



SUSTAINABILITY:
a foundation of the
forest products industry



American
Forest & Paper
Association

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Introduction

As a condition of membership, American Forest & Paper Association (AF&PA) companies have formally agreed to adhere to the Association's Sustainable Procurement and Environmental, Health & Safety (EHS) Principles. These self-imposed principles guide, demonstrate, and measure progress towards the industry's strong sustainability commitment to protecting the environment, the health and safety of employees, and their communities.

AF&PA Environmental, Health & Safety (EHS) Principles

The EHS Principles require members:

1. To make environmental, health, and safety considerations priorities in operating existing facilities, as well as in the planning of new operations.
2. To recognize, in developing and designing products to meet customer needs, the environmental, health, and safety effects of product manufacture, distribution, use, and disposal.
3. To monitor their environmental, health, and safety performance and to report regularly on these matters to their Boards of Directors, as well as to confirm their adherence to these principles annually to the American Forest & Paper Association.
4. To train employees in their environmental, health, and safety responsibilities and to promote awareness and accountability on these matters.
5. To improve environmental, health, and safety performance through support of research and development that advances the frontiers of knowledge.
6. To communicate with employees, customers, suppliers, the community, public officials, and shareholders to build greater understanding on environmental, health, and safety matters.
7. To participate constructively in the development of public policies on environmental, health, and safety matters.
8. To continue to pursue energy conservation, increased energy efficiency, greater utilization of alternatives to fossil fuels, and opportunities for cogeneration of electricity.

AF&PA Sustainable Procurement Principles

1. Take part in the Sustainable Forestry Initiative® program as a program participant; or
2. Adhere to the following principles:
 - i. Support programs that supply regionally appropriate information or services to forest landowners, describing the importance of and providing implementation guidance on best management practices (BMPs); reforestation; afforestation; visual quality management; management of harvest residue; control of invasive exotic plants and animals; characteristics of special sites; and conservation of critical wildlife habitat elements and threatened and endangered species, and Forests with Exceptional Conservation Value.
 - ii. Encourage landowners to utilize the services of qualified resource professionals and qualified logging professionals in applying principles of sustainable forest management.
 - iii. Maintain a program for the purchase of raw material from wood producers that have completed training programs and are recognized as qualified logging professionals.
 - iv. Maintain a program to address adverse weather conditions.
 - v. Monitor and evaluate the use of BMPs across the wood and fiber supply area.
 - vi. Monitor the use of BMPs by wood producers supplying the company's facilities and use the information to maintain rates of conformance to best management practices and to identify areas for improved performance.
 - vii. If the company procures wood fiber outside North America, maintain programs to:
 - Promote conservation of biodiversity hotspots and major tropical wilderness areas.
 - Ensure fiber sourcing programs support the principles of sustainable forestry, including efforts to thwart illegal logging.
 - Assess the risk that fiber-sourcing programs could acquire material from illegal logging.
 - Assess the risk that fiber-sourcing programs could take place in countries without effective laws addressing worker safety, fair labor practices, indigenous people's rights, anti-discrimination, anti-harassment, prevailing wages, and workers' right to organize.
 - viii. Individually and/or through cooperative efforts provide support or funding for forest research to improve forest health, productivity, and sustainable management of forest resources, and the environmental benefits and performance of forest products.
 - ix. Provide funding and other support for training and education programs to foster improvement in the professionalism of wood producers, including awareness and implementation of sustainable forest management practices.
 - x. Comply with applicable federal, provincial, state, and local forestry and related environmental and social laws and regulations.
3. Participate in one of the qualifying sustainable forest management programs, including chain-of-custody certification.

Welcome from AF&PA's President

We welcome you to the American Forest & Paper Association's 2010 Sustainability Report. AF&PA members continue to demonstrate leadership in sustainability, and their longstanding commitment to sustainability has produced remarkable progress in key indicators as shown in this report.

In the forest products industry, sustainability means that we strive to ensure our resources will be as plentiful and available to future generations as they are today; to preserve and grow the economic contributions of the industry and its businesses; and to foster the well-being of the communities where we live and work. Sustainable practices—forest management, efficient manufacturing, energy generation and conservation, and fiber recovery and recycling—define our dedication to protecting our environment and meeting our economic and societal commitments. These sustainable practices are the foundation of our industry and, therefore, they serve as the core of this report.

The specific practices identified by AF&PA members as those that define sustainability for the forest products industry, and which serve as the organizing basis for this report, are:

- Sustainable use of renewable resources
- Leading the way in recycling
- Reducing our environmental footprint
- Generating and conserving energy and materials
- Reducing greenhouse gases
- Benefiting the communities, employees, and families everywhere our products are made and sold

As members of AF&PA, companies are required to adhere to and report biennially on a rigorous set of Environmental, Health & Safety (EHS) Principles and sustainable forest management and procurement principles. The information in this report has been generated through our 2008 EHS performance verification survey of members, additional information pertaining to AF&PA sustainability activities, and data from government agency sources. Information regarding recent AF&PA initiatives in fiber procurement, recycling, and economic performance tracking is also included in this report.

Without question, the challenging economic conditions that became painfully apparent in 2008 and 2009 have had impacts on performance, most notably in the area of economic performance. However, as the report also shows, members have reacted to these challenges in proactive ways and continue to build on the strong progress already made to further improve sustainability performance for the future. Thank you for your interest in our industry. For additional information, please refer to our website at <http://www.afandpa.org>.

Best regards,



Donna Harman, President and CEO
June 2010



Executive Summary

The American Forest & Paper Association (AF&PA) is proud to present its sustainability report for 2010. AF&PA is the national trade association of the forest products industry, representing pulp, paper, packaging and wood product manufacturers, as well as forest landowners. These companies make essential products for people from renewable and recyclable resources that sustain the environment.

The information in this report has been generated through our 2008 EHS performance verification survey of members, additional information pertaining to AF&PA sustainability activities, and data from government agency sources. Information regarding recent AF&PA initiatives in fiber procurement, recycling, and economic performance tracking is also included in this report.

Adherence to the AF&PA EHS Principles is mandatory for our members. Members owning forestland must conform to an independent sustainable forest management program, and members that source wood fiber from the forest must comply with AF&PA Sustainable Procurement Principles.

Providing essential products and high-quality jobs, while pursuing a unique mission of wise and sustainable use of natural resources, the forest products industry has been a long-term leader in sustainability. AF&PA members subscribe to the sus-

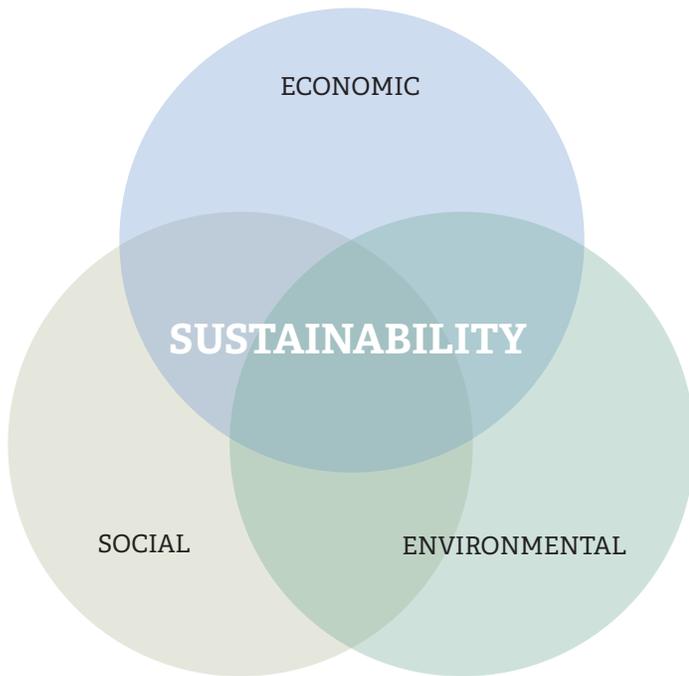
tainability concepts recognized by a number of international forums, including the United Nations General Assembly 2005 World Summit. These forums have established that the three essential pillars of sustainability – the economic, social, and environmental elements – are interdependent factors which must collectively support long-term viability, growth, and environmental improvement. Each pillar influences or is dependent upon the others, and business practices that support them often address more than one, often all three.

Economic Contributions

While each of the three pillars of sustainability is important and interdependent, economic sustainability is absolutely essential to the successful pursuit of overall sustainability. AF&PA member companies make important contributions to the economy globally, nationally, regionally, and especially within the communities in which they operate. The jobs they provide at pulp, paper, and wood products manufacturing facilities are for highly skilled employees and produce commensurate wages and salaries. Local purchases of raw materials, supplies, and

AF&PA members utilize the three interdependent pillars of sustainability – economic, social, and environmental – that must collectively support long-term viability, growth, and environmental improvement.





support services extend the economic reach of these operations well beyond the plant gate. Local taxes paid and financial contributions or donations made by companies provide important economic support for educational programs, civic organizations, and local government services.

Social Contributions

AF&PA members are committed to the communities in which they operate. They provide direct and indirect employment, contribute community volunteers, support education, advance health and safety practices, provide recreational opportunities, and support arts activities for local citizens. AF&PA member pulp, paper, and wood products mills utilize timber harvested from forest lands through sustainable forest management practices. These advanced timber procurement activities provide highly skilled manufacturing jobs, maintain the environment, and support local family-owned businesses in rural communities. Sustainable forest practices utilized by land managers that supply the mills also produce important ecosystem, recreation, and aesthetic benefits. Members respond to social needs on a global scale, providing natural disaster relief including building materials and assistance to world food programs. Member support for schools, educational curriculums, and other programs improve the lives of children worldwide.

Many forest products companies have established foundations to improve and add value to the quality of life in the communities where their employees live and work.

Participation in the development of Life Cycle Assessment (LCA) tools is leading an AF&PA member paper company to apply the tools to decision making regarding the use of recycled fiber in product design.

Environmental Performance

Enhancing and maintaining the environmental performance of the industry is a primary objective. This industry continually strives for environmental sustainability through pursuit of forest management standards, efficient manufacturing practices, specialized energy generation and conservation measures, fiber recovery and recycling activities, responsible use of water resources, and a continuous improvement focus. In turn, these environmental improvements, through reduction in waste and increased efficiencies, improve the economic health of AF&PA members. These improved economics provide financial resources for continued environmental improvements and social benefits to local communities.

AF&PA Sustainability Elements

AF&PA members have identified six practices to define sustainability for the forest products industry that span across all three pillars – economic, social, and environmental viability. These elements are:

- Sustainable use of renewable resources
- Leading the way in recycling
- Reducing our environmental footprint
- Generating and conserving energy and materials
- Reducing greenhouse gases
- Benefiting the communities, employees, and families everywhere our products are made and sold

This report highlights sustainability performance for each of the six elements.

1. Sustainable use of renewable resources

The products of the forest products industry, and the processes used to make them, are inherently sustainable. AF&PA members have shown leadership in development and use of forest certification programs and sustainable procurement principles.

- AF&PA members owning forestland must conform to an independent sustainable forest management program. These

include: the Sustainable Forestry Initiative (SFI®) program; systems endorsed by the international Program for the Endorsement of Forest Certification (PEFC), which in North America are the Canadian Standards Association program, the American Tree Farm System® and SFI; and the seven regional forest management standards developed for the U.S. by the Forest Stewardship Council (FSC).

■ These programs promote good forest management practices that guide forest management toward sustainable outcomes; ensure that timber and non-timber forest products are produced under the highest ecological, social and ethical standards; and integrate reforestation, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water resources, protection of wildlife and fish habitat, and maintenance of forest aesthetics.

6 ■ All AF&PA members sourcing fiber directly from the forest are required to adhere to the AF&PA Sustainable Procurement Principles. These require support of programs that supply regionally appropriate information and services to forest landowners regarding best management practices; reforestation; afforestation (conversion of non-forested land to forestland); visual quality management; management of harvest residue; and conservation of critical wildlife habitat, threatened and endangered species, and Forests with Exceptional Value.

2. Leading the way in recycling

Recovered fiber is an important raw material in the production of new paper products.

■ Leading the way, the paper industry has set and achieved incremental recovery goals since 1990. In the 20 years since, recovery has doubled. In 2009, 63.4 percent of U.S. paper consumed



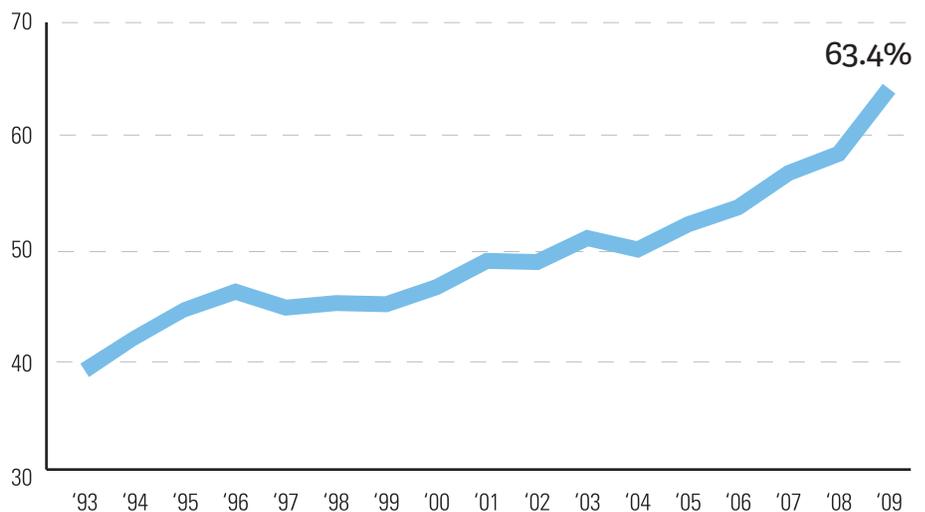
was recovered – surpassing AF&PA’s 60 percent recovery goal three years ahead of schedule.

■ AF&PA engages in a variety of programs and partnerships. To help educate students and their families about the importance of paper recycling, programs carried out in conjunction with Scholastic Books and the Keep America Beautiful organization deliver curricula straight

to the classroom. In addition, AF&PA is engaged with the Environmental Paper Network, the Environmental Protection Agency, and a variety of stakeholders that also encourage increased paper recovery.

■ The annual AF&PA Recycling Awards recognize outstanding business, school, and community recycling programs and share their best practices on paperrecy-

Paper and Paperboard Recovery Rate
(% of annual consumption recovered for recycling)



cles.org, so that they can be replicated by other organizations.

■ Recycling saves landfill space and eliminates associated greenhouse gas emissions that would be generated by decomposition of the landfilled paper.

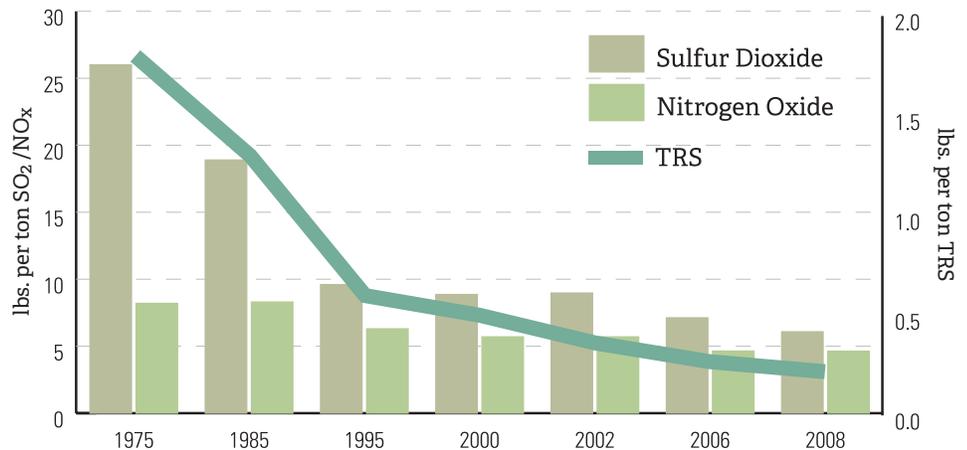
■ The use of recycled fiber also reduces the energy, and associated greenhouse gas emissions, required to manufacture a number of paper products.

3. Reducing our environmental footprint

Over the past several decades, forest products industry manufacturing facilities have dramatically reduced their environmental footprint. Modernization of manufacturing processes and expanded pollution control and prevention measures have produced these results. Having already achieved significant reductions in releases, recent incremental reductions in water and air emission releases have approached the practical limits of what is possible using existing technology. Nonetheless, the industry continues to pursue increased efficiencies and new innovations that will further enhance sustainability.

■ Pulp and paper mill air emissions, since 1995, have been substantially reduced. These reductions continued in 2008. Compared to 2006, sulfur dioxide releases decreased 14.6 percent, nitro-

Pulp and Paper Mill Emissions Reductions



gen oxides were unchanged, and total reduced sulfur (TRS) releases were reduced 18.6 percent.

■ At wood products facilities, nitrogen oxide releases (per 1000 board feet of product produced) have been reduced by 29 percent since 2000. However, between 2006 and 2008, these releases increased by 12.8 percent, reflecting a 39 percent reduction in collective AF&PA member production levels for this period due to the sustained drop in housing market starts.

■ Pulp and paper mill effluent discharge volumes (per ton of product produced)

have decreased 20 percent since 1995 but were largely unchanged since 2006. Since 1995, total suspended solids (TSS) and biochemical oxygen demand (BOD) effluent release rates have been reduced 41.1 and 29.4 percent, respectively, and remained largely unchanged from 2006 levels.

■ Pulp and paper mill releases of chlorinated compounds have been virtually eliminated. Adsorbable organic halides (AOX), chlorine, and chlorine dioxide releases remain at very low levels. Chloroform releases, also extremely low, decreased 34.7 percent between 2006 and 2008.

■ Aggressive reduction in pulp and paper mill U.S. EPA Toxic Release Inventory (TRI) releases for the core chemicals continued between 2006 and 2008, down another 14 percent. Methanol releases, the compound that made up 62 percent of core chemical releases, were reduced 22 percent since 2006. At wood products facilities, methanol releases have decreased 37 percent compared to 2006. Wood products formaldehyde re-



leases were reduced 26 percent between 2006 and 2008.

■ Pulp and paper mill process residual generation rates have been reduced 18.6 percent since 1995 and were essentially unchanged between 2006 and 2008. Forty-five percent of pulp and paper mill residuals and 96 percent of wood products facilities residuals were beneficially utilized in 2008.

■ All AF&PA members have once again demonstrated adherence to the Association's EHS Principles. They have reported pursuit of the principles through such practices as maintaining written environmental protection, health, and safety policies; accountability through reporting of environmental, health, and safety matters to corporate boards of directors; and utilization of environmental and safety measure compliance audits.

8 4. Generating and conserving energy and materials

Energy savings and the use of renewable fuels have been fundamental objectives of the industry for decades. The forest products industry has been tracking reductions in total energy, purchased energy, and fossil fuel use since the early 1970s and has taken a leadership role in pursuit of energy efficiency and reductions in fossil fuel use.

■ AF&PA member pulp and paper mills are largely energy self-sufficient, and some mills supply excess energy to the electric utility grid. Since 1990, energy use per ton of production has been reduced by 8.2 percent, and in 2008, total energy use per ton of production was nearly the same as in 2006.

■ Since 1990, purchased energy and fossil fuel use per ton of production was reduced by 26 percent. The percent of total energy supplied by purchased and

fossil fuel has been reduced during each reporting period since 1972 and was essentially unchanged in 2008 compared to 2006.

■ The forest products industry, with its reliance on renewable biomass energy, leads all other manufacturing industries in the use of renewable fuels. In 2008, 65 percent of the energy needed to operate member pulp and paper mills was produced from renewable fuels. At wood products facilities, renewable fuels produced 73.5 percent of needed energy. U.S. Department of Energy data shows that pulp and paper mills and wood products facilities, together, produced 94 percent of the renewable fuel energy generated by all manufacturing facilities in all sectors.

■ Virtually all AF&PA member facilities that generate electricity on-site do so using cogeneration technology. In 2008, the forest products industry surpassed the chemical industry and became the

leader among all manufacturing sectors in the use of cogeneration technology, generating 37 percent of the total energy produced by cogeneration capable systems within all manufacturing sectors.

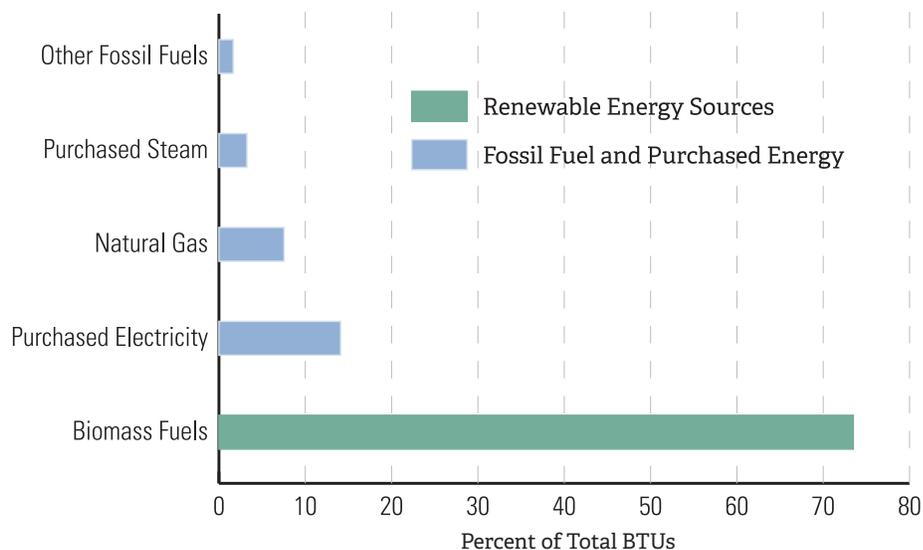
5. Reducing greenhouse gases

The forest products industry provides valuable solutions to climate change issues by carefully managing private forests that absorb carbon dioxide, reducing emissions from manufacturing processes, manufacturing products that store carbon and are made from renewable and recyclable raw materials, and generating and using renewable energy.

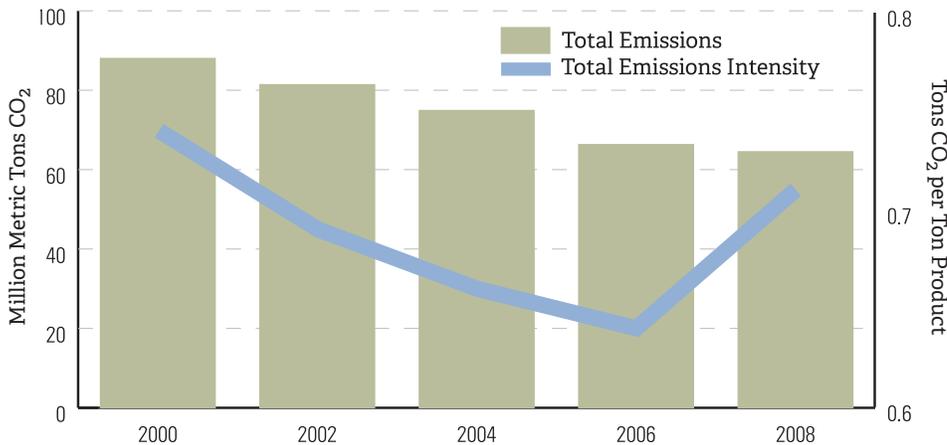
Emissions Intensity

AF&PA members are committed to reducing greenhouse gas emissions intensity 12 percent by 2012 (expressed in metric tons of CO₂ per ton of product), compared to a year 2000 baseline. This includes both direct emissions (those generated at AF&PA member manufac-

2008 Wood Products Facility Energy Sources



Member Greenhouse Gas Emissions (Total Direct and Indirect)



An AF&PA member's design and construction of an environmentally clean and energy efficient greenfield sawmill is expected to produce annual energy savings of \$293,432 for that company. The project took 18 months and will reduce greenhouse gas emissions per board foot of production. Total CO₂ emission savings are expected to be 1,200 metric tons per year. The mill worked with local utilities on incentives to use state-of-the-art technologies. It will require less energy and raw material to produce finished products.

turing facilities) and indirect emissions (those associated with purchased electricity). AF&PA members made progress towards this goal; in fact, they had exceeded it in 2006, but the data presented in this report indicate that it was a challenge to maintain this progress in 2008. Pulp and paper mills maintained their improvement in 2008. The greenhouse gas emissions intensity for wood products facilities increased in 2008, however, due to lower operating rates resulting from the sustained drop in housing market starts, product mix changes, and reduced wood products membership in AF&PA. Overall, the greenhouse gas intensity for the industry increased slightly from 2006.

■ At pulp and paper mills, the combined direct and indirect emissions intensity rate for 2008 was 14.1 percent lower than in 2000 and 1.3 percent lower than in 2006.

■ The share of energy-intensive categories of wood products produced by AF&PA membership increased substantially in 2008. Furthermore, government regulations required air pollution controls that operate on natural gas and release additional greenhouse gases. As a result, the 2008 total direct and indirect emissions intensity for member wood products facilities increased 26.8 percent since 2000 and 32.7 percent compared to 2006.

■ Combined, AF&PA member greenhouse gas intensity decreased 4.3 percent since 2000 but increased 10.8 percent compared to 2006. Almost 90 percent of the increase from 2006 can be attributed to the changes in the wood products share of total membership production.

Absolute Emissions Reductions

On an absolute basis, both direct and indirect greenhouse gas emissions at member pulp and paper and wood products industry facilities have decreased.

■ Combined, pulp and paper mill and wood product facility direct greenhouse gas emissions have been decreased 36.6 percent, 4.2 percent since 2006.

■ Combined, pulp and paper mill and wood product facility indirect greenhouse gas emissions have been decreased 4.1 percent since 2000, with a 0.4 percent decrease since 2006.

■ Total direct and indirect emissions from AF&PA member facilities amounted to 64.5 million metric tons of CO₂ equivalents in 2008. This is a 26.7 percent reduction in emissions from member facilities compared to 2000. Nearly 40 percent of this reduction can be attributed to efficiency improvements and reduced fossil fuel use.

The Carbon Cycle

■ Growing forests, the source of the basic raw material for the industry, naturally absorb carbon dioxide from the atmosphere and store it as carbon in trees, and forest products contain the carbon absorbed from the atmosphere. In 2008, because of the reduction in wood products facility production, the quantity of CO₂ equivalents contained in forest products decreased by 29 percent compared to 2006.

■ Paper in landfills decomposes and produces methane gas, a powerful green-

house gas. In 2008, the landfill methane avoided emissions were 20.2 million metric tons of CO₂ equivalents. Between 2000 and 2006, the greenhouse gas emissions that have been avoided through paper recovery and removal from the landfill waste stream have amounted to between 21 and 24 million metric tons of CO₂ equivalents annually.

Advantages of Wood as a Building Product

As a building material, wood requires less energy to produce, transport, construct, and maintain than available alternatives. Less energy use translates into fewer greenhouse gas emissions. When comparing environmental impacts of a typical wood-frame house to similar structures constructed of steel or concrete over a 20 year period:

■ The house built of steel would emit 26 percent more greenhouse gases than the comparable wood-based home.

■ The house made from concrete would emit 31 percent more greenhouse gases than the comparable wood-based home.

6. Benefiting the communities, employees, and families everywhere our products are made and sold

Economic Contributions

The forest products industry, though challenged by recent economic conditions, remains a significant and important contributor to U.S. gross domestic product (GDP).

■ The industry accounts for approximately five percent of U.S. manufacturing GDP; is among the top 10 manufacturing employers in 48 states; and employs nearly 900,000 people earning \$50 billion annually. In addition, indus-

try companies produce \$175 billion in products annually.

■ Forest product industry economic performance is a key concern as recovery from the recession continues. This market downturn has severely affected forest products industry supported communities where, since 2006, more than 390,000 employees have lost jobs, including 124,000 in 2009 alone. In 2009, paper and market pulp production levels were 12.5 percent below those of 1995.

■ Housing starts, which hovered around 2 million units a year in 2004 and 2005, had declined to 554,000 in 2009, their

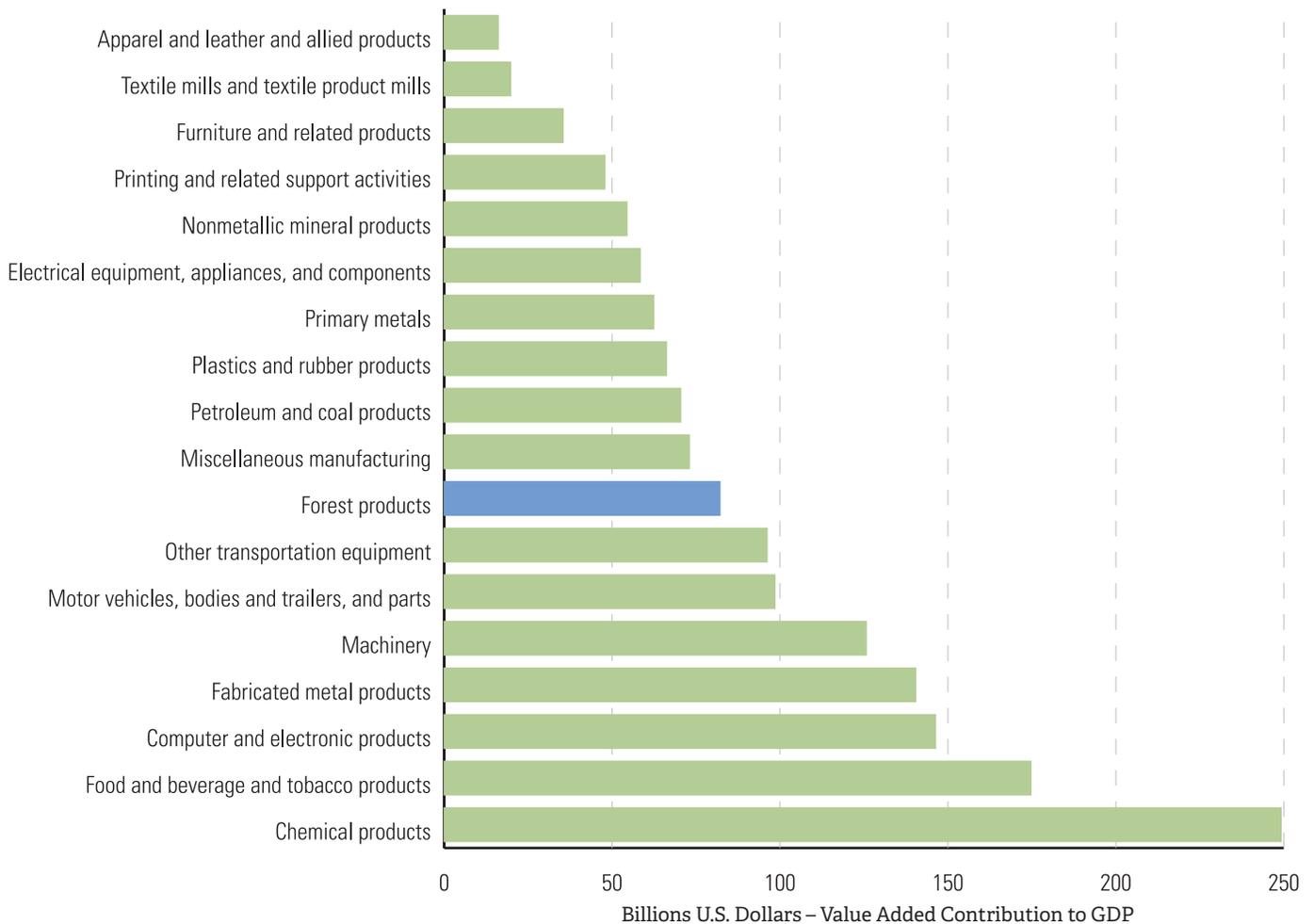
lowest level in more than a half century. Starts have been edging higher since late 2009, but the rebound has been gradual by historical standards. Reflecting this trend, U.S. production of wood products declined 39% between 2006 and 2009.

■ Although at reduced rates, companies have continued to make investments in new processes and equipment. Paper mill and allied product company capital expenditures were \$7.6 billion in 2006 and \$6.3 billion in 2008.

■ Exports continue to be an important element in U.S. forest products revenue streams. From 2002 to 2008, forest prod-



Manufacturer Contribution to GDP (2007 U.S. Commerce Department Data)



ucts exports grew by almost 50 percent, from \$18.2 billion to \$27.1 billion. Exports dropped by 14.4 percent in 2009 but have risen by 19.5 percent year-over-year in the first two months of 2010.

Social Contributions

AF&PA members make substantial contributions to the social well-being of the communities in which they operate.

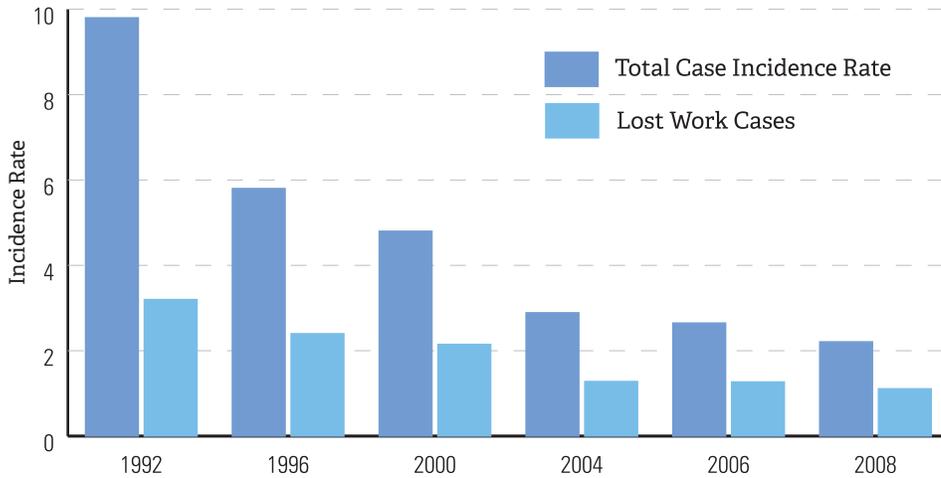
■ They provide highly skilled jobs paying commensurate wages that include

important benefits such as worker health care. They support local community programs and those benefiting society at the state, national, and international levels. The forest areas from which the industry’s raw materials are obtained are sustainably managed to provide important ecosystem services and aesthetic benefits.

■ Safety programs at 84 pulp and paper mills were enrolled in the Department of Commerce’s prestigious OSHA worker safety Voluntary Protection Pro-

gram (VPP). Sixty-seven wood products facility programs were also enrolled. Compared to 2006, pulp and paper mill worker accident and illness total case incidence rates were 16.6 percent lower in 2008. Lost work cases were 12.6 percent lower. At wood products facilities, total case incidence rates were 19.4 percent lower, but lost work cases were slightly higher by 3.4 percent. In 2008, there were six fatalities at member pulp and paper mills, and one fatality at wood products facilities. Member company and govern-

Member Pulp and Paper Mill Occupational Injuries and Illnesses



ment agency personnel conduct detailed investigations after any fatality.

■ AF&PA members are active in their communities. Eighty-seven percent reported they participated in community outreach activities, including philanthropic support for environmental programs or groups and serving on community advisory groups. Sixty-four percent aided school education programs, while 74 percent supported community social programs.

■ AF&PA members actively pursued public engagement and reporting in 2008. Ninety-five percent of members engaged in public policy development activities. Seventy-five percent met with

public officials. Ninety-seven percent of members conducted employee involvement programs.

Sustainability and the Road to the Future

AF&PA members are pursuing their commitment to sustainability through innovation and environmental stewardship. To stay on track for continuous improvement, they continue to support research and development efforts within their companies, industry research organizations, academic institutions, and cooperative partnerships with governments and stakeholders.

An aerial photograph of a vast, dense forest of evergreen trees, likely spruce or fir, covering a hillside. The trees are tightly packed, creating a textured green canopy. The lighting is soft, suggesting an overcast day or a shaded forest environment. The overall tone is natural and serene.

REPORTING SUSTAINABILITY PROGRESS

1. Sustainable Use of Renewable Resources

Sustainable Forestry and Procurement

AF&PA members have shown leadership in development of and participation in forest certification programs. All AF&PA members owning forestland must conform to one or more of the major credible certification systems in the United States. These include: the seven regional forest management standards developed for the U.S. by the Forest Stewardship Council (FSC); the Sustainable Forestry Initiative® (SFI®) program; and systems endorsed by the international Program for the Endorsement of Forest Certification (PEFC). In North America, PEFC has endorsed the Canadian Standards Association program and the American Tree Farm System®, as well as SFI.

Currently, all AF&PA members owning forestland participate in the SFI program. The SFI provides a set of forestry principles designed to meet present needs without compromising the future of forests and forest products. The land stewardship ethic required by these principles integrates reforestation, nurturing, and harvesting of trees for useful prod-

ucts with the conservation of soil, air and water resources, protection of wildlife and fish habitat, and maintenance of forest aesthetics.

Across North America, close to 200 million acres/80 million hectares are certified to the SFI forest management standard. This makes the SFI standard the largest single standard in the world. The SFI program is directed by an independent non-profit organization, the Sustainable Forestry Initiative Inc., which is governed by a multi-stakeholder Board of Directors comprised of 18 members. The Board has equal representation from environmental, economic, and social sectors.

In addition, all AF&PA members sourcing fiber directly from the forest

management; management of harvest residue; conservation of critical wildlife habitat; threatened and endangered species; and Forests with Exceptional Value. Among other things, these principles encourage the use of qualified resource professionals and loggers when applying sustainable forest management principles and encourage programs for the purchase of raw material from recognized qualified logging professionals.

To comply with this procurement policy, most members opt to participate in fiber source requirements, unique to the SFI program, that provide specific objectives addressing the above elements. While both the PEFC and FSC protocols include chain-of-custody elements that track the flow of fiber from certified lands

AF&PA member companies in Florida, along with the Florida Division of Forestry, host a Florida Forests Teachers Tour to give them the opportunity to see demonstrations of harvest operations, the papermaking process and a variety of other forestry-related activities that underscore the value of sustainable forestry.

are required to adhere to the organization's Sustainable Procurement Principles. These principles require support of programs that supply regionally appropriate information and services to forest landowners regarding best management practices; reforestation; afforestation (conversion of non-forested land to forests); visual quality manage-

to end markets, neither protocol provides objectives that address the vast majority of forested acres which are not certified. The SFI protocol also includes chain-of-custody elements. AF&PA members participate in one or a combination of these programs. In doing so, they fulfill their commitment to the AF&PA Sustainable Procurement Principles.

2. Leading the Way in Recycling

Record High Recovery

In 2009, an impressive 63.4 percent of the paper consumed in the U.S. was recovered for recycling. This achievement is thanks to industry leadership and the ongoing commitment of millions of

The paper industry has set and achieved incremental recovery goals since 1990. In the 20 years since, recovery has doubled, surpassing the industry's most recent 60 percent goal three years ahead of schedule.

Americans who recycle at home, school, and work on a daily basis.

Leading the way, the paper industry has set and achieved incremental recovery goals since 1990. In the 20 years since, recovery has doubled, surpassing the industry's most recent 60 percent goal three years ahead of schedule.

Paper recovery removes a valuable resource from the waste stream, and uses it to produce new paper products. Further, recycling saves landfill space, thereby eliminating associated greenhouse gas emissions.

AF&PA Recycling Incentive Programs

In order to achieve its mission of ensuring a continuing and expanding domestic recovered fiber supply to help meet global demand, AF&PA engages in a variety of programs and partnerships. To help educate students and their families about the importance of paper recycling, programs carried out in conjunction with Scholastic Books and the Keep America Beautiful organization deliver curricula straight to the classroom. In addition, AF&PA is

engaged with the Environmental Paper Network, the Environmental Protection Agency, and a variety of stakeholders that also encourage increased paper recovery.

Further, the annual AF&PA Recycling Awards recognize outstanding community, business, and school paper recycling programs. Together, the 2010 award winners – the city of Virginia Beach, Virginia, Continental Airlines, and the Parkway School District in Chesterfield, Missouri – recovered more than 27,000

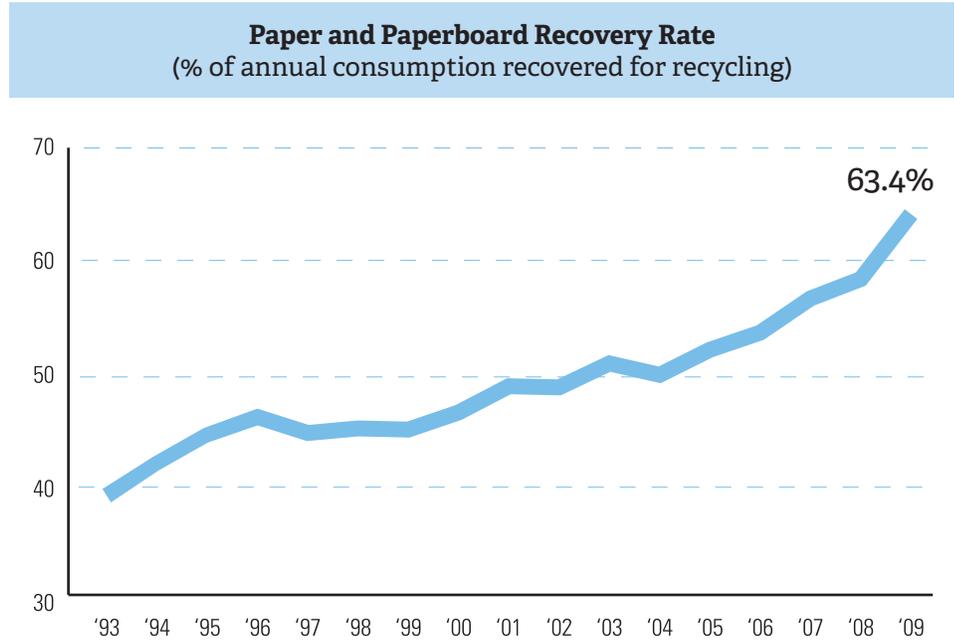
tons of paper and paper-based packaging for recycling in 2009.

■ Developed in 1997, the Virginia Beach recycling program includes a customized, voluntary, single-stream, automated system that services 124,000 residents, 94

City schools, and 106 municipal buildings, along with five public-use drop-off sites. Thanks to a variety of education and outreach efforts, the City of Virginia Beach recovered nearly 23,800 tons of paper and paper-based packaging in 2009 – more than 68 percent of all recyclables collected.

■ Thanks to a renewed commitment to the environment in recent years, Continental Airlines has significantly increased the effectiveness of its recycling program by maximizing cost-effective, manageable, and sustainable collection efforts. Continental has recovered 6,000 tons of paper from its aircraft, hubs, offices and supporting facilities in recent years.

■ The Parkway School District, serving 18,000 students in 29 buildings, started their recycling program after several elementary students requested of the Board of Education that they be better environmental stewards. The results are impressive, including the recovery of more than



For the latest AF&PA information regarding recycling programs and resources visit paperrecycles.org

1,031 tons of newspaper, magazines, catalogs, direct mail, office paper, envelopes, and brochures, along with more than 138 tons of paper-based packaging in 2009.

For details on the award-winning programs, case studies of previous winners, free downloadable classroom materials, statistics, interactive features and more, visit www.paperrecycles.org.

Additional Benefits of Recycling

In addition to providing an important fiber source for papermaking, there

are other important benefits from the AF&PA paper recovery efforts. Paper recycling is an important element in the effort to manage greenhouse gas emissions. Keeping paper out of landfills, where it would otherwise decay, reduces the production of methane, a greenhouse gas. Paper recovery diverts these paper products from the landfill waste stream. The use of recycled fiber also reduces the energy, and associated greenhouse gas emissions, required to manufacture a number of paper products.

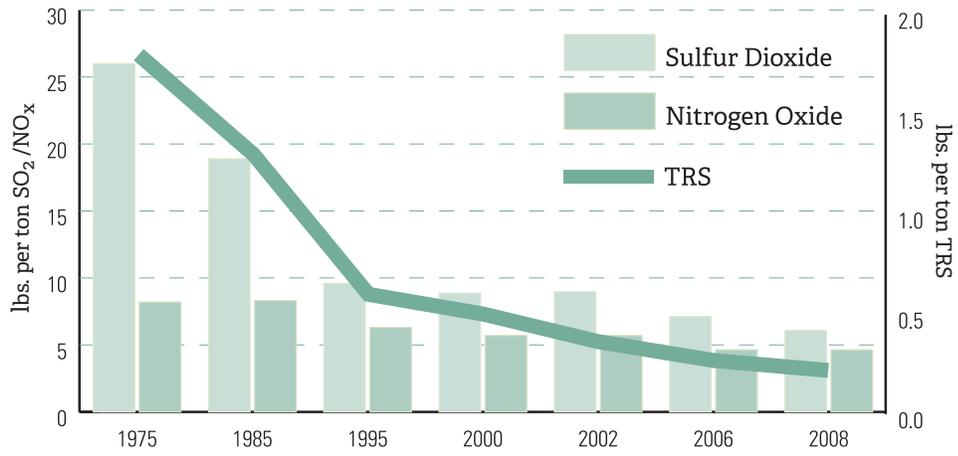
3. Reducing Our Environmental Footprint

The forest products industry has worked for decades to reduce impacts on the environment. By striving for sustainable use of natural resources today, members seek the same opportunities for future generations. AF&PA's EHS reporting and tracking system shows how the industry has significantly reduced discharges to both air and water while also extensively decreasing the generation of waste. Modernization of manufacturing processes and expanded pollution control and prevention measures have produced these results. And, indeed, the job is not done. Having already achieved significant reductions in releases, recent incremental survey-to-survey reductions in some releases have slowed. In addition, survey-to-survey changes of a few percentage points, up or down, may not differ from normal variability. However, AF&PA members are looking forward. Additional gains must, and will, come from new technological advances and more aggressive capital expenditures.

Pulp and Paper Mill Air Emissions Releases

Improved process controls, installation of new air pollution control equipment and the use of biomass and low sulfur fuels have resulted in substantial reductions in air emissions from member pulp and paper mills during the past several decades. This progress has been made in all phases of mill operations from pulping, bleaching and chemical recovery to power generation operations. AF&PA's tracking of air emissions reduction progress shows that:

Pulp and Paper Mill Emissions Reductions



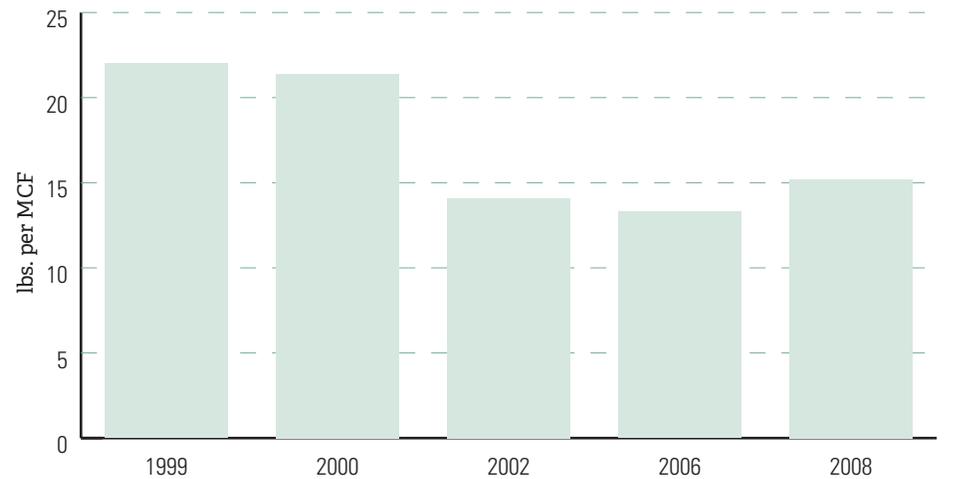
- Sulfur dioxide (SO₂) releases have been reduced by 36.7 percent since 1995. Between 2006 and 2008, these releases decreased by 14.6 percent. Sulfur dioxide releases were 6.08 lbs. per ton of product produced in 2008 vs. 7.12 lbs. per ton in 2006.
- Since 1995, nitrogen oxide (NO_x)

releases have been reduced by 26.5 percent. Releases in 2008 were unchanged from those in 2006, 4.6 pounds per ton of product produced.

■ Total Reduced Sulfur (TRS) compound releases have been reduced by 63.5 percent since 1995. Significant reductions continued between 2006 and

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Member Wood Products Facility NO_x Reductions



2008, 0.219 pounds per ton in 2008 compared to 0.269 lbs. per ton in 2006, an 18.6 percent reduction.

Wood Product Facility Air Emissions Releases

AF&PA has been tracking wood products facility air emissions releases since 1999. Improved boiler operations and modernized equipment have reduced emissions.

■ Since 2000, nitrogen oxide (NO_x) releases at member wood products facilities have decreased 29 percent. NO_x releases from these member operations increased by 14.3 percent, from 13.3 to 15.2 lbs. per thousand cubic feet (MCF) of product produced, between 2006 and 2008. Likely causes for the increase are a combination of reduced production levels due to the recent economic downturn and the start-up at some facilities of new government required air pollution controls that operate on natural gas where NO_x is a by-product. Wood products facilities do not produce significant SO₂ or any TRS releases.

Pulp and Paper Mill Water Discharges

Pulp and paper mills were among the first industries to develop and invest in effluent treatment technologies. Primary treatment systems were in common use in the 1950s. By the early 1970s, fully operational primary and secondary effluent treatment systems were in use at

An AF&PA member pulp and paper mill has used a collaborative approach with stakeholders to implement a river restoration plan. Process modifications improved effluent color, reduced BOD releases, and allowed for enhanced river designated uses.

all U.S. mills – an accomplishment that mills in other countries would not match for decades.

AF&PA water discharge tracking data shows:

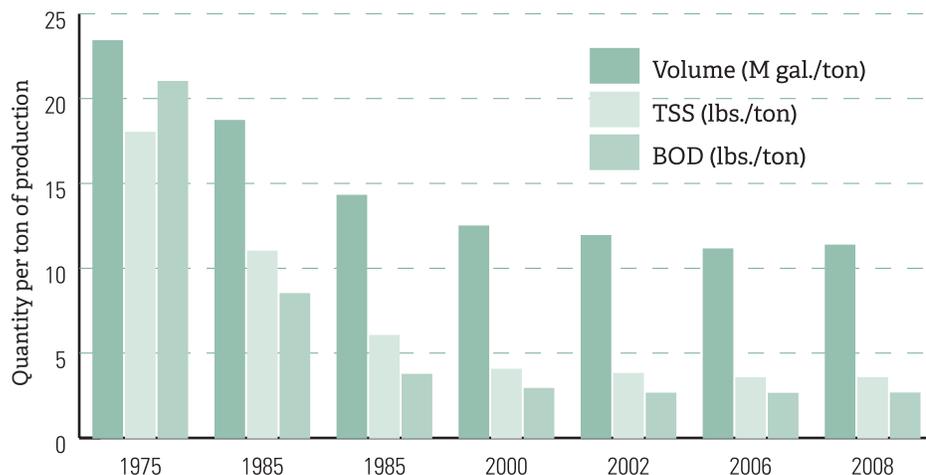
■ The volume of water discharged from pulp and paper mills has decreased 20.5 percent since 1995. Advances in mill process technologies, enhanced water

recycling and reuse practices, and active conservation efforts have reduced the amount of water needed to produce a ton of product. In 2008, largely due to decreases in production, the average water discharge volume from member mills was 2.1 percent higher (11.4 thousand gallons per ton of product) than in 2006 (11.1 thousand gallons per ton).

■ Total suspended solids (TSS) are fibrous and finely divided materials, such as clay particles, that are not retained in pulp and papermaking processes. The vast majority of this material (80 to more than 90 percent) is removed from the effluent stream by mill treatment systems. Advances in mill processes and effluent treatment practices have continued to reduce the amount of this material in mill water discharges. Since 1995, TSS releases have been reduced by 41.1 percent. Member mill TSS releases per ton of product produced were largely unchanged at 3.6 pounds per ton in 2008 versus 3.5 pounds per ton in 2006.

■ Effluent treatment systems developed and used by pulp and paper mills are very effective at removing biochemical oxygen demand (BOD), the organic contaminants in effluents that can deplete oxygen needed to support aquatic organisms in receiving streams. Mills continue to optimize BOD removal performance from existing systems and evaluate alternative, high efficiency, treatment technologies. Since 1995, member average BOD releases have been reduced 29.4 percent. Member mill BOD releases per ton of product produced were unchanged

Pulp and Paper Mill Water Discharge Reductions



from 2006 to 2008, 2.6 pounds per ton.

Pulp and Paper Mill Chemical Compound Release Reductions

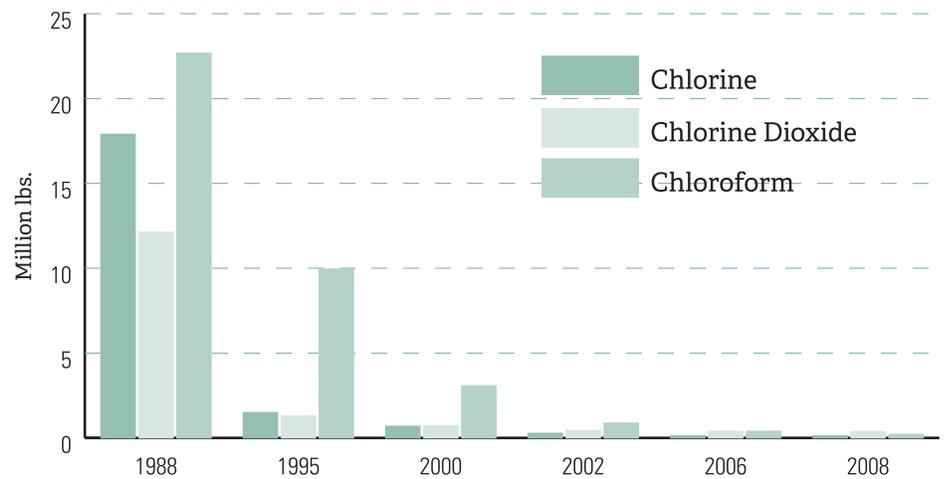
Chlorinated compound releases from bleached kraft pulp mills have been virtually eliminated through the use of Elemental Chlorine Free (ECF) bleaching processes and pulp mill air emission control systems.

■ Since 1995, releases of adsorbable organic halides (AOX) in bleached pulp and paper mill effluents have been reduced by 80.4 percent. In 2008, AOX releases were just 0.198 kilograms per metric ton of unbleached pulp produced, two percent lower than releases in 2006, 0.202 kilograms per metric ton.

Industry reports chemical releases to the U.S. EPA Toxic Release Inventory (TRI) database annually. Tracking release quantities for chlorine compounds provides important trend information regarding these substances.

■ Chlorine releases, primarily from air emission sources, at all reporting pulp

Pulp and Paper Mill Chlorine Compound Release Reductions (U.S. EPA data)



and paper mills have been decreased by 91.6 percent since 1995. Chlorine releases in 2008 were essentially the same as in 2006, just 0.3 percent lower.¹

■ Chlorine dioxide releases have decreased 71.1 percent since 1995. Compared to 2006, chlorine dioxide releases

decreased 3.6 percent in 2008.

■ Chloroform releases were reduced 97.8 percent since 1995. Between 2006 and 2008, chloroform releases decreased by 34.7 percent.

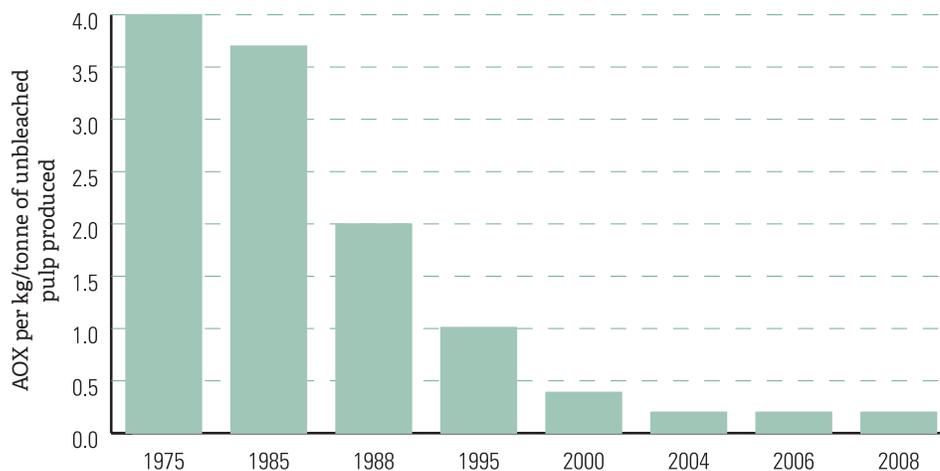
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Pulp and Paper Mill TRI Chemical Releases

Periodically, U.S. EPA changes the list of chemicals for which release reports must be filed. When this occurs, new chemicals are added, some substances can be removed from the list, or reporting thresholds are modified. A list of Core Chemicals, first established in 1988, remains relatively constant. Therefore, data regarding the release of these compounds is used to compare annual reporting trends. Since 1988, TRI substance releases have steadily declined at both pulp and paper mills and wood products manufacturing facilities.

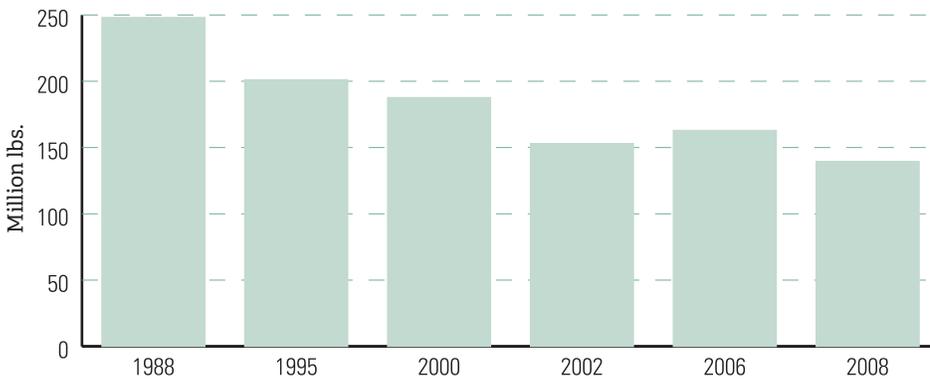
■ Pulp and paper mill TRI core chemical releases have decreased 31 percent since 1995. Between 2006 and 2008, these releases decreased 14 percent. These reduc-

Member Pulp Mill AOX Release Reductions

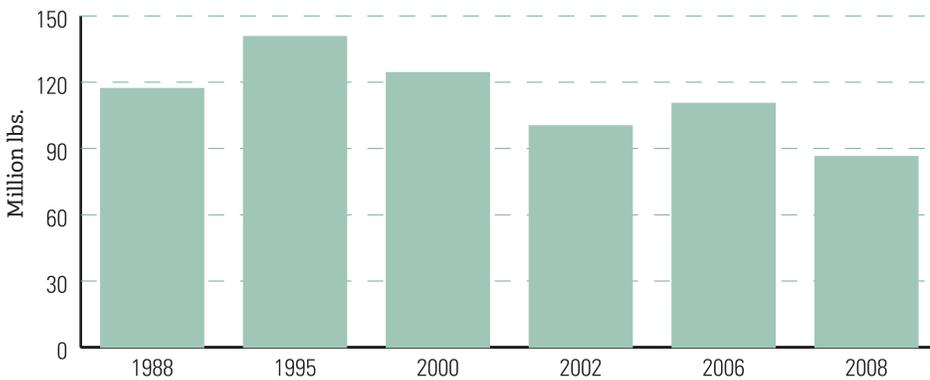


¹ A corrected value for chlorine releases submitted to U.S. EPA by one mill has been used in these calculations.

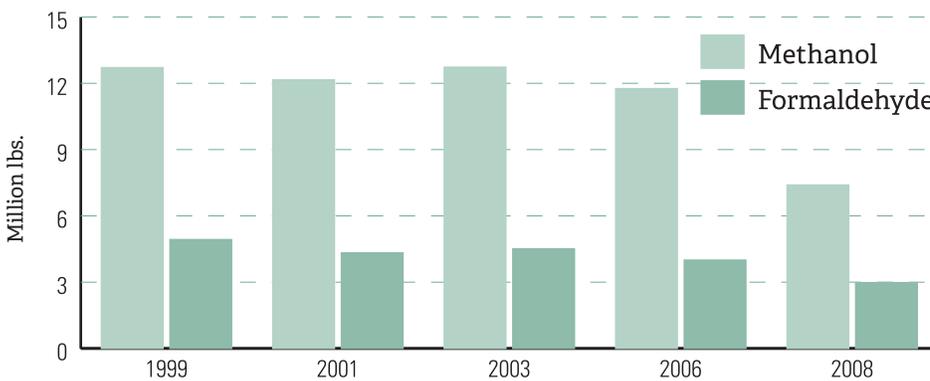
Pulp and Paper Mill Core Chemical Release Reductions (U.S. EPA data)



Pulp and Paper Mill Methanol Release Reductions (U.S. EPA data)



Wood Products TRI Compound Release Reductions (U.S. EPA data)



tions are the result of improved pollution control equipment, process changes, raw material changes, and other pollution prevention measures.

■ In 2008, methanol releases amounted to 62 percent of the total core chemical releases. Releases of methanol have been substantially reduced since the TRI reporting program began. Since 1995, methanol releases have decreased 39 percent. Between 2006 and 2008, methanol releases decreased 22 percent. Air emissions control modifications at pulp mill bleach plants are largely responsible for these reductions.

Wood Products Facility Chemical Compound Release Reductions

Pollution control equipment installations and changes in materials used in the manufacture of wood products have produced reductions in TRI chemical releases at wood products manufacturing facilities. The data needed to track these reductions became available starting in 1999. New U.S. EPA Maximum Available Control Technology (MACT) standards became effective in 2007–2008 leading to significant reductions in plywood and composite wood panel facility hazardous air pollutant emissions, including methanol and formaldehyde. In 2008, methanol and formaldehyde made up 77 percent of wood product facility core chemical releases.

■ Methanol releases have been reduced by 42 percent since 1999. Between 2006 and 2008, methanol releases decreased by 37 percent.

■ Formaldehyde releases have been reduced by 40 percent since 1999. Between 2006 and 2008, releases of formaldehyde decreased by 26 percent.

Pulp and Paper Mill Residuals Management

AF&PA members work to reduce manufacturing process residuals that must be disposed of in some fashion.

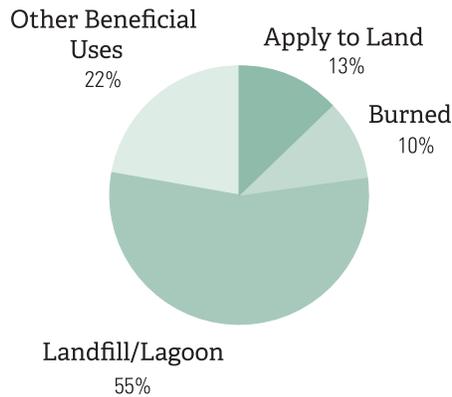
■ Since 1995, pulp and paper mills have reduced the total process residuals generation rates in pounds per ton of product by 18.6 percent

■ Compared to 2006, AF&PA member paper mill total process residuals generation rates in 2008 were essentially unchanged at 250 pounds per ton of product in 2006 versus 259 pounds per ton in 2008.

■ Since 1995, pulp and paper mill effluent treatment plant residuals generation rates in pounds per ton of product have been reduced by 26.4 percent. Between 2006 and 2008, effluent treatment residuals generation rates were essentially unchanged, 95 and 92 pounds per ton of product produced, respectively.

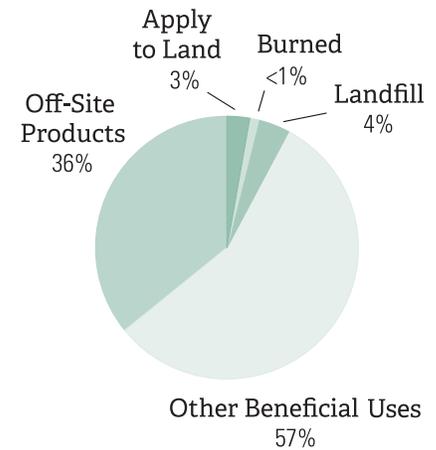
AF&PA member pulp and paper mills seek beneficial uses for process residuals.

Pulp and Paper Mill Residuals Utilization



In 2008, 45 percent of generated residuals were beneficially reused. Ten percent was burned for energy recovery, 13 percent applied to land as soil amendments, and 22 percent beneficially used in other ways. The remaining 55 percent was landfilled or placed in dewatering lagoons.

Wood Products Facility Residuals Utilization



Wood Products Facility Residuals Management

AF&PA member wood products facilities utilized 96 percent of generated process residuals in 2008.

■ Thirty-six percent of wood products facility residuals were utilized in other products by off-site facilities. Fifty-seven percent were used for other beneficial uses such as energy recovery, landscaping materials, or animal bedding. Three percent was applied to land and less than one percent was disposed of by burning.

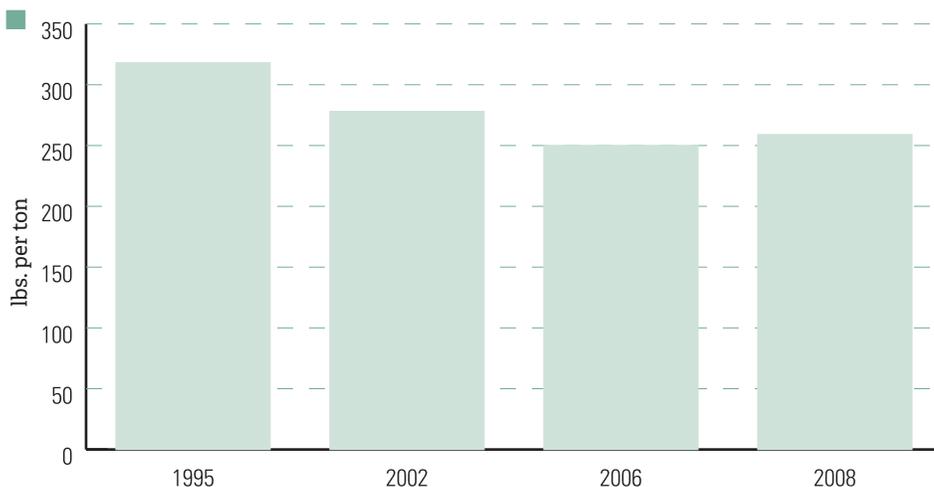
Adherence to Mandatory AF&PA EHS Principles

All AF&PA members demonstrate adherence to the mandatory EHS Principles in maintaining their environmental performance. In 2008:

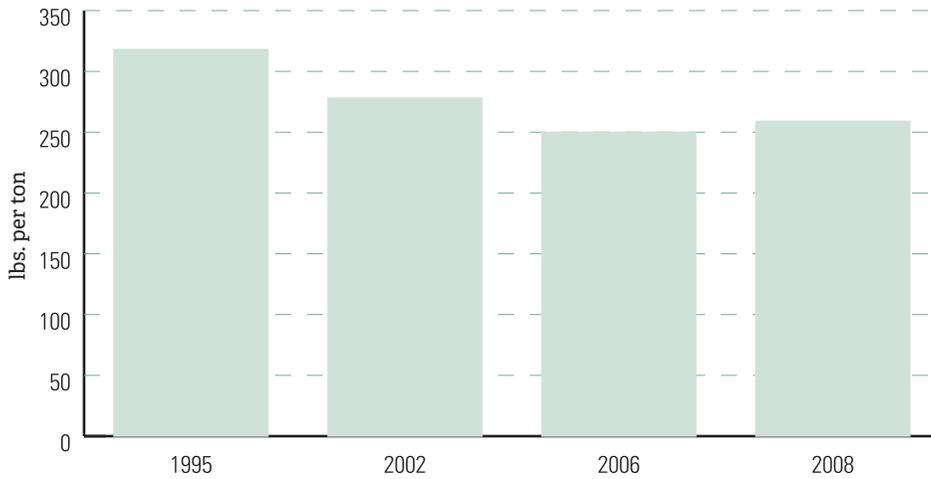
■ Ninety-three percent reported having written environmental policies while 95 percent also have written health and safety policies.

■ Seventy-seven percent of companies also reported having written policies on

Member Pulp and Paper Mill Total Residuals Reductions



Pulp and Paper Mill Wastewater Treatment Plant Residuals Reductions



While pulp and paper companies encourage recycling, they are also good recyclers themselves. For example, one mill recently outlined its program that now recycles metals, scrap wood, batteries, used oil, aerosol cans, fluorescent light bulbs and antifreeze, in addition to waste paper and fiber.

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responding to environmental, health and safety incidents.

- A majority of companies reviewed capital improvement projects and product designs for environmental performance implications.

- Ninety percent of the companies con-

ducted accountability and management reporting activities. These include reporting on EHS performance to their Board of Directors or Board EHS Committee.

- Eighty-two percent of members reported maintaining an environmental audit program.

4. Generating and Conserving Energy and Materials

While all manufacturing sectors and public utilities are currently focused on conserving energy and exploring the potential for using renewable fuels, these are not new concepts to the forest products industry. Energy savings and the use of renewable fuels have been fundamental objectives of the industry for decades. The forest products industry has been tracking reductions in total energy, purchased energy, and fossil fuel use since the early 1970s and has taken a leadership role in pursuit of these efficiencies and reductions in fossil fuel use.

Energy Use and Self-Sufficiency

AF&PA member pulp and paper mills are largely energy self-sufficient. Some mills supply excess energy to the electric utility grid. These mills have also significantly reduced their total amount of energy needed per ton of production over the last four decades.

■ Since 1990, energy use per ton of production has been reduced by 8.2 percent.

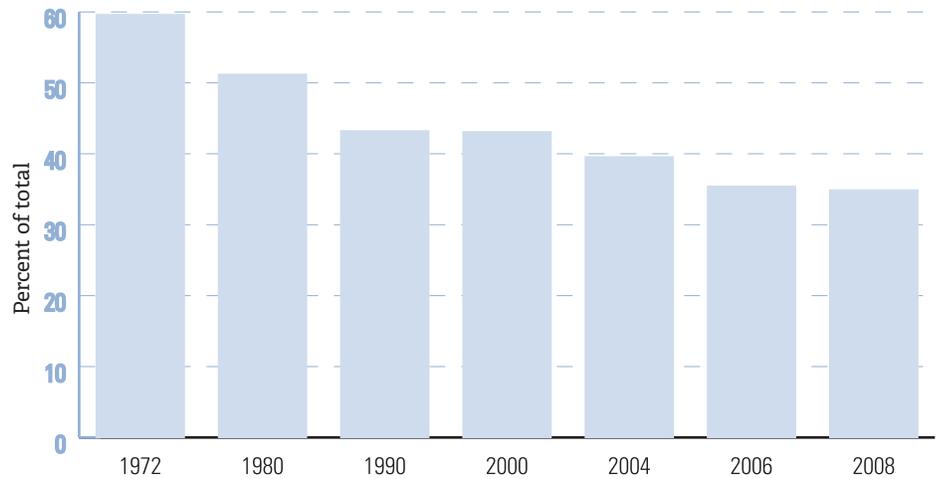
■ In 2008, total energy use per ton of production was nearly the same as in 2006, 24.41 million BTU per ton of production (2008) versus 24.03 (2006).

Fossil Fuel Use Reductions

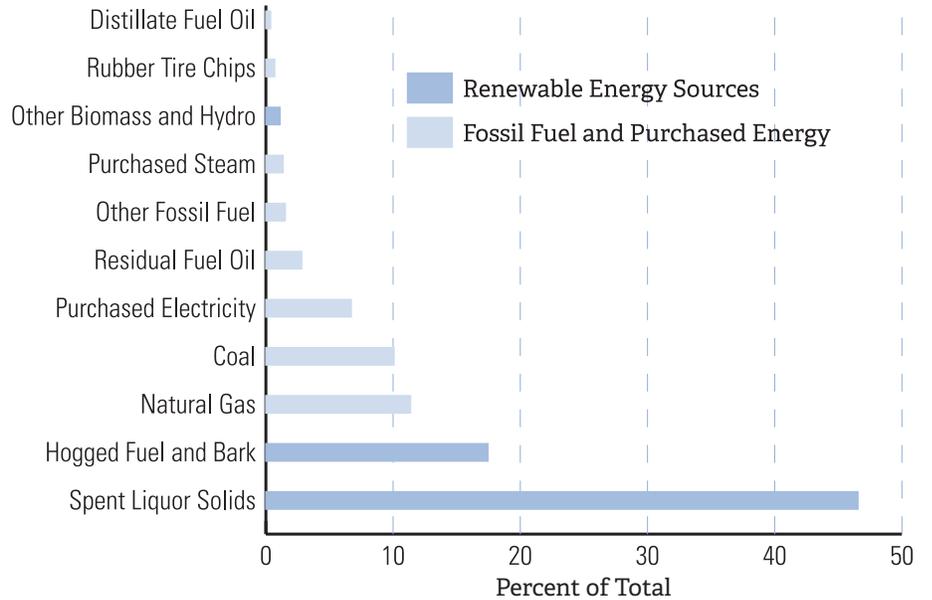
Use of purchased energy and fossil fuels has continued to decline at pulp and paper mills.

■ Since 1990, purchased energy and fossil fuel use per ton of production was re-

Pulp and Paper Mill Purchased Energy and Fossil Fuel Use



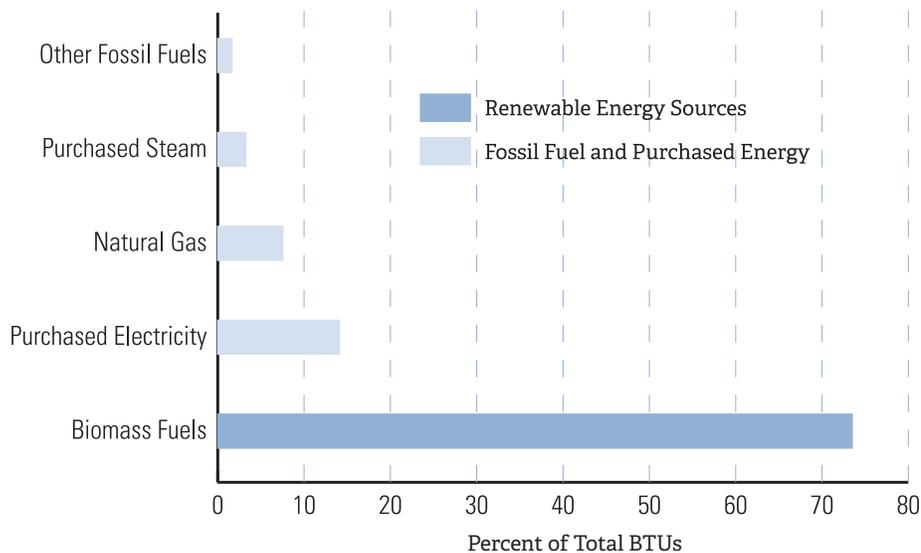
2008 Pulp and Paper Mill Energy Sources



duced by 26 percent. The percent of total energy supplied by purchased and fossil fuel has been reduced during each reporting period since 1972.

■ Compared to 2006, purchased and fossil fuel use was essentially unchanged in 2008, 8.51 million BTU per ton of production in 2006 vs. 8.52 in 2008.

2008 Wood Products Facility Energy Sources



■ In 2008, wood products facilities relied on renewable biomass fuels to provide 73.5 percent of the energy required to produce their products.

Renewable Fuels Use

The forest products industry, with its reliance on renewable biomass energy, leads all other manufacturing industries in the use of renewable fuels.

■ Member pulp and paper mills generated 65 percent of their energy needs from renewable fuels in 2008. At wood products facilities, renewable fuels produced 73.5 percent of needed energy.

■ In 2008, U.S. Department of Energy data shows that, pulp and paper mills and wood products facilities, together, produced 94 percent of the renewable fuel energy generated by all manufacturing facilities in all sectors. All of these renewable fuels are derived from wood. Pulp and paper mills produced 88 percent of these, while wood products facilities produced six percent. All other manufac-

turers in all other sectors produced just six percent.

Cogeneration

Virtually all AF&PA member facilities that generate electricity on-site do so using cogeneration technology. In 2008,

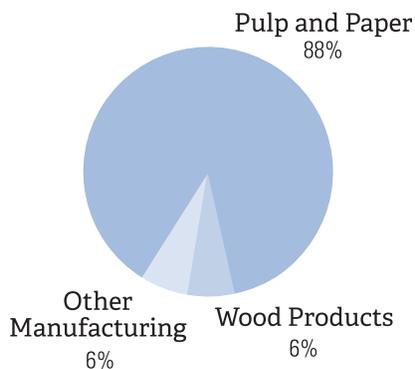
the forest products industry became the leader among all manufacturing sectors in the use of cogeneration technology. Cogenerated electricity is produced by using steam extracted from the exhaust side of electrical generators for heat in either the manufacturing processes or for space heating. In non-cogenerating systems, all of this exhaust steam is condensed by cooling towers or heat exchangers, with the heat energy not beneficially used.

In 2008, forest products facilities generated 37 percent of the total energy produced by cogeneration capable systems within all manufacturing sectors. No other sector matched this performance. Previously, only the chemical sector had surpassed the forest products industry in production of energy from these systems.

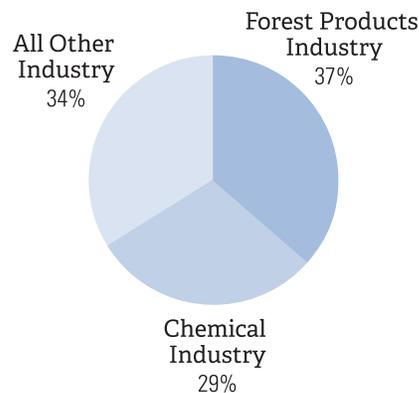
Conserving Materials and Pollution Prevention

AF&PA members are constantly working to improve efficiencies and product design to reduce energy consumption, water use and effluent releases, and the generation of process residuals. For ex-

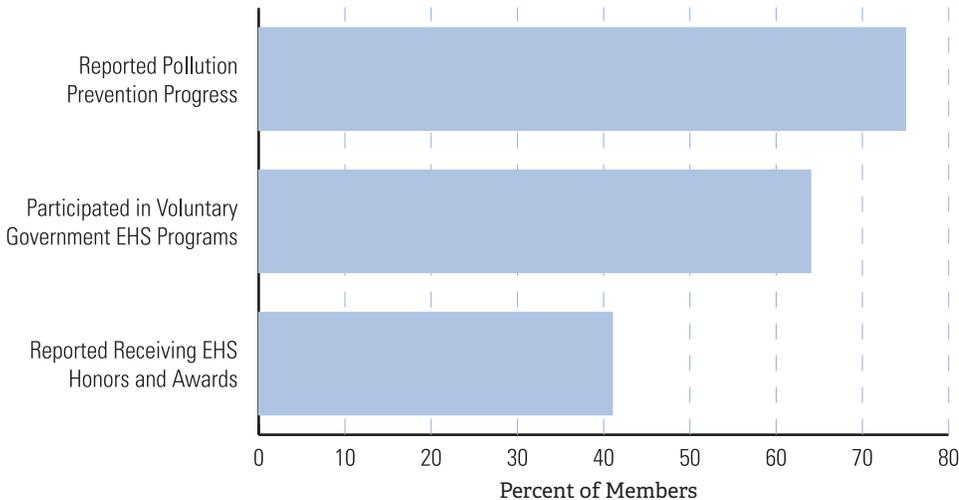
Manufacturing Sector Derived Renewable Fuel Use (2008 U.S. DOE data)



Industry Use of Cogeneration Electricity Technology (2008 U.S. DOE data)



Member Pollution Prevention Progress



ample, increases in product strength and, in some cases, product weight reductions have allowed members to produce more product with less fiber while reducing manufacturing wastes and energy requirements, including fuel needed to transport materials. In 2008:

■ Seventy-five percent of members reported pollution prevention progress, and 64 percent participated in voluntary government EHS programs. Significantly, 41 percent of members received EHS honors or awards in 2008.

A site audit and resulting implementation plan have enabled one company to reduce site utilities and chemical costs by more than 10 percent, or \$2.2 million annually. The plan used best practices throughout the facility and implemented an audit system for continuous improvement. By using only one power boiler instead of two 69 percent of the time, SO₂ and NO_x emissions have been reduced along with costs.

5. Reducing Greenhouse Gases

The forest products industry provides valuable solutions to climate change concerns by carefully managing private forests that absorb carbon dioxide, reducing emissions from manufacturing processes, manufacturing products that store carbon and are made from renewable and recyclable raw materials, and generating and using renewable energy.

AF&PA members have made a significant commitment to reduce greenhouse gas emissions. Collectively, they have pledged to reduce their greenhouse gas emissions intensity (metric tons of CO₂ equivalents per metric ton of production) 12 percent by 2012, using year 2000 as a baseline. Tracking and accounting for these emissions requires tabulating both emissions that occur directly at AF&PA member manufacturing facilities, as well as indirect emissions associated with purchased electricity from off-site power plants. Quantities of pulp, paper, and the

An AF&PA member company has reduced its natural gas use by 10 percent and eliminated 15,700 tons of CO₂ emissions by installing a condensing economizer on the cogeneration exhaust stack. This unit captures and reuses heat energy to preheat white water. An added benefit was increased production that resulted from piping changes that increased temperatures and increased paper machine drainage.

several different types of wood products manufactured at member mills are combined, expressed in tons, and used to calculate the AF&PA member total releases on a per ton of product (intensity) basis.

AF&PA members made good progress towards the above goal; in fact, they had exceeded the total in 2006. However,

the data presented in this report indicated that it was a challenge to maintain progress in 2008. This is primarily due to the fact that wood products represented a much smaller share of the total AF&PA member production than in previous years. Since wood products are a lot less energy intensive to produce than paper and paperboard, this structural change in membership mix had the effect of increasing greenhouse gas intensity of the aggregated membership for 2008, compared to previous years. Additionally, as explained below, the intensity for wood products also increased significantly in 2008. These two factors combined to offset the continued progress at member pulp and paper mills.

Emissions Intensity Reductions

■ The combined member pulp and paper mill greenhouse gas emissions intensity for direct and indirect emissions has decreased 14.1 percent since 2000 and 1.3 percent between 2006 and 2008.

■ In 2006, the combined direct and indirect greenhouse gas emissions intensity for wood products facilities had decreased 4.5 percent compared to 2000. The pro-

portion of energy-intensity categories of wood products within AF&PA membership increased substantially in 2008. Significant changes in AF&PA membership as well as varying production decreases within these product categories resulted in an intensity increase. Furthermore, government regulations required installation of air pollution control devices that burn natural gas, thereby emitting additional greenhouse gases. As a result of all of these factors, the 2008 total direct and indirect emissions intensity rate for member wood products facilities increased 26.8 percent compared to 2000, and 32.7 percent compared to 2006.

■ Overall, the 2008 greenhouse gas emissions intensity for AF&PA members was 4.3 percent less than it was in the baseline year 2000. Between 2000 and 2006, the reduction was 13.7 percent. Compared to 2006, the overall member greenhouse gas intensity increased by 10.8 percent in 2008. Almost 90 percent of the increase from 2000 can be attributed to the changes in wood products share of total membership production.

Absolute Emissions Reductions

Direct greenhouse gas emissions, those generated at AF&PA member manufacturing facilities (both pulp and paper mills and wood products manufacturing plants) have decreased. Indirect emissions, those associated with purchased electricity, at wood products facilities have also decreased. Pulp and paper mill indirect emissions have remained relatively constant.

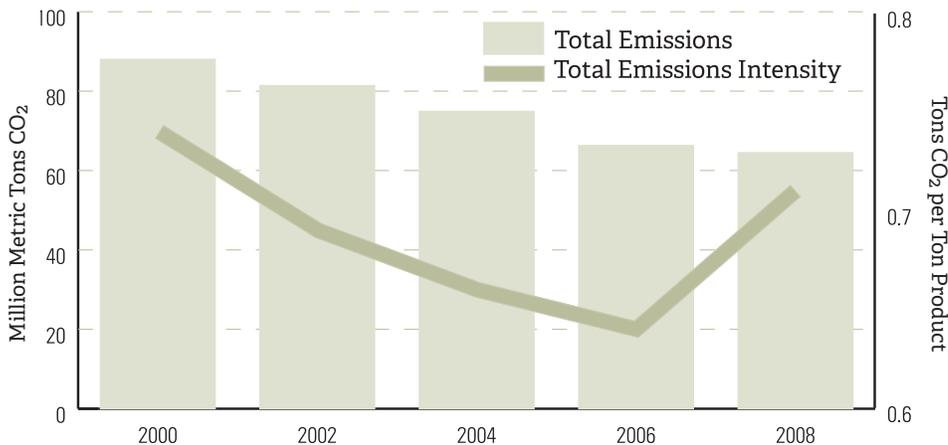
Direct Emissions:

■ The 2008 pulp and paper mill data shows that direct greenhouse gas emissions have been reduced by 36.7 percent since 2000, four percent since 2006.

■ Wood products facility direct greenhouse gas emissions have been reduced by 30.7 percent since 2000, 17.7 percent since 2006.

■ Combined, pulp and paper mill and wood product facility direct greenhouse gas emissions have been decreased 36.6 percent, 4.2 percent since 2006.

Member Greenhouse Gas Emissions (Total Direct and Indirect)



Indirect Emissions:

■ Pulp and paper mill indirect greenhouse gas emissions have increased slightly in 2008. These off-site emissions were 1.4 percent higher than in 2000 and increased 3.2 percent between 2006 and 2008.

■ Wood products facility indirect greenhouse gas emissions have been reduced by 29.6 percent since 2000, 19.5 percent since 2006.

■ Combined, pulp and paper mill and wood product facility indirect greenhouse gas emissions have been decreased 4.1 percent since 2000, with a 0.4 percent decrease since 2006.

■ Total direct and indirect emissions from AF&PA member facilities amounted to 64.5 million metric tons of CO₂ equivalents in 2008. This is a 26.7 percent reduction in emissions from member facilities compared to 2000. Nearly

40 percent of this reduction can be attributed to efficiency improvements and reduced fossil fuel use.

The Carbon Cycle

The forest products industry is unique in that some significant aspects of nature's carbon cycle are inherent in industry operations.

■ Growing forests, the source of the basic raw material for the industry, naturally absorb carbon dioxide from the atmosphere and store it as carbon in trees.

■ The products produced by both pulp and paper mills and forest products facilities contain the carbon absorbed from the atmosphere. Forest products produced by member facilities contained between 23.8 (2006) and 28.2 (2008) million metric tons of CO₂ equivalents annually. In 2008, because of the reduction in wood products facility production, this quantity decreased to 16.8 million metric tons

of CO₂ equivalents, a decrease of 29 percent compared to 2006.

■ Paper recycling provides another important greenhouse gas reduction. When paper is recycled, it does not end up in landfills. Paper in landfills decomposes and produces methane gas, a powerful greenhouse gas. Between 2000 and 2006, the greenhouse gas emissions that have been avoided through paper recovery and removal from the landfill waste stream have amounted to between 21 and 24 million metric tons of CO₂ equivalents annually. In 2008, the landfill methane avoided emissions were 20.2 million metric tons of CO₂ equivalents.

Advantages of Wood as a Building Product

As a building material, wood requires less energy to produce, transport, construct, and maintain than available alternatives. Less energy use translates into fewer greenhouse gas emissions. When comparing environmental impacts of a typical wood-frame house to similar structures constructed of steel or concrete over a 20 year period:

■ The house built of steel would consume 17 percent more energy, emit 26 percent more greenhouse gases, release 14 percent more air pollutants, and generate 12 percent more water pollutants than the comparable wood-based home.

■ The house made from concrete would consume 16 percent more energy, emit 31 percent more greenhouse gases, and release 23 percent more pollutants into the air than the comparable wood-based home.

6. Benefiting the Communities, Employees, and Families Everywhere Our Products are Made and Sold

Economic Performance

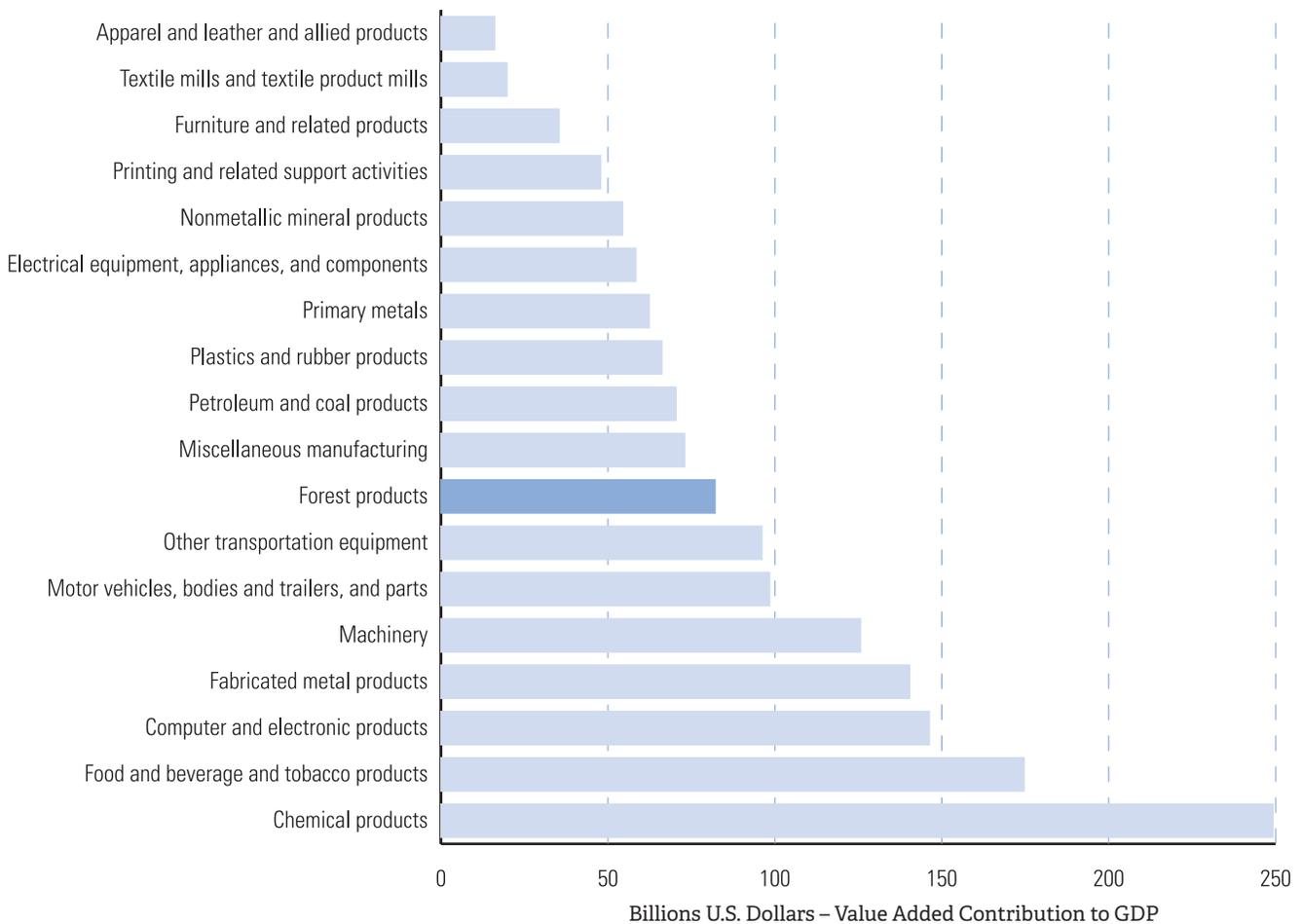
The three pillars of sustainability are all inter-related and dependent on each other. However, it cannot be overemphasized that sustainable economic performance of individual companies, and the industry at large, is essential for achieving sustainability.

The forest products industry contributed approximately five percent to the U.S. gross domestic product (GDP) in 2007, according to the most recent government statistics available. Among

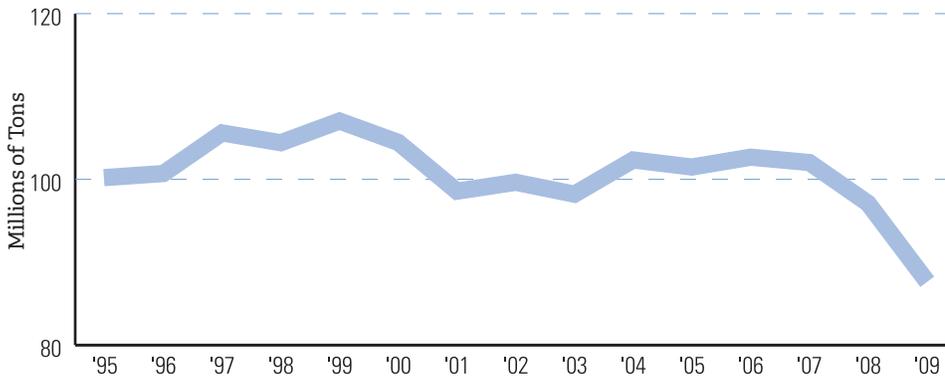
manufacturers, the forest products sector ranked eighth in contribution, just behind motor vehicles and transportation equipment and just ahead of the petroleum and plastic products sectors. The industry is among the top 10 manufacturing employers in 48 states where its nearly 900,000 employees earn \$50 billion annually in wages and salaries.

However, recent business and economic conditions have been challenging for AF&PA member companies. Since 2006, more than 390,000 employees have

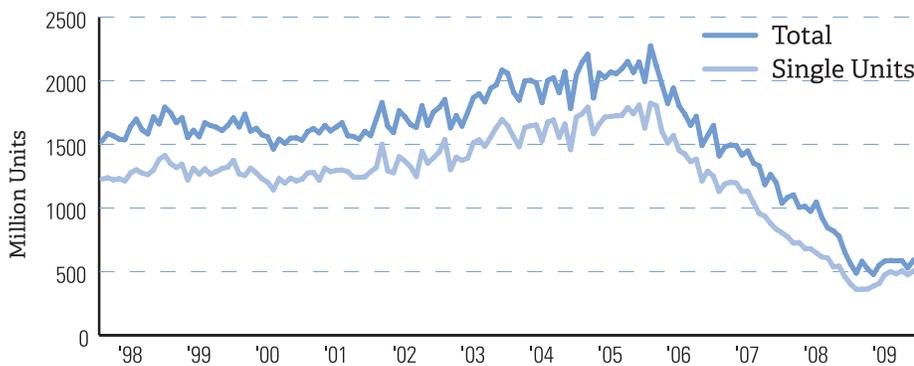
Manufacturer Contribution to GDP
(2007 U.S. Commerce Department Data)



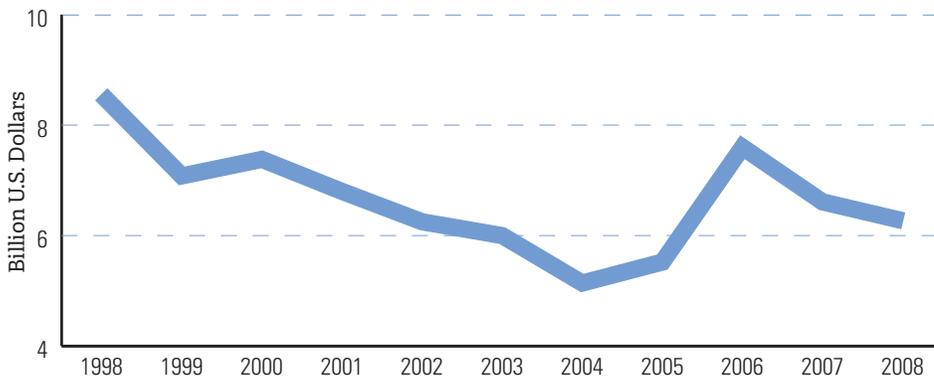
Paper, Paperboard and Market Pulp Production (AF&PA Statistics)



U.S. Housing Starts (U.S. Bureau of the Census Data)



U.S. Paper Mill and Allied Product Capital Expenditures (U.S. Bureau of the Census: Annual Survey of Manufacturers)



lost their jobs including 124,000 in 2009 alone. Breaking down this number:

- Logging: 7,200
- Paper and allied products: 33,500
- Wood products: 60,000
- Kitchen cabinets: 24,000

In 2008, 18 paper mills were permanently closed, shutting down 27 paper machines. Fourteen paper machines were permanently shut down at other facilities. As market conditions continued to deteriorate in 2009, 14 paper mills were permanently closed, shutting down 16 machines. Further, 11 more machines ceased operations permanently at other paper mills.

Between 1995 and 2007, U.S. market pulp, paper and paperboard production fluctuated about a fairly stable long-term trend, rising just two percent over the entire period. However, in part due to the worldwide economic downturn, production declined five percent in 2008 and 10 percent in 2009.

Housing starts, which hovered around 2 million units a year in 2004 and 2005, had declined to 554,000 in 2009, their lowest level in more than a half century. Starts have been edging higher since late 2009 but the rebound has been gradual by historical standards. Reflecting this trend, U.S. production of wood products declined 39% between 2006 and 2009, and some 220,000 wood products industry jobs were lost during this three-year period. Production leveled off during early 2010 but has not appreciably rebounded.

Paper and allied product capital expenditures during the past decade have varied between \$8.5 billion in 1998 to \$5.1 billion in 2004. Expenditures for new processes and equipment rebounded to \$7.6 billion in 2006 but were \$6.3 billion in 2008.

Companies are responding to the economic challenges through use of innova-

tion and the pursuit of excellence to gain strength and improve economic performance in the years to come. Examples of these measures include:

- Paying down debt
- Reorganizing capital structures
- Pursuing growth strategies, especially in product lines with increasing demand
- Shifting capacities to more profitable, in-demand products
- Focusing on customers and anticipating or exceeding their needs
- Producing the best products in the industry's global marketplace

U.S. Forest Products Exports

An important part of the U. S. forest products industry's contribution to the economy is its exports. U.S. producers have improved their global competitiveness in the past decade, taking advantage of stronger growth in emerging economies and the more competitive currency after the value of the U.S. dollar reached a high point in the first quarter of 2002. From 2002 to 2008, forest products exports grew by almost 50 percent, from \$18.2 billion to \$27.1 billion. However, as the global recession took hold, U.S. forest products exports collapsed, dropping 14.4 percent in 2009. Forest prod-

ucts exports are rebounding, rising by 21.4 percent year-over-year in the first two months of 2010.

Safety Program Recognition

AF&PA member safety programs meet high standards. Many mills have been enrolled in the Occupational Safety and Health Administration's (OSHA) prestigious Voluntary Protection Program (VPP). Within VPP enrolled programs, management, labor, and OSHA establish cooperative relationships at workplaces that have implemented a comprehensive safety and health management system. Approval into the VPP is OSHA's official recognition of the outstanding efforts of employers and employees who have achieved exemplary occupational safety and health records. In 2008:

- Safety programs at 84 AF&PA member pulp and paper facilities were enrolled in the VPP program, an increase of two since 2006 when 82 programs were recognized.

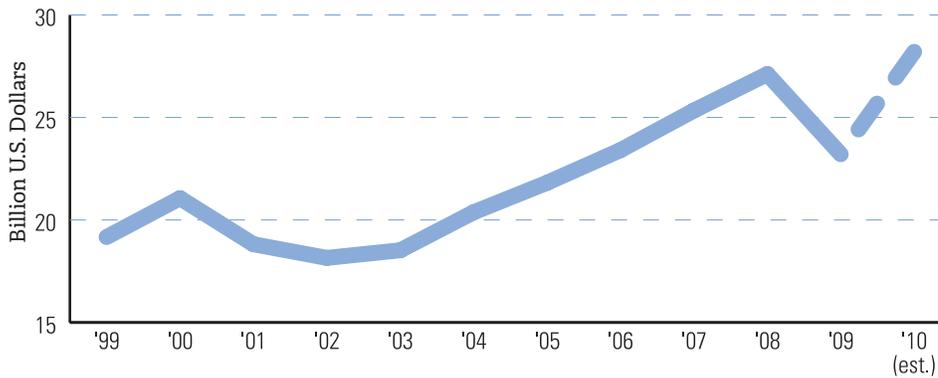
- Sixty-seven member wood products facility safety programs were enrolled in the VPP program. In 2006, 100 wood facility programs were registered. This reduction reflects the many wood product manufacturing facilities that either did not operate in part or all of 2008 or relinquished their AF&PA membership.

- Of the manufacturing industry safety programs recognized by the VPP program, only the chemical industry has more facilities registered than the forest products industry.

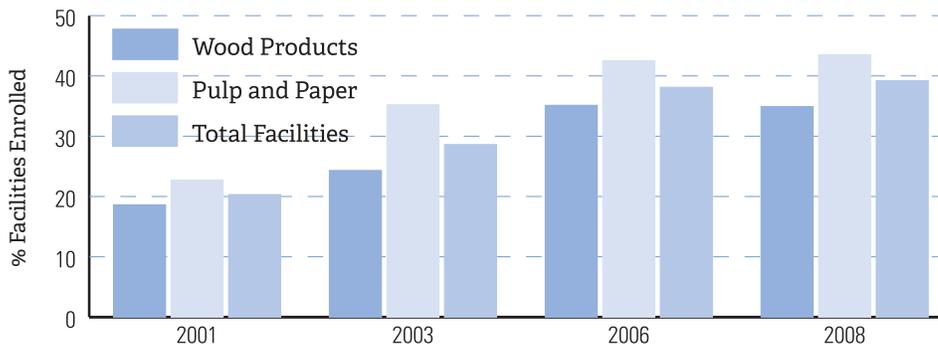
Safety Performance Reporting

AF&PA members track and report safety performance in accordance with OSHA standards. Occupational injury and illness incidents are recorded as any work-related injury or illness involving medical treatment beyond first aid. Injury and

U.S. Forest Products Exports
(U.S. Bureau of the Census Data)



Member VPP Enrolled Facilities



illness statistics are reported as incidence rates, defined as recordable incidents per 100 equivalent full-time workers. In 2008:

■ At member pulp and paper mills, the total case incidence rate was 2.21, 16.6 percent less than the 2006 rate of 2.65. The lost work case incidence rate was 1.11, 12.6 percent less than the 2006 rate of 1.27.

■ Since 1996, pulp and paper mill total case incidence rates have been reduced by 61.9 percent. Lost work case incidence rates have been reduced by 53.8 percent.

■ At wood products facilities, the total case incidence rate was 2.00, 19.4 percent lower than the 2006 rate of 2.48. The lost work case incidence rate was 1.17, slightly higher than the 2006 rate of 1.13.

■ Since 1996, wood products facility total case incidence rates have been reduced by 75.3 percent. Lost work case incidence rates have been reduced by 70.8 percent.

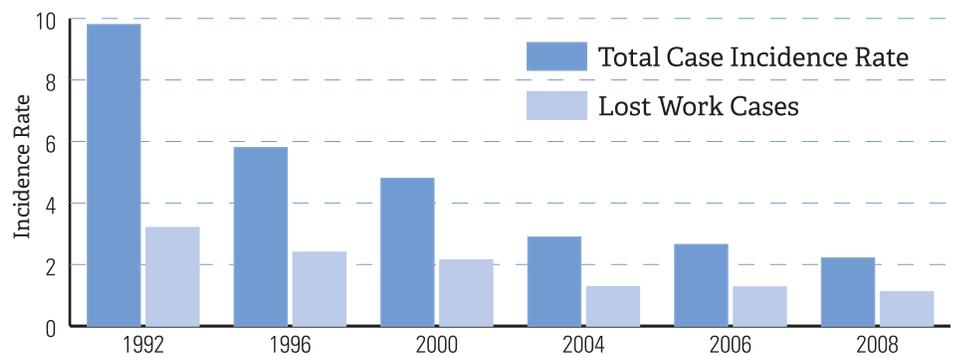
■ Six fatalities occurred at pulp and paper mills in 2008. One occurred at a wood products facility. Member company and government agency personnel conduct detailed investigations after any fatality. The results of these investigations serve as the basis for any necessary changes in operations.

Public Engagement and Reporting

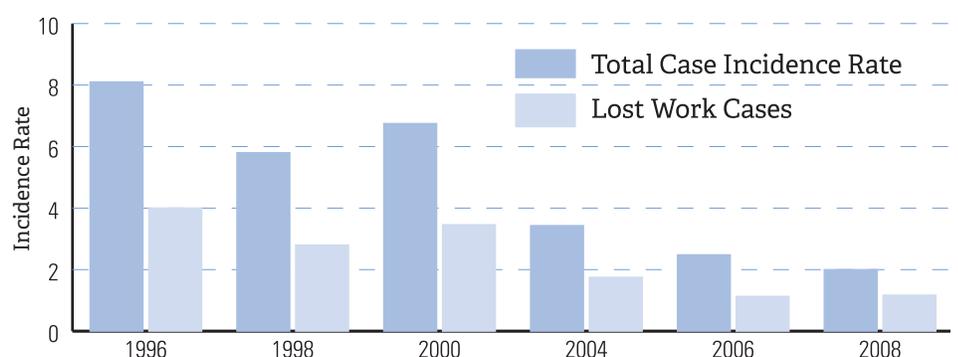
AF&PA companies are engaged in communicating with the public in the communities in which they operate.

■ Eighty-four percent of members reported to the public on environmental, health and safety performance in 2008. Some companies provided formal reports while more than half placed information on the internet.

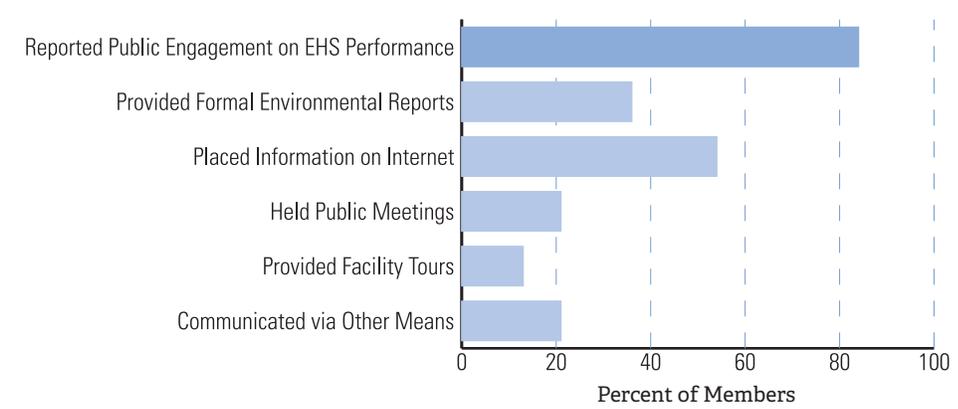
Member Pulp and Paper Mill Occupational Injuries and Illnesses



Member Wood Products Facility Occupational Injuries and Illnesses



Member Public Engagement and Reporting



■ More than 20 percent held public meetings, and 13 percent provided facility tours.

Community Involvement and Outreach

AF&PA members are active in their communities.

■ Eighty-seven percent reported they participated in community outreach activities. These activities included philanthropic support for environmental programs or groups and serving on community advisory groups.

■ Sixty-four percent aided school education programs, while 74 percent supported community social programs.

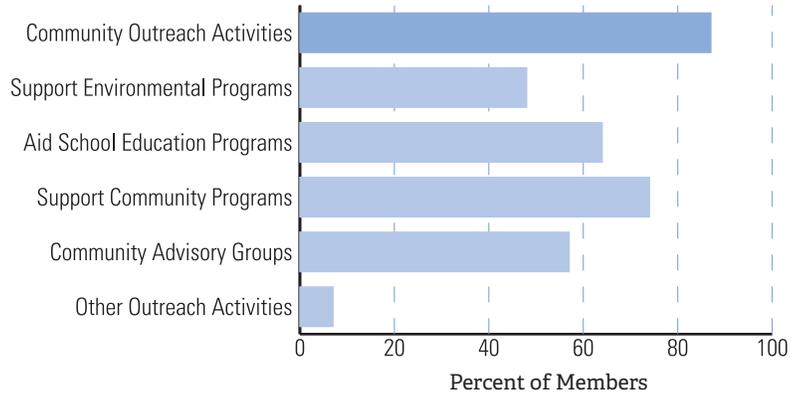
Participation in Public Policy Development

Member companies are actively involved in the development of public policy at the federal, state, and local levels.

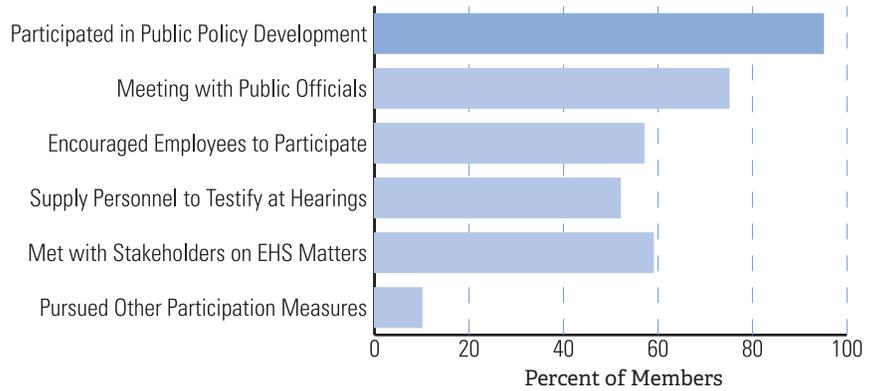
■ Ninety-five percent of the companies reported participation in the development of public policy related to environmental, health, & safety matters in 2008.

■ In addition, 75 percent met with public officials; 57 percent encouraged employees to participate in public policy development.

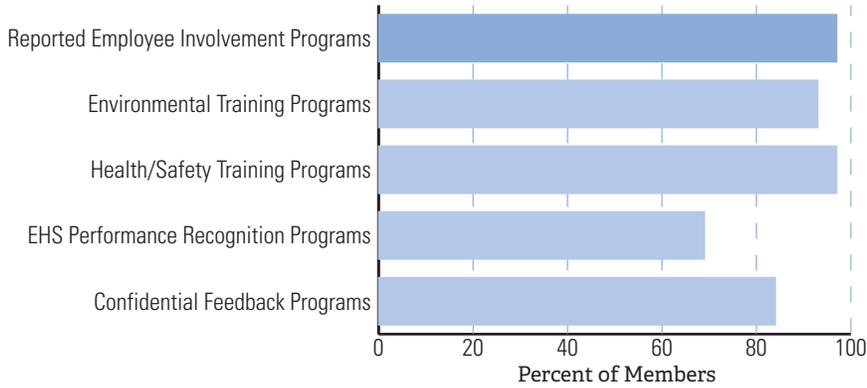
Member Community Outreach and Social Support Activities



Member Participation in Public Policy Development



Member Employee Involvement Programs



opment; 52 percent supplied company personnel to testify at federal, state, and local government hearings; and 59 percent met with interested stakeholders to discuss environmental, health, & safety matters.

Employee Involvement Programs

Engaging employees in company EHS program planning and execution is a key part of the AF&PA EHS principles.

In 2008:

- Ninety-seven percent of members reported employee involvement in EHS programs.

- Employees in 84 percent of companies gave confidential feedback regarding EHS matters.

- Sixty-nine percent of the companies have employee recognition programs for improved performance in EHS areas.

Sustainability and the Road to the Future

Innovation and Continuous Improvement

The forest products industry meets its commitment to sustainability through innovation and environmental stewardship. Innovation is enabling the industry to develop new manufacturing processes that use fewer raw materials, reduce waste, and lessen energy consumption. It is creating the resources that allow the industry to support local communities and make forest products economically and environmentally viable for the future. AF&PA environmental and forest procurement principles ensure that value is placed on sustainability.

Research and Development Support

34 Innovation to date has reduced the industry's environmental footprint and greenhouse gas emissions, as well as allowed the industry to support local communities. However, a much larger

research agenda is being pursued to provide further improvement. In 2008:

- Eighty-two percent of members reported supporting research and development activities.
- Fifty-four percent supported internal research and development, while nearly 60 percent support external research activity.

Industry Sponsored Research Organizations

AF&PA members directly support world-class research and technical support programs specifically tailored to meet forest products industry needs. Included are programs conducted by:

- National Council for Air and Stream Improvement
- Institute of Paper Science and Technology at the Georgia Institute of Technology
- Center for Paper Business and Industry Studies, also at Georgia Tech

Programs pursued by these organizations provide:

- Tracking and reducing greenhouse gas emissions
- Tracking and evaluating control options for reduced air emissions
- Effluent treatment improvements, reductions in effluent discharges, and assessment of conditions in receiving streams
- Information to reduce chemical substances used, produced, or released
- Forest sustainability, robust wildlife, and species diversity
- New materials and product platforms for a sustainable forest products industry
- New process technologies to support the industry and provide new products – including biofuels and biobased chemical feedstocks that serve as an alternative to petrochemicals
- Identification and understanding of social science issues of interest to industry stakeholders
- Connections between academic personnel and community stakeholders to improve understanding of the industry
- Dissemination and communication of research findings to industry in order to facilitate better decisionmaking
- Increasing management and analytical capacity within the industry





■ Skilled industry-oriented PhD and M.S. graduates in a variety of disciplines.

In addition, the U.S. Forest Service’s Forest Products Laboratory in Madison, Wisconsin develops knowledge and technologies for the industry. This lab provides a center of excellence for the science related to processing wood and woody materials into valuable products.

Support for Academic Institutions

Members support paper science and engineering programs at several colleges and universities that train scientists and engineers for technical, operational, and management positions within the industry and conduct research focused on industry needs. These include top-rated schools such as:

- Auburn University (Alabama)
- Georgia Institute of Technology
- Miami University (Ohio)
- North Carolina State University
- State University of New York College of Environmental Science and Forestry
- University of Maine

- University of Washington
- University of Minnesota
- Western Michigan University
- University of Wisconsin – Stevens Point

These institutions pursue research agendas of importance to the industry including:

- Obtaining the highest possible sustainable value from forest-based biomass
- Improving the efficiency of wood use and decreasing chemical use in pulping and bleaching operations
- Increasing the use of recycled fiber and improving the strength of recycled pulps to reduce the use of virgin wood fiber
- Developing processes that produce biofuels and chemical building blocks from renewable forest resources
- Improving environmental management systems
- Optimizing pulping processes to reduce energy requirements
- Developing new effluent treatment and spent pulping liquor recovery processes that enhance performance, improve chemical and odor removal, increase energy recovery, and enhance water recycling



Cooperative Partnerships

The Agenda 2020 Technology Alliance, a special project of AF&PA, works to advance breakthrough technologies for the forest products industry with a strong focus on opportunities to improve sustainability. Agenda 2020 leads the development of a technology agenda for the industry, as evidenced by its 2010 Technology Roadmap. It works to establish collaborative programs for technology development that include companies, universities, and government agencies as partners. As an example, Agenda 2020 manages the Value Prior to Pulping (VPP) research program that aims to extract hemicelluloses from wood before pulping and convert them to value-added fuels and chemicals. The VPP collaboration involves multiple companies and research institutions and is funded in part by the U.S. Department of Energy. The 2010 Roadmap outlines research needs in sustainability-focused areas such as reducing energy consumption, reducing fresh water intake, creating biobased products that displace fossil fuel feedstocks, enabling the development of products made with less fiber, and increasing the recovery and recycling of waste products.

Internet Addresses for Forest Products Organizations

| | |
|---|--|
| American Forest & Paper Association | www.afandpa.org |
| National Council for Air and Stream Improvement | www.ncasi.org |
| Technical Association of the Pulp and Paper Industry | www.tappi.org |
| Institute of Paper Science and Technology | www.ipst.gatech.edu |
| Center for Paper Business and Industry Studies | www.cpbis.gatech.edu |
| Agenda 2020 Technology Alliance | www.agenda2020.org |
| Society of Wood Science & Technology | www.swst.org |

Member Company Corporate Research Programs

AF&PA members conduct independent research programs that seek to improve efficiencies, eliminate or reduce air and water releases, and improve product designs.

Examples of projects conducted within these programs include:

- Finding ways to reduce energy requirements of existing papermaking processes and equipment
- Increasing recycled water use within mill systems and reducing fresh water withdrawal
- Improving the recyclability of used packaging cartons
- Increasing product packaging efficiency to reduce shipping fuel requirements
- Extending the use of wood residuals and other alternative fuels to further reduce reliance on fossil fuels
- Utilizing boiler ash and other residuals as fertilizers and soil conditioners to enhance forest nutrition and tree growth
- Implementing technologies that increase pulp yield, decrease wood use, and reduce generation of air emissions and water discharges per ton of product produced



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