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REGULATION IN THE PULP AND PAPER INDUSTRY: COSTS AND CONSEQUENCES

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Abstract

The paper and pulp industry is one of the most heavily regulated industries in the United States. This working paper investigates the extent to which environmental and workplace regulations affect the industry and evaluate the impact of these regulations on the industry, its customers, its employees and society in general. A review of literature on this topic reveals that numerous scholars have attempted to discern the effects of specific regulations on the industry or attempted to place a dollar value on what pollution abatement costs paper manufacturers. In this paper, we will take their findings into account, identify which regulations affect the industry, and describe the total cost these regulations impose on society. We investigate the tangible and direct costs of regulation, meaning the amount that regulation actually costs companies within the industry in dollar terms, as well as the less-visible, non-monetary costs resulting from regulation. Regulation also inevitably creates unforeseen costs that neither the regulators nor participants in the market could have anticipated, and those unanticipated consequences of regulation often create the very types of problems the regulators intended to reduce or eliminate. Although the paper and pulp industry incurs a relatively high regulatory burden, firms in the industry also tend to be quite large, which gives them the advantage of being able to disperse the costs of regulation over more units. It therefore remains unclear whether regulation affects firms in this industry to a greater or lesser extent than the average firm in the United States in absolute terms, but the industry nonetheless serves as an example of the costs and consequences of government regulation.

Introduction

The paper and pulp industry represents one of the largest manufacturing sectors in the United States.[1] The industry brings in $160 billion of revenue annually,[2] employs nearly 400,000 individuals across the country,[3] and provides essential products such as paper, paperboard, and insulation to businesses and individuals around the world.[4] It also faces a great deal of criticism from activist groups—and regulation from government agencies—because of its impact on the environment and its comparatively dangerous working conditions.[5]

The paper and pulp industry faces constant pressure both to limit the extent to which it negatively impacts the environment and to limit the number of injuries and fatalities that happen in its workplaces. That pressure comes from both inside and outside the industry, since the industry benefits from improving its relations with employees and other groups affected by its activities. Federal regulation imposes numerous requirements on the industry with the presumed intent of reducing the undesirable effects on the environment and making its workplaces safer, but regulation also creates additional costs that can reduce their net benefits and impede the industry's ability to provide important products and services. Moreover, the environmental benefits of lower pollution are somewhat offset by economic costs,[6] and are further offset by the foregone environmental benefits industry expansion would provide.

Within developed countries, environmental quality and workplace safety tend to improve over time, because people tend to demand more of both as their income increases. Therefore, regulations that seek to enhance environmental quality and workplace safety essentially attempt to accelerate developments that would occur even in the absence of regulations, so the exact extent to which regulations have affected those aspects of the economy is not clear. Between 1970 and 1998 the paper and pulp industry significantly reduced its emissions of air pollutants—carbon monoxide, sulfur dioxide, and particulate matter—by 32 percent, 36 percent, and 89 percent respectively. The industry kept pace with the average reduction of emissions for all industries in the United States with regard to carbon monoxide and sulfur dioxide, and it exceeded the national pace with regard

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[1] Bureau of Labor Statistics, *Industries at a Glance* (U.S. Department of Labor, May 2012), accessed May 9, 2012, http://www.bls.gov/iag/tgs/iag31-33.htm.

[2] Bureau of Economic Analysis, *1998–2010 Supplementary Make Table after Redefinitions at the Summary Level* (U.S. Department of Commerce, 2010), accessed February 2, 2012, http://www.bea.gov/industry/io_annual.htm.

[3] Bureau of Labor Statistics, Occupational Employment and Wage Estimates (U.S. Department of Labor, May 2010), accessed February 3, 2012, http://www.bls.gov/oes/oes_dl.htm.

[4] Aselia Urmanbetova, *US Pulp and Paper Industry Review, 1970–2000: Report on Data & Preliminary Research Questions* (Atlanta, GA: School of Economics, Georgia Institute of Technology, 2004), http://www.cpbis.gatech.edu/files/papers/CPBIS-WP-04-11%20Urmanbetova_US%20Pulp%20and%20Paper%20Industry%20Review.pdf, 1.

[5] Ibid., 10.

[6] Wayne B. Gray and Ronald J. Shadbegian, *Environmental Regulation, Investment Timing, and Technology Choice* (The Journal of Industrial Economics, June 1998), 236.

to particulate emissions.[7] The industry also dramatically reduced its contribution to water pollution during the same period as a consequence of technological advancements, particularly with the adoption of solid waste incinerators that generate electric power by burning organic waste. Such waste previously contributed substantially to the pollution of lakes and rivers.[8]

Additionally, between 1994 and 2010 the number of workplace injuries in the paper and pulp industry declined at a faster rate than the national rate for all private industries. The table below shows the number of workplace injuries per 100 workers in the paper industry, in the manufacturing sector overall, and in private industry overall.[9]

Year	Paper	Manufacuring	Private Industry
1994	8.8	10.4	8.4
1995	7.8	9.9	7.5
1996	7.2	9.2	6.9
1997	6.8	8.9	6.6
1998	6.6	8.5	6.2
1999	6.5	8.0	5.9
2000	6.0	7.8	5.8
2001	5.5	7.0	5.4
2002	5.2	6.4	5.0
2003	4.4	6.0	4.7
2004	4.5	4.9	4.5
2005	4.0	4.6	4.4
2006	4.0	5.5	4.2
2007	3.7	5.1	4.0
2008	3.3	4.6	3.7
2009	3.0	3.9	3.4
2010	3.1	4.0	3.4

The visible economic costs and unintended consequences of federal regulation, combined with the difficulty of assessing its benefits, mean that the less obvious aspects of regulations must be seriously investigated and taken into account when determining their overall effect on society. The following sections will go into greater depth on the specific regulations that affect this industry, and will describe their effects.

Industry Regulations

Since paper and pulp production has historically been considered a major contributor to air and water pollution,[10] and since manufacturing necessitates a comparatively dangerous work

[7] U.S. Environmental Protection Agency, *National Air Pollutant Emission Trends, 1900–1998* (Office of Air Quality Planning and Standards, March 2000), accessed December 7, 2011, http://www.epa.gov/ttn/chief/trends/trends98/trends98.pdf.
[8] *Tripartite Meeting on Social and Labour Issues in the Pulp and Paper Industry* (Geneva, 1992), 24.
[9] Bureau of Labor Statistics, *Industry Injury and Illness Data* (U.S. Department of Labor, May 2010), accessed March 16, 2012, http://www.bls.gov/iif/oshsum.htm#94Supplemental%20News%20Release%20Tables.
[10] Gray and Shadbegian, *Environmental Regulation*, 236.

environment,[11] the pressure that the paper and pulp industry faces from regulatory agencies comes largely from the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). Environmental regulation is intended to improve the quality of the air, land, and water so as to reduce the harmful effect industrial activity has on the health of those living nearby, and also—ideally—to improve the overall quality of life across society. Labor regulations are intended to reduce the incidence of fatalities and injuries in the workplace in order to ensure a better quality of life for laborers. Regulators realize that achieving these goals will entail costs, and they presumably attempt to pass regulations for which the intended end results justify the higher production costs and the inevitable price increases that will face consumers of the final goods.[12]

A report by Energetics Incorporated that was written for the U.S. Department of Energy in 2005 lists the Clean Water Act and the Clean Air Act, both environmental regulations adopted by the EPA, as the primary regulations affecting this industry.[13] The Clean Water Act consists of various laws regulating the discharge of chemical pollutants and the absorption of oxygen from the water by unused organic material. The act also requires producers to adopt the best available technology (BAT) for limiting water pollution, meaning that firms must identify the most effective technology and adopt that technology within a certain timeframe.[14]

The Clean Air Act, first implemented in 1970 and amended several times since then, also significantly affects the paper and pulp industry by regulating air pollutants such as sulfur dioxide, carbon monoxide, nitric and nitrous oxide, and various particulate emissions.[15] The production of paper also generates solid waste such as sludge, ash, and bark. While manufacturers typically use landfills to dispose of sludge and ash, they dispose of bark using incinerators that generate electric power for manufacturing plants. The 1990 amendments to the Clean Air Act regulate emissions from such incinerators.[16]

The 1990 amendments to the Clean Air Act also establish Maximum Achievable Control Technology (MACT) standards that require all firms to adopt the best available pollution abatement technology.[17] Depending on the number of firms in the industry, this means that all firms must adopt the technology of the 12 percent of firms in the industry with the most efficient technology within three years, or—if 30 or fewer establishments exist in the industry—of the five

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[11] Deanna H. Matthews and Lester B. Lave, "Evaluating Occupational Safety Costs and Policy in an Input-Output Framework," In *Improving Regulation: Case Studies in Environment, Health, and Safety* (Washington, DC: RFF Press, 2001), 373.
[12] Ibid., 358.
[13] *Energy and Environmental Profile of the U.S. Paper and Pulp Industry* (Energetics Incorporated, 2005), accessed December 11, 2011, http://www1.eere.energy.gov/industry/forest/pdfs/pulppaper_profile.pdf, 8.
[14] James E. McCarthy, *Clean Air Act: A Summary of the Act and Its Major Requirements*, CRS Report for Congress, last modified May 9, 2005, accessed January 14, 2012, http://fpc.state.gov/documents/organization/47810.pdf, 13.
[15] Ibid., 1.
[16] *Energy and Environmental Profile*, 8.
[17] McCarthy, *Clean Air Act*, 10.

most efficient firms within three years.[18] Many other environmental regulations have an effect as well. Below is a summary of environmental regulations that affect this industry, along with their requirements:[19]

Rule	Description
Clean Water Act	Regulates the discharge of chemical pollutants and BOD, requires that producers adopt the best available technology for pollution control
Clean Air Act	Regulates chemical and particulate pollution emissions from solid waste incinerators, requires that producers use Maximum Available Control Technolgoy
Cluster Rules	Amendments to the Clean Water and Clean Air Acts that further restrict many pollutants, with a particular focus on chlorine and dioxin
Environmental Pesticide Control Act	Requires companies that grow and harvest trees to register and obtain EPA approval of their pesticide
Resource Conservation and Recovery Act	Requires that the EPA monitor and track hazardous waste at all stages of use
Toxic Substances Control Act	Regulates the production of chemicals at all stages of use — chlorine is the one that most affects this industry
Endangered Species Act	Restricts logging and production in certain areas
Great Lakes Initiative	Specifically regulates chemical discharges in 8 states bordering the Great Lakes
Comprehensive Environmental Response, Compensation, and Liability Act	Requires firms to pay into a fund that will assist with cleanup in the event of a major spill or leak

Workplace regulations affect this industry as well and, like all workplaces, paper and pulp manufacturers must comply with numerous workplace health and safety regulations. OSHA focuses its efforts on reducing workplace accidents and fatalities by closely monitoring firms with poor compliance records and penalizing non-compliance by fining the offending firms.[20] The workplace regulations that affect the paper and pulp industry most are listed below with brief explanations:[21]

[18] Ibid.
[19] *Energy and Environmental Profile*, 9.
[20] Matthews and Lave, "Evaluating Occupational Safety Costs and Policy," 359.
[21] Occupational Safety & Health Administration, *Pulp, Paper and Paperboard Mills* (U.S. Department of Labor, March 2005) accessed January 4, 2012, http://www.osha.gov/SLTC/pulppaper/index.html

Rule	Description
1910.22: General requirements	Guidelines for cleanliness, aisles and passageways, covers and guardrails, and floor loading
1910.23: Guarding floor and wall openings and holes	Guidelines for hinged floors, ladderways, stairway floors, and skylights
1910.24: Fixed industrial stairs	Guidelines for the angle, width, tread, clearance, and location of stairs
1910.29: Manually propelled mobile ladder stands and scaffolds	Guidelines for the strength, working loads, and design of scaffolding and mobile ladders
1910.36: Design and construction requirements for exit routes	Guidelines for the number and design of exit doors
1910.37: Maintenance, safeguards, and operational features for exit routes	Requires exit doors to be unobstructed and marked with a standardized "Exit" sign
1910.39: Fire prevention plans	Guidelines for fire prevention plans: Requires plans to be communicated to employees verbally and in writing
1910.95: Occupational noise exposure	Requires that controls be implemented when employees are exposed to noise exceeding established thresholds
1910.104: Oxygen (bulk oxygen systems)	Guidelines for equipment with storage capacity exceeding 13,000 cubic feet of oxygen
1910.106: Flammable and combustible liquids	Guidelines for importation, storgage and disposal of combustible liquids
1910.119: Process safety management of highly hazardous chemicals	Requirements for handling toxic, flammable, reactive, and explosive materials
1910.133: Eye and face protection	Requirements that employees use appoved equipment to protect their eyes and face
1910.134: Respiratory protection	Requires that employers to use approved controls to mitigate
1910.145: Specifications for accident prevention signs and tags	Sets standards for signs that indicate danger
1910.146: Permit-required confined spaces	Guidelines for tight enclosed spaces

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Various workplace regulations exist for virtually every stage of production, including the construction of the facilities, the training of employees, the actual paper production, the transportation of inputs to production, and the delivery of the final product to consumers. While the explicit purpose of such regulations is preventing workplace injuries, illnesses, and fatalities, workers in the industry undoubtedly take such risks into consideration when evaluating whether to take a job. In order to attract a high-quality workforce, employers must provide a competitive mix of monetary compensation and safety measures that compare favorably to those of the rest of the industry. Employers do not have the option of eliminating risk entirely. Tougher safety measures also impose monetary costs that reduce the funds available for hiring additional employees or raising salaries.[22] So while workplace regulations presumably increase workplace safety, the extent to which they increase safety is offset by reductions in the compensation of workers. The reduction in wages and salaries happens first because hiring workers becomes more expensive, and second because employers are compelled to make safety a larger part of the overall

[22] For example, a job valued by an employer at $70,000 can either be (a) offered at a salary of $70,000 plus some amount of risk to the employee, or (b) offered at a salary of $60,000 plus $10,000 worth of safety equipment. Alternatively, an employer may choose to offer seven jobs at $70,000 each (and absorb $10,000 per person in safety compliance costs) instead of offering an eighth job for the $70,000 that went to pay the safety compliance costs for the first seven workers.

compensation for employees—which reduces the amount of monetary compensation necessary to hire or retain quality workers. Regulations that require employees to choose safety over monetary compensation may very well go against the employees' best interests.[23] Additionally, as the cost of employment rises, the employer may choose to substitute capital for labor, thereby decreasing the number of jobs available in the industry.

These regulations also consume the time and energy of management personnel, and require more management input into making paper than would exist otherwise, thereby increasing the price that consumers must pay for the final product. In addition, regulations that penalize companies based on their workplace injuries incentivize the firms to outsource relatively dangerous tasks to other firms that specialize in placing temporary workers, which further increases the amount of resources involved in production and reduces productivity by placing less experienced employees in positions that more experienced workers would otherwise fill.[24]

Costs of Regulation

The paper and pulp industry spends several billion dollars per year to comply with federal regulations. The most recent report on pollution abatement operating costs from the Census Bureau reports that the industry spent nearly $5.6 billion in 2005 on capital expenditures to reduce pollution and that the operating costs of pollution abatement programs totaled nearly $1.8 billion for the industry.[25] In 2001, Mark Crain and Joseph Johnson published a study in cooperation with the National Association of Manufacturers that estimated the cost per employee of federal labor regulation in the United States. They determined that the cost per employee in the paper industry was $1,320 per year in 2000, which in 2010 dollars would be $1,647 per employee.[26] When multiplied by the 393,500 employees in the industry, this amounts to a total cost of $648 million per year.[27] In an industry where revenues exceed $160 billion annually, the direct cost of regulation in dollar terms—which equals roughly half a percentage point of total revenues—may appear modest. Understanding the full impact of regulation, however, requires comprehending more than the dollar amounts that the industry pays for compliance.

The actual expenditures that companies make to comply with regulation are only the final and most easily measured costs in the process of regulatory compliance. Isolating the amount spent on regulatory compliance alone and using that amount as the "price" of regulation significantly

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[23] Matthews and Lave, "Evaluating Occupational Safety Costs and Policy," 361.
[24] Peter F. Drucker, *They're Not Employees, They're People* (Boston, MA: Harvard Business Review, 2002), http://www.peowebhr.com/Newsreleases/Harvard%20Business%20Review.pdf, 4.
[25] U.S. Census Bureau, *Pollution Abatement Costs and Expenditures: 2005* (U.S. Department of Commerce, Economics and Statistics Administration, April 2008), accessed November 17, 2011, http://www.census.gov/prod/2008pubs/ma200-05.pdf.
[26] Mark W. Crain and Joseph M. Johnson, *Compliance Costs of Federal Workplace Regulation: Survey Results for U.S. Manufacturers* (Arlington, VA: Regulatory Studies Program, Mercatus Center at George Mason University, 2001), 24.
[27] Federal Reserve Bank of St. Louis Economic Research, *Gross Domestic Product: Implicit Price Deflator* (April 27,2012), accessed May 8, 2012, http://research.stlouisfed.org/fred2/series/GDPDEF.

understates the actual cost. These expenditures occur only after companies have identified the regulations with which they must comply, assessed which aspects of their business they must change (and to what extent) in order to comply, and agreed upon the most effective way of making these changes. All these processes require time and energy on the part of owners and management personnel, which diverts that time and energy away from productive activities.[28] Therefore, in addition to the monetary costs of regulation, the paper and pulp industry faces costs that do not show up on their books—but nonetheless decrease efficiency and make production more expensive.[29]

As in all industries, firms in the paper and pulp industry have a finite amount of financing, so expending capital to comply with regulation necessarily means less capital is available for production. The relationship between stricter regulation and lower amounts of investment in productive capital has been demonstrated empirically. Wayne Gray and Ronald Shadbegian estimated that an increase in pollution abatement costs crowds out productive investment by about 188 percent, meaning that for each additional dollar spent on pollution abatement, companies will reduce productive investment by $1.88.[30]

In addition to the tradeoff between productive investment and expenditures for the purpose of regulatory compliance, regulation may actually have the opposite of the intended effect. For example, in less regulated countries, trees used for paper production come from tree farms. Tree farming is efficient because firms can reduce their costs by buying from farmers who continually use the same land rather than constantly purchasing and clearing new land. Therefore, a larger paper and pulp industry in these countries leads to more forested land than would exist otherwise.[31] In the United States, industry regulations divert resources away from possible expansion and toward compliance, and therefore reduce the amount of forested land. Forested land—including land on which people farm trees for harvest—reduces erosion, cleans the air, and enriches the soil. Collectively, these effects enhance the quality of the environment.[32]

Furthermore, in the modern economy companies have options about where to locate their operations. In 1970, the United States was the world's top producer of pulp, paper, and paperboard, producing 36.5 percent of the world's paper and paperboard and 35 percent of the world's pulp. Production of paper and paperboard in the United States was over three times greater than production in Japan, which at the time was the world's second largest producer. Pulp production in the United States was also more than double that of Canada, the second largest producer. In 2010 the United States remained the top producer of pulp, producing 27 percent of the world's total. However, by 2010 the United States dropped to second place in terms of paper and

[28] Drucker, *They're Not Employees*, 4.
[29] Ibid.
[30] Gray and Shadbegian, *Environmental Regulation*, 252.
[31] *Tripartite Meeting*, 13.
[32] Western Australia Department of Agriculture and Food, *Benefits of Farm Forestry* (1998), accessed March 23, 2012, http://www.agric.wa.gov.au/PC_92523.html.

paperboard—behind China—producing 19 percent of the world total.[33] Below are charts showing the production of the top five countries in terms of pulp and of paper and paperboard in 2010, tracking their total production since 1970.

Paper and Paperboard Production (thousands of tonnes)					
	1970	**1980**	**1990**	**2000**	**2010**
China	2961	6884	17409	35039	96501
United States	45805	56839	71965	86252	75786
Japan	12973	18088	28088	31828	27364
Germany	5892	7868	12194	18182	23202
Canada	11253	13390	16466	20921	12733

Pulp Production (thousands of tonnes)					
	1970	**1980**	**1990**	**2000**	**2010**
United States	36341	45569	56397	57178	49355
China	3430	4809	13325	14856	20438
Canada	16235	19672	22839	26495	18576
Brazil	867	3404	7364	7341	14164
Sweden	7828	8577	9919	11903	11714

Regulation also reduces competition within the paper and pulp industry. The Best Achievable Technology (BAT) standards established in both the Clean Air Act and the Clean Water Act encourage innovation by giving companies a regulatory advantage, in addition to the competitive advantage they would gain anyway, if they develop and employ more efficient technology.[34] In general, larger manufacturers adopt new technology more readily than their smaller competitors do because they can spread the upfront costs over a larger number of units. Since new technology is disproportionately more expensive for smaller companies, larger companies may have an incentive to use the BAT standards to impede smaller firms' ability to compete.[35]

Environmental regulation has numerous drawbacks, many of which result from hidden costs, and a substantial amount of literature suggests that workplace regulation has a similar counterproductive effect. Workers in less safe work environments command higher wages than identical workers in safer work environments, so when regulatory agencies require a safer workplace, the wages that companies must pay in order to attract qualified workers decrease.[36] Lower-income people are typically less willing to spend on health care—so while employees become less likely to suffer a work-related injury they simultaneously become more likely to suffer

[33] Food and Agriculture Organization of the United Nations, "ForesSTAT," January 2012, accessed March 18, 2012, http://faostat.fao.org/DesktopDefault.aspx?PageID=626&lang=en#ancor.
[34] Peter M. Clarkson, Yue Li, and Gordon D. Richardson, "The Market Valuation of Environmental Capital Expenditures by Pulp and Paper Companies," *The Accounting Review* 79.2 (2004): 332.
[35] Ibid.
[36] Matthews and Lave, "Evaluating Occupational Safety Costs and Policy," 361.

a health problem due to delaying or perhaps entirely foregoing medical treatment.[37] The net effect on workers' health depends on which effect of workplace regulation is greater.

Some workplace regulations are so burdensome that they require an expenditure of millions of dollars per statistical life saved. While estimates vary, a review of several studies determined that members of society typically demonstrate a willingness to pay a median of $7 million per life saved.[38] Some regulations cost far more than $7 million per statistical life saved, which means employees incur a higher cost in complying with a regulation than what they would be willing to pay to avoid the risk of injury or premature death if given the choice.

Spending more than this on one particular area of risk means diverting resources away from other uses where they would be spent more effectively, particularly health care. This is true for any additional safety that a worker might obtain, whether it comes from mandates through regulation or from voluntary action like purchasing insurance. The difference is that people will only *choose* to purchase insurance if the benefit of the added security is worth the cost. So, for example, while a person may enjoy the added security of having insurance against damage to her home, she may rationally decide not to purchase such insurance if the monthly premiums are so high that she must cut back on food purchases.

Expensive regulation does not give people such a choice, and a very expensive regulation with a small benefit can create exactly that kind of outcome. Workers become poorer when they must accept less monetary compensation in exchange for more safety, and poorer workers typically spend less on health care, leading to less preventative care and ultimately to a higher chance of serious health complications.[39] Therefore the total number of fatalities in society may very well *increase* due to the implementation of safety regulations.

An example of this situation is the "control of hazardous energy" regulation, which establishes performance requirements for machines that could potentially injure employees when they are started, due to stored energy.[40] A study by Kip Viscusi and Ted Gayer in 2002 estimated that this particular law cost over 20 times more per statistical life saved than people would typically be willing to pay to avoid the risk of premature death.[41] Under such circumstances it is perfectly reasonable to expect expensive regulations that seek to make workplaces safer to end up making society more dangerous overall.[42]

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[37] Kip W. Viscusi, "Mortality Effects of Regulatory Costs and Policy Evaluation Criteria," *RAND Journal of Economics* 25.1 (1994): 96.
[38] Kip W. Viscusi, "The Value of Life," Discussion Paper 517 (Harvard John M. Olin Center for Law, Economics, and Business, 2005).
[39] Kip W. Viscusi and Ted Gayer, "Safety at Any Price?," *Regulation* 25.3 (2002): 58.
[40] Occupational Safety and Health Administration, *Pulp, Paper, and Paperboard Mills* (U.S. Department of Labor, 2005), January 4, 2012, http://www.osha.gov/SLTC/pulppaper/index.html.
[41] Safety at Any Price?, 59.
[42] Viscusi, "Mortality Effects of Regulatory Costs and Policy Evaluation Criteria," 108.

Conclusion

The paper and pulp industry incurs many seen, unseen, direct, and indirect costs from dealing with workplace and environmental regulations. Over the past fifty years, the industry has considerably reduced pollution and the incidence of workplace injuries and fatalities due to technological improvements and to rising standards of living, which generally lead workers to demand a safer workplace and encourage the industry to gain a reputation for safety in order to build and maintain a competitive workforce.[43] The industry also generates roughly 56 percent of the electricity it uses for production by incinerating organic waste, which means it consumes less power from other sources and creates less pollution in the form of solid waste.[44]

While the industry already faces many regulatory hurdles, several new amendments to the Clean Air Act are now under consideration. The proposed rules that would have the greatest impact on the industry would categorize solid waste incinerators as waste disposal rather than power generation, which would make them more expensive and less useful as a way to reduce waste and reduce the consumption of electricity from other sources. These new regulations, called Boiler MACT rules, could cost the industry large amounts of money up front and add substantially to individual firms' operating expenses.[45]

The burden of regulation on the paper and pulp industry is considerable. While the existence of these regulations is often justified on the grounds that the industry generates large amounts of air and water pollution and creates a dangerous work environment, the regulations also decrease productivity, limit competition, and in many instances have the opposite effect to what they intended to achieve.

[43] *Tripartite Meeting*, 24, 96.
[44] U.S. Census Bureau, *Statistics for Industry Groups and Industries: 2005* (U.S. Department of Commerce, Economics and Statistics Administration, November 2006), accessed December 3, 2011, http://www.census.gov/prod/2006pubs/am0531gs1.pdf.
[45] Don Wolf, *Understanding the Industrial Boiler MACT Rule* (HPAC Engineering, June 10, 2010), accessed February 3, 2012, http://hpac.com/bse/understanding-industrial-boiler-mact-0610/.

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