

It all starts with a tree.



Responsibility Report 2022



Making high-performance paper products and removing carbon dioxide from the atmosphere start the same way, with a tree.



We want to leverage the power of forests within our existing value chain, as well as future carbon-pollution-free opportunities, to become a **net-zero emissions** company by 2050.

PCA'S CARBON REDUCTION TARGETS

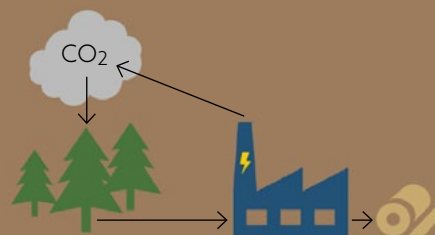
- 2030 ● 35% reduction of scopes 1 and 2 (market-based) greenhouse gas emissions
- 2040 ● 60% reduction of scopes 1, 2 and 3 greenhouse gas emissions
- 2050 ● Net-Zero scopes 1, 2 and 3 greenhouse gas emissions



Trees clean air and water, provide habitat for wildlife and offer recreational opportunities for people to connect with nature. Trees are also a low-cost option for removing carbon dioxide (CO₂) from the atmosphere.

All trees eventually die, typically from natural disturbances such as a tornado or wildfire, or from disease or invasive species — and some are harvested. PCA mills have been making essential wood-based paper products for over a century and, through managed forestry practices, the amount of forest area in the U.S. has remained stable — evidence of a sustainable system.

Over the past year, PCA's Carbon Neutrality Team began pursuing several opportunities for our company to achieve net-zero carbon emissions by 2050. Our greatest opportunity starts with a tree.



Currently, the parts of the tree (biomass) that cannot be made into pulp for our products are combusted for energy. By using this wood waste for fuel (biogenic fuel), we reduce the amount of fossil fuel we combust. And with combined heat and power (CHP) technologies deployed at our mills, we also reduce the amount of electricity we need to purchase.

When biomass is combusted, some of the carbon dioxide the tree sequestered while growing is returned to the atmosphere, just as it would be if the tree died naturally. Provided the amount of U.S. forest area remains stable, the carbon released as part of our energy production and manufacturing process is considered **NEUTRAL**.

We are evaluating taking this a step further by using existing and emerging carbon capture and storage (CCS) technologies to capture and then pump biogenic CO₂ into saline aquifers for permanent storage. This would make *removal* of carbon dioxide from the atmosphere a byproduct of pulp and papermaking, and turn a process that is currently carbon **NEUTRAL** into one that is carbon **NEGATIVE**.

	NO CCS	WITH CCS
Fossil Fuel	Carbon POSITIVE	Carbon NEUTRAL
Biogenic Fuel	Carbon NEUTRAL	Carbon NEGATIVE

In the [Climate Change](#) section of this report, you will find detailed information about how PCA intends to achieve our climate goal and targets.

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Mark W. Kowlzan

*Chairman and
Chief Executive Officer*

June 30, 2023

Executive Statement

To all Stakeholders,

In last year's statement we shared our Sustainable Business Principles, a comprehensive set of values that we consider our foundational approach to sustainability. For a detailed understanding of our approach, we invite you to review our principles on the last page of this report. Abiding by these principles, our Carbon Neutrality Team has been hard at work this past year identifying opportunities and developing a robust roadmap for achieving carbon neutrality.

This was no simple task, but we did not need to look far to identify our greatest opportunity: trees in our existing value chain within our regional forest communities. The areas surrounding most of our mill communities contain abundant forestland, a statement that's as true today as it was when our mills were built — some more than a century ago. These forests provide clean air and water, recreational opportunities for the community and habitats for wildlife. These forests are also exceptionally good at absorbing carbon dioxide from the atmosphere.

Currently, much of the carbon dioxide absorbed by trees is eventually returned to the atmosphere. This is a natural part of the carbon cycle, with emissions occurring due to both natural disturbances and human activity. However, we have come to understand that we can work together with trees to complete the job they started. This is why we are working toward leveraging the power of trees and using existing and emerging technologies to capture and store biogenic carbon emissions, aiming to permanently remove carbon dioxide from the atmosphere as an inherent outcome of our pulp and papermaking operations.

To accomplish this undertaking will require patience and persistent effort. In the Climate Change section of this report, you can get a detailed look at how we plan to do it, as well as our philosophy, strategies, our near-, mid- and long-term targets, and goal to become a net-zero carbon emissions company by 2050.

Our ambitious net-zero climate goal demonstrates our commitment not only to the well-being of our company, but to the health of our environment and the prosperity of the communities and customers we serve. As we continue this journey, we encourage our stakeholders to join us in thinking long term to build a resilient economy. We believe that through our collective effort, we can make a tangible, positive impact for generations to come.

I am personally proud of the work of our cross-functional Carbon Neutrality Team and the professionals around the company eager to follow their lead. They are a testament to the benefits of diverse thought in solving complex problems. Their dedication, expertise and resilience fuel our progress and inspire us every day as we move forward on this critical journey.

A handwritten signature in black ink, reading "Mark W. Kowlzan". The signature is fluid and cursive, with a long horizontal line extending to the right.

Company Profile 2022

15,100 employees \$8.5 billion in revenue

Packaging Segment

7 containerboard mills 86* converting operations

4.6 million tons of containerboard 63.4 billion square feet of corrugated products

15,000 customers

31,000 locations

* Number of facilities, as of June 2023

Paper Segment

1 white paper mill

510 thousand tons of uncoated freesheet

40 customers

150 locations

General Disclosures

Company Overview

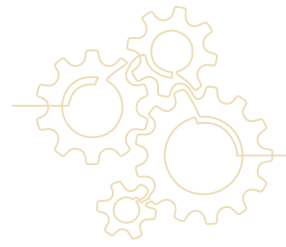
Sustainability Governance

Materiality

Key Impacts

Map of Locations

AF&PA 2030 Goals



Company Overview

Packaging Corporation of America is an ideas and solutions company that produces essential, sustainable products that people rely on every day. Our Packaging segment is known for its expertise in the manufacturing and sales of containerboard and corrugated products, and our Paper segment (Boise Paper) produces and sells consumer-brand office and business papers. Together, we are focused on bringing value to a growing number of customers around the world.

PCA's corrugated products are vital to businesses (large and small), retailers (brick and mortar and online) and shoppers (in stores and at home). And our paper products are used every day in schools, offices and homes. We remain committed to meeting the needs of our customers by providing outstanding service and essential products that exceed expectations for performance and environmental responsibility.

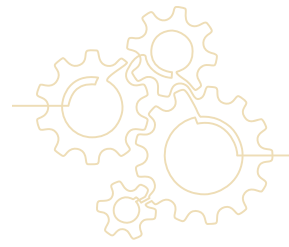
PCA's common stock is listed on the New York Stock Exchange under the ticker symbol **PKG**.

PCA is the third largest producer of containerboard and corrugated products in North America. We manufacture many grades of kraft linerboard and corrugating medium at our containerboard mills and produce a wide variety of corrugated containers and displays at our converting facilities.

Boise Paper is a leading producer of uncoated freesheet in North America. Our team is dedicated to providing high-quality products, outstanding customer service and industry-leading supply chain performance, with a product portfolio that includes office papers and printing and converting papers.

Sustainability Governance

On January 1, 2022, PCA established a Corporate Sustainability and ESG department upon the promotion of our Vice President, Tax to Senior Vice President, Tax, ESG and Government Affairs. This newly established role has management responsibility for the Board Sustainability Committee, which met five times in 2022 and is scheduled to meet five times in 2023. The Corporate Sustainability and ESG department is responsible for evaluating long-term ESG risks, benchmarking company performance, establishing metrics and targets, working collaboratively with our Carbon Neutrality Team and developing strategies to effectively manage risks and realize opportunities. This department also engages with and communicates our performance on ESG issues to a wide array of stakeholders. Additionally, this department works cross-functionally to educate internal and external stakeholders and implement sustainability initiatives for the company.



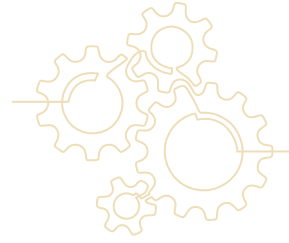
Materiality

In 2021, we began licensing Datamaran’s technology to assist our materiality and ESG risk management efforts. Using this technology, we can quickly identify the relevance of key ESG issues for a broad set of stakeholders. Datamaran uses natural language processing to contextualize information found in companies’ financial and sustainability reports, and looks at current regulations, voluntary initiatives and news to prioritize issues.

For our latest assessment completed in 2022 we relied entirely on Datamaran’s technology to create our external view. For our internal view, we surveyed our Executive Officers and members of our Sustainability Committee of our Board of Directors.

The ESG issues we evaluated are shown in the matrix below. High and medium priority issues are included in this report.

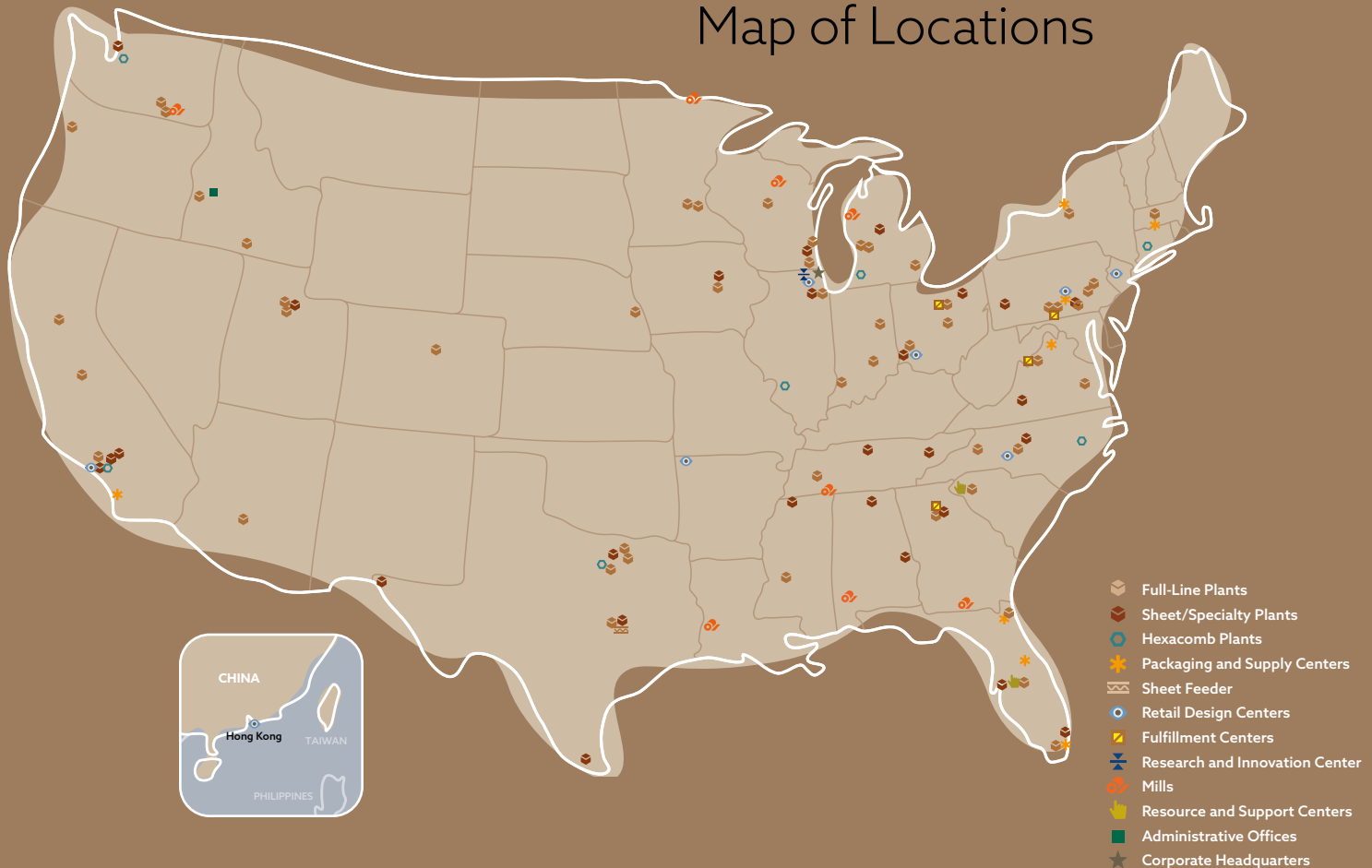


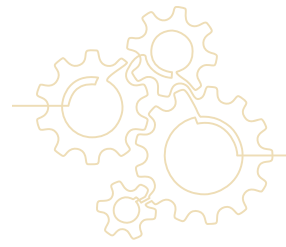


Key Impacts

PCA IMPACTS FOR MATERIAL GR1 TOPICS	FIBER SOURCING	PULP AND PAPERMAKING	CONVERTING	SUPPORT, SERVICE, PROVISION	CUSTOMER USE	END-OF-LIFE, RECOVERY
ENVIRONMENTAL						
Materials	●	●	●			●
Energy		●	●			
Water & Effluents		●	●			
Climate Change & Emissions	●	●	●			●
Waste		●	●			●
SOCIAL						
Employment		●	●	●		
Occupational Health & Safety	●	●	●	●		
Learning & Development	●	●	●	●		
Diversity, Equity & Inclusion		●	●	●		
Community Outreach	●	●	●		●	●
Consumer Health & Safety	●	●	●		●	●

Map of Locations





AF&PA 2030 Goals

PCA's operational performance helped the industry achieve many of the American Forest & Paper Association's *Better Practices, Better Planet 2020* goals. PCA will continue to build on this progress and is committed to helping the industry achieve the ambitious AF&PA 2030 goal of reducing total scope 1 and 2 greenhouse gas emissions intensity by 50% from a 2005 baseline. We also support AF&PA's 2030 goals of Advancing a Circular Value Chain, Zero Injuries, Drive Water Stewardship, and Resilient Forests, in addition to supporting AF&PA's Diversity, Equity and Inclusion Statement of Principles. For more information on these goals, please visit the sustainability section of the AF&PA website at afandpa.org/2030.

For more information on PCA's own climate goal and carbon reduction targets, please visit the [Climate Change](#) section of this report.

Global Reporting Initiative (GRI) Index

We leverage our GRI Index to report many of our general disclosures, which streamlines our reporting process. The majority of these disclosures appear in our Annual Report on Form 10-K filed with the Securities and Exchange Commission (SEC), in other SEC filings and in policies available on our website. You can find our index at the back of this report starting on page [56](#).



People

Occupational Health and Safety

Learning and Development

Employment

Diversity, Equity and Inclusion

Consumer Health and Safety

Community Outreach

Meeting Customer Expectations

Occupational Health and Safety

PCA remains committed to providing and maintaining a healthy and safe work environment for our employees. We believe that all accidents are preventable, and an injury-free environment is achievable. Our goal is to prevent, reduce and address potential health and safety risks and incidents wherever and whenever possible.

Our Approach

We use a four-pillar approach to achieve our goal.

1. **Invest in our people** — We ensure that our workers have the appropriate training and protective equipment they need to succeed.
2. **Invest in our equipment** — We ensure that our equipment is well maintained, reliable and safe to operate.
3. **Learn and improve** — We keep a record of our health- and safety-related incidents and near misses, and use the data for continuous improvement planning.
4. **Implement controls**¹ — We have a robust Occupational Health and Safety (OHS) management system, alongside protocols and guidelines.



Core Competency Teams and Governance Structure

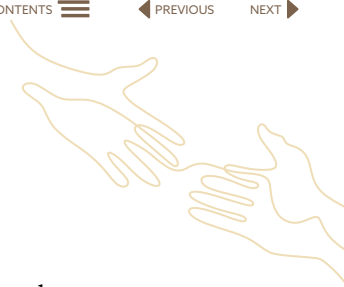
The make-up of our core OHS competency teams varies between our box plants and mills depending on the size and complexity of the operation. The teams include Health and Safety Managers, Safety Supervisors, Safety Engineers, registered nurses (RNs), EMTs or paramedics.

PCA has established a robust governance structure for managing OHS risk. Our Health and Safety group is responsible for the development, management and implementation of our OHS systems, the review of all incidents across all our facilities, and health and safety policy planning. It consists of a Senior Vice President, a Vice President, Senior Directors, Corporate Managers, Regional Managers, and Facility Health and Safety professionals. Collectively, our team members have demonstrated safety excellence for decades, and many of them hold professional certifications including Certified Safety Professional (CSP) and Certified Hazardous Materials Manager (CHMM).

Our leaders strive to be strong mentors for the next generation of Health and Safety professionals at PCA. They are actively involved with and are members of our industry safety committees including American Society of Safety Professionals (ASSP), Fibre Box Association (FBA) safety committee, American Forest & Paper Association (AF&PA), and Pulp & Paper Safety Association (PPSA). These committees work to raise awareness; share ideas and best practices; and stay current on trends, regulations and shared opportunities within the industry through meetings, roundtables and conferences. We also work with our labor unions and are actively involved with Labor/Management Health and Safety Committees to continually review PCA's safety structures and to collaborate on various safety projects. The Health and Safety group meets throughout the year for training, performance and program reviews, and strategic planning.

PCA's Sustainability Committee provides Board-level oversight of health and safety. Health and safety performance is reviewed annually by the committee.

¹ PCA follows the [Hierarchy of Controls](#) method to select a control method that is the most feasible, efficient and permanent.



Maintaining Worker Health and Safety During the COVID-19 Pandemic

Since the coronavirus (COVID-19) pandemic began in 2020, PCA has raised the health and safety awareness of our employees, and we have continually worked to prevent the spread of the virus. In 2022, we continued to adapt and manage changes to our OHS practices, protocols and policies to reflect the necessary and appropriate precautions that are taken based on the progression of the virus.

Today, workers who are unwell or exhibit any sickness symptoms are asked to stay home. Hand sanitizers are readily available throughout our box plant and mill locations. In managing the COVID-19 experience, we have employed a full-time corporate nurse to coordinate with registered nurses at each one of our mills, and we continue to actively monitor the development of the virus and make assessments to additional policy changes accordingly.²

Occupational Health and Safety Management System

PCA's OHS management system includes elements intended to engage employees, define success and provide practical guidance to achieve excellence. These elements include management commitment, safety policy, safe work rules, employee training, safety meetings, employee involvement, safety committee, facility inspections, incident investigation, medical treatment/first aid, plant emergency organization, hazard/risk assessment, job hazard analysis, communication, industrial hygiene, ergonomics and environment.³ Our management system elements are also incorporated into contractual labor agreements, where applicable. Resources and tools that support the management system are available to employees on PCA's Health and Safety intranet site.

To continuously develop, update and maintain our knowledge around OHS, we have implemented a specific Binder Safety Program at our box plants where we house a physical binder on the management of an EH&S topic. Each Binder contains the playbook on specific safety topics including definitions, guidelines, protocols and the management of the topic. Binders are continually reviewed and updated by the location, providing a constant reminder of safety topics we must be aware of.

Workers Covered by an OHS Management System

All employees, temporary workers and contractors are subject to and are covered by PCA's OHS management system. Contractor agreements require that foundational safety training is provided to workers, and site-specific health and safety training is also provided by PCA.⁴ PCA utilizes a third-party verifier to ensure contract workers receive adequate health and safety training, maintain written safety programs and have a demonstrable history of safe operation.

Worker Training

PCA provides guidance and instruction for completing federally mandated training required under the OSHA Act.⁵ Training is spread throughout the year and is delivered in a variety of methods including classroom instruction, online modules, block training and on-the-job training. In addition to the federally mandated OSHA training, each job classification has specific safety training provided prior to an hourly associate being placed in the job. Training includes task-specific safety requirements of that job and how

² May 5, 2023 the World Health Organization (WHO) announced that COVID-19 is no longer a public health emergency of international concern (PHEIC).

³ PCA's OHS management system accounts for requirements outlined in OSHA's Illness and Injury Prevention Program and 29 CFR Subpart R 1910.261 "Pulp, Paper and Paperboard Mills." Additional guidance is provided through various standards written by the American National Standards Institute (ANSI), and Industry Practices.

⁴ PCA has an internal Safe Operating Practice Instruction dedicated to practices of outside contractors, in addition to [Safe Practices for Outside Contractors](#), available on our website.

⁵ Identified training includes federally mandated OSHA training under 29CFR1910.261.

to perform these, as well as awareness of the required task-specific personal protective equipment (PPE). Training records are maintained by each location.

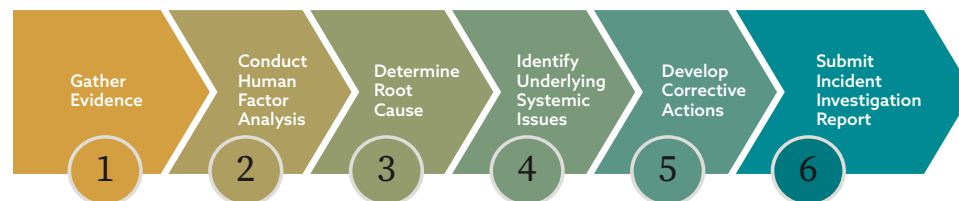
We have designed our training programs to bring emphasis to performing work activities in situations where health and safety risks could be present. Each month, safety managers of each of our operations also meet virtually to discuss issues that are tailored to a specific region, such as heat stress, or cause and prevention of certain incidents. Trainings are also provided throughout the year on each one of the safety topics that a Binder covers. For our mills, we work with ISN (a third-party verifier) to review training and safety components for our external contractors before a contractor arrives on site.

Health and Safety Audit Program

PCA's policy requires health and safety audits to be conducted every three years at a minimum, with our Corporate EH&S managers visiting each one of our facilities in between to ensure operations are continuously managed within our health and safety parameters. Audits and pre-job analysis are conducted by corporate and facility Health and Safety professionals to identify work-related hazards and assess the associated risks. Findings are shared internally and are used as a basis for continuous improvement of OHS protocols, practices and management systems.

Employees are instructed and encouraged to report workplace hazards along with corrective actions taken. Reporting of hazards can be communicated through entry into our electronic work order system; verbally with a supervisor, other members of management or joint Health and Safety committee members; or via the PCA Hotline. Employees are free to report workplace hazards without fear of reprisal.⁶

Incident Investigation



PCA provides written instructions on how to report and investigate near misses, first-aid treatment, doctor visits, restricted duty cases and lost time accidents. We use a 6-step investigation technique designed to identify root causes and develop corrective actions utilizing the hierarchy of controls. At the same time, these are entered into an electronic incident reporting database for tracking and notification. Incident trending and analysis is performed utilizing functions in our reporting database. Daily injury reports are produced for each facility and used to identify leading causes of incidents, root causes and appropriate corrective actions. OSHA recordable incidents, along with significant near misses, and regulator inspections (as well as COVID cases) are reviewed in our monthly health and safety calls. Executive summaries of the reports are sent to our senior management, where data is used to develop improvement plans for incident and injury reduction.

Health Services

PCA maintains and has available health and emergency response services at all its locations. Each one of our paper mills has a full-time RN on site. Our box plants have either licensed practical nurses, EMTs or paramedics on site during the day and either on site or on call after hours. Since our operating floors in our facilities tend to have high noise

⁶ This is supported by union contractual language known as "Right to Act" as well as PCA's Code of Ethics and Business Conduct and federal law (U.S. Department of Labor – Whistleblower Protection Act).

level due to the running machineries, our licensed medical professionals provide routine services such as spirometer testing and audiometric examinations to ensure the auditory health of our workers. In addition to these services, they offer many health and wellness procedures such as blood pressure screenings, vision screenings, health consultations, health education and over-the-counter medications. All employees are encouraged to visit the medical facility to discuss any health issues or concerns they may have at any time.

PCA's converting operations have access to a 24/7 nurse triage line. All plants maintain first-aid supplies and have employees certified in CPR and first aid. Workers are also provided with a key card so they can obtain free health and safety supplies from several of the vending machines located in each facility. Corporate policy requires that each shift be staffed with at least two individuals with CPR and first-aid certifications.

PCA has procedures and protocols in place when it comes to documentation and archiving. All health records, personal information and the health services participation data of our workers are kept and maintained in the strictest confidence and are not used for any favorable or unfavorable treatment of workers.

Worker Participation, Consultation and Communication

All PCA paper mills have union contracts, which include language concerning hourly associates' participation in safety activities. This participation consists of safety committees that meet regularly to discuss issues and concerns, to identify opportunities to mitigate potential hazards and to serve as information exchange sessions. Hourly associates also play pivotal roles within departments, functioning as safety coordinators and auditors during shutdowns. In addition, United Steelworkers (USW), International Association of Machinists and Aerospace Workers (IAM) and PCA's management have annual contractual roundtable meetings. Employee participation in the roundtable comprises union leadership, hourly employees and management. Topics discussed cover best practices, trends and issues. Action items are identified and tracked to completion by the moderator and union officials.

PCA's converting operations maintain joint Health and Safety committees that meet monthly. Minutes are kept and posted where all employees have access. Committee members are represented by all shifts and include management and hourly employees. Safety committees participate in safe plant operating assessments, incident investigations and inspections. Other employee participation options include being a member of the plant emergency organization. In addition, Effective Joint Health and Safety Committee training is being completed at all USW-represented locations.

This year, PCA is proud to announce Bruce Ridley, Senior Vice President of Environmental Health and Safety and Operational Services to be the recipient of the Pulp & Paper Safety Association (PPSA) Executive Eagle Safety Performance Award. The Executive Eagle award is given annually to a distinguished industry leader who has made major contributions in accident prevention in their company and beyond.



PCA's Vice President of Health and Safety Operations, Bruce Kummerfeldt (left) congratulating Mr. Ridley after receiving the Executive Eagle Safety Performance Award.

Promotion of Worker Health

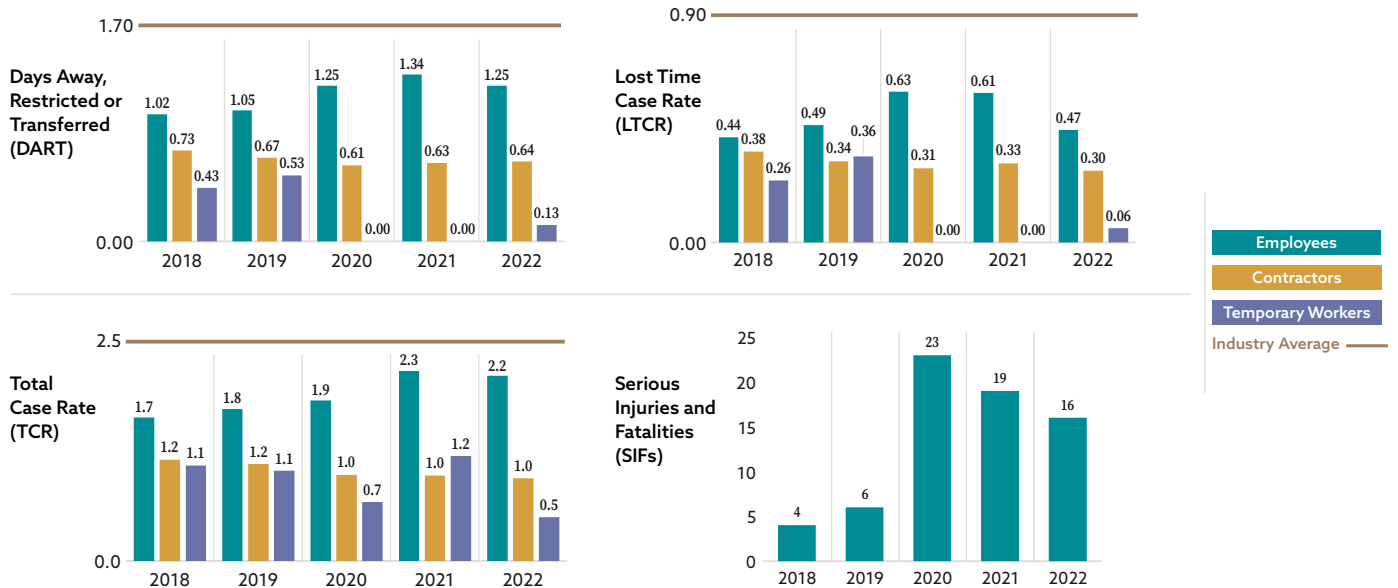
Subsidized full-time employee benefits include medical, dental and vision insurance; access to an Employee Assistance Program (EAP); short-term disability; life insurance and health screening services. The EAP addresses mental and general health concerns and is available for employees and family members. Communication for these services is provided through posters, e-mail and in our annual benefits enrollment materials.

PCA partners with Catapult Health Service, whose goal is to empower individuals to improve their health through preventive health checkups and health fairs held at the worksite. Events are free to employees and families.

Looking Ahead

PCA has an aspirational goal of zero injuries, and we are in full support of AF&PA's safety goal of *emphasizing continual progress on reducing serious injuries and fatalities (SIFs)*. Looking ahead, PCA has implemented several recruitment, education and training programs to prepare our leaders — working smarter to reduce risk and OHS-related incidents. For more information on our recruitment efforts and employee training programs, please review the [Learning and Development](#) section of this report.

SAFETY PERFORMANCE METRICS (cases x 200,000/total hours worked)



Note: These charts are generated based on raw values. Bars with the same value may differ in length due to rounding.



Learning and Development

We invest in our people and strive to equip them with skills and knowledge that will help them succeed both personally and professionally. We understand the tremendous value high-performing employees can bring, and that great leaders are a crucial ingredient to building a resilient organization. In 2022, we have continued our journey of training and educating our team members, preparing them for the great opportunities that are to come. These include short, job-specific programs and online courses that focus on different skill areas such as data, customer service, management, sales and marketing, project management and more. These educational and training opportunities keep our employees current on their skills and enhance their continued professional growth.

In addition, PCA provides several more in-depth and detailed educational programs and opportunities that are longer in duration to those who have demonstrated both interest and ability to grow in management and leadership roles.

PCA's Learning and Development team oversees the development and deployment of our training and educational programs.

PCA University

In 2021, PCA partnered with Skillsoft to launch PCA University, an online learning platform specifically designed for PCA. The goal of PCA University is to provide our employees flexible and accessible tailored trainings and job-specific courses. Our e-learning courseware provides our employees across the country an opportunity to access quality content that is based on individual needs and interest, without the need for travel.

Through regular e-mail communication, employees receive updates whenever a new course becomes available. Learners also receive suggestions for content based on courses they have completed. PCA University's course library is available to all employees. The majority of our online resources are available 24 hours per day, 7 days per week. This benefit is available at no cost to PCA learners.

In 2022, 10,987 courses were completed by 2,353 employees for a total of 9,663 hours. PCA averaged 4.1 hours of training per participating employee, and 0.6 hours per employee.

Function-Related Content

The coursework available on PCA University is vast and covers topics that are specific to each one of our department functions, including EH&S, Mills, Quality Management, Engineering, Sales & Marketing and Human Resources. These courses provide job-based knowledge that helps learners perform the day-to-day activities of their jobs.

Skills Enhancement

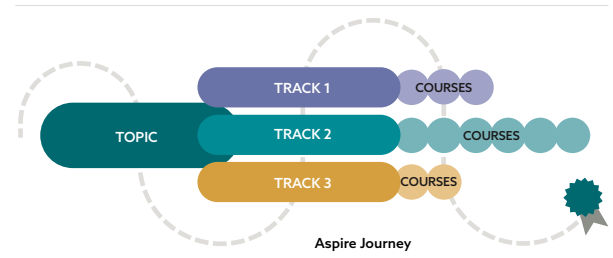
Learners could also select courses based on a skill area or topic that they are interested in. Skill-based courses help further develop a learner's business acumen, skills and knowledge that are transferable and will help them succeed in future roles. Some examples of these courses include Diversity, Equity and Inclusion (DE&I), Management, Productivity and Collaboration, Data Management and more.

Certification Training

PCA University offers certification preparation courses that help learners sit for a wide range of certification examinations. Contents of these courses align with the exam content outline of each of the given certifications. Through Skillsoft, PCA also partners with individual certification bodies to provide courses that satisfy study hours requirements for specific certifications. Examination preparation courses include certifications from Cisco, Amazon Web Services (AWS) and Project Management Institute (PMP), just to name a few.

Aspire Journeys

Learners who are interested in a specific topic can opt to follow an “Aspire Journey” for that topic. An “Aspire Journey” offers learners different themes to follow, where a learner completes a set of courses that are related to a specific theme as a learning path. Each course ends with a test to evaluate a learner’s knowledge on the topic. Learners receive a digital badge after the completion of each theme.



Stress to Wellness

We believe knowledge and skills are not the sole ingredients to achieving professional success but also caring about our mental and physical health. To reflect this understanding, PCA offers e-Learning Challenges that aim to promote mindfulness and body-relaxation. These include short videos that give guidance and tips on maintaining our overall wellness, from winding down at the end of a long day to breathing techniques and stretching exercises. PCA encourages employees to take a holistic approach when it comes to our overall professional development.



Novice	0-9
Aspiring	10-49
Developing	50-69
Proficient	70-89
Advanced	90-100

Skill Benchmarking

A new feature that was added to PCA University this year was *Skill Benchmark*. Skill Benchmark is a virtual assessment tool that enables learners to see where they stack up in a particular skill and gauge where to target their efforts. Results for an assessment are immediate, and personalized learning recommendations are provided based on the results. This is a great tool for learners to discover their strengths and gaps in any skill.

Additional Resources

PCA University offers additional resources that complement the courses that our learners take. These additional resources come in different formats and they include digital books, podcasts and audiobooks.

Industrial Maintenance Training and Development

Since 2010, PCA has provided online maintenance and safety training courses to our maintenance teams through our training partner TPC, a Certus company. TPC is an online maintenance training system that offers industry-based maintenance training nationwide, with courses on topics such as OSHA’s Hazard Communication Standard, Electrical Troubleshooting, and Basic Mechanics. Our maintenance teams enroll in courses and attend live webinars covering topics related to their job function.

In 2022, we had 708 learners who completed a total of 20,799 hours of training. PCA averaged 29.4 hours per participating employee.



Leadership and Development

Throughout PCA's history, several initiatives and programs have been developed internally to grow the skills and know-how of our workforce, building on the strengths of our current front-line, functional and general management leaders. We grow our programs based on the culture and needs of our company, and shape our programs based on the feedback of our employees.

As we look to the future, we have continued to enhance our approach to training and development, finding new ways to better serve our employees and help them to grow and achieve excellence. We are leveraging technology and the experience of PCA experts to develop personalized content that is aligned with our business objectives and is made available virtually for broader reach. We also embed frequent feedback into the training process to increase engagement and ensure that content is on the leading edge. This approach helps empower our employees to grow their skillset and ensures that our customers continue to get the support they need to grow their business.

Current programs are as follows:

Leadership Development Program (LDT): LDT is a highly selective leadership program for mid-level employees, intended for those currently demonstrating deep engagement, initiative and promise, and is positioned to support the growth of current employees that have potential to report to the General Manager level within 2-5 years. Participants come from a range of different disciplines and include those working in operations, finance and accounting. This 8-week program, spread over 12 months, provides participants an opportunity to experience and learn about the various operations across our different box plant locations. The LDT program takes an interactive approach, in which senior managers are invited to participate as guest lecturers, providing participants the opportunity to engage with those most experienced in the field, to ask questions and get information in a small group setting.

Generational Investment for Tomorrow (GIFT) Program: GIFT is a 4-year early talent program for college recruits or other new employees who are passionate and demonstrate leadership potential. Participants rotate among and learn across operational roles such as sales, production, customer service and maintenance, and attend topic-focused national conferences throughout the year. This program was developed with the intention of building the participants' leadership development competencies, as well as a well-rounded workforce for PCA.

Blueprint for Success: Blueprint for Success is a 2-year developmental program for college recruits graduating with an electrical, mechanical, chemical or industrial engineering degree. Engineers hired at PCA as part of the program participate in a series of technical, functional and leadership development learning opportunities. Participants are assigned 6-month rotations and work on different projects on topics such as installation, efficiency and maintenance. The goal of the program is to equip engineers with the skills they need to optimize processes across PCA.

Engineers are paired with a mentor, and they collaborate on similar projects and engage with other program participants through a Microsoft Teams channel. Each engineer has multiple one-on-one calls with PCA's Training and Development Manager to provide feedback on their experience in the program.

Leadership Excellence and Professionalism (LEaP): LEaP is a series of proven best practices delivered in focused training modules that describe what excellent leadership is and how excellent leaders behave. Modules are tailored based on the results of our employee engagement survey and include topics such as company history and culture, time management, conflict management and feedback composition.

DiSC Assessment and Training: DiSC is a personality and work style assessment that provides insight into an individual’s personality categorized in four profiles: Dominance, Influence, Steadiness and Conscientiousness. The assessment is designed for all levels of management. Based on employment assessment outcomes, feedback and needs, topics such as conflict resolution and communication techniques are added to our DiSC assessment exercise as DiSC training.

Educational Assistance

PCA established the Educational Assistance Program to support salaried employees in developing their capabilities through reimbursement of costs incurred in pursuit of higher education programs. Additionally, some participants of our Internship/Co-Op program qualify for tuition reimbursement.⁷

2022 EDUCATIONAL ASSISTANCE PARTICIPATION AND CONTRIBUTION

EMPLOYEE		CO-OP		TOTAL
WOMEN	MEN	WOMEN	MEN	
39	41	0	1	81
\$441,700		\$2,400		\$444,100

Cybersecurity, Ethics and Compliance Training

In 2022, we continued to provide training to our employees on topics important to reducing risk, such as cybersecurity. The following trainings are specific to social and governance topics:

Cybersecurity

As data fraud or theft and cyberattacks increase in prevalence and severity, PCA has heightened its protection against these threats. Malicious actors are advancing each day, using innovative ways to gain access to personal information and digital assets. Since February of 2019, with our training delivery partner Mimecast, we launched a training program utilizing short, comical videos that are easy to follow and understand. These videos raise cyber awareness, and they equip our workforce with the necessary knowledge to protect our digital private information and reduce cyberattack risk. Topics covered include phishing, data protection, physical security and sharing of sensitive information.

In 2022, our employees completed 88,141 courses, totaling 4,407 hours.⁸

Ethics and Compliance

PCA holds ethics, integrity and lawful conduct as essential behaviors. To ensure that our high standards are upheld, we require salaried and supervisory employees to participate in and complete periodic online education on topics such as antitrust laws, protecting confidential information and intellectual property, conflicts of interest, financial integrity and fraud, insider trading, sexual harassment and employment law. We also conduct in-person training for sexual harassment. In total, 5,934 hours of ethics and compliance training were completed in 2022.

⁷ Qualifications include minimum GPA of 3.0/4.0, at least one semester as a co-op or intern, and must be in their senior year of college.

⁸ Assuming three minutes per training video and test question.

Employment

PCA strives to be the employer of choice and works to create a culture where all employees are treated with respect and dignity. We place a high priority on attracting talented and engaged employees. We aim to have a highly motivated, knowledgeable and diverse workforce in both skills and backgrounds. Retaining those whom we recruit and develop is paramount as we work toward achieving our objectives.

2022:
15,100
EMPLOYEES
99.9%
FULL TIME
IN THE U.S.

Our Human Resources (HR) team oversees all aspects related to employment. They provide guidance and support to every step of an employee’s employment journey at PCA. Our HR team’s area of focus includes Talent Acquisition, Early Talent Program, career development and advancement, and end-of-career transition assistance.

NEW EMPLOYEE HIRES by age, 2022

	TOTAL	WOMEN	MEN
18–24	940	168	772
25–34	1,333	231	1,102
35–44	944	204	740
45–54	610	145	465
55–64	388	79	309
65+	46	8	38
GRAND TOTAL	4,261	835	3,426

EMPLOYEE TURNOVER by age, 2022

	TOTAL	WOMEN	MEN
18–24	628	133	495
25–34	1,209	196	1,013
35–44	832	157	675
45–54	588	122	466
55–64	554	98	456
65+	240	43	197
GRAND TOTAL	4,051	749	3,302

Talent Acquisition

The Talent Acquisition (TA) team manages salaried recruitment and provides assistance to the corrugated box plants and mills in their recruiting efforts to attract both hourly and salaried candidates. The Corporate HR team manages the salaried onboarding process and conducts exit interviews.

For our corporate new hires, we have implemented a check-in process in which we connect with new employees at 30, 60 and 90 days to follow up on their new role, gain feedback and provide any assistance that they may need. We also host “Meet and Greet” events where new hires have the opportunity to meet each other, share experiences and make a connection with one another.

When an employee leaves the company, exit interviews are conducted to gain insight on their journey at PCA. Feedback is captured in the interviews and used to provide guidance to department managers on how to make improvements, if necessary, as well as inform future HR strategy and program planning.

The new hire check-in process at 30/60/90 days was an example of a program developed from the exit interview process. For our mill new hires, employees participate in a week-long onboarding program where they meet the different members of the management team, go through HR-related topics such as payroll and benefits, and take part in a full tour at the mill before physically starting their position. Our two Executive Directors of Human Resources provide support to our Area HR Managers for our corrugated box plants and HR Managers at our mills.

College Recruitment

The Early Talent Program team manages the recruitment of current students looking for co-op or internship opportunities or soon-to-be graduates looking for full-time employment with PCA. PCA has partnerships with universities that have strong pulp-and-paper-related engineering programs across the United States. The goal is to attract the most qualified college students/graduates who have chemical, mechanical or electrical engineering degrees to work in one of the most interesting industries in the nation – pulp and paper.

PCA recruited from 57 colleges and universities in 2022; the full list is as follows:

STATE	COLLEGE/UNIVERSITY	STATE	COLLEGE/UNIVERSITY
AL	Auburn University University of Alabama University of South Alabama	MI	Ferris State University Michigan State University Michigan Technological University West Shore Community College Western Michigan University
CA	California State Polytechnic University – Pomona	MN	Iron Range Engineering University of Minnesota – Duluth University of Minnesota – Twin Cities
FL	Florida State University University of Florida	MS	Mississippi State University
GA	Georgia Institute of Technology University of Georgia Valdosta State University	NC	North Carolina State University
IA	University of Iowa	ND	University of North Dakota
ID	University of Idaho	NY	Rochester Institute of Technology
IL	Augustana College DePaul University Illinois Wesleyan University Loyola University Chicago North Central College Northern Illinois University Northwestern University Southern Illinois University University of Illinois – Chicago University of Illinois – Urbana-Champaign	OH	Miami University University of Cincinnati
IN	Indiana University Purdue University	SC	Clemson University
LA	Louisiana Tech University McNeese State University University of Louisiana at Lafayette	TN	Christian Brothers University University of Memphis University of Tennessee – Martin
MD	University of Maryland	TX	Lamar University Texas A&M University
ME	University of Maine	UT	University of Utah
		VA	Virginia Tech
		WA	University of Washington Washington State University
		WI	Carthage College Milwaukee School of Engineering University of Wisconsin – Platteville University of Wisconsin – Stevens Point University of Wisconsin – Stout



Career Development and Advancement

There are a handful of leadership development opportunities available at PCA to those who show a desire and potential to advance into senior leadership positions. When it comes to career development, we fully embrace an open dialogue between our HR team, senior managers and our employees. Employees are encouraged to speak with their direct managers during annual performance reviews to discuss potential career advancement pathways. Our HR team also offers career consultation appointments where the employee and a member of our HR team work together to devise a plan that would help achieve the goals of both the employee and the company. For more information on PCA's training and leadership development programs, please visit the [Learning and Development](#) section of this report.

End-of-Career Transition Assistance

The Employee Benefits team is available to our employees during their employment at PCA in planning for retirement. They provide information such as retirement planning and employment benefits. When an employee reaches the end of their time at the company, a member of our HR team will reach out to them to answer any questions that they have and guide them in their transition and exit from the company. Employees are also encouraged to utilize the free resources that are available through our Employee Assistance Program (EAP) on topics such as financial planning, mental health and legal.

Benefits Provided to Full-Time Employees

Around 99.9% of PCA employees are full time and work in the United States. PCA provides comprehensive health and welfare benefits to its employees, including participation in medical, dental and vision coverage plans, an employee assistance program, wellness screenings, flexible spending accounts, basic and supplemental life/AD&D insurance, disability coverage and paid holiday and vacation. PCA provides medical and parental leave in accordance with U.S. laws. Examples of benefits include:

Health Care: The following plans are offered to salaried and hourly employees:

- **Medical Plans** and prescription plans with different employee cost and benefit levels that meet the varying needs of our employees.
- **Dental** coverage designed to place emphasis on preventive treatment, while providing assistance for more serious conditions.
- **Vision** coverage that provides discounts on glasses and contact lenses, in addition to providing coverage for routine eye exams.
- **Flexible Spending Accounts** that allow employees to use tax-free dollars to pay for eligible out-of-pocket healthcare or dependent care expenses.
- **Health Savings Account** available for those who enroll in the company's high-deductible medical plan option and offers a tax-free way to save for future healthcare expenses.

Employee Assistance Program (EAP): This program is a resource to help employees with everything from checking off daily tasks, online advice, webinars and up to eight free mental health counseling sessions.

Medical Guidance/Claim Assistance: Third-party assistance with one-on-one support to help make informed decisions about any medical condition. In addition, experts can provide support with medical claims and billing issues.

Wellness Screenings: We have partnered with a third-party healthcare group to provide free, quick and confidential preventive health checkups at company location sites to eligible employees.

Disability Coverage: Long-Term Disability (LTD) and Short-Term Disability (STD) plans for salaried and hourly employees.



Parental Leave: Coverage allowed in accordance with the U.S. Family and Medical Leave Act (FMLA).

Vacation Days and Holidays: Paid vacation and holidays are made available to all full-time employees.

Retirement: Both salaried and hourly employees are covered by a defined contribution plan and/or defined benefit plan. In addition, we have a third-party organization that provides advisory services for the defined contribution retirement plan to help save for and live in retirement. These services include retirement account evaluations and various online investment resources provided at no cost to the employee.

Basic Life Insurance/Accidental Death & Dismemberment (AD&D): Both life insurance and AD&D are provided at a value equivalent to 1.5 times the employee's annual salary. Business travel insurance is also available to many employees that travel on behalf of PCA.

Supplemental Life Insurance/Supplemental AD&D: Most employees will have options to add supplemental life insurance for themselves, spouses and children. In addition, most employees will also have an option to add supplemental AD&D for themselves or family.

Stock Ownership: Available as an option in several employee thrift plans, including PCA's primary defined contribution plans.

Work-From-Home for Corporate and Administrative Employees

Effective May 2021, PCA introduced a hybrid workplace policy for our corporate and administrative offices. This policy provides options to managers to allow their teams to work fully remote, partly remote, or vary their hours with flex time.



Diversity, Equity and Inclusion

PCA employees are encouraged to do the right things for each other and foster a culture of caring and inclusivity. Every person brings unique perspectives, which help PCA to work collaboratively to deliver exceptional customer experiences and position us as a market leader. We succeed through our people, who are highly engaged and results-oriented, operating in an entrepreneurial culture.

In 2021, we established a Diversity, Equity and Inclusion (DE&I) Council comprising leaders from across the company including corporate, mill and corrugated business roles. In 2022, this Council met five times (four virtual, once in person). The Council worked diligently in 2022 to create a DE&I statement that reflects PCA's position and serves as a guide to help PCA leaders advance diversity and inclusion in our organization.

Diversity, Equity and Inclusion Statement

At PCA, we believe that our people make the difference. We embrace the fact that every person brings unique perspectives and ideas to the workplace. Talented employees with diverse backgrounds and perspectives are critical to our ability to deliver innovative packaging solutions and exceptional customer experiences.

Our success is driven by our people who operate in an entrepreneurial culture where decisions are made closest to the customer. We are committed to fostering an inclusive work environment where all employees feel valued, respected and empowered to do their best work. We strive to be the employer of choice in markets where we operate. A culture of inclusivity builds engagement and trust and encourages our employees to be advocates for the organization. This helps us attract and retain the best talent.

A diverse and inclusive work environment is the right thing to do for our people. It is also the right thing to do for our business. Diverse and inclusive teams help us creatively engage with all our stakeholders — our employees, our customers and our communities. Diversity of thought helps us drive innovation, and inclusive teams collaborate effectively to deliver results.

We will advance diversity and inclusion throughout our organization by:

- **Investing in our people through training and development.** Our employees are expected to actively participate and expand their skills and knowledge. This allows us to build on our proven track record of promoting from within.
- **Seeking feedback from our employees** through employee engagement surveys.
- **Actively engaging with the communities** in which we operate.
- **Supporting a culture where employees feel empowered** to share their experiences.

Equal Opportunity and Affirmative Action

We are proud to be an equal opportunity workplace and an affirmative action employer.⁹ We take a proactive approach to recruit diverse and talented applicants by sending open job postings to local organizations who specialize in recruiting protected classes of job candidates. On the following page is a summary of PCA's employee and Board of Directors demographics.

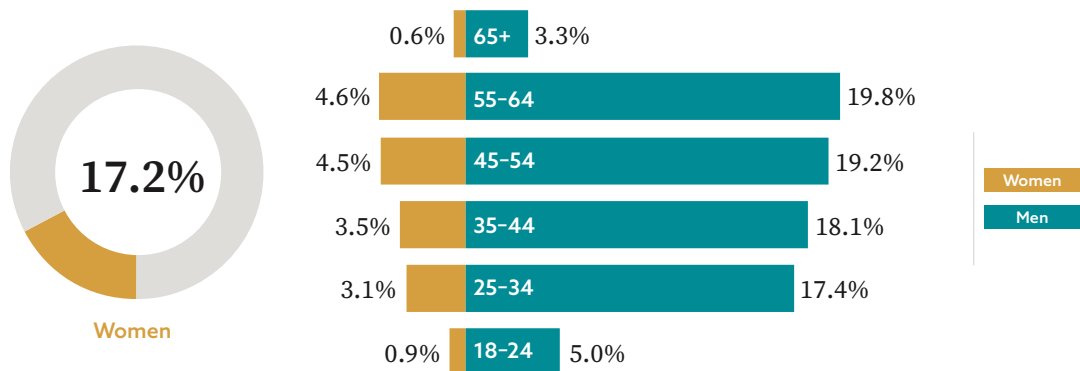
⁹ PCA has long held an Equal Employment Opportunity and Affirmative Action policy that all salaried employees are required to affirm adherence to each year.

Diversity of Governance Bodies and Employees

PCA's Board of Directors has adopted a policy under which it will actively seek out qualified diverse candidates for consideration when seeking new directors.¹⁰ In the Appendix to this report, you will find our [U.S. Equal Employment Opportunity Commission's EEO-1 Report](#), which includes ethnicity and gender details.

EMPLOYEE POPULATION 2022

PCA is committed to developing, promoting and maintaining a culture and environment of respect and inclusion.



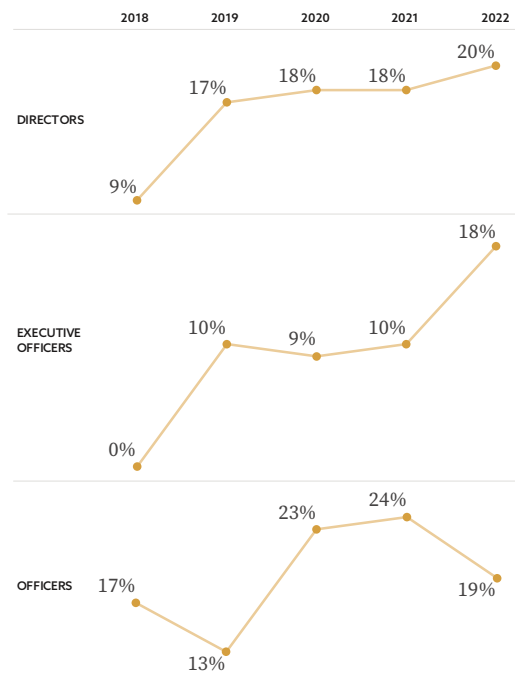
Data presented for calendar year 2022, as of 12/31/22

BOARD MEMBERS	WOMEN	MEN
30-50 years old	—	—
Over 50 years old	2	8

EXECUTIVE OFFICERS	WOMEN	MEN
30-50 years old	—	—
Over 50 years old	2	9

OFFICERS	WOMEN	MEN
30-50 years old	1	3
Over 50 years old	5	22

PERCENT OF BOARD MEMBERS, EXECUTIVE OFFICERS AND OFFICERS WHO ARE WOMEN



¹⁰ [Nominating and Governance Committee Charter](#)



Consumer Health and Safety

PCA believes that serving our customers, and the consumers who purchase from them, comes with significant responsibility. We do everything we reasonably can to support the health and safety of the ultimate consumer of food, beverage, pharmaceutical and personal care products carried in PCA packaging.

For more than a decade PCA has been a leader in working to ensure the safety of corrugated packaging food applications. In 2010 we undertook an initiative to universally implement Good Manufacturing Practices (GMPs). Concurrently, we chose to inspect our manufacturing locations and audit our food safety management systems to the appropriate AIB International standards. By December 2011, all PCA full-line plants had fully implemented GMPs and successfully audited to AIB standards. Also in 2011, we began exploring the Global Food Safety Initiative (GFSI) and undertook preparations to pilot emerging GFSI-benchmarked standards for practices for implementation across our system of manufacturing plants. In 2013 we successfully launched an initiative to fulfill our commitment to certify all full-line packaging plants by the end of 2016.

Global Food Safety Initiative

GFSI provides the platform to build food safety management systems that will not only be effective but also be externally assured, credible and universally accepted. PCA has developed, implemented and audited our food safety management systems to the FSSC 22000 standard. FSSC 22000 combines a rigorous and comprehensive set of GMPs with the internationally accepted ISO 22000 Food Safety Management standard.

PCA remains the only large North American, vertically integrated provider to accomplish GFSI conformance across all full-line corrugating operations. As the PCA system continues to grow organically and by acquisition, all full-line plants accomplish GFSI conformance, as well as sheet plants whose customer base benefits from certification.

Notable Achievements

2011	2012	2016
PCA led the corrugated industry in committing to GFSI accomplishment well in advance of standards being finalized for packaging.	Our Colby, Wisconsin, plant became the first North American corrugating operation to attain GFSI certification. ¹¹	PCA became the first large North American corrugated provider to achieve GFSI conformance nationwide across our entire system of full-line packaging operations.

¹¹ Our Colby, Wisconsin, plant moved to Marshfield, Wisconsin, in 2019 and is audited to the Safe Quality Food (SQF) Program.



Assessment of the Health and Safety Impacts of Product and Service Categories

We view our role in supporting the health and safety of the consumer purchasing the products we package to be of the utmost importance. This begins with ensuring that the containerboard we produce and incorporate into our packaging is compliant with statutory and regulatory law and is fit for its intended use. PCA invests in a robust product stewardship function to accomplish these objectives. This ensures the cleanliness and safety of the materials we combine and convert into packaging.

Food Safety Management Systems

A crucial component of our strategy is our food safety management systems, which are established and maintained at each certified operation. The foundation of these systems is based on GMPs and hazard analysis critical control points (HACCP). This foundation drives us to accomplish an in-depth review of every process we employ that may influence the safety of our products. End-to-end, all-encompassing and exhaustive efforts go into identifying any potential hazards and subsequently into quantifying any risks present in our processes. The ultimate objective is to prevent potential illness by effectively mitigating risk to consumer health and well-being. The end result is assurance that we have built health and safety expectations into our products. By doing so, both our customers and the consumer know that every effort has been made to support food safety. Our food safety management systems are audited annually by NSF International for external assurance.



GFSI Vision

Safe food for consumers — everywhere.

GFSI Mission

Provide continuous improvement in food safety management systems to ensure confidence in the delivery of safe food to consumers worldwide.

GFSI Objectives

- Reduce food safety risks by delivering equivalence and convergence between effective food safety management systems.
- Manage cost in the global food system by eliminating redundancy and improving operational efficiency.
- Develop competencies and capacity building in food safety to create consistent and effective global food systems. Provide a unique international stakeholder platform for collaboration, knowledge exchange and networking.

Community Outreach

We seek to be a good neighbor in the more than 90 communities where we operate. We see this objective as the right thing to do, and it fits with our business philosophy of fostering a caring culture within all PCA operations. Working collaboratively and driving shared value benefits everyone. We regularly promote our community outreach activities through our social media accounts on LinkedIn and Twitter.

We are currently reporting cash donations and do not have a tracking system for tracking volunteer hours or in-kind donations.

CHARITABLE GIVING Cash donations (dollars)

	2018	2019	2020	2021	2022
TOTAL	\$2,764,000	\$3,726,000	\$985,000	\$944,000	\$1,609,000
Education (Schools and Scholarships)	78%	80%	29%	27%	33%
Charitable Organizations	22%	20%	71%	73%	67%

PROJECT UP™ by Boise Paper

Funded primarily through sales of select office papers and in partnership with the Arbor Day Foundation, Project UP works to transform distressed urban areas, like school playgrounds and vacant lots, into vibrant green spaces. Since 2011, Boise Paper has sponsored 15 planting events across the country, including neighborhoods in Indianapolis, Baltimore, Miami, Toronto, Atlanta, Los Angeles, Chicago, Phoenix and Jacksonville. In cooperation with 60 local partners, more than 1,500 Project UP volunteers have planted thousands of trees and hundreds of other woody plants and perennial flowers.



Meeting Customer Expectations

Corrugated packaging plays an important role in nearly every business by containing and protecting products during distribution. It would not be possible to efficiently transport most goods without corrugated packaging.

Many decisions made by our customers are driven by consumers. For that reason, it is important for us to help our customers by educating consumers on the sustainability of corrugated packaging and other paper products. We participate in the Paper & Packaging Board and their *How Life Unfolds*® campaign, which educates consumers about our industry's unrivaled sustainability story through television advertisements, engaging videos and social media content.

An engaged workforce is essential to providing outstanding customer service and developing sustainable solutions that exceed our customers' expectations. Our employee engagement program, Your Opinion Counts, is offered to approximately 10,000 employees of PCA's Corrugated Products group. Our customer engagement program, Customer ConneXions, is currently offered to customers of PCA's Corrugated Products group.

These programs help us focus our efforts to ensure we are meeting our employees' needs and exceeding our customers' expectations every day.

Employee Engagement, **Your Opinion Counts**

To promote employee engagement and improve the work experience of our employees, PCA regularly conducts employee engagement surveys. In 2022, PCA worked with a new external partner who specializes in developing, administering and interpreting employee surveys. With their help, we transitioned our survey to an online format, which made it more accessible to our employees. We also adopted updated methodologies and industry comparisons to measure employee engagement. According to the survey, PCA's overall employee engagement level is in line with other U.S. manufacturing companies. Our survey continued to have a high level of participation, assuring us that the survey results are an accurate reflection of the feelings and opinions of our employees. In their survey responses, our employees reaffirmed our strong safety culture, and that they feel the company is socially and environmentally responsible. For the first time, our survey introduced a question related to diversity and inclusion and our employees' perceptions on this topic were favorable. In addition, most employees acknowledged that they know what is expected from them and how their work contributes to PCA's success. Our next survey is scheduled for early 2024.



The goal of PCA's *Your Opinion Counts* survey is to solicit feedback and input from our employees on their work experience. Employees are given the opportunity to take the survey during work hours. The survey is anonymous, which allows employees to respond openly and honestly. We encourage participation and work to ensure that every voice is heard. Once survey results are collected and analyzed, we focus on turning results into action so that we can make PCA an even better place to work.

Customer Engagement, **Customer ConneXions**

Our customers know that a partnership with PCA isn't just about buying boxes. It's about building a relationship with a knowledgeable, trusted, committed source; adding value to their business and actively contributing to their success in the marketplace.





PCA takes this responsibility very seriously. We survey our customers on a continual basis in an effort to measure customers' perception of their relationship with us and to ensure that we are delivering on our promises.

Seeking feedback from our customers is an ongoing process at PCA and takes various forms. We seek feedback through regular business reviews as well as formal online surveys. We had paused our online surveys during COVID to allow our customers the time to focus on the demands of their own business. Now that COVID is behind us, we will be resuming our online surveys later this year.

PCA's business philosophy is that highly engaged employees lead to highly engaged customers. The feedback we receive from our customers validates this statement as they repeatedly acknowledge the strong collaborative relationships they have with PCA's sales and customer service professionals.



Planet

Climate Change

Energy

Emissions

Raw Material Sourcing

Water and Effluents

Waste



Climate Change

At PCA, making our products and removing carbon dioxide from the atmosphere start the same way, with a **tree**.

For over a century, PCA mills have manufactured products from wood grown in North American forests, predominantly located in the contiguous United States. During this period, the amount of forestland in the U.S. has remained consistent at about one-third of total land area.¹² Concurrently, tree growth rates in the eastern U.S. (the wood basket for seven of our eight mills) have increased by 30% to 50%.¹³ Both metrics provide empirical evidence of a well-managed, sustainable system.

PCA is actively working to enhance the symbiotic relationship between trees and humans. Our goal is to permanently remove carbon dioxide (CO₂) from the atmosphere by collaborating with nature. We aim to achieve this by harnessing the natural resource of trees, integrating them with both established and emerging carbon capture and storage (CCS) technologies.

Just like human-made technology that improves with each iteration, trees have undergone remarkable adaptations over a span of more than 300 million years. These adaptations make them incredibly resilient and capable of serving as a powerful biological technology. Trees possess the remarkable ability to absorb CO₂ using energy from the sun, making them nature’s own CO₂ absorption tool.

In this context, we refer to trees as a form of biological technology because they offer a natural solution for removing CO₂ from the atmosphere. Their ability to capture and store carbon is akin to a technological process, albeit one that has evolved over millions of years through the intricate workings of nature. By continuing to utilize the tremendous potential of trees already within our value chain, we can advance our work together with nature to address the challenges of climate change and achieve an even more sustainable future.

Climate Goal

PCA’s climate goal is to leverage the power of trees within our existing value chain, and future carbon-pollution-free opportunities, to become a net-zero emissions company by 2050. We have established short-, mid- and long-term targets from a 2021 baseline to help keep us on track.

Our current targets are:

2030	2040	2050
<p>35% reduction in scopes 1 and 2 emissions.¹⁴</p> <p>10% reduction in fossil fuel consumption.</p> <p>Support 800,000 MWh/year of carbon-pollution-free electricity generation.</p>	<p>60% reduction in scopes 1, 2 and 3 emissions.</p> <p>20% reduction in fossil fuel consumption.</p> <p>Capture and permanently store 1.75 million metric tons of biogenic CO₂ per year.</p>	<p>Net-zero carbon emissions for scopes 1, 2 and 3.</p> <p>—</p> <p>Capture and permanently store 4.1 million metric tons of biogenic CO₂ per year.</p>

¹² [Forest Resources of the United States, 2017 \(usda.gov\)](#)

¹³ Loehle C, Solarik K. 2022. [Climate Change and Historical Forest Growth Changes in the US and Canada. NCASI Fact Sheet](#)

¹⁴ Includes 19% of temporary reductions from energy attribute certificates (EACs)



PCA's carbon reduction strategy is **MORE**.

- **M**aximize resource efficiency.
- **O**ptimize carbon benefits of sustainable forestry.
- **R**educe waste to landfills.
- **E**nergize our operations with clean power.

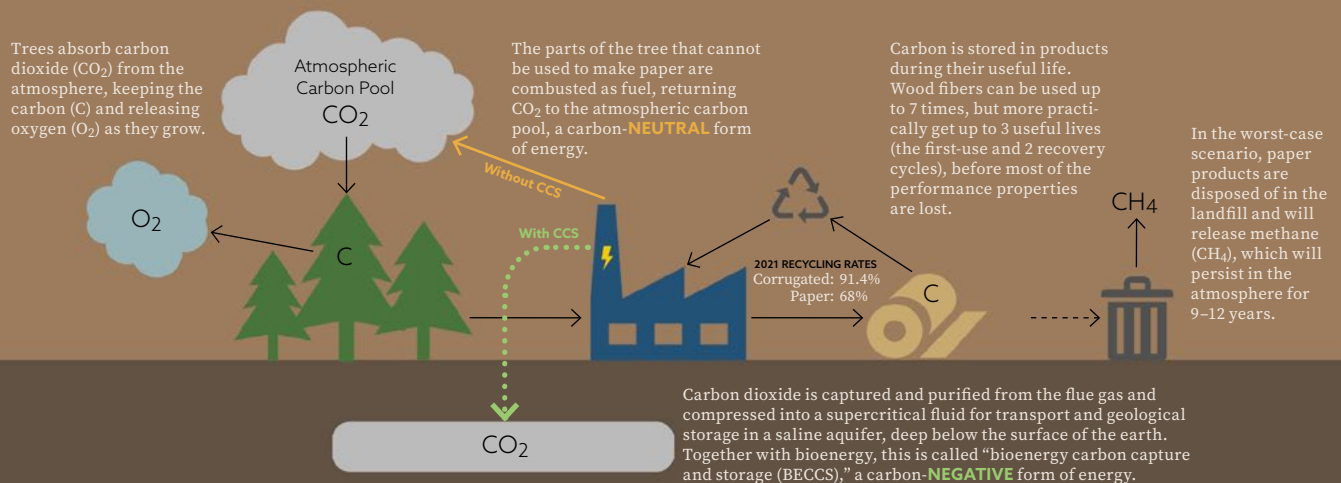
These efforts are led by PCA's Carbon Neutrality Team, a cross-functional group of key engineering, environmental, operational, procurement and sustainability personnel.

Carbon Dioxide Removal

Carbon dioxide removal (CDR) is a fundamental aspect of PCA's net-zero strategy. Trees play a crucial role in this process by absorbing carbon dioxide (CO₂) and releasing oxygen (O₂) for the benefit of humans and other animals. When PCA acquires a tree, whether as roundwood or wood chips, our manufacturing process begins from a "carbon-negative" standpoint because the tree has removed carbon atoms from the atmosphere and stored them within its structure.

At PCA mills, we utilize a combination of first-use (virgin) fiber and secondary (recycled) fiber to create our products. Generally, the higher the proportion of first-use fiber in our products, the greater the availability of renewable fuel for our manufacturing processes. This is because the biomass content in trees, which cannot be used for paper production, serves as a renewable fuel source known as biogenic fuel. Currently, when biomass is combusted for renewable energy at our mills, the resulting carbon dioxide emissions are released back into the atmosphere, rendering the energy production carbon neutral.¹⁵

However, if we were to capture and permanently store these biogenic carbon¹⁶ dioxide emissions in geological reservoirs, such as saline aquifers, the outcome would be carbon-negative energy. Our goal is to maintain carbon negativity through the implementation of existing and emerging CCS technologies. By doing so, we strive to achieve verifiable and permanent CDR as an inherent outcome of our pulp and papermaking operations.



¹⁵ For the energy to be unequivocally considered carbon-neutral, the amount of standing timber in the sourcing area must remain consistent at minimum.

¹⁶ "Biogenic carbon" is carbon that was originally removed from the atmosphere through photosynthesis. Without human intervention, this carbon will eventually return to the atmosphere as carbon dioxide (and potentially methane) when the tree dies. When a natural disturbance like a forest fire occurs, or when wood is used as fuel for heating, carbon dioxide is released immediately. Otherwise, the tree will slowly release carbon dioxide and methane as the tree decays in the forest.



Saline Aquifers

Saline aquifers are geological formations of porous rocks that contain salt water. Saline aquifers are typically greater than 1,000 meters (3,281 feet) below the surface of the earth. Saline water is often too expensive to desalinate for drinking water, and its use is limited to applications such as cooling power plants or for mining purposes.¹⁷

The first carbon storage project in a saline aquifer occurred in 1996, where one million metric tons of CO₂ per year continue to be captured and stored below the North Sea, west of Norway. The Massachusetts Institute of Technology found there is enough capacity in the United States' saline aquifers to store all the CO₂ emitted from the country's coal-fired power plants for the last one hundred years.¹⁸ To date, storage in saline aquifers has been found to be a safe and secure method for permanent carbon dioxide removal.

PCA's four southern U.S. mills — Counce, Tennessee; DeRidder, Louisiana; Jackson, Alabama; and Valdosta, Georgia — emitted a combined 4.5 million metric tons of biogenic CO₂ in our 2021 baseline year and are located on or near saline aquifers that can be used to permanently store carbon dioxide. This presents an opportunity to remove carbon dioxide from the atmosphere with emerging and existing CCS technologies over and above what we currently achieve with our existing fiber supply chain.

Climate Goal Details and Progress

PCA has established a 2030 target to reduce our absolute scopes 1 and 2 emissions 35% from a 2021 baseline (using a market-based inventory),¹⁹ a 2040 target to reduce scopes 1, 2 and 3 by 60%, and to reach net-zero carbon emissions by 2050.

PCA's Carbon Neutrality Team began exploration into CCS technology mid-year 2022. In 2022, we conducted a pre-feasibility study for the mill where we intend to build our first carbon capture plant. In 2023, our Carbon Neutrality Team is continuing our due diligence work in selecting technology and storage partners. The remaining stages of project development will take approximately four years to complete, making 2028 the earliest we could have a commercial scale carbon capture plant operational.

Our target includes using trees and point-source carbon capture technology to remove 1.75 million metric tons of CO₂ from the atmosphere per year by the year 2040 and an additional 2.35 million metric tons per year by the year 2050 for a total of 4.1 million metric tons. Achieving our 2050 carbon removal target with carbon capture technology will provide a 68% reduction across scopes 1, 2 and 3 emissions from our 2021 baseline using a market-based inventory, and 75% using a location-based inventory.

We are also working to reduce our scopes 1 and 2 emissions by proven methods, including enhancing circular economy principles we currently employ in our production processes to recover and reuse chemicals, water and fiber. Our industry continues to work collaboratively to improve recycling rates of our products, which provides scope 3 reductions as more old corrugated containers (OCC) and mixed paper are diverted from landfills.

¹⁷ [Is saline water used for anything? | U.S. Geological Survey \(usgs.gov\)](#)

¹⁸ [Lifetime of carbon capture and storage as a climate-change mitigation technology | PNAS](#)

¹⁹ PCA is not including scope 3 in our 2030 target because our inventory relies heavily on life cycle assessments (LCA) that are not regularly updated. We will continue using this method until meaningful progress has been made in transitioning the U.S. electrical grid and transportation system to carbon-pollution-free technologies, or we are compelled to do so by regulators.



Operational Efficiency (Scope 1)

PCA employs a substantial number of engineers and professionals whose primary focus is to maximize efficiency of unit operations. Activities to increase efficiency of our operations inclusive of strategic capital projects will contribute more than a 20% reduction by 2050, considering all scopes of emissions, from our 2021 baseline.

Renewable Electricity (Scope 2)

PCA's 2030 target is established on a market-based inventory approach for scope 2 emissions. This choice is driven by our intention to utilize energy attribute certificates (EACs) as a temporary measure to reduce emissions until we can implement carbon capture plants or other emerging technologies. As part of our 2030 target, we plan to procure 800,000 MWh/year of EACs, specifically supporting carbon-pollution-free electricity generation.

Our preference is to prioritize renewable energy projects that generate renewable energy certificates (RECs). Additionally, we are open to considering nuclear energy projects that produce emissions-free energy certificates (EFECs). These projects are primarily sought within the United States, and we are also open to exploring opportunities in Canada, given that some of PCA's operations are situated near the U.S.–Canada border.

This carbon-pollution-free electricity target is expected to result in a 19% reduction in CO₂ of scopes 1 and 2 from a 2021 baseline, accounting for more than half of the necessary reductions to meet our 2030 target of a 35% reduction.

Supply Chain (Scope 3)

We estimate 70% of our scope 3 emissions are tied to purchased goods, transportation and energy-related transmission and distribution losses, 20% from fugitive emissions (methane) primarily related to end-of-life treatment of sold products, and the remaining 10% from agricultural land use related to plant-based starch used to manufacture our products. In setting our 2050 net-zero target, we assumed a 43.5% reduction in scope 3 emissions by the year 2050 (which is approximately 1.5% each year from our 2021 baseline), or 18% of all scopes from our 2021 baseline. Our scope 3 reduction target is largely premised on societal progress, influenced by government policies to achieve a greener U.S. electrical grid, and the acceleration and adoption of low-carbon transportation vehicles.

MOST SCOPE 3 EMISSIONS REDUCTIONS IN OUR VALUE CHAIN REQUIRE SOCIETAL PROGRESS TO LOW-CARBON TECHNOLOGIES.

Land Use and Land Use Change

Outside of plant-based starch, land use in PCA's value chain primarily comprises working forests in the United States, which are some of the most productive forests in the world. A forest that is productive at growing wood is also productive at sequestering CO₂. Forests and the products made from them offset approximately 13% of all annual U.S. carbon dioxide emissions each year.²⁰ We source from a mix of mostly semi-natural forests, which are managed stands of native species that regenerate naturally, and plantations of native pine trees that are mechanically or hand planted.

Pine plantations in the U.S. South are a considerable success story. From the end of the Civil War through World War II, much of the agricultural land used to grow tobacco and cotton was abandoned due to declining soil productivity. During the early 1950s, degraded agricultural lands were reclaimed for pine plantations. From 1952 to 1999 the amount of pine plantations increased from 1.8 million to 32 million acres with an increase of timber

²⁰ [Marketplace Sustainability | AF&PA \(afandpa.org\)](https://www.afandpa.org/Marketplace-Sustainability)



volume exceeding 3,500%.²¹ Today there over 37 million acres of pine plantations in the southeastern United States.²² There are approximately 765 million acres of forestland in the United States.²³

According to the recently published drafts of the Greenhouse Gas Protocol *Land Sector and Removals Guidance*, forests are the best-case land use scenario for carbon sequestration.²⁴

Well Positioned for a Net-Zero Future

We believe we are in a strong position to achieve net-zero carbon emissions by 2050 due to sourcing of our primary raw material from carbon sinks,²⁵ existing use of renewable biogenic energy from trees, potential to capture and permanently store biogenic CO₂, the capabilities of our engineering and professional staff focused on carbon neutrality, our proven track record of effective capital investment, and the fact that we make products from renewable and sustainable materials that are recycled at a high rate.²⁶

Risks and Uncertainties

Our carbon reduction goals and our plans to achieve those goals discussed above were developed based upon what we believe to be reasonable current assumptions, which in many cases involve assumptions regarding future operations, emergences in future technologies, the tax and regulatory environments involving carbon emissions, as well as other key factors involving future events. Our carbon reduction goals and plans to achieve those goals are forward-looking statements. These statements reflect our current views with respect to future events and are subject to risks and uncertainties. There are important factors that could cause actual results to differ materially from those in forward-looking statements, many of which are beyond our control. These factors, risks and uncertainties include, without limitation, the following factors:

- Our nearer term goals and plans rely on EACs to temporarily reduce scope 2 carbon emissions. The cost and availability of EACs and the availability of feasible opportunities to purchase EACs specifically supporting development of carbon-pollution-free electricity generation are subject to uncertainty based upon market conditions, overall supply and demand for EACs, and other factors beyond our control.
- The emergence of mandatory climate reporting standards and the continued development of voluntary standards and frameworks may result in definitional or other changes that alter how our greenhouse gas emissions (both biogenic and anthropogenic) are calculated and reported both historically and prospectively. In addition, continued development and emergence of standards and frameworks may change how or if EACs, carbon offsets and carbon dioxide removal credits may be applied to net or offset emissions from other sources and the scope in which these are reported. There is considerable uncertainty in any regulatory or standard framework for carbon emissions reduction in the United States and the definitions, rules, permits and requirements under such frameworks.
- Our longer-term plans involve the continued emergence and development of carbon capture utilization and storage technologies that can feasibly be incorporated into multiple operations of our size and scale. We are currently assessing these technologies and the means to implement these technologies. Advances in technology are inherently

²¹ [The Evolution of Pine Plantation Silviculture in the Southern United States](#)

²² [CFR News Story | College of Forest Resources | Mississippi State University \(msstate.edu\)](#)

²³ [U.S. Forest Ownership and Management | Congressional Research Service](#)

²⁴ [Land-Sector-and-Removals-Guidance-Pilot-Testing-and-Review-Draft-Part-1.pdf \(ghgprotocol.org\)](#), p. 104

²⁵ Carbon sinks are anything that absorbs more carbon from the atmosphere than it releases.

²⁶ [Cardboard Box Recycling is a Success Story | American Forest and Paper Association \(afandpa.org\)](#), [Paper Recycling Success | AF&PA \(afandpa.org\)](#)



uncertain, and these technologies may not emerge in the time frame we currently expect nor reach commercialization. We may not be able to incorporate these technologies into our operations in an efficient or cost-effective manner.

- We believe that continued tax and regulatory incentives and support are necessary to advance carbon reduction technologies and meaningfully influence our investment decisions in order to achieve our goals and plans. The future tax and regulatory environments are inherently uncertain.

Our actual performance on the achievement of our plans and goals could differ materially from what we have stated and we can give no assurances that any of the events anticipated by our plans and goals will actually occur. Our plans and goals are also subject to the risk and uncertainties presented by our operations, which are disclosed in our Annual Report on Form 10-K for the year ended December 31, 2022, under the caption “Risk Factors.”



Energy

Improving energy efficiency and expanding our use of renewable sources is the central component of our sustainable energy strategy. Much of our focus has been on utilizing biofuels, which are byproducts of our manufacturing process, predominantly wood waste (bark) and black liquor solids. We also purchase supplemental fuels, some of which are also carbon neutral.

Mill energy usage is tracked and compared to internal and external benchmarks on a routine basis. Energy benchmarks for individual unit processes within a mill are tracked and compared with historical usage and targets. Energy usage is discussed in daily production meetings, and systems are in place for operators and managers to evaluate usage and pricing data in real time. Decisions can then be made on how to operate our mills most efficiently and economically based on current energy information.²⁷

Community Benefits of Mill Energy Usage

Due to most PCA mills being placed in rural areas, some of the communities around the mills depend on the mills in different ways. One of these ways is for accessible energy. This most prominently occurs at PCA's International Falls mill. The International Falls mill pays a substantial amount of the utilities total energy cost. This allows for lower operating cost of the natural gas pipeline that provides service for the mill as well as the surrounding community, which results in lower natural gas costs for the residents and businesses of the surrounding rural community.

Combined Heat and Power (CHP) and Self-Generated Electricity

The majority of our mills utilize CHP processes wherein high-pressure steam is routed to steam turbines to generate electricity on site. Subsequently, exhaust steam from the turbines is utilized for both pulping and papermaking processes. Two of our mills, Tomahawk, Wisconsin, and International Falls, Minnesota, also self-produce and utilize hydroelectricity. As discussed in the [Emissions](#) section of this report, heated water is reused as many times as possible in order to conserve the energy used to heat the water.

Energy Reduction

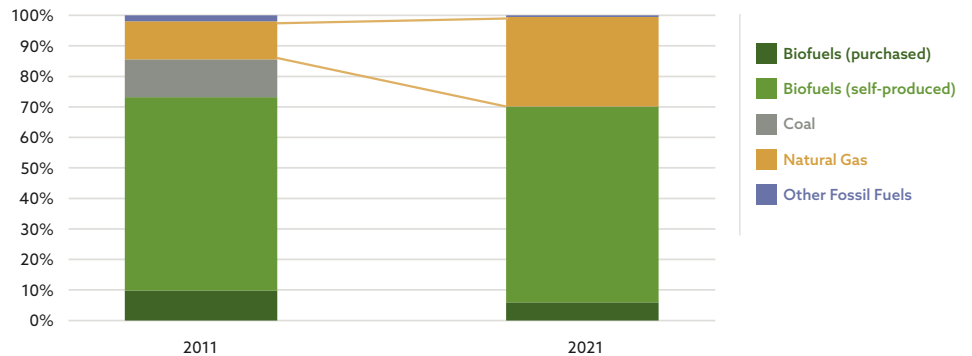
Through significant strategic investments, our mills have improved their energy efficiency by replacing fixed speed with variable speed electrical drives. Over the past decade, several PCA mills have increased capacity for biogenic fuel types and replaced coal with lower-emitting fuels like natural gas. PCA consistently aims to reduce both costs and environmental impact.

²⁷ Packaging plants account for less than 5% of our total energy consumption — these predominantly utilize purchased electricity and natural gas. Our full-line plant boilers combust natural gas to produce and supply steam to corrugators as well as for building heat.



MILL ENERGY MIX BY FUEL TYPE

Switching from coal to natural gas helped our mills avoid nearly 500,000 metric tons of CO₂e in our 2021 climate target baseline year, compared to 2011.



Energy Modeling

All PCA mills have a computer model of their energy system, which is used to identify energy reduction opportunities. Multiple smaller capital projects are identified by the model and executed each year at all mills. When any capital project is identified, the model is used to determine the optimum energy balance for the new installation and to quantify the benefit of the project after it is installed. Mill and corporate personnel work together so that opportunities identified at one mill may be quickly implemented at other mills.

Examples of Capital Investment in Energy Improvements

International Falls

We installed a turbine generator that increased our rate of electrical self-generation by 595,000 GJ of energy per year. This is the equivalent electrical consumption of 15,120 homes — or five times the number of households in the entire city of International Falls.

Counce and Valdosta

We upgraded our recovery boiler and turbine generator assets to increase the use of internally generated wood waste and black liquor as energy sources, thereby increasing our capacity to self-generate electricity. These projects substantially increased energy efficiency. This investment added approximately 3 million GJ of biogenic, carbon-neutral energy to our portfolio, which enables the mills to reduce consumption of fossil fuels.²⁸ It would require over 2,800 acres (or 4.4 square miles) of solar panels to generate this same level of renewable power.²⁹

Filer City

We recently installed a bubbling fluidized bed boiler to combust wood waste (previously shipped off site) and other fuel types. This investment added 888,000 GJ of biogenic, carbon-neutral energy, and it allows the mill to reduce consumption of fossil fuels. Also, 10% of the boiler’s fuel supply comes from used passenger vehicle tires that might otherwise be landfilled. When operating at capacity, for every full year of operation, over 790,000 tires are converted into recovered energy.

²⁸ Based on the difference in average energy production from biogenic fuels before the project (2005–2011), and since the project (2012–2019).

²⁹ [Land-Use Requirements for Solar Power Plants in the United States | NREL 2013](#), based on Large PV generation-weighted average land use, 3.4 acres/GWh/yr.

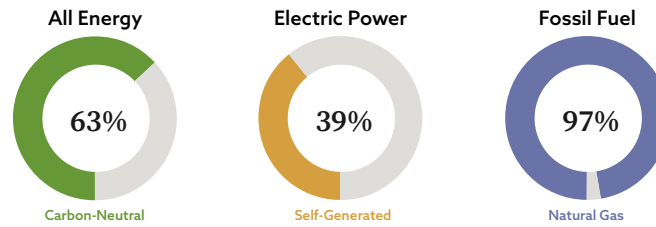


ENERGY CONSUMPTION WITHIN AND OUTSIDE OF THE ORGANIZATION (million GJ)

	2018	2019	2020	2021	2022
Renewable Fuel	72.9	71.6	69.0	70.6	70.2
Non-Renewable Fuel	30.7	33.0	30.3	34.3	30.5
Electricity and Steam	9.7	9.4	9.5	10.3	9.9
Hydroelectricity	0.3	0.3	0.3	0.2	0.2
TOTAL	113.6	114.3	109.1	115.4	110.8

Notes: Lower energy consumption in 2020 was due to the idling of our Jackson mill from May–Sept 2020. In 2021, we changed our data collection methods resulting in minor changes to previously reported data for the years 2017–2020 for renewable fuel, non-renewable fuel, and electricity and steam.

ENERGY PERFORMANCE METRICS all locations, 2022





Emissions

PCA is one of the largest producers of containerboard, corrugated packaging products and business paper in the United States. The scale of our production requires significant amounts of energy and resources. Over 90% of the company's energy requirements are at our pulping and papermaking operations. These needs are met in large part via electric and steam self-generation and leveraging combustion of renewable, biogenic fuels. While doing so creates greenhouse gas emissions, the majority are reported as biogenic CO₂. However, combustion of biomass does result in net additions of methane and nitrous oxide to the atmosphere. Emissions of these pollutants are included as part of our scope 1 emissions.

Greenhouse Gas Emissions Inventory and Accounting

Today we track all direct (scope 1),³⁰ indirect (scope 2) and the vast majority of applicable other indirect (scope 3) emissions at our mills and packaging plants for which we have operational control.³¹

2022 FOSSIL CO₂e EMISSIONS 5.66 million metric tons CO₂e (market-based)

Fossil by Scope:	32%	25%	43%		
	SCOPE 1	SCOPE 2 (MARKET-BASED)	SCOPE 3		
Fossil by Category:*	59%	18%	9%	8%	6%
	ENERGY	WASTE	MATERIALS	MOBILE	OTHER
	<ul style="list-style-type: none"> • Scope 1, Fuel • Scope 2 • Scope 3, Cat. 3 	<ul style="list-style-type: none"> • Scope 1, Company-owned landfill • Scope 3, Cat. 5, 12 	<ul style="list-style-type: none"> • Scope 3, Cat. 1 	<ul style="list-style-type: none"> • Scope 1, Company-owned/leased vehicles • Scope 3, Cat. 4, 6, 7, 9 	<ul style="list-style-type: none"> • Scope 1, Process emissions • Scope 3, Cat. 2

*Scope 3, Cat. 8, 10, 11, 13, 14 & 15 are not applicable for PCA. For more information about our scope 3 emissions, please see the Appendix.

GHG EMISSIONS, DIRECT, INDIRECT, OTHER INDIRECT (million metric tons CO₂e)

	2018	2019	2020	BASELINE 2021	2022
Scope 1	1.80	1.91	1.77	1.95	1.81
Scope 2 (location-based)	1.28	1.20	1.10	1.06	1.07
Scope 2 (market-based)	-	-	1.38	1.62	1.43
Scope 3	2.27	2.47	2.30	2.48	2.43
TOTAL (LOCATION-BASED)	5.35	5.58	5.17	5.49	5.31
TOTAL (MARKET-BASED)	-	-	5.45	6.05	5.67
Biogenic CO ₂	6.52	6.40	6.16	6.32	6.28

Notes: In 2021, we changed our data collection methods and, in the process, identified a minor biogenic fuel source that was double counted in previously reported data for the years 2018–2020. All updates to previously reported biogenic CO₂ data resulted in changes of less than 3%. Sum of values may not equal total due to independent rounding. In 2022, PCA retired 104,940 MWh of emissions-free energy certificates (EFECs) for a temporary reduction in GHG emissions of 46,033 metric tons of CO₂e.

³⁰ Greenhouse gas emissions from company-owned landfills are reported on a one-year lag due to the complex nature of the calculation and the length of time required for data aggregation necessary for computation. Methane gas collection systems are in place at PCA-owned landfills. However, there is limited methane release from PCA landfills since the majority of landfill waste is inert ash from biomass use in the process of energy generation. This ash releases limited emissions when landfilled due to most of the emissions being released upon combustion. As such, EPA emission factors likely result in higher reported emissions than are actually released.

³¹ In 2018, we began tracking emissions for our regional, in-house trucking fleet, our corporate headquarters and our technical center. In 2020 we began tracking emissions for our supply services and fulfillment centers.



We compile our greenhouse gas inventory following the World Resources Institute and World Business Council for Sustainable Development *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* with the help of Schneider Electric's sustainability data management platform, Resource Advisor™, which we have utilized since 2013. We utilize invoice data for electric power, natural gas, propane and solid waste disposal, in addition to other minor sources contributing to our footprint. Where invoice data was not readily available, manually reported data was applied, and estimations were made for remaining gaps based on consumption patterns within a plant or of like plants.

Scope 3 Inventory

After the publication of our 2020 report, the National Council for Air and Stream Improvement (NCASI) released two tools to support member companies in compiling their scope 3 inventories. These resources helped us identify gaps, as well as guided us to refine some existing processes, and all values included in this report have been updated to reflect these changes. There were two significant gaps that more than doubled our previously reported scope 3 statements: end-of-life treatment of sold product, and fuel- and energy-related activities for natural gas. With these additions, we believe our inventory includes all substantial scope 3 emission sources.

GHG EMISSIONS INTENSITIES

NUMERATOR (METRIC TONS CO ₂ e)	PER	2020	2021	2022
Fossil Scopes 1 + 2 (market-based)	Employee	205	235	215
	\$ Revenue	0.00047	0.00046	0.00038
	Ton of Paper	0.62	0.65	0.64
Fossil Scopes 1 + 2 (market-based) + 3	Employee	356	398	376
	\$ Revenue	0.00081	0.00078	0.00067
	Ton of Paper	1.08	1.11	1.12

Life Cycle Assessment of Products

For both our corrugated and paper products, we provide data to our trade associations to conduct life cycle assessments (LCAs) for the entire industry. The most recent LCA for corrugated products was published in 2017 (using 2014 data). The industry average corrugated product had a global warming potential of 0.533 kg CO₂e per kilogram of corrugated.³²

The most recent LCA for printing and writing paper products was published in 2010 (using 2006/2007 data). The industry average ream of office paper had a global warming potential of 4.25 kg CO₂e per ream.³³

Air Emissions

We calculated nitrogen oxides (NO_x), sulfur dioxide (SO₂) and Particulate Matter 10 (PM₁₀) based on emission factors derived from stack testing and/or from our continuous emission monitoring systems (CEMS). These factors are used to calculate our emissions based on the type and volume of fuel we combust and the efficiency of our control equipment. Due to our increased use of natural gas rather than coal, our power boiler SO₂ emissions have decreased by more than 99% in the past decade.

³² Using the flow accounting approach. For an executive summary of the 2014 corrugated LCA, please visit fibrex.org.

³³ [Printing & Writing Papers Life-Cycle Assessment Summary Report | TwoSides](#)


AIR EMISSIONS Mills (thousand metric tons)

	2018	2019	2020	2021	2022
Nitrogen Oxides (NO _x)	6.4	6.6	6.0	6.4	6.0
Sulphur Dioxide (SO ₂)	1.4	1.5	2.1	2.4	2.1
Particulate Matter 10 (PM ₁₀)	-	1.6	1.0	1.1	1.1

Note: 2019 was our first year reporting Particulate Matter 10.

Starting in 2015 PCA moved from coal combustion to natural gas to power PCA mills. Natural Gas offers cleaner burning energy than coal when it comes to particulate matter, nitrogen oxides, carbon dioxide and sulfur dioxide. Further, natural gas combustion yields zero ash.

Biomass is also burned at PCA mills. Biomass generates roughly 75% more CO₂ per unit of energy than natural gas when combusted. However, the emissions are biogenic and not anthropogenic, meaning the carbon emissions do not result in a net addition of CO₂ to the carbon cycle. Biomass energy generates more particulate matter and nitrogen oxides than natural gas. Pollution control equipment helps reduce the amount of air emissions from biomass energy.

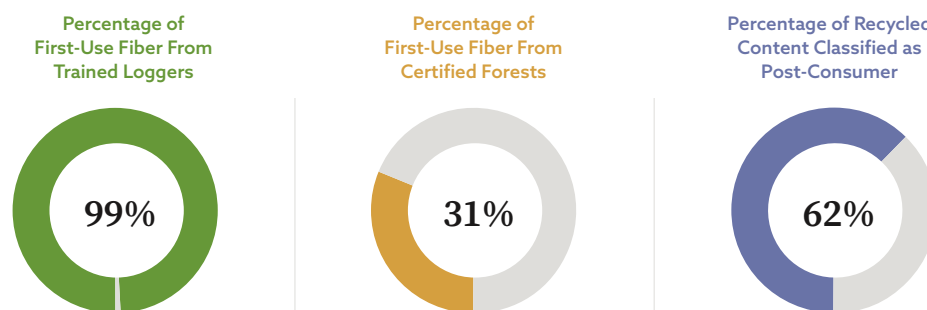
Particulate matter (PM), sulfur dioxide (SO₂) and nitrogen oxides (NO_x) release is measured at each PCA mill in order to comply with applicable EPA emission limits and thereby meet the National Ambient Air Quality Standards (NAAQS). In 2022, PCA mills discharged 19.0%, 10.5% and 57.3% of the allowed limit for PM, SO₂ and NO_x, respectively, on a weighted average basis.



Raw Material Sourcing

Wood fiber is a renewable resource and the essential material used to make our products. PCA's mill system utilizes both first-use (virgin) fiber and recycled content. A sustainable fiber stream requires both first-use fiber and recycled content. PCA's role in maintaining this sustainable system is to supply first-use fiber, which is necessary to continue to make recovered fiber available and useful. It is also our role to provide end markets to growers of timber, so they are provided appropriate economic incentives to continue to grow trees that provide important ecosystem services during their lifetime.

First-use fiber is sourced almost exclusively from the United States, with less than 1% sourced from Canada (Ontario and Manitoba) by our International Falls white paper mill. We also source a small amount of market pulp for white paper. We procure wood from timberlands, both private and public, in the form of roundwood and in-field chips. We also procure residuals from sawmills in the form of chips and sawdust.



All PCA Mills

Responsible and sustainable procurement of fiber is both a key policy and principle at PCA. PCA's commitment to practicing and supporting sustainable forestry and responsible wood fiber procurement is communicated both internally and externally. Internally, our Sustainable Forestry Policy is required to be posted at all manufacturing sites as part of our certification program, and it is also readily available on our company website.

Externally, all PCA-approved wood suppliers receive our policy through an annual correspondence. Prior to delivery, we make sure that suppliers are adequately insured, legally established businesses and are able to meet our terms. Once approved and a purchase order has been submitted, PCA woodlands managers and foresters verify the accuracy of the information. Our wood management system tracks and catalogs details of our wood and fiber sourcing, including county of origin. PCA's policy is incorporated by reference in our Terms and Conditions for the Purchase of Wood Fiber Goods in every transaction and is available on our website.³⁴

³⁴ [Wood Fiber Addendum TC | PCA](#)



SOURCES OF WOOD FIBER (thousand tons)

	2018	2019	2020	2021	2022
First-Use Fiber (green tons)	14,668	15,021	13,933	13,986	13,731
PEFC Certified	26%	26%	28%	27%	25%
FSC Certified	4%	4%	5%	5%	6%
Controlled Material*	70%	70%	67%	68%	69%
Recycled Content	1,083	1,053	994	1,200	1,044
Market Pulp	4	6	18	53	2

NOTE: All data in thousands of air-dried short tons except for first-use fiber, reported as thousands of green short tons.

*All fiber procured by PCA mills meets the requirements for SFI Fiber Sourcing, PEFC Controlled Sources, and FSC Controlled Wood at minimum. Market pulp increased in 2020 and 2021 at both our International Falls and Jackson mills due to the conversion of our Jackson mill from white paper to containerboard, and COVID-19-pandemic-related supply chain issues.

Our packaging plants source containerboard (linerboard and corrugating medium) and corrugated sheets. The majority of our containerboard comes from PCA mills or trade partners. To ensure that our containerboard and sheets come from non-controversial sources, all suppliers are evaluated by our due diligence system and risk assessment. Any supplier that sells finished paper products to PCA for the corrugated production process is checked for a valid sustainable forestry certificate annually (FSC, SFI or PEFC, see below), in order to ensure the lowest possible risk of sourcing from controversial sources.

Due Diligence System and Risk Assessment

PCA uses a due diligence system in conformance with the Sustainable Forestry Initiative® (SFI) and Programme for the Endorsement of Forest Certification (PEFC)³⁵ standards to avoid controversial sources in our supply chain. Each year we evaluate the contiguous United States and Canada for all of our operations that source wood fiber. Additionally, all of our mills have successfully audited to the Forest Stewardship Council® (FSC®),³⁶ U.S. Controlled Wood National Risk Assessment (NRA) and FSC Canada Controlled Wood NRA.³⁷ These efforts help ensure that we avoid sourcing conflict timber or otherwise illegally harvested wood, genetically modified forest-based organisms, species that are included in Appendices I to III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and wood from land converted to other vegetation types.

We evaluate our sources at both the origin (country) level and supply chain level, as well as the effectiveness of social laws. The U.S. and Canada both have effective social laws, relatively strong law enforcement and low levels of corruption. For these reasons, our 2022 assessment determined there is negligible/low risk that PCA supplies originate from controversial sources. The FSC U.S. NRA identified 11 mapped areas of specified risk for high conservation values within PCA's supply area.

Environmental Impact Assessments

We utilize NatureServe and state Natural Heritage websites to check for threatened or endangered species and ecosystem conservation priorities in combination with on-the-ground inspections prior to harvest activity. This enables us to ensure that biodiversity constraints are identified and that an effective plan of action is in place before, during and after forest management activity.

³⁵ (PEFC/29-31-222) (PEFC/31-29-09)

³⁶ (FSC-C139165) (FSC-C020415)

³⁷ Only applicable to our International Falls, Minnesota, mill.



PCA fully complies with the U.S. Lacey Act, Endangered Species Act and the Clean Water Act. We also fully comply with the Canadian Environmental Protection Act, Species at Risk Act and provincial timber regulations. PCA is in full conformance with the European Union Timber Regulation (EUTR).

Best Management Practices

The forest certification programs we adhere to support the protection of biodiversity through voluntary and compulsory measures. For example, the SFI standard requires a trained Master Logger or Qualified Logging Professional (QLP) on site during harvest activities, and wood suppliers must remain up to date on continuing education requirements, including biodiversity protection. In 2022, 99% of the wood sourced directly from forestlands was delivered by QLPs.³⁸ PCA promotes and financially supports training programs for logging professionals as part of our commitment to sustainable forestry standards. We are dedicated to applying all mandatory and voluntary state best management practices (BMPs)³⁹ during harvest activity to protect a site's biodiversity and to preserve the quality of water and soil within the landscape.

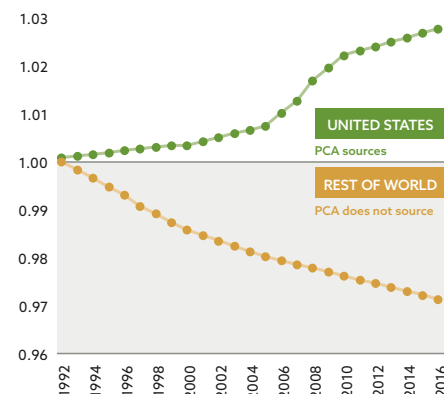
Zero Deforestation

PCA sources the majority of first-use fiber from private landowners, which is consistent with the broader forest products industry. This is important because healthy end markets for timber are part of what keeps these lands forested. Without appropriate economic incentives like timber grown for harvest, landowners may elect to convert to different land uses such as human food agriculture and livestock, which are the leading causes of deforestation globally.⁴⁰ Additionally, PCA takes steps to mitigate risks when sourcing from specified counties that have a higher risk of conversion due to urbanization.

Preserving the “working forests” of private landowners is critical in propping up the economy of the rural areas located around PCA mills. Without the fiber from timberland that goes into the paper product supply chain, there would be substantially less forestry and paper product careers. PCA mills play a crucial role in the economies of these communities, as well as a major role in the culture and everyday life of residents. The American Forest & Paper Association (AF&PA) reports annually on the economic impacts of the forest and paper industry. In 2022 the AF&PA reported the forest industry produced \$353.0 billion of manufacturing output and paid out \$64.2 billion in total compensation to workers, as well as paid \$4.2 billion in taxes. The forest and paper industry is also responsible for providing employment to 925,800 individuals.⁴¹

Deforestation is a significant issue in many parts of the world. Between 1992 and 2016, the world lost roughly 327 million acres of forestland. Conversely, during the same time period, the United States added 19.3 million acres of forestland. It is important to also understand how land use has changed over a longer period — 100 years is a long time for a human, but to a planet aged 4.5 billion years, it is relatively faster than the blink of an eye.

FOREST AREA (% OF LAND COVERAGE) Index, 1992 = 1



Source: World Bank

³⁸ Although it is a requirement of voluntary standards, there are limited exceptions granted because we are not legally allowed to deter new loggers from gaining entry to markets. We require loggers to be enrolled in the next available QLP training course at a minimum.

³⁹ To view states' BMPs, please see the interactive map at <https://www.stateforesters.org/bmps/>

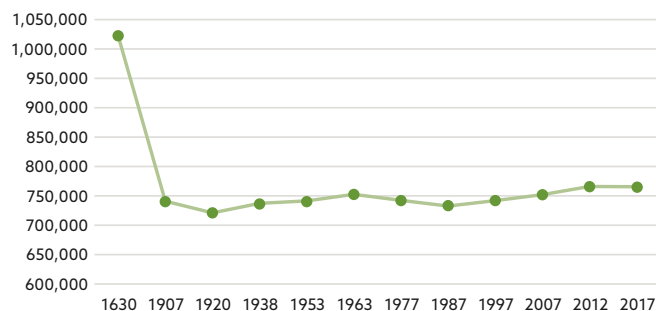
⁴⁰ [The State of The World's Forests 2020 | FAO](#)

⁴¹ www.afandpa.org/statistics-resources/our-economic-impact



When the United States was settled between 1630 and the early 20th century, a substantial amount of forestland was lost (over 280 million acres). However, U.S. forest acreage has been stable since 1907.⁴²

FOREST AREA IN THE UNITED STATES (acres)



1630	1,022,535
1907	740,870
1920	721,415
1938	737,572
1953	741,652
1963	762,786
1977	742,345
1987	732,553
1997	741,937
2007	752,272
2012	766,234
2017	765,439

Source: U.S. Forest Service

Certification

PCA has a fiber procurement program for all mills in compliance with the Sustainable Forestry Initiative® (SFI) Standard Requirements, the Forest Stewardship Council® (FSC®)⁴³ and the Programme for the Endorsement of Forest Certification (PEFC).⁴⁴ We also recognize the American Tree Farm System® (ATFS) individual and group certifications. Our program ensures compliance with the certification standards and follows all applicable laws and regulations. Approximately 8% of corrugated products were sold under certified chain of custody in 2022.

CERTIFIED PRODUCT SOLD (thousand tons)

	2018	2019	2020	2021	2022
CORRUGATED					
PEFC	167.3	174.9	206.3	305.6	313.1
WHITE PAPER					
FSC	126.6	116.5	72.2	66.8	37.9
PEFC	48.1	33.5	27.1	40.7	28.3
TOTAL	342.0	324.9	305.6	413.1	379.3

Note: Corrugated output is measured in thousand square feet (MSF) and was converted to tons for reporting this metric in a common unit of measure for both our packaging and paper segments.

⁴² U.S. Department of Agriculture, Forest Resources of the United States, 2017 (2019) https://www.fs.usda.gov/research/publications/gtr/gtr_wo97.pdf Table 31 page 164

⁴³ (FSC-C139165) (FSC-C020415)

⁴⁴ (PEFC/29-31-222) (PEFC/31-29-09)

HISTORY OF CERTIFICATION

2005

PCA white paper mills certified to SFI Fiber Sourcing standard.*

2007

All of PCA's containerboard mills and corrugated packaging operations certified to SFI's Fiber Sourcing standard, including Certified Sourcing.

PCA white paper mills certified to SFI, PEFC and FSC Chain of Custody, and FSC Controlled Wood standards.*

2010

PCA's containerboard mills certified to SFI and PEFC Chain of Custody standards.

2011

PCA's entire system of corrugated packaging plants certified to SFI and PEFC Chain of Custody standards.

2018

PCA's containerboard mill system certified to FSC Chain of Custody and Controlled Wood standards.

PCA's entire system of full-line plants certified to FSC Chain of Custody standard.

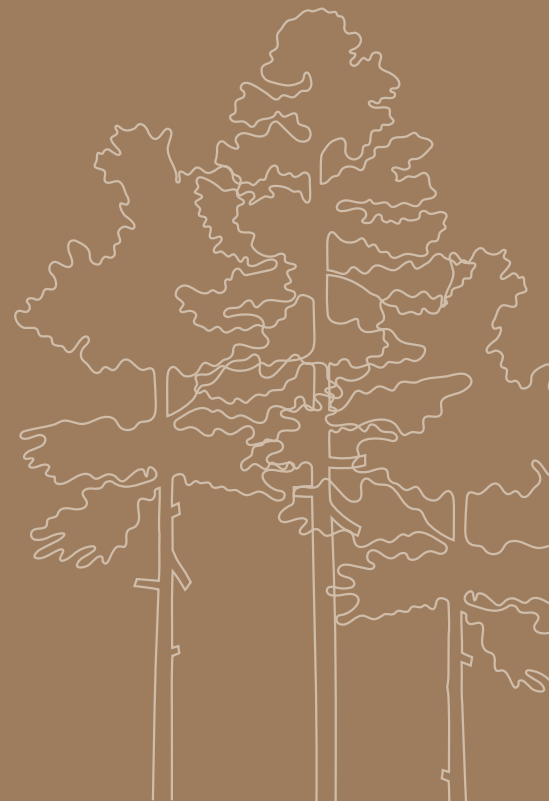
2019

PCA containerboard mill system successfully audited to FSC U.S. Controlled Wood National Risk Assessment.

2020

PCA white paper mills successfully audited to FSC U.S. and Canada Controlled Wood National Risk Assessments.

*Prior to PCA acquisition of Boise, Inc. in October 2013.



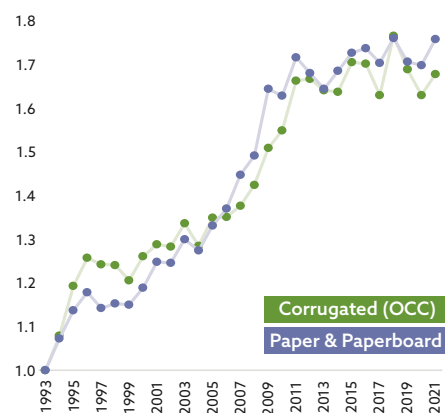
Recycling

Corrugated is the most widely recycled packaging material on the planet. To promote the recyclability of our products, PCA is a proud user of the *Corrugated Recycles* symbol and encourages our customers to print it on qualified products. Since the program was introduced, the recycling rate of corrugated has increased from 54.5% in 1993 to 91.4% in 2021, and it achieved a record of 96.2% in 2018.⁴⁵ Paper has a similar success story. Over the same time period, the recycling rate of paper and paperboard rose from 38.7% in 1993 to 68.0% in 2021, and it reached a record of 68.1% in 2018.

By recycling used paper, boxes and scrap from the manufacturing process, the amount of timber required to be harvested is reduced. This also serves to prevent greenhouse gas emissions from decomposition in a landfill. However, there are limits to fiber recycling. Wood fibers can only be recycled five to seven times before they become too short and brittle to bond any longer. Once fibers are no longer able to form quality bonds the integrity of the paper is no longer ideal for production. *The Fiber Cycle Technical Document* published by Metafore in 2006 was updated by the National Council for Air and Stream Improvement (NCASI) in 2019 with current data.⁴⁶ This document



INCREASES IN U.S. RECYCLING RATES Index, 1993 = 1



Source: AF&PA, U.S. Census Bureau

⁴⁵ [Recovery for Recycling of Old Corrugated Containers: Explaining the Exceptional Rate | AF&PA](#)

⁴⁶ [The Fiber Cycle Technical Document | TwoSides](#)



provides a model that takes into account the finite nature of fiber recycling and how long the cycle could continue without adding fresh fiber. Even when the recycled fiber utilization rate is maximized, the model shows that without the introduction of first-use fiber the North American containerboard supply would be exhausted in 13.5 months, and printing and writing grades would be exhausted in 1.5 months.

It is also worth noting that paperboard that is produced strictly from virgin paper has a lower risk of containing unsafe chemicals. This is due to the fact that it is easier to regulate the chemical contents of materials used to make virgin paper directly at a PCA mill than it is to know the chemical contents of recycled materials that make their way to a PCA mill as old corrugated containers (OCC).

Recycled Content of Finished Paper Product

The recycled content of our finished products is calculated based on the proportion of recovered fiber to overall production after taking into account production yield for each stream. The average recycled content of our containerboard was 22% in 2022 (14% post-consumer, 9% post-industrial),⁴⁷ the substantial majority in our corrugating medium. Our white paper division sells products under our ASPEN® brand that specify a minimum percentage of post-consumer recycled content (30%, 50% and 100%). This information is available through our Office Paper Product Finder on the Boise Paper website.⁴⁸

In 2021, our Wallula mill began operation of a new OCC pulping line (post-consumer recycled content). The mill consumed 154,000 tons of OCC in 2022.

Product Stewardship

PCA has a robust product stewardship process to ensure all raw materials used in producing, manufacturing, packaging and transporting paper and containerboard products comply with the applicable product regulations, including FDA and USDA, along with any certifications PCA has made regarding customer requirements. The product stewardship process (for product and raw materials qualification) must be followed for all new chemicals/ingredients prior to use in PCA's processes.

The Product Stewardship team at PCA ensures product safety through two levels of assurance. The first level takes place at the PCA mills where the majority of the chemical process is taking place through the pulping process. The second level is at the box plants, where the risk of chemical hazard is lower, due to the process mostly consisting of paper product assembly.

The PCA Product Stewardship team ensures all PCA products are in compliance with California Proposition 65, European Union REACH SVHC (Substances of Very High Concern) and the requirements for the FDA Federal Food, Drug, and Cosmetic Act (FD&C Act). The goal of the PCA packaging production process, as well as the PCA Product Stewardship team is to make sure that no regulated chemicals are present directly in paper or corrugated sheets that could be in direct contact with packaged products. In addition, PCA utilizes third-party testing facilities for its products to test for chemicals of concern on an annual basis.

PCA relies on supplier diligence as well when it comes to the chemical safety of essential products. It is expected that anyone who supplies materials to PCA that are essential in creating the final products supplied to PCA customers follow the same secure chemical safety standards (California Proposition 65, European Union REACH SVHC, FDA Federal

⁴⁷ Breakdown does not add to total recycled content due to independent rounding.

⁴⁸ <http://bph.boisepaper.com/product/>



FD&C Act). REACH SVHC chemicals are validated twice a year by a representative from the PCA Product Stewardship team. This team member will query all PCA vendors to see if any chemicals are present in the raw materials being sourced that do not meet PCA's chemical safety standards.

Elemental Chlorine Free

Our white paper mills do not utilize elemental chlorine gas in our bleaching processes. In addition, we ensure all virgin pulp suppliers use elemental chlorine free (ECF) bleaching. PCA's self-produced containerboard product is unbleached.

Heavy Metals

The Coalition of Northeastern Governors (CONEG) created Model Toxics in Packaging Legislation, which has been adopted by 19 U.S. states.⁴⁹ To ensure conformance, we test our paper products on an annual basis to determine that the presence of incidentally introduced heavy metals — namely lead, mercury, cadmium and hexavalent chromium — does not exceed 100 parts per million. None of these heavy metals are intentionally added to our products.

⁴⁹ [The Clearinghouse | Toxics in Packaging Clearinghouse](#)



Water and Effluents

Pulp and paper manufacturing is a water-intensive process. We use either surface or ground water, depending on the location of the mill. Water withdrawal is measured with in-line flowmeters. Our mills intentionally maximize the reuse/recycle of water within the pulping and papermaking processes as a matter of sustainable manufacturing. We quantify water recycling using the *National Council for Air and Stream Improvement (NCASI) Water Recycle Tool*⁵⁰ and determined our average water recycle ratio to be 7.5 in 2022. States issue permits for groundwater and surface water based on extraction volumes. We report daily water use and release to each state where we operate mills via monthly discharge monitoring reports.

Water Risk Assessment and Due Diligence

In 2020 we used the World Resources Institute (WRI) Aqueduct 3.0 Water Risk Atlas⁵¹ to identify potential risks associated with our water supply. The assessment showed low risk for seven of our mills. Our Tomahawk, Wisconsin, corrugating medium mill assessment indicated high baseline water stress,⁵² but we believe it is a limitation of the model as it is not indicative of either ambient conditions nor our actual experience.

WATER WITHDRAWAL BY SOURCE (in billion liters)

SOURCE	2018	2019	2020	2021	2022
TOTAL	280.5	273.9	270.8	274.9	261.2
Surface Water	70%	72%	73%	71%	71%
Ground Water	28%	27%	27%	28%	29%
Municipal Water	1%	1%	1%	<0.5%	1%

Data points may not add to 100% due to rounding.

Water Stewardship

Our trade association, the American Forest and Paper Association (AF&PA), and its members are in the process of developing industry-specific tools to help guide our water stewardship efforts. We hope to begin evaluating the usefulness of these tools by the end of 2024, and support AF&PA's commitment to set a goal for increasing member use of the tools by 2030.

The impact of water withdrawal on the local fish population was evaluated by a third party during a year-long study at our Tomahawk mill in 2013. The study found that the mill's annual effect on the local fishery was less than the impact of a single fisherman harvesting their allowable limit of fish in a single week.

Valdosta Mill Water Conservation Plan

In accordance with the Georgia Environmental Protection Division's Water Conservation Rules, our Valdosta, Georgia, containerboard mill has had a water conservation plan in place since 2004. The mill strives for continued incremental reduction of water consumption to the extent practical through a broad water conservation strategy. This includes

⁵⁰ [Water Reuse & Recycle | NCASI](#)

⁵¹ Default parameters were used.

⁵² GRI recommends reporting a location's water withdrawal as stressed if the baseline water stress or baseline water depletion is rated "high."



recycling, reclamation and reduction of use. The key performance indicator used to determine this program's effectiveness is gallons per ton of product. The mill's average process water use is 8,068 gallons per ton, which is below the industry average. The majority of water loss in the production of paper is due to evaporation in the papermaking process, while the rest of the withdrawn water is physically and biologically treated prior to releasing it back into the environment.

Water Reduction

In 2021, we designated Carbon Neutrality Leads at each of our pulp and paper mills to identify projects that have the potential to reduce carbon emissions and water use. Our leads were able to identify five significant water reduction projects across our eight mills. We estimate these projects will reduce our annual water withdrawal by approximately 6% when fully implemented. We anticipate completing these projects by the end of 2023.

Water Discharge

Mills essentially "borrow" water resources for manufacturing, subsequently returning virtually all water back to the environment.⁵³ In 2022, PCA mills consumed 1.39% of water withdrawn, or about 1,071 liters per ton of production. Water is returned in two primary ways, depending on its use at the mill.⁵⁴ Non-contact cooling water (NCCW), used to cool energy turbines and lubrication systems, is returned without treatment. During the winter months, our northern mills route spent NCCW into the papermaking process in order to recover heat and thereby increase energy efficiency. Process wastewater is treated in on-site wastewater treatment plants prior to being discharged to a river or lake. At all PCA mills, treated wastewater is tested for biological oxygen demand (BOD) and total suspended solids (TSS), the two most common water discharge metrics used by the EPA to assess receiving water impacts. All PCA mills are in water-rich areas. The water withdrawn for PCA mills does not have a measurable adverse impact on the local economy, people or the environment. Since mills "borrow" water from the environment the only real water loss occurs from evaporation. Overall water loss from evaporation is 283 gallons per ton of manufactured paper.

In addition to BOD and TSS, other parameters are tested in accordance with state-specific requirements. Each month, results are reported to state governments to verify each mill is operating within the permitted limits. When comparing composite results of actual discharge of all PCA mills to the allowed (i.e., aquatic resource protective) discharge limit set by the EPA, in 2022 PCA mills discharged 24.5% of allowable BOD and 21.7% of TSS.

PLANNED WATER DISCHARGES Mills (in billion liters)

	2018	2019	2020	2021	2022
TOTAL	252.4	271.9	275.0	271.2	247.4
Process Wastewater	82%	77%	76%	75%	74%
Non-Contact Cooling Water (NCCW)	18%	23%	24%	25%	26%

⁵³ [National Council for Air and Stream Improvement. \(2018\). Water Profile of the U.S. Forest Products Industry.](#)

⁵⁴ Due to geographic location, International Falls operates a fully enclosed, UNOX system, (an anaerobic reactivated sludge system) for wastewater treatment. Wastewater treatment plant residuals from this system are subsequently dried and combusted as a biofuel. A fraction of 1% of Valdosta's treated wastewater is land applied to manage wastewater treatment system hydraulic inventory during drought events. Valdosta and International Falls both draw municipal water (for sinks, bathrooms, etc.), which is segregated and treated by publicly owned treatment works (POTW).



WATER DISCHARGE QUALITY Mills (lbs/ton of production)

	2018	2019	2020	2021	2022
Biological Oxygen Demand (BOD)	1.88	1.38	1.54	1.60	1.38
Total Suspended Solids (TSS)	3.24	2.42	2.37	2.38	2.45

The energy used to heat water is also considered when recycling water through the paper-making process. Once water is withdrawn from its source and heated to be used in the pulping and papermaking process, it would be wasteful to release that heated water after one use. Rather than wasting energy to reheat water, the water is reused multiple times throughout the entire production process until the water is too dirty to be useful. At that point, the water is then treated and returned to the environment.

Water temperature is also monitored when discharging water back into the environment. The released water from mills does not substantively increase the overall water temperature of the receiving water.

Stormwater Management Initiative

The majority of PCA packaging plants are subject to state stormwater permit programs. A stormwater permit requires a detailed stormwater pollution prevention plan (SWPPP), along with periodic inspections and stormwater sampling/monitoring, reports to state agencies, annual fees and annual training. The PCA corporate Environmental Health and Safety (EH&S) team established a goal in 2016 for the packaging plants to pursue stormwater No Exposure Certifications (NEC) offered by various state programs. Over the past four years, PCA plants have built on the previously attained and audited Good Manufacturing Practices (GMPs) achieved over the prior decade. Further improvements include storing all oil and chemicals indoors and reducing pollutants in stormwater discharges. The PCA EH&S team visits each PCA plant approximately once every three years to ensure that all SWPPPs are in place and followed correctly.

PCA has invested significant time, engineering resources and capital dollars where necessary to help plants attain the goal where feasible. Since 2016, the number of PCA facilities achieving NEC status has more than doubled. Currently, 50 box plants have achieved rigorous management standards and achieved NEC coverage.

As a best management practice, NEC plants conduct thorough monthly inspections with a site-specific checklist and annual NEC training. The success of the program reflects dedication to environmental excellence by the PCA plant and corporate personnel, as well as improved environmental performance, reduced compliance costs and reduced risk of spills at PCA packaging plants.



Waste

Seven of our mills own and operate private landfills (exception: Filer City, Michigan). These landfills are typically used to dispose of two high-volume waste byproducts — ash from burning woody biofuels (see [Energy](#)) and residuals from our process wastewater treatment plants (WWTP). Low-volume incidental wastes (e.g., construction debris, lunchroom waste, process grit) are also disposed of. As a matter of principle, PCA mills and converting operations avoid sending waste to landfills whenever possible. For example, portions of process residuals are beneficially reused rather than landfilled.

Mandated methane gas collection systems are in place at several PCA-owned landfills. However, methane release from PCA landfills is sparse since the majority of landfill waste is inert ash resulting from biomass combustion for energy generation.

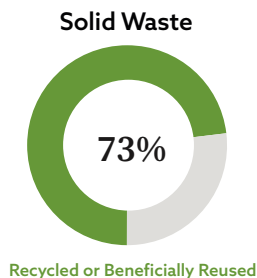
At some of our mills, WWTP residuals and wood-fired boiler ash are beneficially used by local farmers as soil amendments or liming agents to achieve better overall moisture retention, to increase the organic matter content of topsoil and to elevate soil pH, all of which improve plant nutrient uptake. Additionally, at our Counce, Tennessee, mill, combustion residuals are approved for on-site use for building roads, storing logs and buttressing the banks of the mill’s wastewater treatment ponds. Further, PCA is collaborating with Oregon State University on a study to understand the agronomic benefit of using composted Wallula mill residuals on both irrigated and dry-land crop acreage.

PCA plants also have programs to collect and recycle universal waste and hazardous waste. Universal waste like aerosol cans, batteries, used oil and the used water from machine-part washing stations are collected by third-party hazardous waste management service providers who find the most appropriate end-of-life treatment for each waste stream.

Our packaging plants recover the vast majority of their corrugated scrap and sell it back to mills as double-lined kraft (DLK), which is considered pre-consumer recycled material.

WASTE BY TYPE AND DISPOSAL METHOD (thousand metric tons)

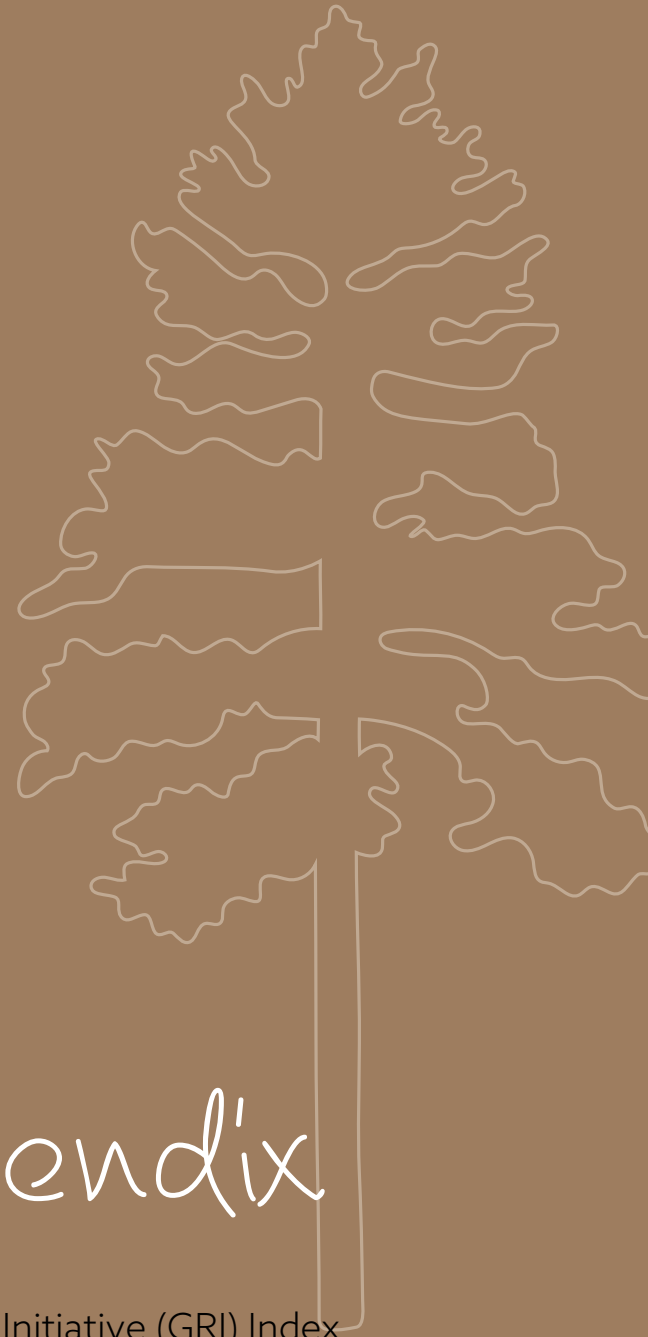
SOURCE	2018	2019	2020	2021	2022
TOTAL	809.1	808.8	834.1	977.7	856.3
Recycled or Beneficially Reused	68%	74%	70%	63%	73%
Landfill	32%	26%	30%	37%	27%



CORRUGATED RECYCLING

IN 2022, PCA RECYCLED APPROXIMATELY 310,000 METRIC TONS OF CORRUGATED SCRAP.

THAT'S ENOUGH TO FILL OVER 40 MILES OF 50-FOOT RAIL BOXCARS.



Appendix

Global Reporting Initiative (GRI) Index

Membership of Associations

Emission Factors and Global Warming Potential (GWP)

Employer Information Report EEO-1, Employment Data

Master Data Table

Glossary

List of Referenced Sources

PCA's Sustainable Business Principles



Global Reporting Initiative (GRI) Index

THE ORGANIZATION AND ITS REPORTING PRACTICES		
2-1	Organizational Details	Packaging Corporation of America (PCA) is publicly held, incorporated in Delaware, USA. Our common stock is listed on the New York Stock Exchange under the symbol “PKG.” PCA headquarters are located in Lake Forest, Illinois, USA, and the company operates primarily in the United States.
2-2	Entities Included in the Organization’s Sustainability Reporting	2022 10-K, Exhibit 21.1
2-3	Reporting Period, Frequency and Contact Point	Both sustainability and financial reporting are for PCA’s fiscal year, which aligns with the calendar year. The frequency of sustainability reporting is annual, and the reporting period is January 1, 2022, to December 31, 2022. This report was published June 30, 2023. For questions about the report or reported information, please contact responsibility@packagingcorp.com .
2-4	Restatements of Information	Any restatements of information are noted with an adjacent footnote.
2-5	External Assurance	No external assurance for PCA’s 2022 Responsibility Report. All data and information has undergone internal review.
ACTIVITIES AND WORKERS		
2-6	Activities, Value Chain and Other Business Relationships	PCA operations align to the Forestry (specifically production of pulp and paper) and Packaging sectors as classified by GRI. 2022 Annual Report, pages 2–7 No significant changes to the organization during 2022.
2-7	Employees	20, 25
2-8	Workers Who Are Not Employees	PCA utilizes contractors to carry out non-routine tasks to supplement the core competencies of our operations. This ensures that the work is done efficiently and effectively. Temporary employees supplement our workforce, especially during peak seasons. This allows flexibility in scheduling employee work hours and in production planning. We also engage temporary employees to do piece work for low-volume specialized boxes and displays that are assembled by hand. Reputable staffing agencies are used to source temporary employees, and each is required to agree to, and is bound by, PCA legal agreements mandating compliance with applicable law and other legal provisions.
GOVERNANCE		
2-9	Governance Structure and Composition	Corporate Governance Guidelines, Audit Committee Charter, Compensation Committee Charter, Section 162(m) Subcommittee Charter, Nominating and Governance Committee Charter, Sustainability Committee Charter, Board of Directors, Senior Management Team
2-10	Nomination and Selection of Highest Governance Body	Corporate Governance Guidelines
2-11	Chair of the Highest Governance Body	Board Committee Composition
2-12	Role of the Highest Governance Body in Overseeing the Management of Impacts	Corporate Governance Guidelines
2-13	Delegation of Responsibility for Managing Impacts	Nominating and Governance Committee Charter
2-14	Role of the Highest Governance Body in Sustainability Reporting	PCA’s Sustainability Committee oversees sustainability reporting. Sustainability Committee Charter
2-15	Conflicts of Interest	Corporate Governance Guidelines, Code of Ethics for Directors, Code of Ethics for Executive Officers and Principal Accounting Personnel
2-16	Communication of Critical Concerns	Procedures for Handling Complaints
2-17	Collective Knowledge of the Highest Governance Body	Board of Directors
2-18	Evaluation of the Performance of the Highest Governance Body	Corporate Governance Guidelines
2-19	Remuneration Policies	Compensation Committee Charter, Section 162(m) Subcommittee Charter
2-20	Process to Determine Remuneration	SEC Form DEF 14A, pages 21–52
2-21	Annual Total Compensation Ratio	SEC Form DEF 14A, page 49



STRATEGY, POLICIES AND PRACTICES		
2-22	Statement on Sustainable Development Strategy	2, 4, 32–37, 72
2-23	Policy Commitments	72 Code of Ethics and Business Conduct PCA follows a “precautionary approach” when developing, and prior to offering, new products. We seek to identify potential hazards and risk early in development, such that they can either be eliminated or assuredly managed to a level where they are acceptably mitigated for purposes of our customers, employees, communities and other stakeholders. Sensitivity to the impact that our products and their sourcing/production/provision may have on health, safety and the environment is a key underpinning of our sustainability strategy and objectives.
2-24	Embedding Policy Commitments	Corporate Governance Guidelines, Code of Ethics and Business Conduct, Code of Ethics for Directors
2-25	Process to Remediate Negative Impacts	Procedures for Handling Complaints, Code of Ethics and Business Conduct
2-26	Mechanisms for Seeking Advice and Raising Concerns	Procedures for Handling Complaints, Code of Ethics and Business Conduct
2-27	Compliance With Laws and Regulations	In 2022, PCA agreed to pay \$2.5 million in civil penalties to settle allegations of violation of the Clean Air Act’s General Duty Clause and Risk Management Program Regulations at our containerboard mill in DeRidder, Louisiana. PCA did not admit liability for violation of the Clean Air Act in connection with the settlement.
2-28	Membership of Associations	59
STAKEHOLDER ENGAGEMENT		
2-29	Approach to Stakeholder Engagement	7
2-30	Collective Bargaining Agreements	2022 Annual Report, pages 8, 14, 74
DISCLOSURE ON MATERIAL TOPICS		
3-1	Process to Determine Material Topics	7
3-2	List of Material Topics	7
ENVIRONMENTAL DISCLOSURES		
301	Materials Management Approach	45
301-1	Materials Used by Weight or Volume	46
301-2	Recycled Input Materials Used	46
301-3	Reclaimed Products	48
302	Energy Management Approach	38
302-1	Energy Consumption Within the Organization	40
302-2	Energy Consumption Outside of the Organization	40
303-1	Interactions With Water as a Shared Resource	51
303-2	Management of Water Discharge-Related Impacts	52
303-3	Water Withdrawal	51
303-4	Water Discharge	52
305	Emissions Management Approach	41
305-1	Direct (scope 1) GHG Emissions	41
305-2	Energy Indirect (scope 2) GHG Emissions	41
305-3	Other Indirect (scope 3) GHG Emissions	41
305-4	GHG Emissions Intensity	42
305-5	Reduction of GHG Emissions	41–42
305-6	Emission of Ozone-Depleting Substances (ODS)	Emissions from unrecovered refrigerant are a de minimis source of GHG emissions for PCA.



305-7	Nitrogen Oxides (NO _x), Sulfur Oxides (SO _x) and Other Significant Air Emissions	42
306	Waste Management Approach	54
306-2	Waste by Type and Disposal Method	54
306-4	Transport of Hazardous Waste	54
307-1	Non-Compliance With Environmental Laws and Regulations	In 2022, PCA agreed to pay \$2.5 million in civil penalties to settle allegations of violation of the Clean Air Act's General Duty Clause and Risk Management Program Regulations at our containerboard mill in DeRidder, Louisiana. PCA did not admit liability for violation of the Clean Air Act in connection with the settlement. PCA did not have any material violation of environmental laws in 2021, 2020, 2019 or 2018.

SOCIAL DISCLOSURES

401	Employment Management Approach	20
401-1	Employee Hires and Turnover	20
401-2	Benefits Provided	22–23
401-3	Parental Leave	23
403-1	Occupational Health and Safety Management System	12
403-2	Hazard Identification, Risk Assessment and Incident Investigation	13
403-3	Occupational Health Services	13
403-4	Worker Participation, Consultation and Communication on Occupational Health and Safety	14
403-5	Worker Training on Occupational Health and Safety	12
403-6	Promotion of Worker Health	15
403-7	Prevention and Mitigation of Occupational Health and Safety Impacts Directly Linked by Business Relationships	11
403-8	Workers Covered by an Occupational Health and Safety Management System	12
403-9	Work-Related Injuries	15
404	Training and Education Management Approach	16
404-1	Average Hours of Training per Year per Employee	16
404-2	Programs for Upgrading Employee Skills and Transition Assistance Programs	16–19
404-3	Percentage of Employees Receiving Regular Performance Reviews	PCA utilizes various formal and informal performance management processes, trainings and development programs to build competence among employees. Employees are evaluated on job performance, including performance against the expected standards of conduct.
405	Diversity and Equal Opportunity Management Approach	24
405-1	Diversity of Governance Bodies and Employees	25
413	Local Communities Management Approach	28
413-1	Operations With Local Community Engagement	28
413-2	Operations With Significant Actual and Potential Negative Impacts on Local Communities	PCA is not aware of any current operations that pose actual or potential material negative impacts on the communities where we operate.
416	Consumer Health and Safety Management Approach	26
416-1	Assessment of the Health and Safety Impacts	27
416-2	Incidence of Non-Compliance Concerning Health and Safety	PCA did not have any material incidents of non-compliance with product safety regulations or material incidents of non-compliance with voluntary product safety codes in 2022.



Membership of Associations

American Forest and Paper Association (AF&PA)

American Forest Resource Council (AFRC)

American Society for Quality (ASQ)

ASTM International

Corrugated Packaging Alliance (CPA)

Envelope Manufacturers Association (EMA)

Federal Water Quality Coalition (FWQC)

Fibre Box Association (FBA)

Forest Stewards Guild

Forest Stewardship Council® (FSC®)

Institute of Packaging Professionals (IoPP)

International Corrugated Case Association (ICCA)

International Corrugated Packaging Foundation (ICPF)

International Organization for Standardization (ISO)

International Safe Transit Association (ISTA)

National Council for Air and Stream Improvement (NCASI)

National Fire Protection Association (NFPA)

National Paper Trade Association (NPTA)

North American Forest Partnership (NAFP)

Programme for the Endorsement of Forest Certification (PEFC)

Pulp and Paper Safety Association (PPSA)

Recycled Paperboard Technical Association (RPTA)

Society for Human Resource Management (SHRM)

Society of American Foresters (SAF)

Supplier Ethical Data Exchange (SEDEX)

Sustainable Forestry Initiative® (SFI)

Sustainable Packaging Coalition (SPC)

Technical Association of Pulp & Paper Industry (TAPPI)

The Longleaf Alliance

The Nature Conservancy



Emission Factors and Global Warming Potential (GWP)

SCOPES 1 & 2	
Scope 1	U.S. EPA MRR: Final Rule (40 CFR 98) — Industrial Sector 2013
Scope 2 (2016–17)	U.S. EPA eGRID: eGRID 2017 v2 (w/ 2014 Data)
Scope 2 (2018)	U.S. EPA eGRID: eGRID 2018 (w/ 2016 Data)
Scope 2 (2019)	U.S. EPA eGRID: eGRID 2020 (w/ 2018 Data)
Scope 2 (2020)	U.S. EPA eGRID: eGRID 2021 (w/ 2019 Data)
Scope 2 (2021)	U.S. EPA eGRID: eGRID 2022 (w/ 2020 Data)
Scope 2 (2022)	U.S. EPA eGRID: eGRID 2023 (w/2021 Data)
SCOPE 3	
Category 1 — Purchased Goods and Services	<ul style="list-style-type: none"> – Life cycle assessment of caustic soda production: A case study in China, 2013 – Life cycle assessment study of starch products for the European starch industry association (AAF): Sector study, Figure 3 – Life cycle assessment of forest harvesting and transportation operations in Tennessee – Environmental impacts of roundwood supply chain options in Michigan: Life cycle assessment of harvest and transport stages
Category 2 — Capital Goods	– Carnegie Mellon University Green Design Institute (2020) Economic Input-Output Life Cycle Assessment (EIO-LCA) U.S. 2002 (428 sectors) Purchaser model
Category 3 — Fuel- and Energy-Related Activities	<ul style="list-style-type: none"> – U.S. EPA eGRID: Grid Gross Loss (GGL) – DEFRA GHG Conversion Factors for Company Reporting, 2021
Category 4 — Upstream Transportation and Distribution	<ul style="list-style-type: none"> – Life cycle assessment of forest harvesting and transportation operations in Tennessee – Environmental impacts of roundwood supply chain options in Michigan: Life cycle assessment of harvest and transport stages
Category 5 — Waste Generated in Operations	– U.S. EPA Solid Waste Management and Greenhouse Gases. A Life Cycle Assessment of Emissions and Sinks, 3rd edition.
Category 6 — Business Travel	<ul style="list-style-type: none"> – U.S. EPA MRR — Final Rule (40 CFR 98) — Industrial Sector 2013; EPA (2014) Inventory of U.S. Greenhouse Gas Emissions and Sinks – Air Travel factors from 2017 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. Version 1.0 August 2017
Category 7 — Employee Commuting	– EPA Hub (Mar 2018), CO ₂ , CH ₄ , N ₂ O emissions data for highway vehicles are from Table 2-13 of the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. Vehicle-miles and passenger-miles data for highway vehicles are from Table VM-1 of the Federal Highway Administration Highway Statistics 2015.
Category 9 — Downstream Transportation and Distribution	<ul style="list-style-type: none"> – EDF Green Freight handbook, Rail, Distance – U.S. EPA MRR — Final Rule (40 CFR 98) — Industrial Sector 2013; EPA (2014) Inventory of U.S. Greenhouse Gas Emissions and Sinks
Category 12 — End-of-Life Treatment of Sold Product	– EPA Emission Factors Hub (April 2021), Table 9
Categories 8 — Upstream Leased Assets, 10 — Processing of Sold Products, 11 — Use of Sold Products, 13 — Downstream Leased Assets, 14 — Franchises, 15 — Investments	Not Relevant
GLOBAL WARMING POTENTIAL	
CH ₄ (2016–2019)	25
N ₂ O (2016–2019)	298
CH ₄ (2020–2022)	28
N ₂ O (2020–2022)	265



Employer Information Report EEO-1, Employment Data

JOB CATEGORIES		NUMBER OF EMPLOYEES (Report employees in only one category)														TOTAL COLUMNS A-N
		RACE/ETHNICITY														
		HISPANIC OR LATINO		NOT-HISPANIC OR LATINO												
		MALE (A)	FEMALE (B)	MALE							FEMALE					
White (C)	Black or African American (D)			Native Hawaiian or Other Pacific Islander (E)	Asian (F)	American Indian or Alaska Native (G)	Two or More Races (H)	White (I)	Black or African American (J)	Native Hawaiian or Other Pacific Islander (K)	Asian (L)	American Indian or Alaska Native (M)	Two or More Races (N)			
Executive/ Senior-Level Officials and Managers	(1.1)	1	1	91	0	0	10	0	0	19	0	0	3	0	0	125
First/Mid-Level Officials and Managers	(1.2)	187	28	1,370	78	5	27	8	6	286	11	0	12	0	3	2,021
Professionals	(2)	54	58	578	19	1	26	2	11	401	24	3	23	1	4	1,205
Technicians	(3)	5	2	41	1	0	0	0	0	9	0	0	0	0	0	58
Sales Workers	(4)	33	62	364	6	1	2	1	0	286	10	0	4	6	7	782
Administrative Support Workers	(5)	35	20	200	16	0	7	0	3	132	9	1	2	1	2	428
Craft Workers	(6)	146	2	1,172	54	1	10	8	15	16	3	0	0	0	0	1,427
Operatives	(7)	1,519	185	3,455	1,003	48	169	30	106	410	138	16	15	3	16	7,113
Laborers and Helpers	(8)	315	124	779	302	13	38	11	26	158	62	3	8	1	7	1,847
Service Workers	(9)	3	3	18	3	0	0	0	0	6	2	0	0	0	0	35
TOTAL EMPLOYEES	(10)	2,298	485	8,068	1,482	69	289	60	167	1,723	259	23	67	12	39	15,041

EEO-1 Consolidated – Analysis Data as of 12/31/2022

Board of Directors

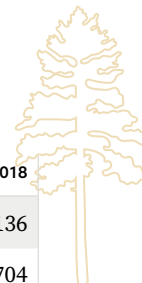
The table below lists the self-identified gender and race of each director by EEO-1 Classification.

	C. Beebe	D. Farrington	D. Harman	M. Kowlzan	R. Lyons	T. Maurer	S. Mencoﬀ	R. Porter	T. Souleles	P. Stecko
GENDER										
MALE		●		●	●	●	●	●	●	●
FEMALE	●		●							
RACE/ETHNICITY										
White	●		●	●	●	●	●	●	●	●
Hispanic										
Black or African American		●								
Asian										
Native Hawaiian or Other Pacific Islander										
American Indian or Alaska Native										
Two or More Races										

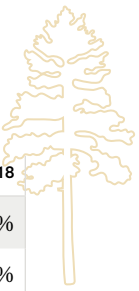


Master Data Table

	UNIT OF MEASURE	2022	2021	2020	2019	2018
PRODUCTION AND SHIPMENTS						
Containerboard Production	thousand tons	4,566	4,887	4,341	4,249	4,081
Corrugated Shipments	billion square feet (BSF)	63.4	65.7	62.8	59.4	58.9
White Paper (UFS) Production	thousand tons	506	572	648	947	1,017
OCCUPATIONAL HEALTH AND SAFETY						
Employee Days Away, Restricted or Transferred (DART)	cases x 200,000/ total hours worked	1.25	1.34	1.25	1.05	1.02
Employee Lost Time Case Rate (LTCR)	cases x 200,000/ total hours worked	0.47	0.61	0.63	0.49	0.44
Employee Total Case Rate (TCR)	cases x 200,000/ total hours worked	2.2	2.3	1.9	1.8	1.7
Employee Fatalities		0	1	0	0	0
Temp. Worker Days Away, Restricted or Transferred (DART)	cases x 200,000/ total hours worked	0.13	0	0	0.53	0.43
Temp. Worker Lost Time Case Rate (LTCR)	cases x 200,000/ total hours worked	0.06	0	0	0.36	0.26
Temp. Worker Total Case Rate (TCR)	cases x 200,000/ total hours worked	0.5	1.2	0.7	1.1	1.1
Temp. Worker Fatalities		0	0	0	0	0
LEARNING AND DEVELOPMENT						
Average Training Hours per Employee	hours/ employee	2.0	1.8	1.6	-	-
Female Employee Participation in Degree Pursuit Program		39	37	42	38	45
Male Employee Participation in Degree Pursuit Program		41	31	43	38	37
Female Co-Op Participation in Degree Pursuit Program		0	0	0	3	-
Male Co-Op Participation in Degree Pursuit Program		1	7	9	6	-
Total Participation in Degree Pursuit Program		81	75	94	85	82
Total Contribution for Degree Pursuit Program	U.S. dollars	\$444,100	\$446,300	\$435,000	\$468,200	\$396,500
EMPLOYMENT						
Grand Total New Hires		4,261	3,293	2,199	3,010	2,427
Total New Hires of Female Employees		835	630	331	519	449
Total New Hires of Male Employees		3,426	2,663	1,868	2,419	1,978
New Hires of Female Employees 18–24 Years Old		168	126	91	131	117
New Hires of Male Employees 18–24 Years Old		772	637	473	639	460



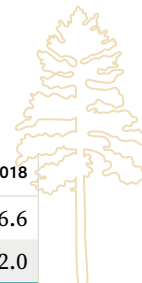
	UNIT OF MEASURE	2022	2021	2020	2019	2018
New Hires of Female Employees 25–34 Years Old		231	183	93	176	136
New Hires of Male Employees 25–34 Years Old		1,102	861	632	848	704
New Hires of Female Employees 35–44 Years Old		204	157	69	100	77
New Hires of Male Employees 35–44 Years Old		740	575	379	496	357
New Hires of Female Employees 45–54 Years Old		145	120	53	77	87
New Hires of Male Employees 45–54 Years Old		465	380	255	341	307
New Hires of Female Employees 55–64 Years Old		79	43	25	32	32
New Hires of Male Employees 55–64 Years Old		309	201	116	159	143
New Hires of Female Employees 65+ Years Old		8	1	0	3	0
New Hires of Male Employees 65+ Years Old		38	9	13	8	7
Grand Total of Employee Turnover		4,051	3,572	2,623	2,611	2,277
Total Turnover of Female Employees		749	616	437	461	397
Total Turnover of Male Employees		3,302	2,956	2,186	2,150	1,880
Turnover of Female Employees 18–24 Years Old		133	110	69	118	92
Turnover of Male Employees 18–24 Years Old		495	461	337	386	273
Turnover of Female Employees 25–34 Years Old		196	150	110	112	74
Turnover of Male Employees 25–34 Years Old		1,103	847	542	589	517
Turnover of Female Employees 35–44 Years Old		157	145	84	67	65
Turnover of Male Employees 35–44 Years Old		675	577	409	388	319
Turnover of Female Employees 45–54 Years Old		122	101	76	73	71
Turnover of Male Employees 45–54 Years Old		466	444	306	316	298
Turnover of Female Employees 55–64 Years Old		98	86	72	60	57
Turnover of Male Employees 55–64 Years Old		456	416	405	328	327
Turnover of Female Employees 65+ Years Old		43	24	26	31	38
Turnover of Male Employees 65+ Years Old		197	211	187	143	146
EMPLOYEES						
Total Employees		15,100	15,200	15,200	15,500	15,000
Total Salaried Employees		4,400	4,400	4,500	4,500	4,500
Total Hourly Employees		10,700	10,800	10,700	11,000	10,500
Employees Covered by Collective Bargaining Agreements (CBA)		6,527	6,840	6,634	6,930	6,615
Hourly Employees in CBA as % of Total Hourly Employees		61%	63%	62%	63%	63%
Employees in CBA as % of All Employees		43%	45%	44%	44%	45%
Percentage of Female Employees		17%	17%	16%	17%	17%



	UNIT OF MEASURE	2022	2021	2020	2019	2018
Percentage of Male Employees		83%	83%	84%	83%	83%
Percentage of Full-Time Employees		99.9%	99.9%	99.9%	99.9%	99.9%
Percentage of Part-Time Employees		0.1%	0.1%	0.1%	0.1%	0.1%
Percentage of Employees in USA		99.9%	99.9%	99.7%	99.7%	99.7%
Percentage of Employees in Canada		0%	0%	0.2%	0.2%	0.2%
Percentage of Employees in Hong Kong		0.1%	0.1%	0.1%	0.1%	0.1%
DIVERSITY, EQUITY AND INCLUSION						
Number of Female Directors		2	2	2	2	1
Number of Male Directors		8	9	9	10	10
Number of Directors 30–50 Years Old		0	0	0	0	1
Number of Directors Over 50 Years Old		10	11	11	12	10
Number of Male Directors 30–50 Years Old		0	0	0	0	1
Number of Male Directors Over 50 Years Old		8	9	9	10	9
Number of Female Directors Over 50 Years Old		2	2	2	2	1
Total Number of Directors		10	11	11	12	11
Number of Female Executive Officers		2	1	1	1	0
Number of Male Executive Officers		9	9	10	9	6
Number of Executive Officers 30–50 Years Old		0	1	2	2	1
Number of Executive Officers Over 50 Years Old		11	9	9	8	5
Number of Male Executive Officers 30–50 Years Old		0	1	2	2	1
Number of Male Executive Officers Over 50 Years Old		9	8	8	7	5
Number of Female Executive Officers Over 50 Years Old		2	1	1	1	0
Total Number of Executive Officers		11	10	11	10	6
Number of Female Officers		6	7	7	3	4
Number of Male Officers		25	22	23	21	19
Total Number of Officers		31	29	30	24	23
Number of Female Employees 18–24 Years Old		130	111	116	134	131
Number of Male Employees 18–24 Years Old		750	814	833	822	790
Number of Female Employees 25–34 Years Old		472	473	459	466	455
Number of Male Employees 25–34 Years Old		2,619	2,735	2,760	2,755	2,648
Number of Female Employees 35–44 Years Old		525	503	505	540	526
Number of Male Employees 35–44 Years Old		2,729	2,702	2,723	2,712	2,605
Number of Female Employees 45–54 Years Old		678	718	718	735	716



	UNIT OF MEASURE	2022	2021	2020	2019	2018
Number of Male Employees 45–54 Years Old		2,893	3,020	3,156	3,165	3,309
Number of Female Employees 55–64 Years Old		692	682	638	639	623
Number of Male Employees 55–64 Years Old		2,984	3,010	2,896	3,010	2,889
Number of Female Employees 65+ Years Old		97	75	64	68	67
Number of Male Employees 65+ Years Old		497	400	370	475	456
ENERGY						
Energy Consumption From Non-Renewable Fuel	million GJ	30.5	34.3	30.3	33.0	30.7
Energy Consumption From Renewable Fuel	million GJ	70.1	70.6	69.0	71.6	72.9
Energy Consumed From Purchased Electricity and Steam	million GJ	9.9	10.3	9.5	9.4	9.7
Energy Consumed From Self-Generated Hydroelectricity	million GJ	0.2	0.2	0.3	0.3	0.3
Total Energy Consumed	million GJ	110.7	115.4	109.1	114.3	113.6
EMISSIONS						
Scope 1 GHG Emissions	million metric tons CO ₂ e	1.81	1.95	1.77	1.91	1.80
Scope 2 GHG Emissions (location-based)	million metric tons CO ₂ e	1.07	1.06	1.10	1.20	1.28
Scope 2 GHG Emissions (market-based)	million metric tons CO ₂ e	1.43	1.62	1.38	-	-
Scope 3 GHG Emissions	million metric tons CO ₂ e	2.43	2.48	2.30	2.47	2.27
Total GHG Emissions (location-based)		5.31	5.49	5.17	5.58	5.35
Total GHG Emissions (market-based)		5.67	6.05	5.45	-	-
Biogenic CO ₂ Emissions	million metric tons CO ₂	6.28	6.32	6.16	6.40	6.52
Nitrogen Oxides (NO _x) Air Emissions	thousand metric tons	6.0	6.4	6.0	6.6	6.4
Sulfur Dioxide (SO ₂) Air Emissions	thousand metric tons	2.1	2.4	2.1	1.5	1.4
Particulate Matter 10 (PM ₁₀) Air Emissions	thousand metric tons	1.1	1.1	1.0	1.6	-
MATERIALS – WOOD FIBER SOURCING						
First-Use (virgin) Fiber Sourced	thousand green tons	13,731	13,986	13,933	15,021	14,668
Percent by Weight of First-Use Fiber Certified Sourced		31%	32%	33%	30%	30%
Percent by Weight of First-Use Fiber PEFC Certified Sourced		25%	27%	28%	26%	26%
Percent by Weight of First-Use Fiber FSC Certified Sourced		6%	5%	5%	4%	4%
Recovered Fiber Sourced	thousand tons	1,044	1,200	994	1,053	1,083
Market Pulp Sourced	thousand tons	2	53	18	6	4
PEFC Certified Product Sold, Corrugated	thousand tons	313.1	305.6	206.3	174.9	167.3
PEFC Certified Product Sold, White Paper	thousand tons	28.3	40.7	27.1	33.5	48.1



	UNIT OF MEASURE	2022	2021	2020	2019	2018
FSC Certified Product Sold, White Paper	thousand tons	37.9	66.8	72.2	116.5	126.6
Total Certified Product Sold	thousand tons	379.3	413.1	305.6	324.9	342.0
WATER AND EFFLUENTS						
Total Water Withdrawn	billion liters	261.2	274.9	270.8	273.9	280.5
Surface Water Withdrawn	billion liters	184.6	196.3	197.1	197.0	197.7
Percent of Surface Water for Process		58.9%	59.9%	61.9%	59.4%	60.9%
Percent of Surface Water for Cooling		40.8%	39.9%	37.9%	40.4%	38.9%
Percent of Surface Water for Potable		0.3%	0.2%	0.2%	0.2%	0.2%
Ground Water Withdrawn	billion liters	74.9	77.2	72.0	74.3	79.3
Percent of Ground Water for Process		89.6%	89.0%	87.1%	83.8%	85.5%
Percent of Ground Water for Cooling		10.0%	10.7%	12.7%	15.9%	14.3%
Percent of Ground Water for Potable		0.4%	0.3%	0.2%	0.3%	0.2%
Municipal Water Withdrawn	billion liters	1.7	1.4	1.7	2.6	2.8
Water Consumption	liters/ton of production	1,071	908	1,110	-	-
Total Water Discharges at Mills	billion liters	247.4	271.2	275.0	271.9	252.4
Percent of Water Discharges at Mills From Cooling		26%	25%	24%	23%	17.8%
Percent of Water Discharges at Mills From Receiving		74%	75%	76%	77%	82.2%
Biological Oxygen Demand (BOD)	lbs/ton of production	1.38	1.60	1.54	1.38	1.88
Total Suspended Solids (TSS)	lbs/ton of production	2.45	2.38	2.37	2.42	3.24
WASTE						
Process Waste Recycled or Beneficially Reused	thousand metric tons	625.1	616.0	583.9	600.4	525.7
Process Waste to Landfill	thousand metric tons	231.2	361.7	250.2	198.1	237.4
Hazardous Waste (disposed of by third party)		de minimis	de minimis	de minimis	de minimis	de minimis
Total Process Waste	thousand metric tons	856.3	977.7	834.1	808.8	809.1
COMMUNITIES						
Cash Donations	dollars, in thousands	\$1,609	\$944	\$985	\$3,726	\$2,764



Glossary

ADS Tons Air-Dried Short Tons. Pulp is generally reported as an air-dried product that is assumed to be 10% water and 90% dry pulp.

American Tree Farm System (ATFS) A group that works with private landowners to help them be effective stewards of forests.

Biodiversity (“biological diversity”) The variety of life on earth or in a specific habitat or ecosystem.

Biogenic Carbon Carbon dioxide (CO₂) emissions related to the natural carbon cycle, as well as those resulting from the combustion, harvest, digestion, fermentation, decomposition or processing of biologically based material such as plants, trees and other form of biomass.

Biogenic Fuel Fuel generated through the consumption of biomass. Generates biogenic carbon as opposed to the use of fossil fuels, which generates carbon that has long been removed from the natural carbon cycle (thus introducing additional carbon to the present day).

Biological Oxygen Demand (BOD) The amount of dissolved oxygen needed by aerobic biological organisms to break down organic material. Used to measure water quality.

Biomass Organic material that comes from plants and animals. In PCA’s case, that would be pulping byproducts like black liquor solids and wood waste (bark, knots, etc.).

Biomass Energy Energy derived by combusting fuel that is developed from organic material. In PCA’s case, pulping byproducts like black liquor solids and wood waste (bark, knots, etc.). Renewable source of energy.

Black Liquor The remaining water, after chemical reclamation processes, from kraft process pulping operations. Contains significant lignin and hemicelluloses. Typically processed to evaporate water and to combust the remaining biogenic material, providing heat, steam and electricity to power mill processes.

California Transparency in Supply Chains Act of 2010

Requires larger manufacturers and certain others that do business in California to publicly disclose their efforts to eradicate slavery and human trafficking from their supply chains.

Carbon Capture and Storage (CCS) A process that captures carbon dioxide emissions and either reuses them or stores them permanently so they will not enter the atmosphere.

Carbon Dioxide Equivalent (CO₂e) A metric to express the combined warming impact of various greenhouse gases (GHGs) in terms of carbon dioxide (CO₂). It is a standardized way to compare the global warming potential of different gases (e.g. methane and nitrous oxide) based on their ability to trap heat in the atmosphere over a specific time frame, typically 100 years.

Carbon Negative When more CO₂ is removed than emitted into the atmosphere.

Carbon Sink Something that stores more carbon than it emits, thus amounting to net removals of carbon from the atmosphere. The world’s largest carbon sinks include the ocean, soil and forests.

Caustic Soda Sodium hydroxide, NaOH, a strong base used in pulping processes.

Chain of Custody A certification that connects materials or products back to their original source. In the case of forest products like PCA’s, it requires connecting and documenting sequential steps through the supply chain from the original procurement of fiber, whether from recycled or certified forests, through each subsequent stage of processing and distribution.

Containerboard Paperboard specifically made for the construction of corrugated packaging (linerboard and corrugating medium). It is also used, to a lesser degree, in the manufacture of several other types of packaging.

Days Away Restricted or Transferred (DART) Refers to the number of recordable (human health and safety) incidents per 200,000 hours worked that resulted in workdays where the employee was assigned to a different task, restricted in their duties or transferred due to work-related injuries or illness.

Direct Emissions (Scope 1) Greenhouse gas emissions directly controlled by PCA.

Double-Lined Kraft (DLK) Corrugated scrap from box-making. Considered pre-consumer recycled material.

“Dual-Chain” (Dual Chain of Custody) PCA’s sheet plants are certified to SFI® and PEFC and are thus described as dual chain of custody.

ECF (Elemental Chlorine Free) A method of bleaching wood fiber from its natural color to white in various brightness levels.

Emissions-Free Energy Certificates (EFECs) Tradable, non-tangible energy certificates that certify and represent emission-free attributes of generating sources.

Fair Labor Standards Act (FLSA) U.S. law declaring the federal minimum wage and hour requirements for employees, along with overtime eligibility. It also divides employees into exempt and non-exempt (regarding eligibility for overtime pay).

Family and Medical Leave Act (FMLA) U.S. law that permits employees to take unpaid time away from work to address health and family matters.

First-Use (Fiber) Fiber that has been produced (pulped) directly from wood and is being used in its first “cycle” — prior to typically being recaptured and recycled back into fiber-based products like paper, containerboard, tissue and similar.

Forest Stewardship Council (FSC) An international sustainable forestry non-governmental organization, known for their voluntary standards on the topic. PCA has earned chain of custody and controlled wood certifications from FSC.



Fossil Fuel Fuels such as gas, oil, coal, petroleum, kerosene, propane, etc. Naturally found, finite resources used for energy production.

FSSC 22000 Food Safety System Certification 22000. Non-governmental organization that produces food safety standards, which are benchmarked and accepted by the Global Food Safety Initiative. Fastest-growing standards in terms of adoption in the U.S. and Europe. PCA's full-line packaging operations are predominantly certified to FSSC 22000.

Fugitive Emissions Emissions of gases released into the atmosphere accidentally and unintentionally, e.g., by spillage or leakage, from pressurized equipment.

Global Food Safety Initiative (GFSI) Initiative created by food industry and retail leaders to collaboratively drive continuous improvement in food safety management systems around the world.

Green Ton Weight of trees as these are harvested with full moisture content, about 50% water weight.

Greenhouse Gas (GHG) Gases like carbon dioxide, methane, nitrous oxide and chlorofluorocarbons (CFCs) that absorb and emit radiant energy.

Indirect Emissions (Scope 2) Emissions from the consumption of purchased electricity, steam, energy, etc., generated upstream of, but purchased by, PCA.

International Union for Conservation of Nature (IUCN) Considers itself the global authority on the status of the natural world and measures to safeguard it.

Kraft A paper- and paperboard-making process that utilizes cooking (rather than mechanical processes) to produce wood pulp from solid wood. Frequently used to produce high-strength paper and paperboard from softwood (coniferous) timber. Frequently employed to produce linerboard (the outer facings of corrugated fiberboard).

Life-altering injury An injury resulting in permanent or long-term impairment or loss of use of an internal organ, body function or body part.

Life-threatening injury An injury that if not immediately addressed is likely to lead to death.

Linerboard Containerboard specifically produced to be utilized as an outer facing in corrugated fiberboard and packaging.

Location-Based Scope 2 greenhouse gas emissions calculated based on the average emissions intensity of the region-wide electrical grid where a facility is located.

Lost Time Case Rate (LTCR) A mathematical calculation that describes the number of lost time cases per 100 full-time employees in any given time frame.

Market-Based Scope 2 greenhouse gas emissions calculated based on the specific electricity that a facility is buying.

Materiality Determination of that which is relevant or significant.

Methane A colorless, odorless, flammable gaseous hydrocarbon that when present in the atmosphere poses a greenhouse effect significantly more potent than carbon dioxide (CO₂). Methane is made up of four hydrogen atoms and one carbon atom and is expressed chemically as CH₄.

Metric Ton (Tonne) A unit of weight equal to 2,204 pounds or 1,000 kilograms. Differentiated from a short ton, which is equal to 2,000 pounds.

MRR Mandatory Reporting Regulation. EPA-issued regulations regarding mandatory reporting on GHG, defining what must be reported and by whom.

NatureServe A network of scientists who collect decision-quality data about species and ecosystems. Used by PCA to protect biodiversity-rich areas.

Net-Zero Carbon Emissions Achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere.

NO_x Term used to refer to nitric oxide (NO) and nitrogen dioxide (NO₂) that are produced when fuel is burned. It can contribute to smog and have health implications.

Occupational Safety and Health Administration (OSHA) U.S. Department of Labor group charged with ensuring safe and healthy working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.

Old Corrugated Containers (OCC) Used corrugated packaging that has been recaptured for purposes of recycling. OCC has a recapture rate of between 85% and 95% in the U.S.

Other Indirect Emissions (Scope 3) Greenhouse gas emissions occurring in the value chain, upon which PCA may have some influence, but limited control.

Particulate Matter (PM) Microscopic solid particles or liquid droplets found in the air. Can impact respiratory health and air quality.

Photosynthesis A process by which plants and other organisms transform sunlight, water and carbon dioxide to create oxygen and chemical energy in the form of sugar.

Programme for the Endorsement of Forest Certification (PEFC) PEFC is an international sustainable forestry standard/endorsement group and non-governmental organization. PEFC writes standards on the topic and recognizes other national or regional standards after benchmarking to their requirements. PCA has earned a chain of custody certificate from PEFC. PEFC recognizes and endorses SFI certification of fiber sourcing.

Renewable Energy Certificates (RECs) Tradable, non-tangible energy certificates that certify and represent energy generation from a renewable energy source.

Renewable Resources Resources that can replenish themselves naturally over time, e.g., wood products.

Safe Quality Food (SQF) A food safety and quality program that produces food safety standards, several of which are benchmarked/accepted by the Global Food Safety Initiative. PCA Marshfield is certified to SQF Level 2.



Saline Aquifer A geological formation consisting of water-permeable rocks that are saturated with salt water, and therefore unfit for consumption.

Semi-Chemical (Corrugating Medium) Containerboard specifically produced to serve as corrugating medium (to be fluted and bonded into the center of a corrugated sheet). Produced with a combination of mechanical and chemical cooking processes.

Serious Injury or Fatality (SIF) An injury resulting in a fatality or a life-threatening or life-altering injury often requiring hospitalization other than for observation or diagnostic testing, and results from a specific event at a work-related facility.

Short Ton (Net Ton) A unit of weight equal to 2,000 pounds. Differentiated from the long (gross) ton, which is equal to 1,000 kilograms, or 2,240 pounds.

SO₂ Sulfur dioxide is formed when fuels like oil and coal are burned. In sufficient concentrations, its presence can lead to the acidification of water and soil.

Stakeholder An individual or entity that has a concern or interest in a business.

Sustainability Accounting Standards Board (SASB) Provides sustainability accounting standards. Controlled by a foundation, chaired by Michael Bloomberg from 2014–2018.

Sustainable Forestry Initiative (SFI) SFI is a North American non-governmental organization that supports sustainable forestry and writes standards on the subject. PCA has the chain of custody and several sourcing certifications.

Terminations Employees who have voluntarily or involuntarily left employment in the reporting year.

Title VII of the Civil Rights Act of 1964 Federal law that prohibits employers from discriminating against employees on the basis of sex, race, color, national origin and religion.

Total Case Rate (TCR), officially, Total Incidence Rate (TIR) A mathematical calculation that describes the number of employees per 100 full-time employees who have suffered an injury or illness requiring medical treatment.

Total Suspended Solids (TSS) The dry weight of suspended particles that do not dissolve in water. These can be separated using a filter. Used to measure water quality.

“Triple-Chain” (Triple Chain of Custody) PCA’s mills and plants that are certified to all three sustainable forestry standards (SFI, PEFC and FSC) and are thus commonly referred to as triple chain of custody.

Turnover Percentage of employees who have voluntarily or involuntarily left employment in the reporting year.

Vertically Integrated A strategy and corporate architecture where a company owns and operates several operations or entities in order to manufacture from raw materials to finished/offered products. PCA is a vertically integrated packaging and paper company.



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Equal Employment Opportunity and Affirmative Action:

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<https://www.ncasi.org/resource/water-profile-of-the-us-forest-products-industry/>

NCASI Water Recycle Tool:

<https://www.ncasi.org/resource/ncasi-water-recycle-tool/>

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pefc.org/

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www.forests.org/

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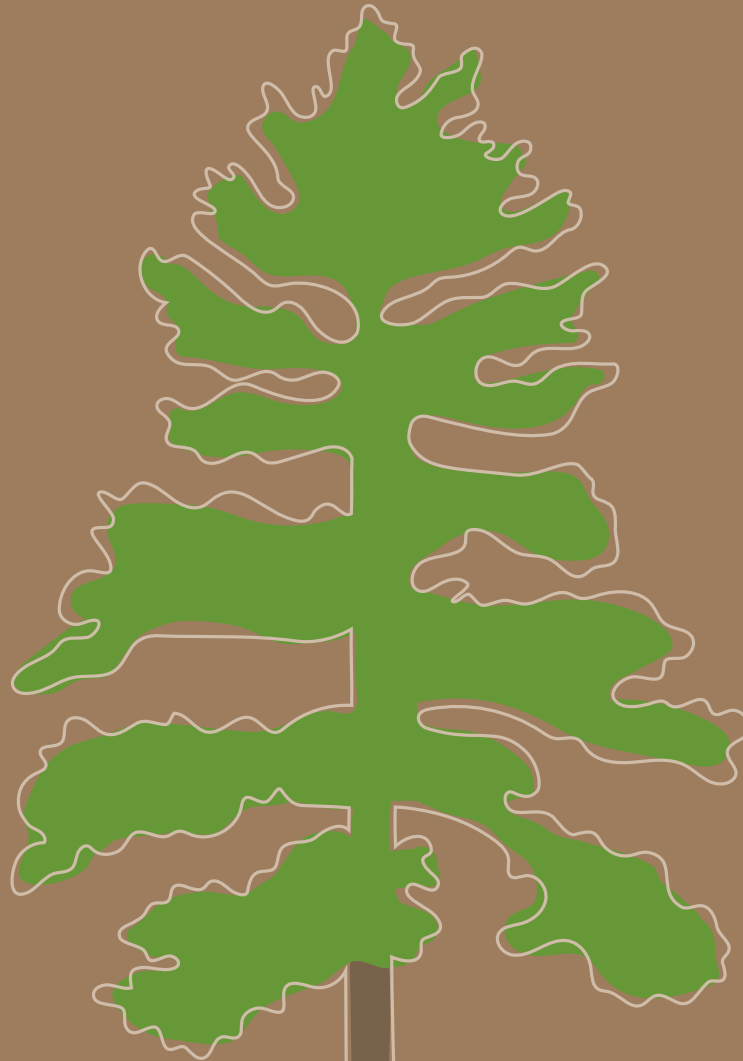
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PCA's Sustainable Business Principles

In May of 2022, PCA's Sustainability Committee of the Board of Directors formalized nine *Sustainable Business Principles* to align our strategies, set goals for the organization and report our progress through the year 2050.

- 1 **Prioritize the health and safety of our employees above all else to achieve a workplace free from serious injuries and fatalities.**
- 2 **Build a resilient culture oriented toward serving the needs of one another, and our stakeholders.**
- 3 **Invest in our people, our operations, technology and science, and our communities to attain unparalleled employee engagement, operational excellence and customer satisfaction.**
- 4 **Make a continuous effort to maximize the efficiency of everything we do to reduce the consumption of raw materials and minimize waste in all its forms.**
- 5 **Uphold the principles of sustainable forest management to provide ecological, social and economic benefits to the communities where we operate.**
- 6 **Increase the use of renewable or carbon-free energy sources until greenhouse gas emissions from fossil fuels have been effectively mitigated.**
- 7 **Be a good steward of the watersheds and aquifers we depend on by understanding water as a shared resource and collaborating with others to ensure water security.**
- 8 **Manufacture high-quality, high-performance products from responsibly sourced renewable materials that are recyclable or reusable.**
- 9 **Act with integrity and use responsible business practices to earn the trust of our stakeholders.**



When you choose Packaging Corporation of America, you work with **people** who do the right things for each other and for our **customers**. We believe in utilizing the power of strong collaborative relationships, bound by the **trust** we have earned, to deliver innovative paper and packaging solutions and an outstanding service experience.

People • Customers • Trust

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