **0.552** tCO_2e per tonne of pulp, paper and paperboard produced
2023: **0.535** tCO_2e per tonne of pulp, paper and paperboard produced

Country tonnes CO_2-equivalent (tCO_2e) per tonne paper produced (tPaper produced)	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Canada	0.21	-	-	-	-	-
China	0.67	0.80	0.62	0.66	-	1.14
Finland	0.07	-	-	-	-	-
Germany	-	-	0.90	-	0.47	-
India	1.97	1.95	1.87	-	1.32	
Italy	-	-		-	0.49	
Sweden	0.04	-	-	-	-	0.12
United Kingdom	-	-	0.12	-	-	-

Region tCO_2e / tPaper produced	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Americas	0.21	-	-	-	-	-
Asia	0.70	1.00	1.12	0.79	1.23	1.33
Europe	0.38	-	0.58	-	0.47	0.12

Sub-region tCO_2e / tPaper produced	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Northern America	0.21	-	-	-	-	-
Eastern Asia	0.67	0.80	0.62	0.79	0.80	1.33
Southern Asia	1.97	1.95	1.87	-	1.32	-
Northern Europe	0.06	-	0.09	-	0.29	0.12
Southern Europe	-	-	-	-	0.49	-
Western Europe	-	-	0.90	-	0.49	-

Global tCO_2e / tPaper produced	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Global	0.64	1.00	0.95	0.79	0.91	0.79

Global Scope 3 as share of total emissions (%)	Fully Integrated	Semi-Integrated (> 50% own pulp)	Non-Integrated
Global	76%	35%	43%

GHG Reduction targets

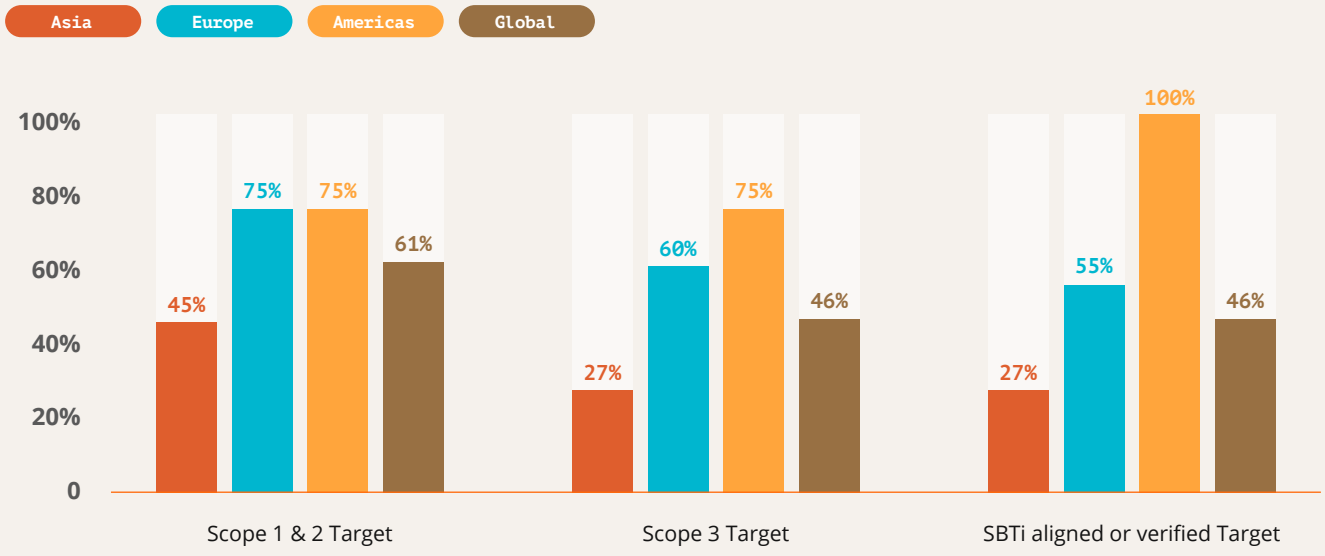
We are seeing many mills set GHG emission reduction targets, but appetites differ between regions when it comes to the type and level of ambition of the targets. Globally, the majority of mills that have responded to our EQ have set Scope 1 and 2 reduction targets. Fewer mills are calculating their Scope 3 emissions, so at this stage we are still seeing less Scope 3 targets being set.

Taking a regional view, there are a similar proportion of mills based in Europe and the Americas setting Scope 1 and 2 and Scope 3 reduction targets. However, far fewer Asian mills are setting Scope 1 and 2 or Scope 3 reduction targets.

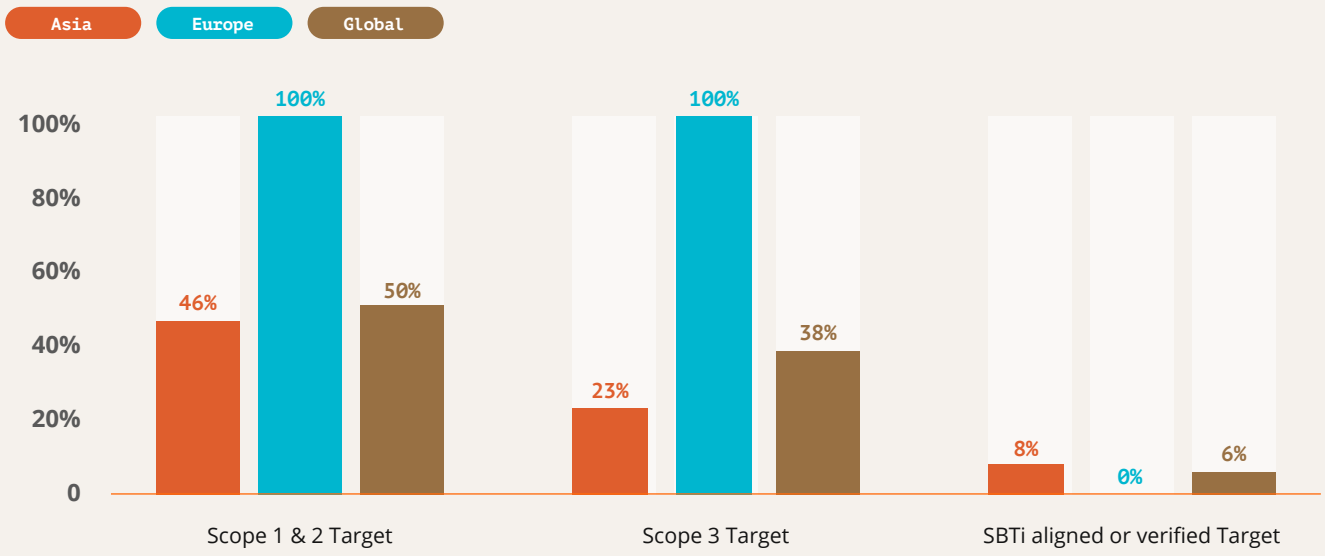
To achieve Scope 1 and 2 targets, mills globally are implementing emission reduction projects. These projects include switching to bioenergy, the on-site generation of renewable electricity and carrying out energy efficiency initiatives. To achieve Scope 3 reduction targets, mills are switching to rail for the transportation of raw materials, switching to locally sourced raw materials and engaging with the supply chain to support their decarbonisation efforts.

One European mill group has established their own supply chain decarbonisation programme through which it supports supply chain partners to calculate their own carbon footprint and encourages the setting of science-based targets.

Mill GHG Emission Reduction Targets 2022



Mill GHG Emission Reduction Targets 2023

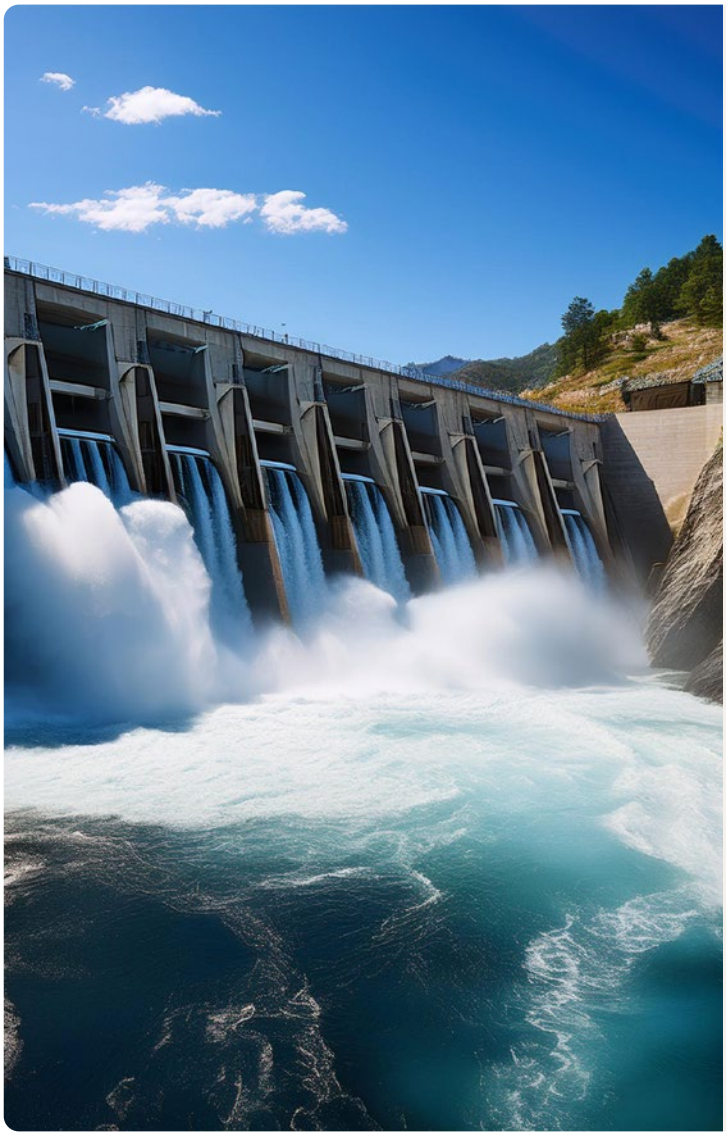


Science Based Targets initiative (SBTi) uptake

The SBTi helps companies to set emissions reduction and net-zero targets aligned with climate science. Mills can set science-based targets which are aligned with the SBTi or set targets which are verified by SBTi. The process of target verification is more complex, with companies being required to set targets which are reviewed by SBTi and companies are required to demonstrate how targets will be achieved.

Within the 2022 dataset, 21% of mills reported having a verified SBTi target in place. These mills belonged to three parent companies (mill groups), and all of which were based within Europe. These targets were set at the mill group level and covered near-term Scope 1, 2 and 3 targets which include absolute, intensity and engagement targets. The three mill groups are yet to have verified net-zero targets.

As the number of companies which set SBTs continues to increase year-on-year, we would expect to see an increase in the number and percentage of mills with SBTs in future years.



Best practice example

Resolute Forest Products

Resolute Forest Products has set GHG reduction goals since 2011, starting with the World Wildlife Fund® (WWF®) Climate Savers program in 2011 and the SBTi in 2022. The goals include a commitment to reduce absolute Scope 1 and 2 emissions by 41.5% by 2026 from a 2015 base year, and a 16.5% reduction in Scope 3 emissions within the same timeframe. Alma and Kénogami paper mills have worked to reduce their Scope 1 emissions by increasing the use of electrical boilers in replacement of natural gas as fuel. The electric boilers run off the hydroelectricity produced by Resolute's hydroelectric generation and transmission network. The company is focused on engaging its supply chain in order to reduce Scope 3 emissions and is committed to working with its suppliers to develop their own Scope 3 emission reduction commitments.

The goals include a commitment to reduce absolute Scope 1 and 2 emissions by

41.5%

Suppliers

Scope 1 and 2 emission factors for suppliers

Suppliers are also asked to provide their emissions data through the EQ. The Book Chain Project distinguishes between suppliers by asking them to confirm if they are a print or non-print supplier. Print suppliers are responsible for putting words onto the paper. Non-print suppliers, however, cover the additional aspects that may be included as part of a book, such as a soft toy. Non-print suppliers can be broken down into different types, such as assembler, audio, binary and novelty components.

As print and non-print suppliers produce different products, their emission factors are calculated slightly differently. For print suppliers, the calculation includes the weight of paper used in the production of books and/or other paper products. For non-print suppliers, the calculation includes the weight of non-paper products produced.

As we only have a small number of non-print suppliers currently taking part in the Book Chain Project, and even fewer currently providing their emissions data, at this stage, we are only able to calculate the emissions factors for print suppliers.

We are beginning to see an uptake in the number of suppliers providing Scope 3 data, however geographic coverage remains patchy. So, similarly to mills, only Scope 1 and 2 emissions have been calculated at the country, sub-region and regional level. However, we have enough quality Scope 3 data to provide a global average for Scope 3 as a share of total emissions (%), which can be used to estimate a Scope 3 figure. This calculation follows the same steps as outlined in the mill GHG emissions section.

GHG emissions

Green = CO_2e intensity is below the weighted average across similar sites on the BCP system.
Red = CO_2e intensity is above the weighted average across similar sites on the BCP system.

Weighted average for paper products:

2022: **0.23** tCO_2e per tonne paper used
2023: **0.27** tCO_2e per tonne paper used

60%

of suppliers are setting Scope 1 and 2 reduction targets

Country tonnes CO_2 equivalent (tCO_2e) per tonne paper used (tPaper used)	Print suppliers	
	2022	2023
Australia	0.29	-
China	0.36	0.35
Germany	0.10	-
India	0.26	0.12
Italy	0.19	-
Malaysia	0.46	-
Netherlands	0.04	-
Poland	0.25	0.27
South Africa	0.98	-
United Kingdom	0.11	-
United States	-	0.32

Region tCO_2e / tPaper used	Print suppliers	
	2022	2023
Africa	0.98	-
Americas	0.17	0.27
Asia	0.29	0.33
Europe	0.10	0.36
Oceania	0.29	-

Sub-region tCO_2e / tPaper used	Print suppliers	
	2022	2023
Sub-Saharan Africa	0.98	-
Northern America	-	0.32
Australia and New Zealand	0.29	-
Eastern Asia	0.36	0.35
Southern Asia	0.26	0.12
South-eastern Asia	0.10	-
Western Asia	0.45	-
Eastern Europe	0.07	0.27
Northern Europe	0.09	-
Southern Europe	0.18	-
Western Europe	0.08	-

Global[2] tCO_2e / tPaper used	Print suppliers	
	2022	2023
Global	0.22	0.33

Global Scope 3 as share of total emissions (%)	Print suppliers
Global	82%

[2] The variation between the figure used to benchmark the weighted average for paper products and the global average calculated can be explained by a difference in the sample of EQs used within the calculations.
- The benchmarked figure is auto-calculated by the system. The system calculates this figure by dividing the total Scope 1 and 2 (location-based) emissions by the total of weight of paper. The EQs included within this sample have a start date within the same calendar year, have provided Scope 1 or 2 (location-based) emissions, have provided a figure for the weight of paper used and are from sites that provide the same service (e.g. printer).
- The global average calculated for this report is a snapshot in time in line with our reporting periods.

GHG Reduction targets

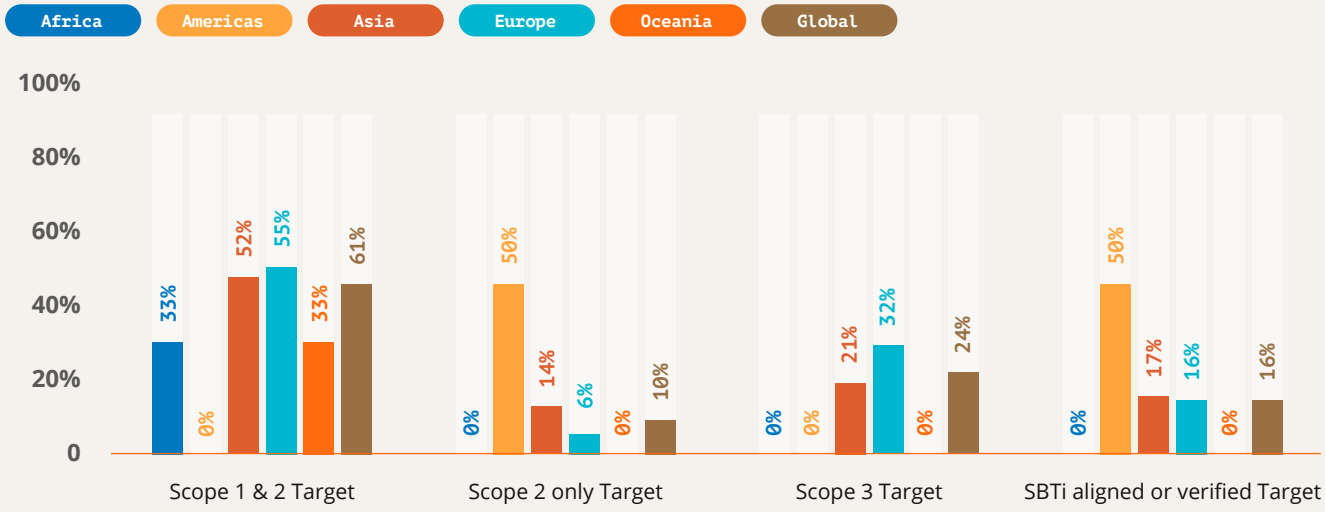
Suppliers across all regions are now setting GHG emission reduction targets. The majority of the suppliers globally who have submitted an EQ onto the BCP have set Scope 1 and 2 reduction targets (60%). The data suggest that it is more common for Asian and European suppliers to set those reduction targets compared to suppliers in Africa and Oceania.

Suppliers are aiming to achieve their Scope 1 and 2 targets through switching to purchased renewable electricity or installing their own renewable electricity generation, transitioning to low-carbon heating and optimising production processes and upgrading of equipment.

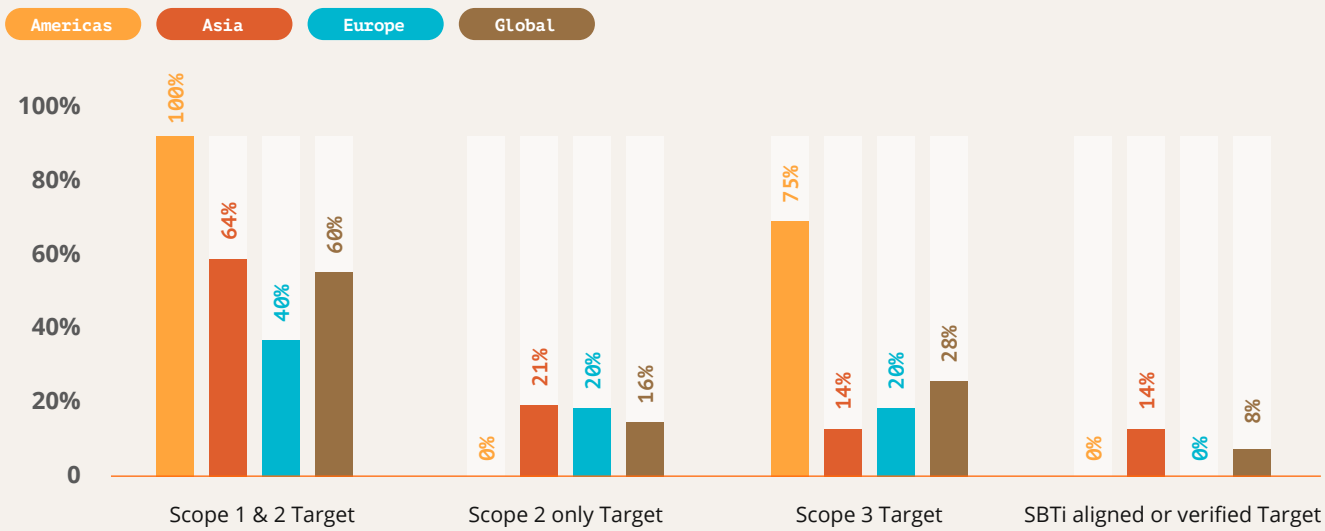
Whilst setting Scope 1 and 2 reduction targets is a well established practice, Scope 3 targets are less common. Our global data suggest that less than 30% of suppliers have set Scope 3 reduction targets. When looking at our regional data, suppliers located in the Americas, Europe and Asia are most likely to have set Scope 3 reduction targets, compared to suppliers in Africa and Oceania. There are a similar proportion of suppliers based in Europe and Asia setting Scope 3 reduction targets, however, a far greater percentage of Suppliers in the Americas have set a Scope 3 reduction target in the 2023 dataset.

Full Scope 3 footprint calculation remains a work in progress but as suppliers continue to strengthen their data, the obvious next steps will be for them to shift their focus to supply chain de-carbonisation action plans.

Supplier GHG Emission Reduction Targets 2022



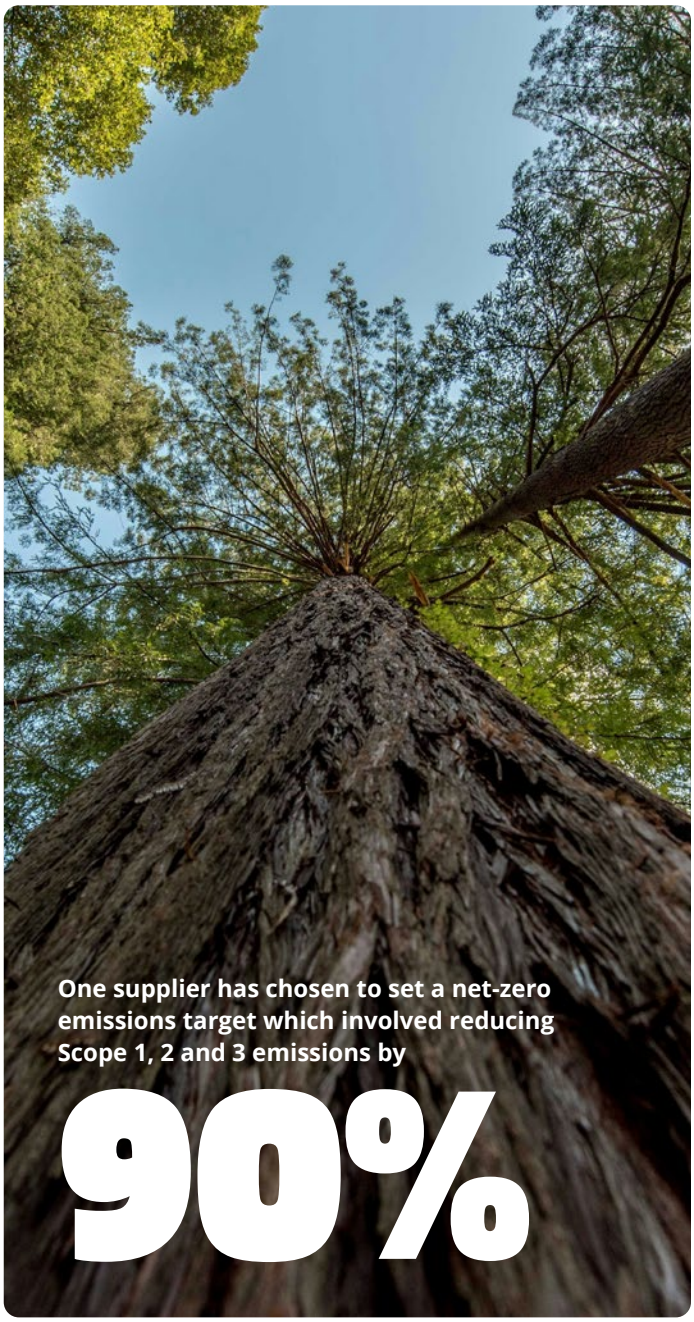
Supplier GHG Emission Reduction Targets 2023



Science Based Targets initiative (SBTi) uptake

We are beginning to see suppliers set SBTi aligned or verified reduction targets. At this stage, only a small number of suppliers (3%), based in Europe and Asia, have set science-based targets which have been verified by SBTi. Unlike the large mill groups, the suppliers that have validated SBTi targets have done so through the streamlined Small or Medium Enterprise (SME) route.

All suppliers verified by SBTi have set near term Scope 1 and 2 reduction targets, and have committed to measure and reduce their Scope 3 emissions (SME's are not required to set near-term targets for their Scope 3 emissions under SBTi). One supplier has chosen to set a net-zero emissions target which involved reducing Scope 1, 2 and 3 emissions by 90% by 2050. It is encouraging to see suppliers make use of the streamlined SME process to set science-based targets.



Best practice example

FINIDR

FINIDR, a print supplier located in Czechia, has been measuring its carbon footprint since 2015. FINIDR achieved a reduction of 40.9% by 2022, compared to the 2015 baseline. FINIDR now sources 100% of electricity from renewable sources and has a long-term objective of continuing to source 100% of their energy from renewable sources. FINIDR has invested in its own photovoltaic (solar) power plant and in 2022, saw a 2.1% decrease in energy consumption from the grid. They have also purchased two fully electric company cars and participated in a large electronic waste collection event.

Since 2015, FINIDR achieved a carbon footprint reduction of

40.9%

Energy

Energy Intensity per tonne of pulp, paper and paperboard produced

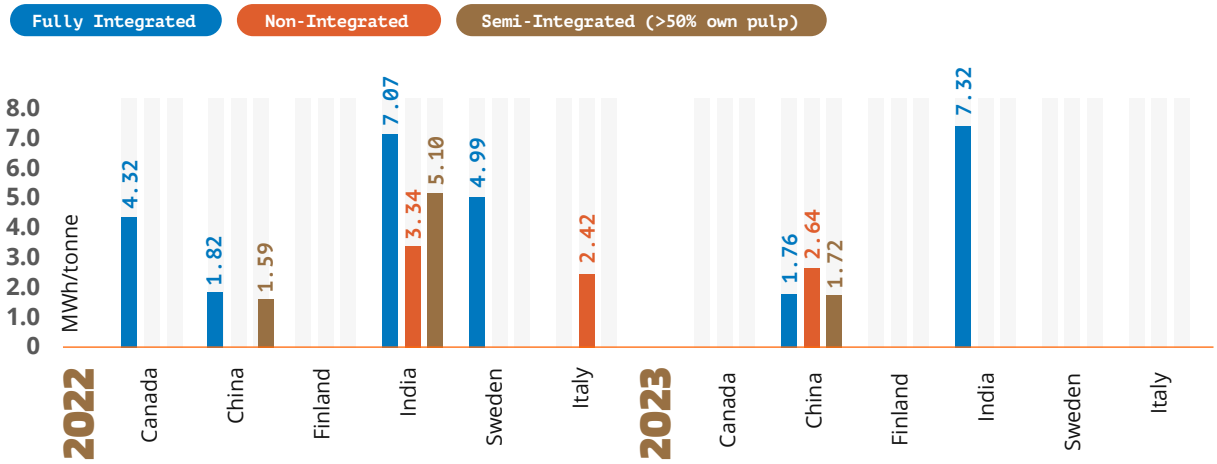
Energy intensity across mills

Across most regions, fully-integrated mills have a higher energy intensity than non-integrated mills. This is to be expected, as fully-integrated mills consume energy for the energy-intensive pulp-making process, while non-integrated mills do not produce the pulp they use themselves.

The energy price crisis that Europe and North America faced primarily in 2022 has continued to affect the pulp and paper industry. According to statistics published by CEPI, consumption of paper remained stable in 2022 in Europe, whilst production dropped by 6% compared to the previous year. The fall in production can mostly be explained by the high energy prices, with paper machines having to be temporarily shut down due to high running costs. Mills that are more energy efficient, or those that rely on renewable energy, will be more resilient to energy price changes.

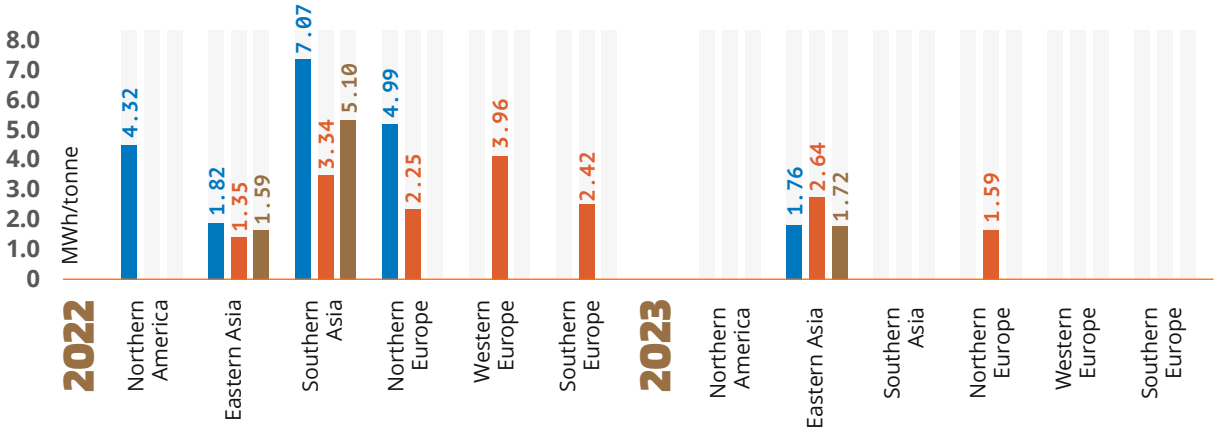
Country

Energy used (MWh)/per tonne paper produced (tPaper produced)



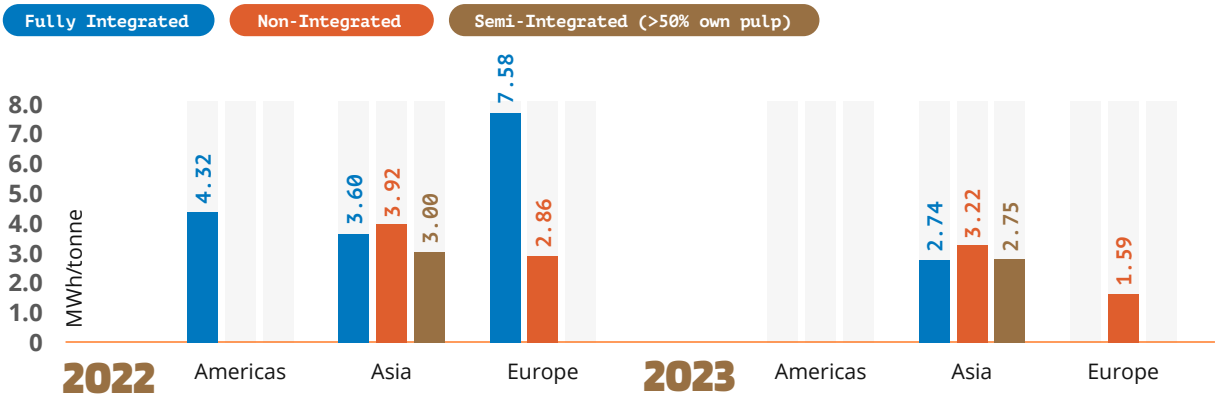
Sub-region

MWh/tPaper produced



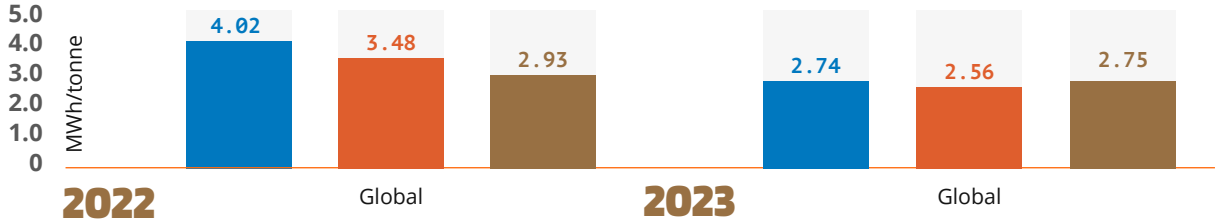
Region

MWh/tPaper produced



Global

MWh/tPaper produced



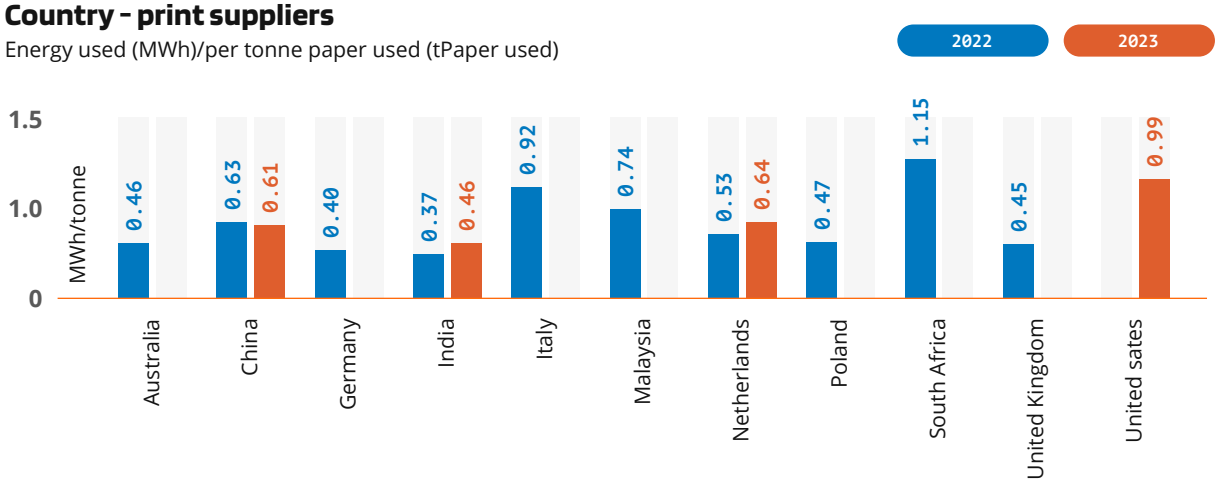
Whilst not directly comparable, the difference in energy intensity between fully-integrated mills across the BCP universe that submitted an EQ in 2022 and 2023 was fairly significant (~33% lower in 2023). The difference between 2023 and 2022 is mainly due to high energy intensive mills from Europe and America having only submitted an EQ in 2022 and not in 2023. It is not an actual improvement in energy intensity but simply a result of a different sample of mills.

Energy Intensity per tonne of paper used in the production of books, journals and/or other paper products

Suppliers

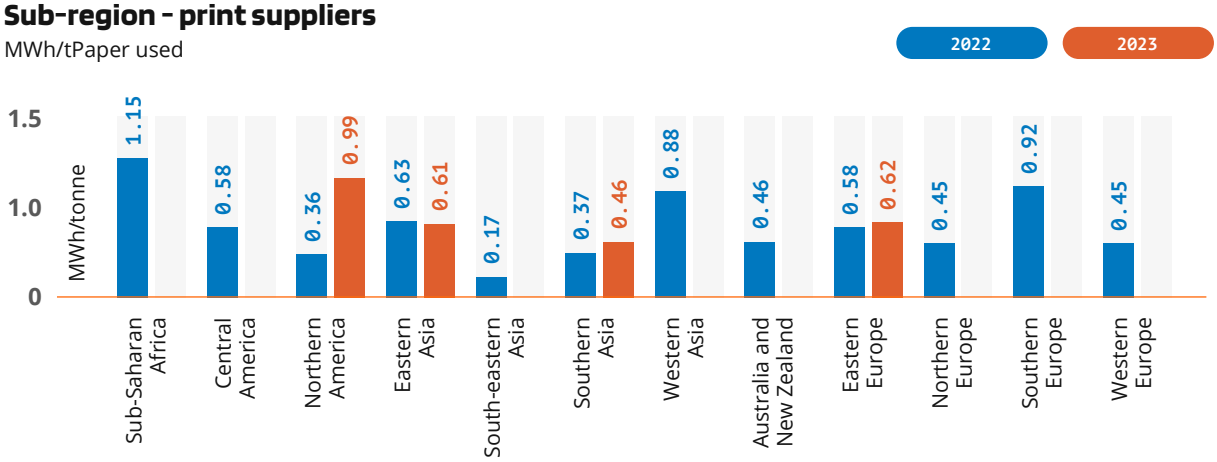
Country - print suppliers

Energy used (MWh)/per tonne paper used (tPaper used)



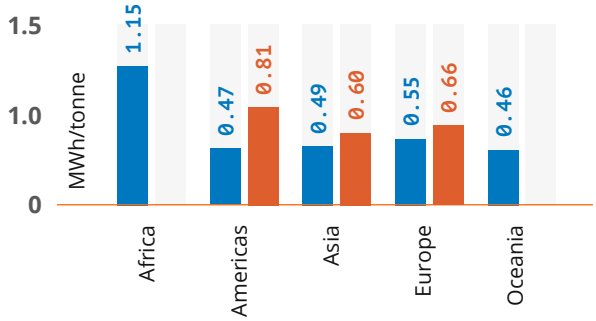
Sub-region - print suppliers

MWh/tPaper used



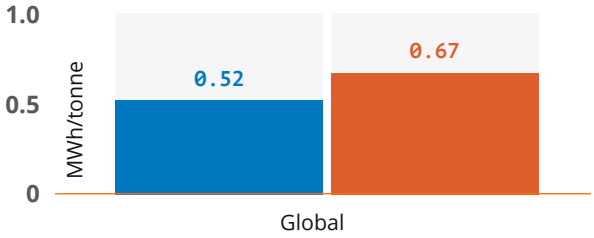
Region - print suppliers

MWh/tPaper used



Global - print suppliers

MWh/tPaper used



Energy intensity across suppliers

In 2022, the energy intensity per tonne of paper used ranges from 0.36 MWh per tonne for Northern America to 1.15 MWh per tonne for Sub-Saharan Africa. South-eastern Asia is an outlier, with a much lower intensity of 0.17 MWh per tonne. Going forward, as more data is reported, we hope to better understand the drivers of the differences between sub-regions.

In Europe and Asia, we can start to see the positive effects of energy efficiency measures implemented since 2020. Various European and Asian suppliers have implemented energy efficiency measures, such as shorter air compressor circuits and deploying new printing machines with reduced energy consumption. These measures have led to a large decrease in the energy intensity of European and Asian suppliers in 2022 compared to 2020 values, where the average MWh per tonne paper produced was 1.48MWh – a reduction of 65% over 3 years. For 2023, there was unfortunately less data meaning that we were only able to report an energy intensity for Eastern Asia. The lower sample size, including more energy intensive suppliers from Asia, meant that the 2023 figure is disproportionately larger than the respective intensity for 2022.

The energy intensity of European and Asian suppliers in 2022 dropped 65% to an average of

1.48MWh

Largest fossil fuel and renewable energy source

Mills

Sub-region	Fossil Fuel Energy Source		Renewable Energy Source	
	2022	2023	2022	2023
Northern America		-		-
Eastern Asia				
Southern Asia				
South-eastern Asia		-		-
Northern Europe				
Southern Europe		-		-
Western Europe		-		-

Coal | Biomass | Natural Gas | Hydroelectric | Wind

Region	Fossil Fuel Energy Source		Renewable Energy Source	
	2022	2023	2022	2023
Americas		-		-
Asia				
Europe				

Energy sources across mills

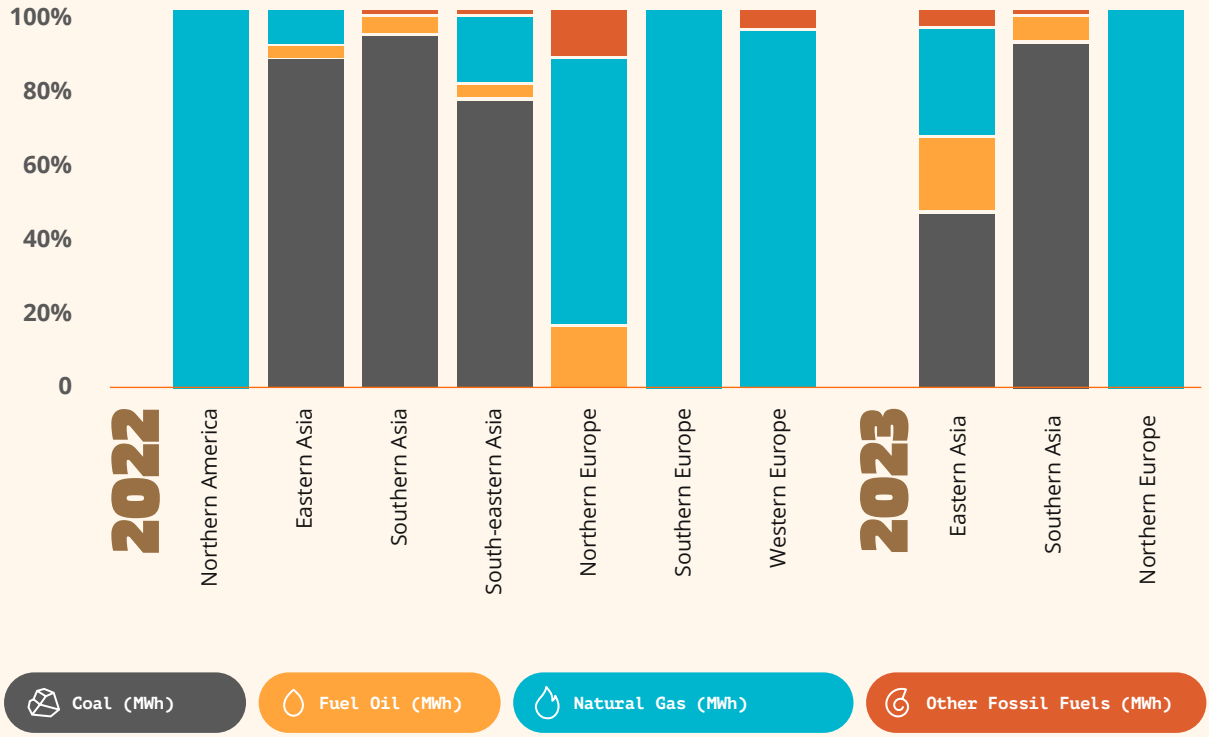
Natural gas is the predominant form of fossil fuel used across mills in most regions with the exception of Asia, that predominantly sources its fossil fuel energy from coal.

In most regions, biomass is the largest source of renewable energy used in mills. That is because biomass is often readily accessible, in many cases as a by-product of the pulping process. It is also readily usable to generate heat which is required in the pulping and paper-making process. Other sources of renewable energy include solar, wind and hydroelectricity. Hydroelectricity is a new addition as a main source of energy for mills, compared to the previous report.

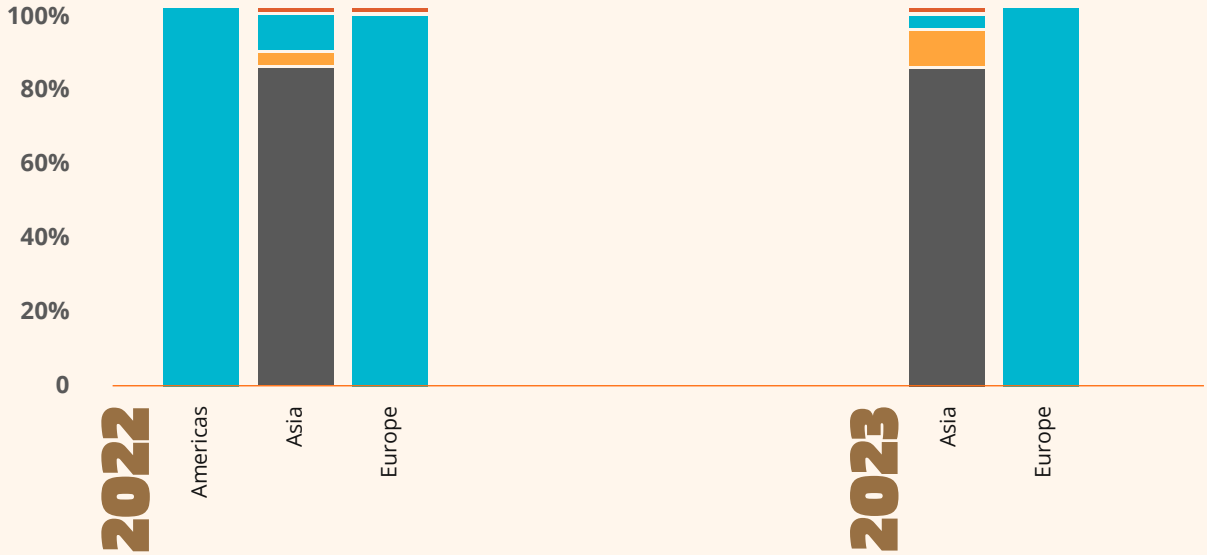
Fuel mix across mills

The western hemisphere is almost entirely dependent on one form of fossil fuel, natural gas. For 2023, there was unfortunately less data meaning that we were only able to report on fuel mix across mills in Asia and Europe. Across all regions, natural gas or coal was the predominant fossil fuel used by mills. Most regions also saw another source of fossil fuel being used, for example fuel oil, but this usage was comparatively small.

Mills sub-regional fuel mix

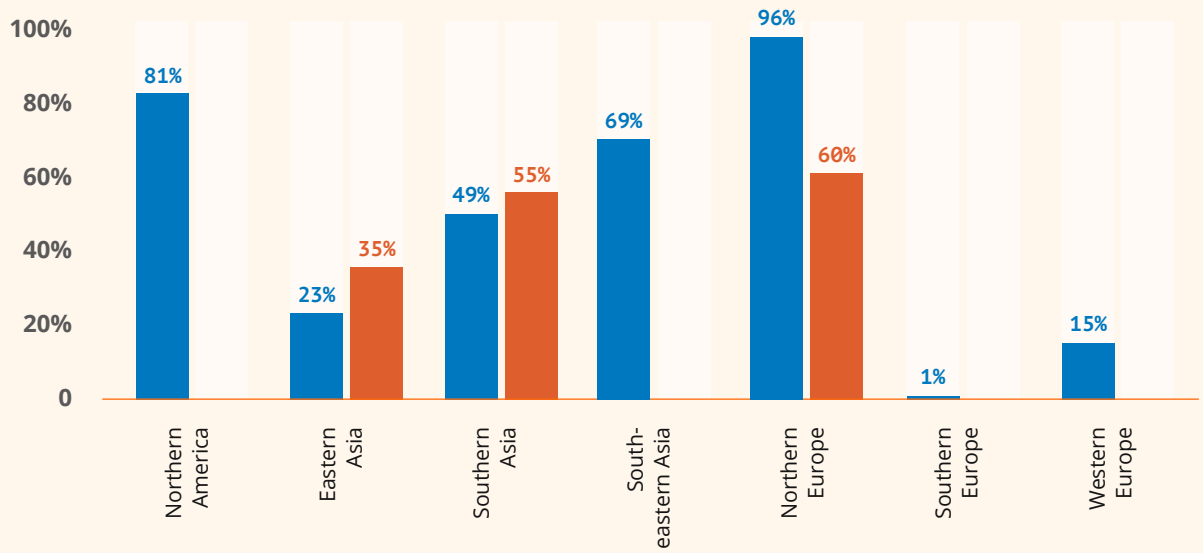


Mills regional fuel mix

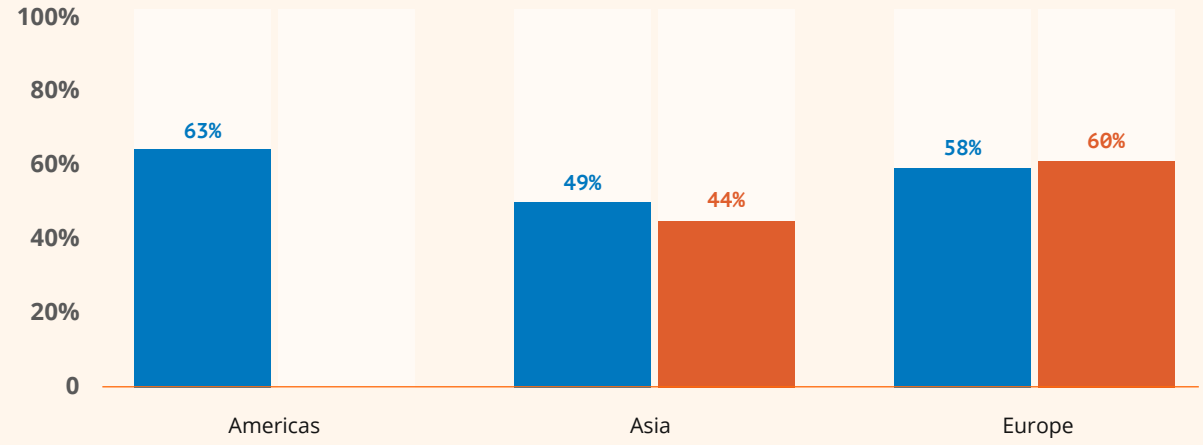


Renewable energy consumption across mills

Mills sub-regional renewable energy consumption as percentage of total energy consumption



Mills regional renewable energy consumption as percentage of total energy consumption



Mills in the Americas and Europe source a high percentage of energy from renewables but this is mainly driven by specific sub-regions within the continent, including Northern America and Northern Europe. In Northern Europe, 96% of energy consumption was renewable in 2022, and 60% was renewable in 2023. The consumption of renewable energy in European mills is helping them work towards their emissions targets, where some mills are seeking to reduce non-renewable energy consumption by a specified percentage by 2030. Renewable energy consumption across Asia has almost doubled since 2020, largely driven by an increase in renewable energy capacity in Asia, rather than a reduction in total energy used in production.

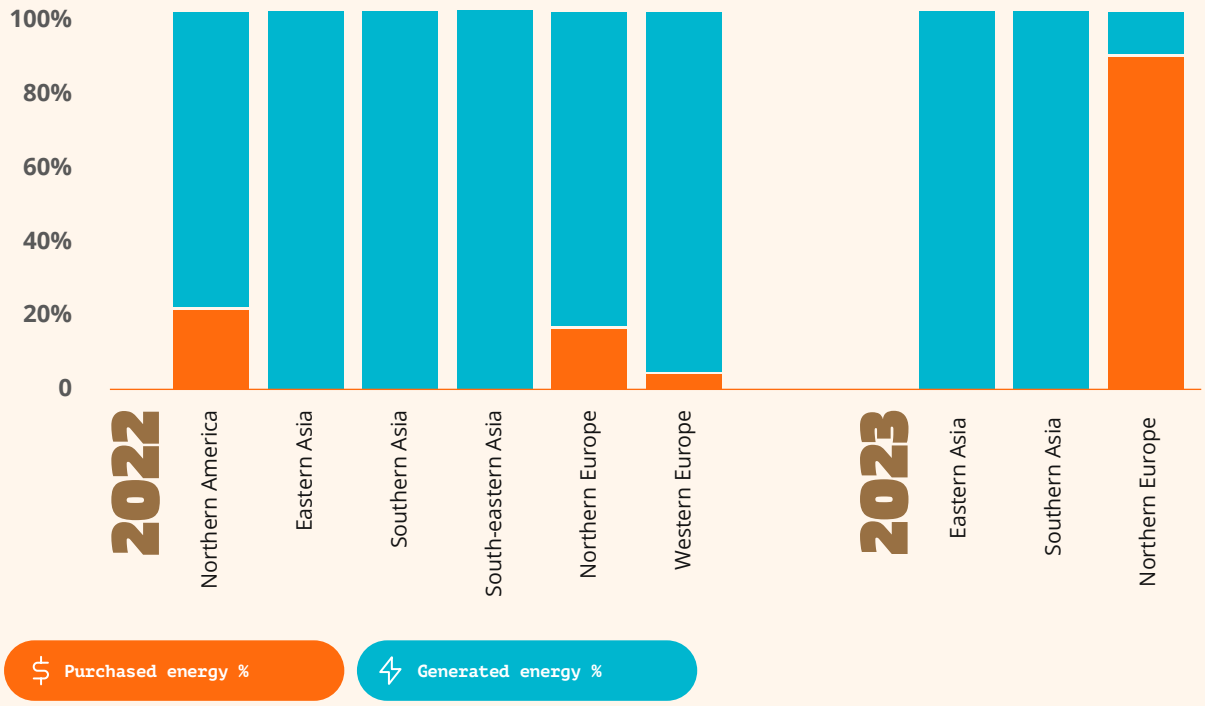
In 2023, energy consumption in Northern Europe was renewable at a rate of

90%

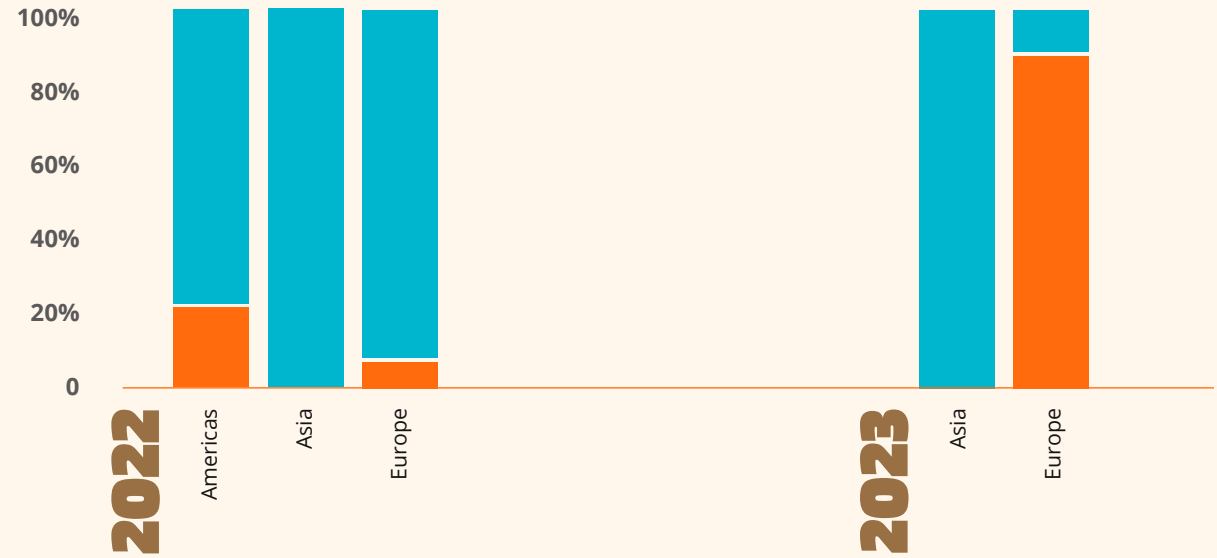
Mix between purchased and generated renewable energy across mills

Interestingly, all the renewable energy used by mills located in Eastern and Southern Asia comes from renewable energy generated on site by mills. Northern Europe is still predominantly purchasing renewable energy. This is possibly due to the renewable energy market not being mature enough in many locations to have the quantity of renewable energy needed for paper production, available to purchase at an affordable rate. An alternative, and perhaps more likely explanation, is the accessibility of biomass as an energy source to mills, as a by-product of the pulping process.

Mill sub-region renewable energy split



Mill region renewable energy split



Largest fossil fuel and renewable energy source

Suppliers

Sub-region*	Fossil Fuel Energy Source		Renewable Energy Source	
	2022	2023	2022	2023
Sub-Saharan Africa	LPG	-	Wind	-
Northern America	-	Natural Gas	-	Wind
Eastern Asia	Natural Gas	Natural Gas	Solar	Solar
Southern Asia	Fuel oil	Diesel	Solar	Wind
South-eastern Asia	Diesel	-	Solar	-
Western Asia	Diesel	-	Wind	-
Australia and New Zealand	Natural Gas	-	Wind	-
Eastern Europe	Natural Gas	Natural Gas	Solar	Solar
Northern Europe	Natural Gas	-	Solar	-
Southern Europe	Natural Gas	-	Solar	-
Western Europe	Fuel oil	-	Solar	-

LPG | Fuel oil | Natural Gas | Diesel | Wind | Solar

Region	Fossil Fuel Energy Source		Renewable Energy Source	
	2022	2023	2022	2023
Africa	LPG	-	Wind	-
Americas	Diesel	Natural Gas	Wind	Wind
Asia	Natural Gas	Natural Gas	Solar	Solar
Europe	Natural Gas	Natural Gas	Solar	Solar
Oceania	Natural Gas	-	Wind	-

Energy sources across suppliers

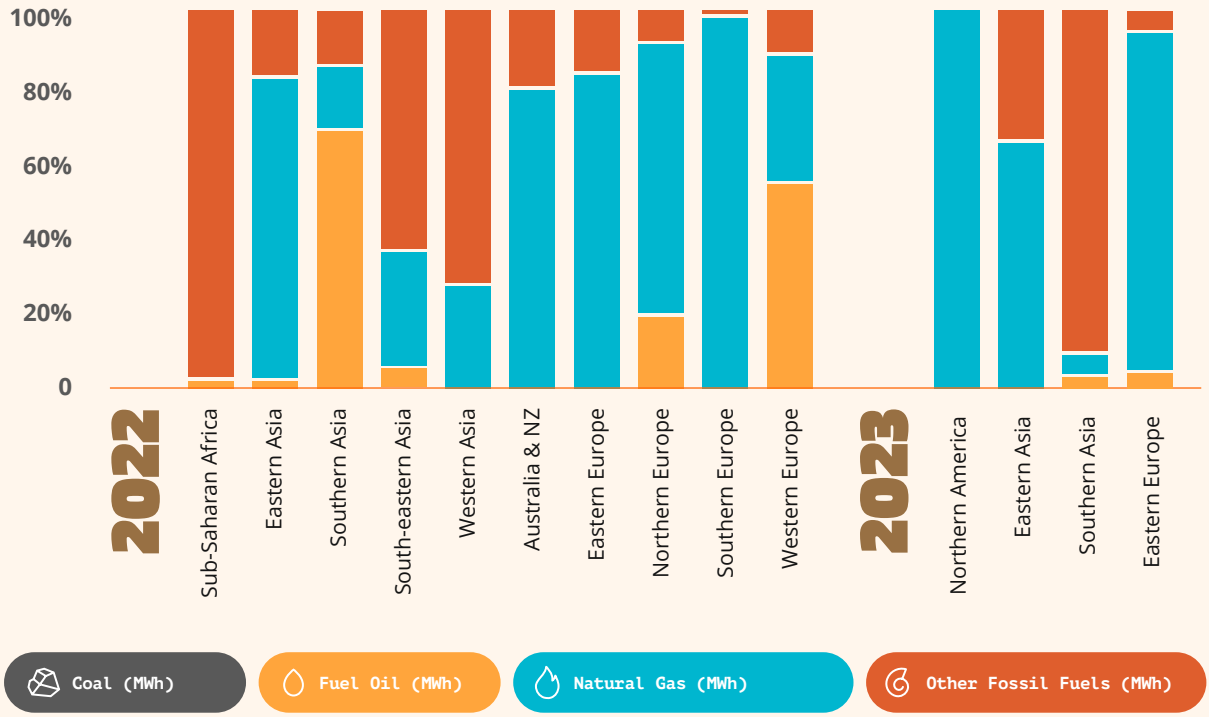
Natural gas is the predominant energy source used by suppliers globally. Having said that, suppliers in some parts of Southern Asia rely heavily on other fossil fuels such as diesel and fuel oil, and suppliers in Africa used LPG as their primary energy source.

Solar and wind are the two predominant sources of renewable energy used across the BCP supplier base. Asia and Europe tend to mostly use solar energy, whilst Oceania, Africa, and America use wind energy primarily. Solar, wind and biomass are the only renewable energy sources being used by suppliers across 2022 and 2023.

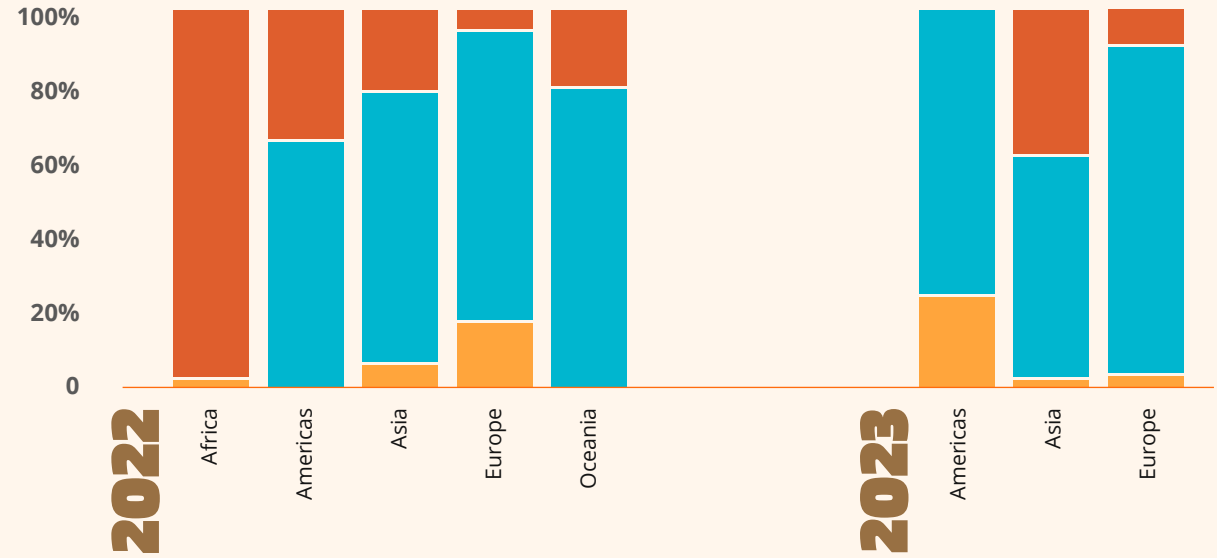
Fuel mix across suppliers

Suppliers in most of Europe, Asia and Oceania primarily use natural gas as the predominant form of fuel. Suppliers in Oceania primarily use natural gas. When comparing mills and suppliers in Europe, the fuel mix is similar. However, in Asia, mills are much more likely to use coal (likely because switching to natural gas is a much higher cost). However, suppliers are more likely to utilise a variety of fuel. African suppliers mainly use other fossil fuels.

Supplier Sub-regional fuel mix

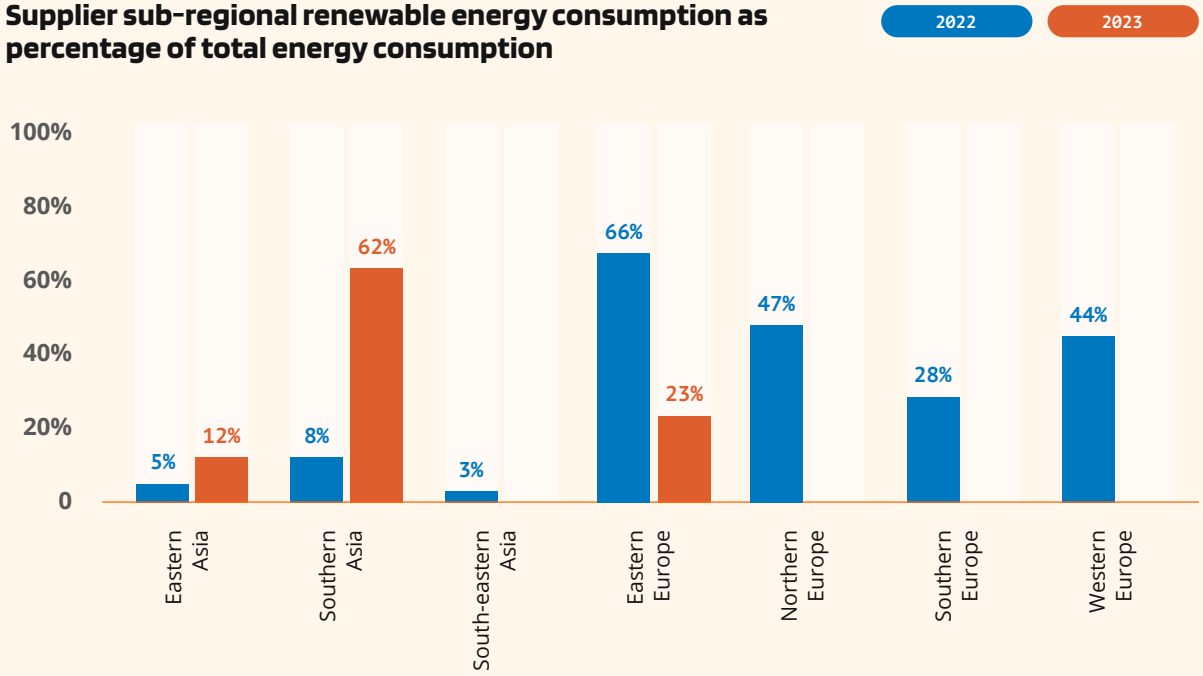


Supplier Regional fuel mix

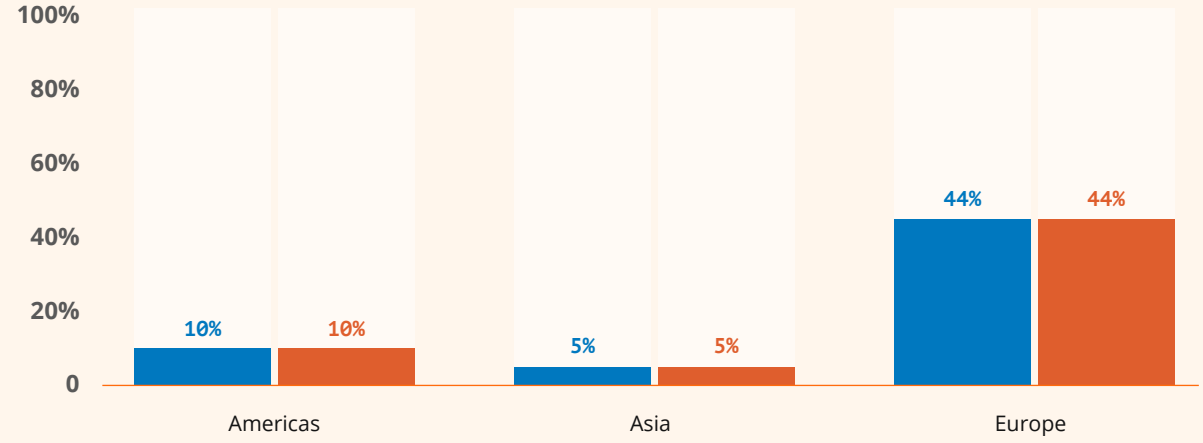


Renewable energy consumption across suppliers

Supplier sub-regional renewable energy consumption as percentage of total energy consumption



Supplier regional renewable energy consumption as percentage of total energy consumption

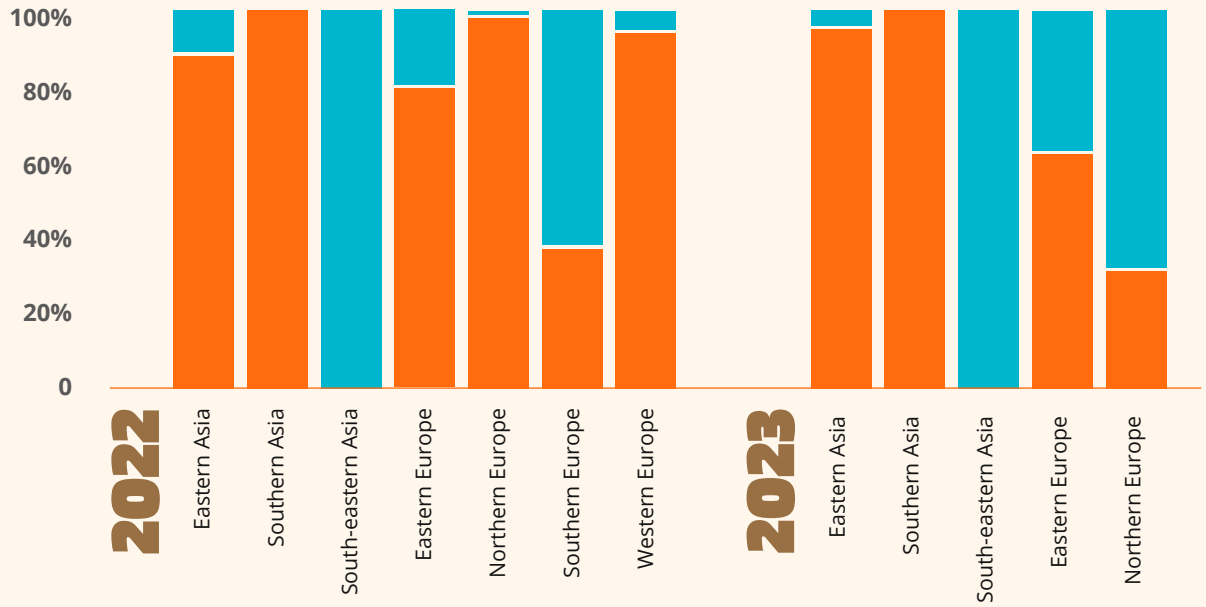


Europe has the highest renewable energy consumption, specifically with Eastern Europe consuming more than other regions in Europe. In Europe, suppliers are purchasing large volumes of renewable energy rather than generating their own energy. The share of renewable energy consumption as a percentage of total energy consumption is notably trending upwards in most Asian regions.

Mix between purchased and generated renewable energy across suppliers

Most suppliers purchase their renewable energy rather than generating it themselves. That is contrary to the trend we observed in paper mills, which tend to generate rather than purchase. Suppliers in South-eastern Asia and Southern Europe were an exception to this, with the former generating 100% of their own renewable energy and the latter 69%.

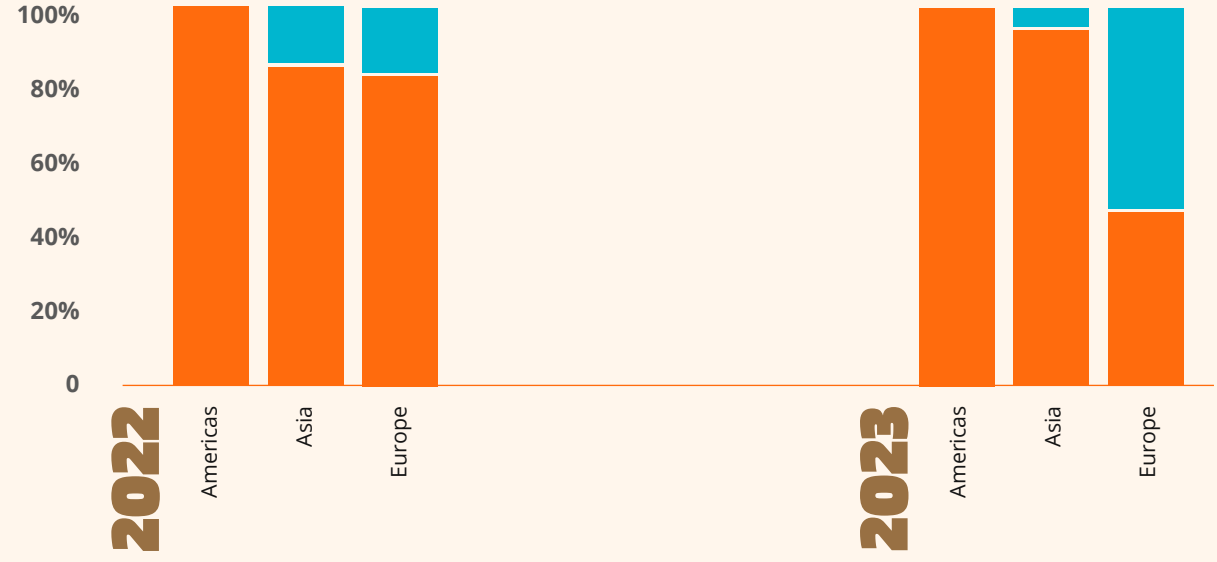
Supplier sub-region renewable energy split



Purchased energy %

Generated energy %

Supplier region renewable energy split




100%
of renewables were generated by suppliers in South-eastern Asia in 2023

Water

Water plays a crucial role in forestry and the production of pulp and paper. According to the United Nations World Water Development Report, Industry, which includes pulp and paper, is responsible for just under 20 percent of global water withdrawals. With global temperatures rising and water scarcity increasing, attention on water withdrawal and usage is increasing.

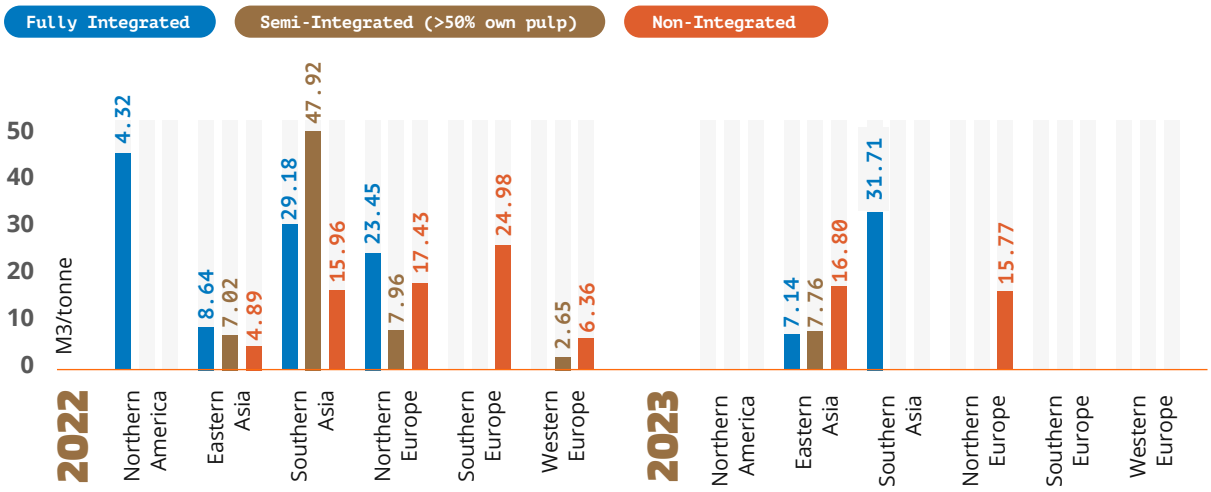
Water intensity per tonne of pulp, paper and paper board produced

Water intensity across mills

By and large, fully-integrated mills have a higher water intensity than non-integrated mills, as would be expected due to water consumption in the pulping process. There are some exceptions to this, particularly in Eastern Asia. We suspect this is more likely to be due to a difference in methodology rather than a genuinely lower water intensity as the availability of consumption metrics on water differ between countries. However, almost all mills have water reduction projects in place, which implies the sector is moving in the right direction when it comes to water consumption.

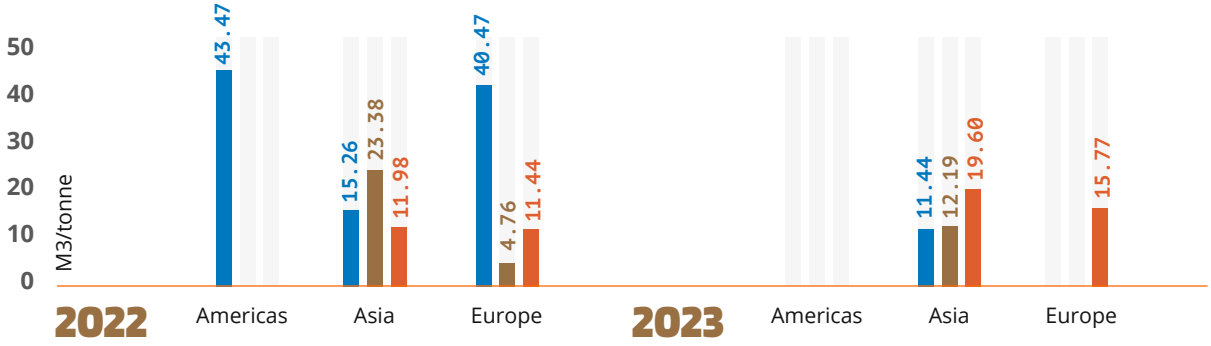
Sub-region

M3/ tonne of pulp, paper and paperboard produced



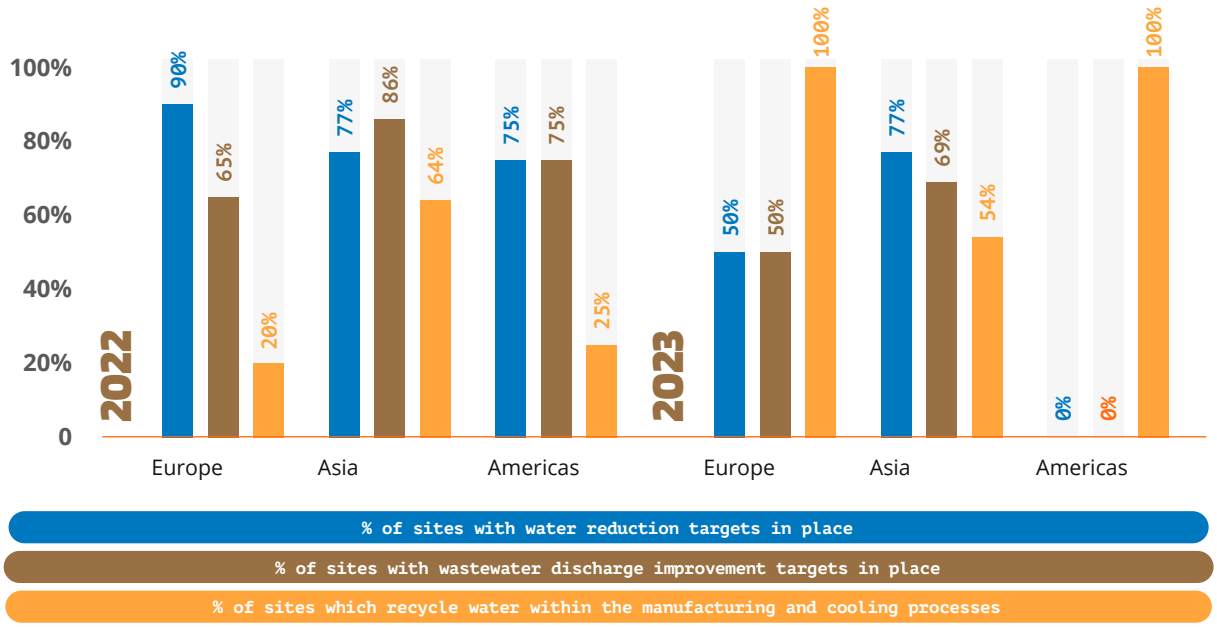
Region

M3/ tonne of pulp, paper and paperboard produced



Mill water reduction measures

We are seeing water reduction measures being implemented by mills across all regions, largely focusing on reducing the amount of fresh water used through reuse and recycling projects. Water use is essential for mills' production and cooling processes. We are encouraged to see mills implement processes to better recycle the water they are using on-site, and reduce the need for fresh water intake. To a lesser extent, we are also seeing mills take action to improve their wastewater discharge. Actions to improve include the implementation of advanced treatment mechanisms and upgrades to wastewater treatment options.



Best practice example

Bhadrachalam

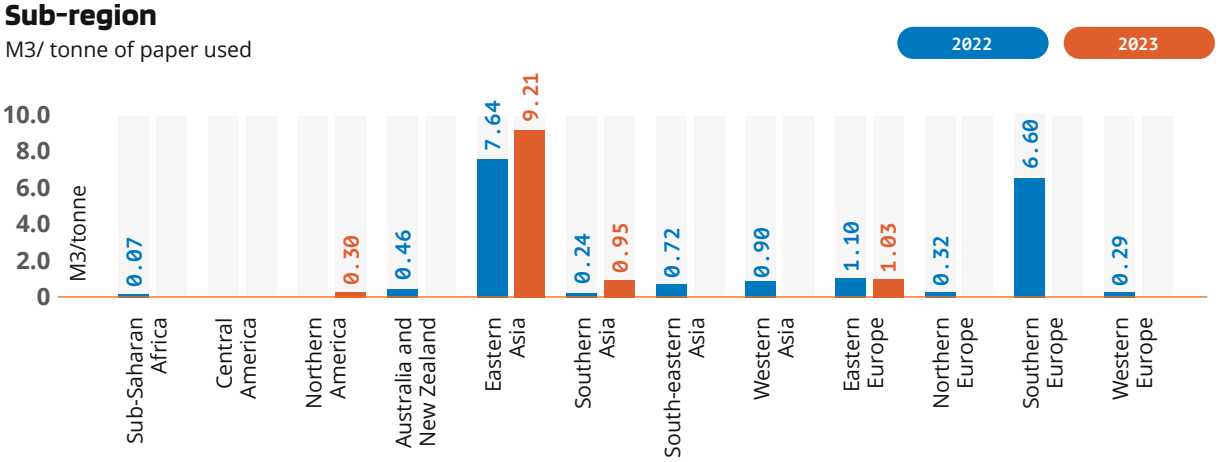
Bhadrachalam is a semi-integrated paper mill, located in India. The Bhadrachalam paper mill contributes nearly 76% of the mill group's total water intake. It has carried out several water reuse initiatives over the last few years. Gland packing and mechanical seals, which are used to form a seal between a rotating shaft and stationary housing in pumps, require water for cooling, lubrication and flushing away impurities in the system. This water is now reused within the cooling towers, diverting it away from being discharged to the effluent treatment plant. This reuse of water has helped Bhadrachalam reduce its freshwater intake by around 1,500 m3 per day, equating to an annual reduction of freshwater intake of >2%.

Water intensity per tonnes of paper used in the production of books, journals and/or other paper products

Suppliers

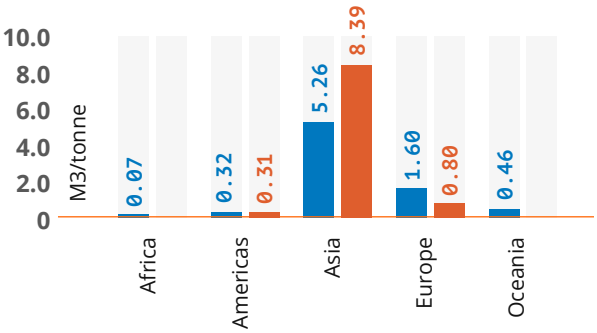
Sub-region

M3/ tonne of paper used



Region

M3/ tonne of paper used



Water intensity across suppliers

Print suppliers across Asia have a comparatively higher water intensity per tonne of paper used, compared to all other regions. This is a trend that has continued on from the findings in the first Environment Report. Many of these suppliers have set year-on-year water reduction targets and have implemented water reduction projects which indicates that they recognise the importance of reducing their water usage.

We are also seeing a continued trend in water intensity: suppliers located in Southern Europe continue to have a higher water intensity than other European sub-regions.

Supplier water reduction measures

We are seeing suppliers across regions implement water reduction measures, although not to the extent that we are seeing from mills. Suppliers in Asia have the highest uptake when it comes to target setting, with more than half setting targets on water reduction and reducing wastewater discharge.

As temperatures increase across Europe, we are expecting to see the percentage of suppliers with water reduction targets to increase as well. For now, the region lags behind Asia, as do the Americas.

Suppliers that do have those targets in place are focusing on reducing their freshwater consumption by switching to more water-efficient machinery and investing in water-saving appliances, as well as implementing new technologies to reduce wastewater discharge.

We are seeing few suppliers setting water recycling targets. Those that do are based in Asia and Europe. We would expect this to be higher as many have already got water reduction targets, and these tend to go hand in hand with water recycling.

Best practice example

Eastern European Print Supplier

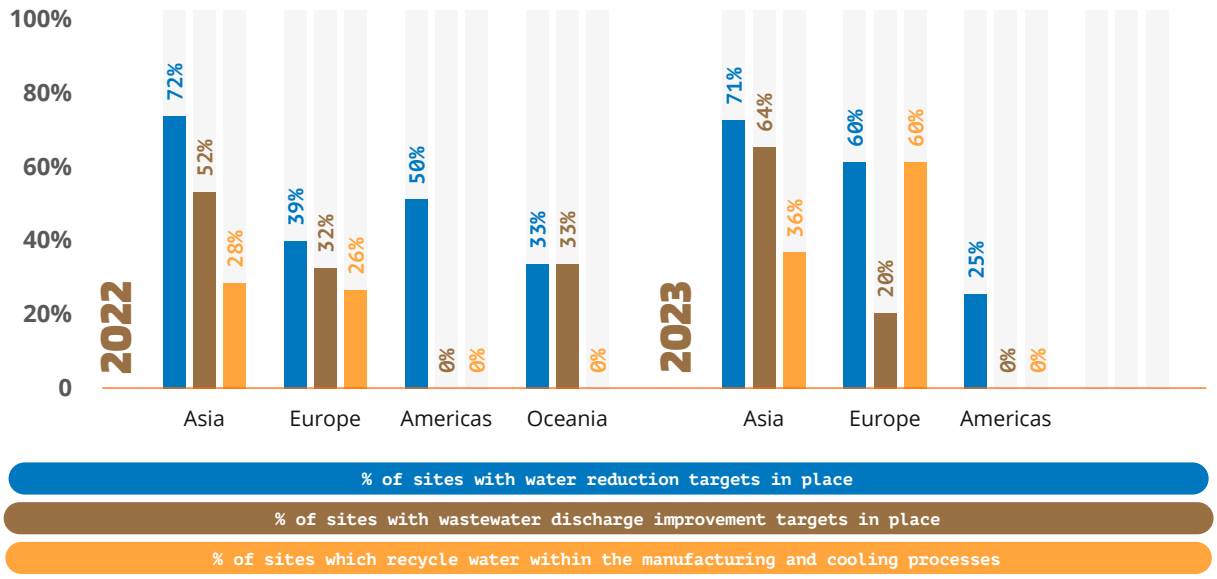
A print supplier, based in Eastern Europe, is making innovative use of rainwater. The roof of the printing house is of a significant size, making it possible to collect rainwater. The rainwater is collected in tanks and is reused within the production process. Each year, the supplier collects more than 15 thousand litres of rainwater from the surface of the roof. They are one of the only few companies reusing rainwater in the region.

The supplier is also taking a conscious approach to water consumption and has introduced water saving cisterns, installed touchless taps and the taps in the printing house have been fitted with aerators; further reducing water consumption. The supplier also conducts training sessions for employees on environmental protection and water saving.

15,000

litres of rainwater is collected from the surface of the company's roof each year

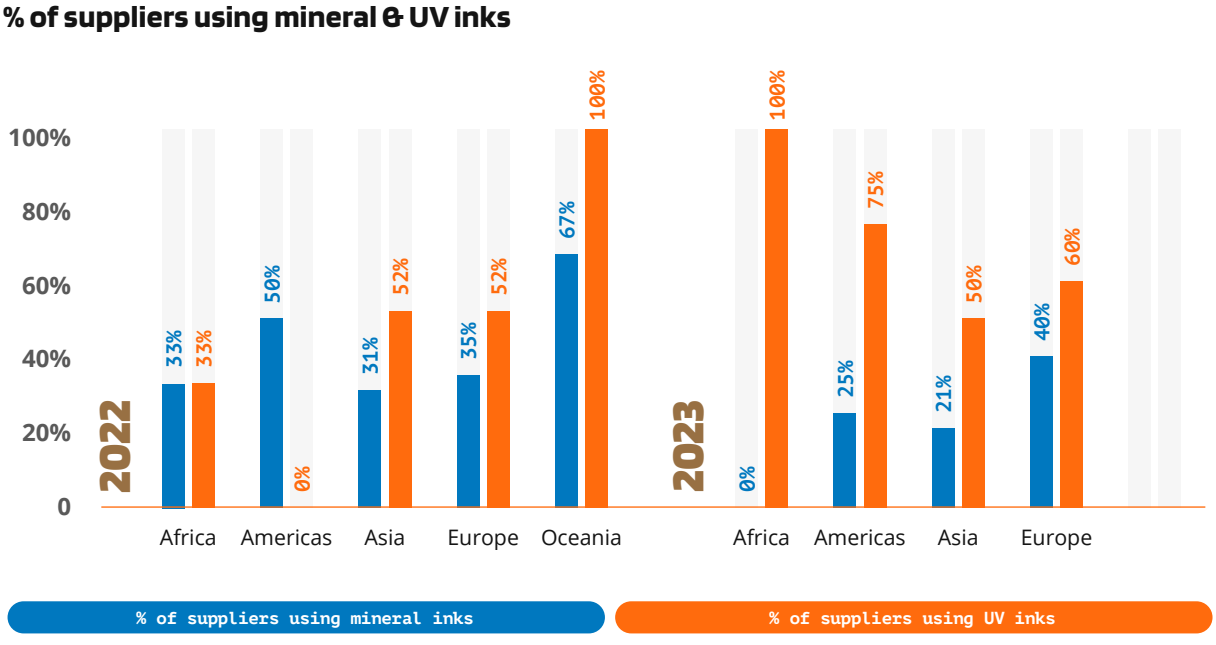
Water measures across supplier sites



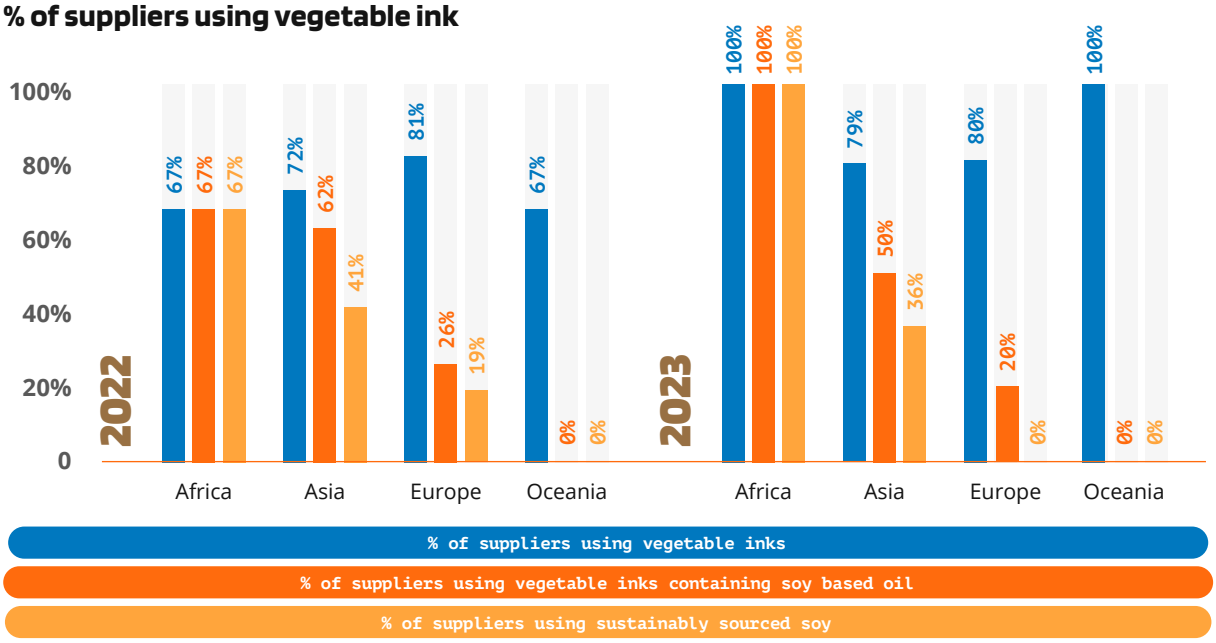
Material use and waste

Ink

- For print suppliers, ink is one of the most commonly used materials, however different inks have different environmental impacts.
- The use of vegetable inks has been the topic of much discussion between Book Chain Project publishers, particularly when considering the mineral ink ban in France.
- It might be in reaction to this that we are seeing the highest percentage of suppliers using vegetable inks in Europe, although Asia and Africa are close behind.
- Despite that, UV and mineral inks are still the predominant type of ink utilised by our suppliers. UV ink can be energy-intensive to use, so it will be interesting to observe how the use of ink will change over the coming years.



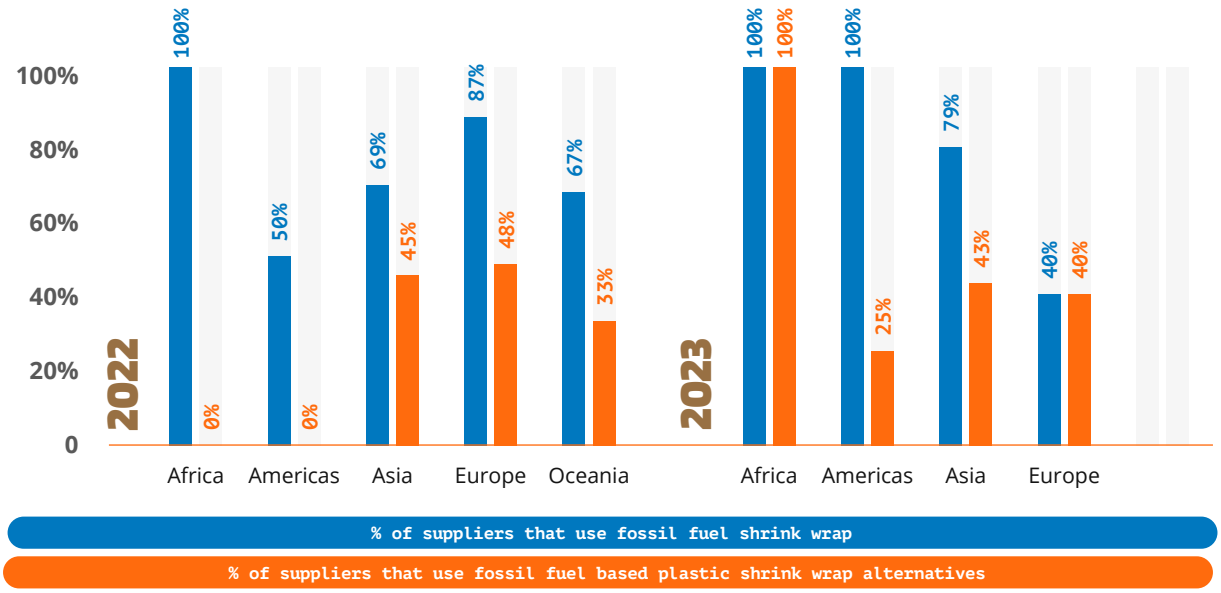
% of suppliers using vegetable ink



Shrink wrap

- The publishing sector is still heavily reliant on shrinkwrap, particularly at the printing stage. It is used for a number of different things, but largely to protect books for shipment.
- Over the past few years, we have been working to understand if there will be a move to different types of shrinkwrap that are not based upon fossil fuels.
- We are seeing more suppliers in Europe and Asia beginning to utilise alternatives to fossil-fuel based shrinkwrap, including kraft paper, cardboard, and/or bio-based shrinkwrap. This trend has not yet been picked up by suppliers in Africa or the Americas, so it will be interesting to see if this changes in the coming years.
- For more information about plastics and shrinkwrap, please read the Book Chain Project's Plastics Guide for the Publishing Industry.

% of suppliers using Fossil Fuel based and non-Fossil Fuel based alternative shrink wrap

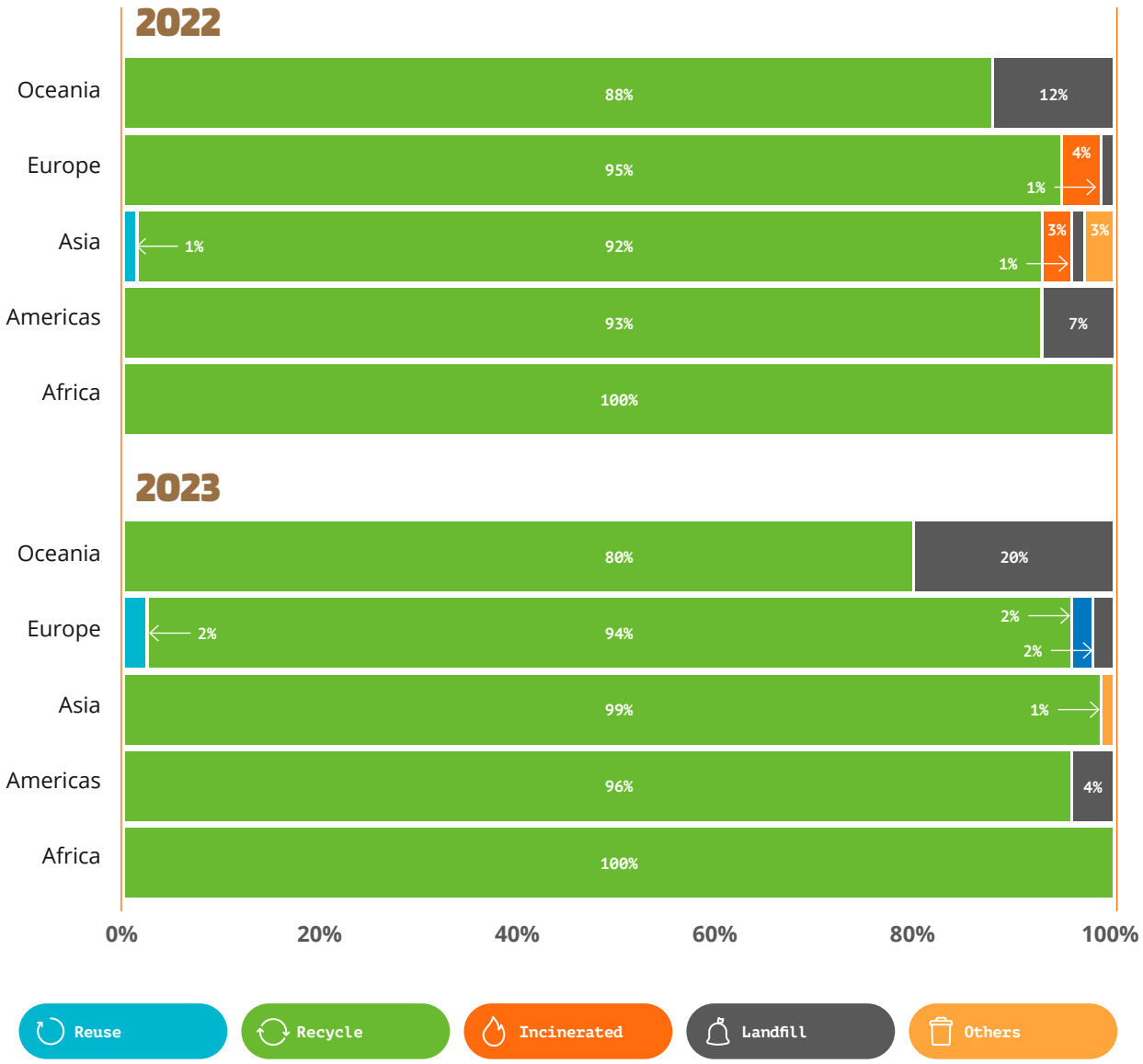


Waste

Non-hazardous waste

- The treatment and disposal of waste plays a key role in the environmental impact of paper products. Across all regions, the majority of non-hazardous waste is recycled.
- Suppliers in Oceania and the Americas are secondly reliant on landfill, although this percentage remains relatively small.
- All suppliers collect their waste data differently, so we would encourage reading this data with a pinch of salt. We expect it is unlikely that suppliers in Africa recycle 100% of their hazardous waste, for example.

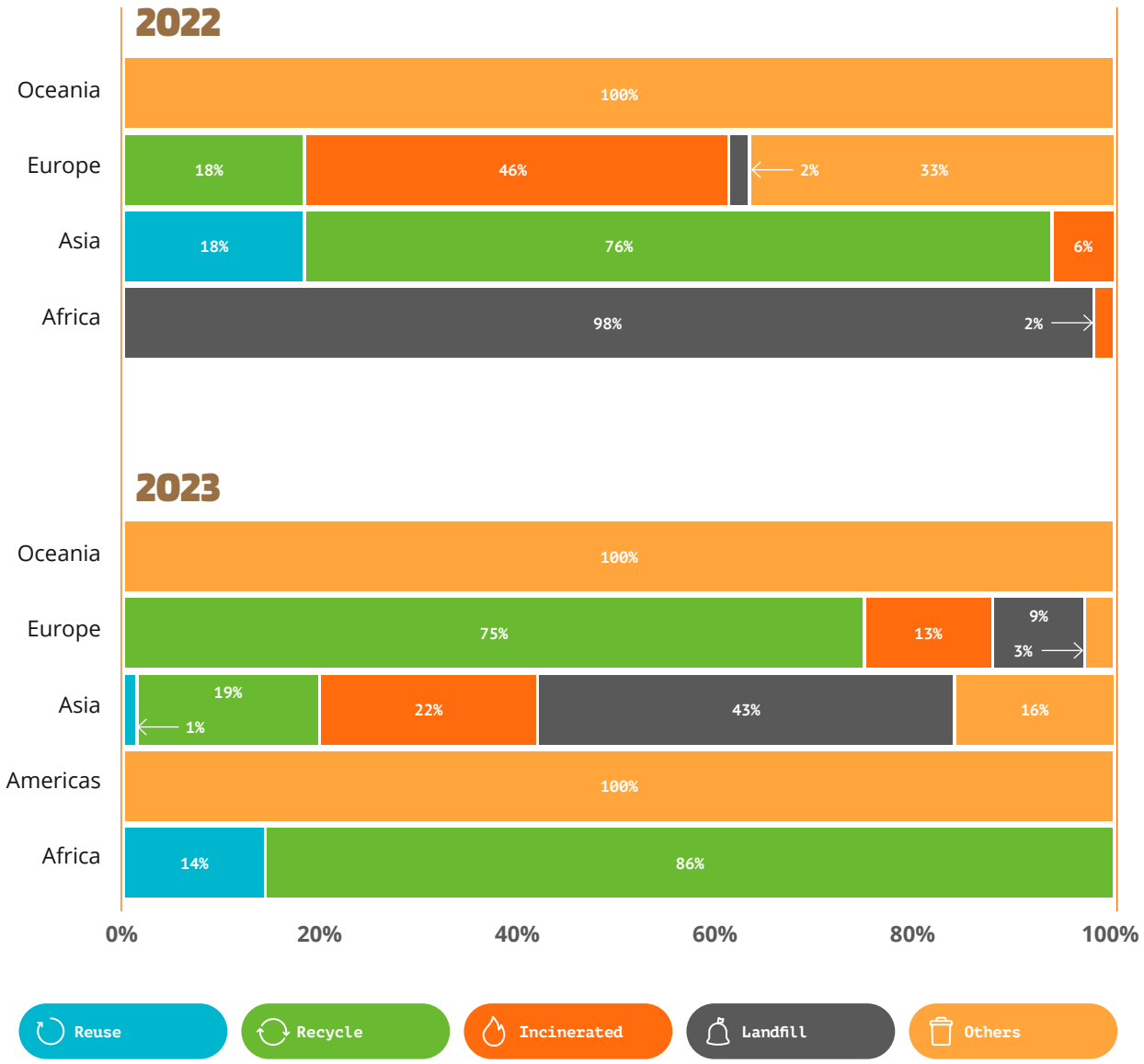
Treatment of non-hazardous waste by region



Hazardous waste

- Suppliers are treating their hazardous waste differently to non-hazardous waste, which is to be expected. Whereas the vast majority of non-hazardous waste is recycled across all regions, we see a more mixed picture for hazardous waste, including incineration, landfill and 'other' treatment methods, which might include specialised treatment methods for hazardous waste.
- There has been quite a change in data between 2022 and 2023 when it comes to treatment of hazardous waste. In 2022, we were seeing Africa largely reliant on landfill, and that has switched to incineration. Oceania is similarly reliant on incineration.
- The percentage of waste getting recycled in Europe has increased significantly, with only 14% now being incinerated. Re-use is becoming increasingly common in both Europe and Asia.

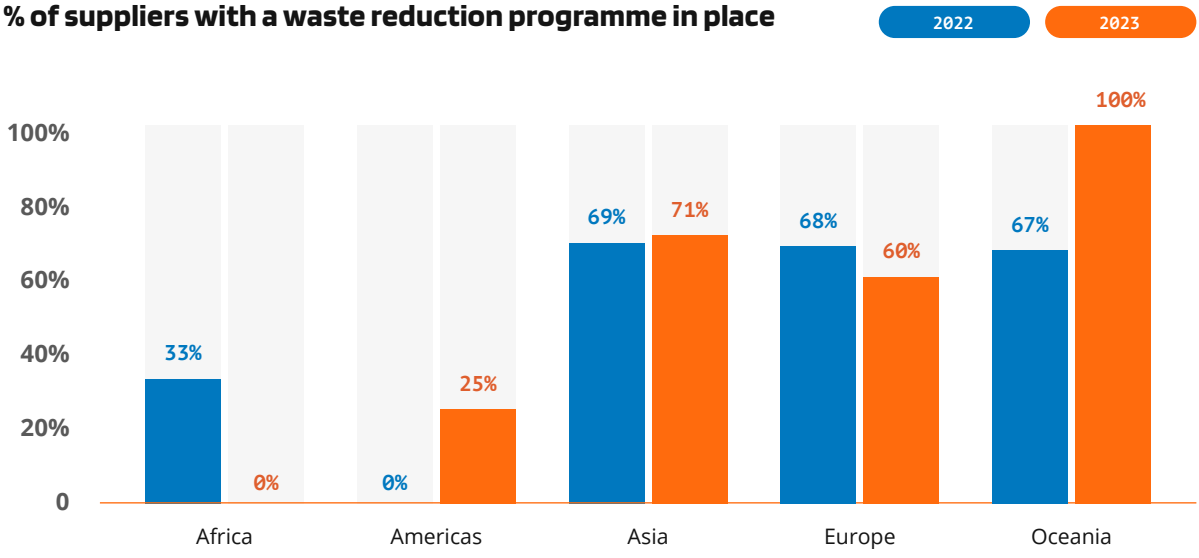
Treatment of hazardous waste by region



Waste reduction projects

- The percentage of suppliers with waste projects in place has stayed largely the same for Asia and Europe since the last edition of the Environment Report. Notable changes are in Africa and the Americas, although these are likely down to having different suppliers submitting data across the years.
- Projects include: the better sorting of recyclable materials, switching from plastic to other alternatives including paper, the reduction of hazardous waste, using more digital technology during production to improve material and process efficiency, and buying back used materials.

% of suppliers with a waste reduction programme in place



50%

of suppliers in all regions, except for Africa and Americas, have waste reduction projects in place

Maturity

The BCP Maturity Model seen below, describes how mature a site is in tracking, reporting, and managing their GHG footprint through the BCP EQ. Each mill and supplier is assigned a maturity rating based on the information provided within the EQ.

This rating can be used by publishers to assess and compare environmental maturity of all mills and suppliers within the Book Chain database. It is also designed to be a pathway for mills and suppliers to develop their capabilities to better measure and manage their environmental impacts and implement best practice.

There are four levels of the Maturity Model, starting at Level 1 which is *Beginner*. There is also a pre-stage: *Not started*. This is reserved for when mills or suppliers submit an EQ but are not able to, or decide not to, provide any site-specific energy data, are not covered by an environmental plan or policy, or do not hold the appropriate permits required by local authorities.

Not started

Level 01

Beginner

- Site had all permits required by the applicable government authorities
- Dedicated person responsible for key environmental measures and initiatives
- Site is covered by an environmental plan or policy
- Able to provide annual data
  - Energy consumption

Level 02

Learning

- Able to provide annual data
  - Scope 1 CO_2e emissions
  - Scope 2 CO_2e emissions
- For scope 1+2, the ability to track and show good performance against industry average (BCP universe)
  - **For mills**, CO_2e intensity metric is at least 25% higher than the paper industry intensity pathways
  - **For suppliers**, CO_2e intensity metric is at least 25% higher than the BCP average
- Set Scope 1 and/or 2 reduction target, as relevant covering the material share of emissions
- Have environmental initiatives in place to
  - Reduce energy use on site
  - Reduce carbon emissions on site

Level 03

Advanced

- For scope 1+2, the ability to track and show good performance against industry average (BCP universe)
  - **For mills**, CO_2e intensity metric is at most 25% higher than the paper industry intensity pathways
  - **For suppliers**, CO_2e intensity metric is at most 25% higher than the BCP average
- Able to provide annual data
  - Scope 3 CO_2e emissions*
- Set Scope 1, 2 and/or 3 reduction targets, as relevant covering the material share of emissions

* Covering the material part of Scope 3, which we would expect includes at least the following categories of the Greenhouse Gas Protocol Corporate (Value Chain) Scope 3 Standard: 1-Purchased Goods and Services, 2-Capital Goods, 3-Fuel and Energy-related Activities, 4-Upstream Transportation & Distribution, 9-Downstream Transportation & Distribution.

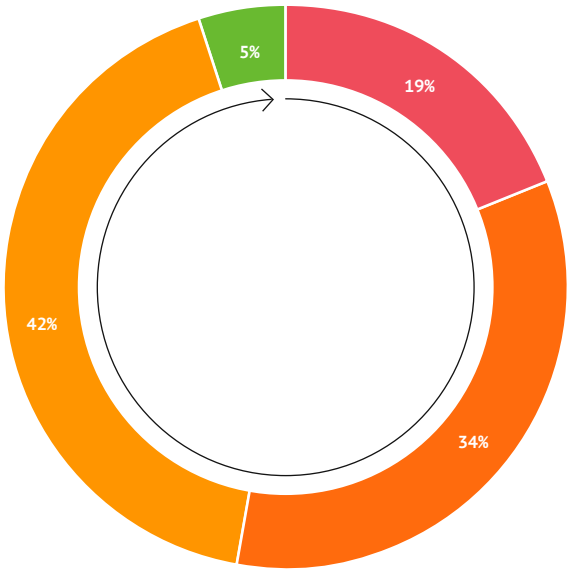
Level 04

Leading

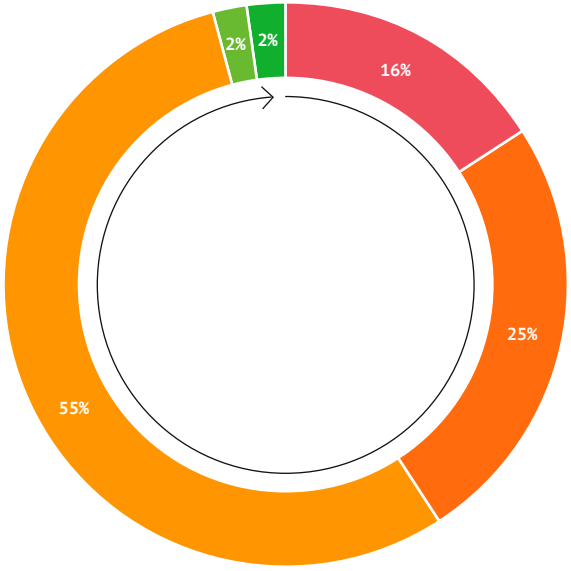
- Have set Science Based Targets (Verified or Aligned)
- For scope 1+2, the ability to track and show good performance against industry average (BCP universe)
  - **For mills**, CO_2e intensity metric is in line or below compared with the paper industry intensity pathways
  - **For suppliers**, CO_2e intensity metric is in line or below BCP average

The maturity profiles are relatively similar between mill and supplier sites. For both groups, a significant proportion of sites are either at the *Beginner* or *Learning* stages of the BCP maturity ladder.

Mill Maturity



Supplier Maturity



Not started | Beginner | Learning | Advanced | Leading

Sites at the *Beginner* level are in the very early stages of their journey of understanding, measuring, and mitigating their environmental impact. These sites tend to have a dedicated person who is responsible for implementing measures and policies and can provide annual energy consumption data. Sites at the *Learning* stage have started to calculate their Scope 1 and 2 emissions data and set emission reduction targets. Our data shows that a large proportion of our sites currently sit at the *Learning* stage, with 42% of mill sites and 55% of suppliers sites at that stage.

A small proportion of mill sites (5%) and supplier sites (2%) have reached the *Advanced* stage. This stage requires a detailed understanding of indirect impacts (Scope 3) and demonstrating good performance (e.g. in terms of comparatively low GHG emission intensities). As the target-setting requirement covers all material reported Scopes of emissions, sites would also be expected to have set a Scope 3 emission reduction target at the *Advanced* stage. There is still a big gap in terms of the Scope 3 data being measured and reported by mill and supplier sites, which explains the small proportion of sites reaching this phase. On a positive note, the trend is going in the right direction with more and more sites able to measure their Scope 3 emissions.

Only 2% of suppliers sites who submitted an EQ have reached the *Leading* stage. These sites had set Science Based Targets (verified or aligned with the SBTi criteria) and were able to track good performance against BCP industry average for Scope 1 and 2 emissions. The publishing and paper industry, whilst making some progress, is tracking behind other industries on setting Science Based Targets.

There are also a number of sites still at the *Not Started* stage. These mills and suppliers require further support to increase their capacity to measure and mitigate their environmental impacts.

Case Study

Rotolito Romania

Rotolito Romania, a printer based in Romania, has been making year on year progress through the maturity ladder. Having achieved *Learning* in the 21-22 reporting year, the supplier moved up to the *Advanced* stage the following year after expanding their Scope 3 data coverage. Over the same period, Rotolito Romania, also increased their renewable energy from 28.82% to 64.78%, reduced their consumption of fossil fuels by more than 50%, set water reduction targets and increased the percentage of recycled water from 4.08% to 16.08%. This is just one example of how sites are developing their capabilities around understanding, measuring and mitigating their environmental impact.

Rotolito Romania, increased their renewable energy to

64.78%

Conclusion

This is the second iteration of the Book Chain Project's Environment Report, and one we aim to continue for many years. We want to demonstrate the real changes that are made in environmental management for mills and suppliers, which should result in an absolute reduction of emissions and water consumption in particular. That said, the industry still has a long way to go in reducing its environmental impacts and contributing to the global effort to limit climate change, reduce our negative impact on nature, and ensure sustainable resource use.

Greater efforts are needed to reduce industry emissions, as paper production is expected to increase by

2030

We hope that this report can allow mills and suppliers to benchmark themselves against current standards within their regions, and more widely, we hope this report can help contribute to an understanding of environmental management across the publishing sector as a whole.

Not many industries have as much primary data on their supply chain as the publishing industry has through the Book Chain Project. This report is one small element of our work to help the industry use that data to create more sustainable supply chains. Going forward, it is clear that there are still some data gaps to fill. While we will remain focussed on improving and expanding the data gathered through the EQ, we will also ensure that data is used by publishers, mills and suppliers to identify and inspire improvement where it matters most.

Appendix

Links to further resources

The Book Chain Project GHG Emissions Calculation: Guidance for the Publishing Industry
https://bookchainproject.com/resource?resource=525

Book Chain Project Environment Report 2020-21
https://bookchainproject.com/viewResource?resource=462

Book Chain Project Home
https://bookchainproject.com/home

The GHG Protocol Corporate Accounting and Reporting Standard
https://ghgprotocol.org/corporate-standard

Country overview of climate performance by Climate Transparency
https://www.climate-transparency.org/g20-climate-performance/g20report2022

Confederation of European Paper Industries ten toes report
https://www.cepi.org/wp-content/uploads/2021/02/ENV-17-035.pdf

Science Based Targets Initiative Home
https://sciencebasedtargets.org/

Data points for mills and suppliers

The number of data points used to inform the data for each country, sub-region and region are outlined in the tables below. The tables indicate how many sites have been used to inform the data that is presented in the report. As the cut off point for including the data was two sites, anything below that has been excluded the analysis to ensure that all averages were representative of a country, sub-region or region. However, where a data point has been included at one level (e.g. at country-level), it may have been included at a more aggregated level (e.g. at sub-region or region level). This was to ensure that the report made best use of the data.

Mills

Country	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Canada	2	-	-	-	-	-
China	7	4	2	2	1	3
Finland	2	-	1	-	-	-
France	-	-	-	-	1	-
Germany	-	-	3	-	2	-
India	2	2	3	1	3	1
Indonesia	1	-	-	-	1	-
Italy	-	-	-	-	2	-
Korea (Republic)	-	-	-	-	1	-
Mexico	-	-	-	-	1	1
Netherlands	-	-	-	-	1	-
Russia	1	-	-	-	-	-
Sweden	2	-	-	-	2	2
United Kingdom	-	-	2	-	1	-
United States	-	-	1	-	-	-

Sub-region	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Central America	-	-	-	-	1	1
Northern America	2	-	1	-	-	-
Eastern Asia	7	4	2	2	2	2
Southern Asia	2	2	3	1	3	1
South-eastern Asia	1	-	-	-	1	-
Eastern Europe	1	-	-	-	-	-
Northern Europe	4	-	3	-	3	2
Southern Europe	-	-	-	-	2	-
Western Europe	-	-	3	-	4	-

Region	Fully Integrated		Semi-Integrated (> 50% own pulp)		Non-Integrated	
	2022	2023	2022	2023	2022	2023
Americas	2	-	1	-	1	1
Asia	10	6	5	3	6	4
Europe	5	-	6	-	9	2

Suppliers

Country	Printer	
	2022	2023
Australia	3	1
Bosnia and Herzegovina	-	-
Bulgaria	1	1
China	13	9
Czech Republic	1	-
Germany	3	-
Hong Kong (China)	1	-
Hungary	1	-
India	4	3
Italy	3	-
Latvia	1	-
Lithuania	1	-
Malaysia	4	1
Mexico	1	1
Netherlands	2	-
Poland	2	2
Romania	1	-
Singapore	1	-
Slovakia	1	-
South Africa	3	1
Spain	1	1
Turkey	1	-
United Arab Emirates	1	-
United Kingdom	11	1
United States	1	3

Sub-region	Printer	
	2022	2023
Sub-Saharan Africa	3	1
Central America	1	1
Northern America	1	3
Australia and New Zealand	3	1
Eastern Asia	14	9
Southern Asia	4	3
South-eastern Asia	5	1
Western Asia	2	-
Eastern Europe	7	3
Northern Europe	13	1
Southern Europe	4	1
Western Europe	5	-

Region	Printer	
	2022	2023
Africa	3	1
Americas	2	4
Asia	25	13
Europe	29	5
Oceania	3	1

BOOK CHAIN PROJECT

Building better supply chains for books

Get in touch with the team to find out more about the Book Chain Project.

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bookchainproject.com

SLR

The Book Chain Project is an initiative run by SLR (Previously Carnstone Partners Ltd).

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