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July 13, 2009

MEMO TO: AF&PA Climate Task Force
FROM: Barry Malmberg
SUBJECT: Waxman-Markey Cost Spreadsheet

A spreadsheet has been prepared to estimate the fuel and electricity related carbon costs associated with the Waxman-Markey House Resolution, i.e. “the American Clean Energy and Security Act of 2009”. Only carbon costs from fuel and electricity use are considered in this spreadsheet, i.e. potential offsets from carbon sequestration, combined heat and power (CHP) operation, allocations for renewable energy and energy efficiency, etc. are not considered. The spreadsheet estimates fuel and electricity costs with and without carbon costs. The pertinent greenhouse gases (GHG) for the pulp and paper industry that will be regulated under the Waxman-Markey House Resolution are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) expressed as carbon dioxide equivalents¹. Energy use, energy costs, electricity use, electricity costs, and production data are input on the Inputs tab of the spreadsheet. Results are displayed graphically on the Results tab and numerically on Fuel Combustion Emissions tab and the Purchased Electricity Emissions tab. Appendix 1 contains an overview of H.R. 2454 prepared by the Congressional Budget Office (CBO) as well as CBO estimates of carbon allowance prices. Material in Appendix 1 has been cut and pasted from a larger CBO analysis of H.R. 2454.

It is expected that free carbon allowances will be provided to the pulp and paper industry from a number of different allocation categories such as free allowances from the trade vulnerable industry category and free allowances available to electricity consumers. In general, the free allowances from each of these categories decrease over time, between the years 2012 – 2034. The free allowance reduction schedule for each category decreases at a different rate and the category specific allocation percentages over time are provided in the spreadsheet. It should be noted that there appears to be incorrect paragraph references within Section 781. Allocation of Allowances for Supplemental Reductions (e) Trade-Vulnerable Industries.

¹ To convert metric tons of methane to carbon dioxide equivalents multiply by 25. To convert metric ton of nitrous oxide to carbon dioxide equivalents multiply by 298.

The pulp and paper industry should be eligible to receive free GHG allocations from the trade vulnerable category based upon eligibility criteria for the trade vulnerable industry category. In 2014, the year that industrial facilities are required to submit allowances for GHG emissions, free allocations covering up to 15% of total covered emissions are provided to the trade vulnerable industry category. This amount is intended to cover 100% of GHG emissions from the trade vulnerable industry category in 2014 based upon fuel and electricity usage from 2005. Free allowances from the trade vulnerable industry sector will decrease to zero by 2035. The categories for allocations within the trade vulnerable industry sector will originally be made by six digit North American Industrial Classification System (NAICS) code². The program Administrator has the ability to reclassify sectors within the trade vulnerable industry. Current NAICS codes related to the pulp and paper industry are Pulp Mills 322110, Paper Mills, except Newsprint 322121, Newsprint mills 322122, and Paperboard Mills 322130. Category allocations within the trade vulnerable industry are based upon indirect and direct carbon factor according to the distribution in Table 1. The direct carbon factor is the product of the average output of the covered entity for the two years preceding the year of distribution and the most recent average direct GHG emission factor (expressed in mt CO₂eq per unit of output) for the sector. The indirect carbon factor is the product of the average output of the covered entity for the two years preceding the year of distribution, the electricity emission intensity factor, and the electricity efficiency factor. The electricity emission intensity factor (kg CO₂eq/MWh) is a value that shall be provided to the electricity consumer by the electricity producer on an annual basis. The electricity efficiency factor is the average amount of electricity used per unit of output for all entities in the relevant sector. Average direct and indirect sector emission factors will be based upon government energy databases such as the 2002 Manufacturing Energy Consumption Survey (MECS) compiled by the Department of Energy³. Preliminary 2006 MECS results are being released⁴. When more recent energy data is available, the Administrator, in general, will use the more recent energy data for calculation of direct and indirect carbon factors.

Table 1: Basis for Distribution of Allowance Rebates by Sector in the Trade Vulnerable Industry Category

Vintage Year	Distribution
2012-2013	Indirect carbon factor
2014-2025	Sum of direct and indirect carbon factor
2026-2035	Sum of direct and indirect carbon factor multiplied by 0.9 in 2026 and declining by 0.1 annually

Table 2 provides average direct emission factors and average electricity efficiency factors for the pulp and paper industry, classified by six digit NAICS code. Descriptions of NAICS codes relevant to the pulp and paper industry are provided in Appendix 2. The values in Table 2 are based upon 2002 MECS energy data and 2002 AF&PA production data⁵. Current direct emission factors (values from 2006 based upon AF&PA Environmental Health and Safety (EHS) data) are less than the values provided in Table 2. Based upon production category, average

² <http://www.census.gov/eos/www/naics/>

³ <http://www.eia.doe.gov/emeu/mecs/mecs2002/data02/shelltables.html>

⁴ <http://www.eia.doe.gov/emeu/mecs/predata/estimates.html>

⁵ 2007 Statistics Data Through 2006, AF&PA

direct emission factor from Table 2 is input to Inputs!I16 in the cost spreadsheet and electricity efficiency factor is input to Inputs!I18. It is unclear within the legislation whether average direct emission factors and average electricity efficiency factors should be based upon all fuels consumed or only fuels considered within the cap and trade framework. The spreadsheet has the flexibility to consider average factors derived using either approach. It should be noted that several individual fuel entries within the 2002 MECS database have been withheld to avoid disclosing data from individual establishments. In these cases, as well as entries where the estimated fuel consumption is less than 0.5 trillion BTU, the energy use has been treated as zero in calculations.

Table 2: Average Direct Emission Factors and Electricity Efficiency Factors for the Pulp and Paper Industry Based upon 2002 MECS Energy Consumption Data and 2002 AF&PA Production Statistics, Emission Factors are for all Fuels

NAICS Code	Name	Direct Emission Factor (mt CO ₂ eq/admt)	Electricity Efficiency Factor (MWh/admt)
322	Paper (entire industry)	0.731	0.787
322110	Pulp Mills	0.233	0.300
322121	Paper Mills, except Newsprint	0.887	0.763
322122	Newsprint Mills	0.167	2.063
322130	Paperboard Mills	0.487	0.402

Example calculation for allocated free allowances from the trade vulnerable industry category: A paperboard mill had production of 250,000 admt/year in 2014 and 260,000 admt/year in 2015. The latest available average direct emission intensity value for the paperboard sector, based upon 2002 MECS energy data and production statistics from AF&PA is 0.49 mt CO₂eq/admt. The latest available average purchased electricity efficiency factor, based upon 2002 MECS energy data and production statistics from AF&PA is 0.40 MWh/admt. The electricity emission intensity factor provided to the mill from the electric utility is 0.6 mt CO₂eq/MWh.⁶ The total direct emissions allocation is 124,200 mt CO₂eq/year (0.487 mt CO₂eq/admt*average(250,000 and 260,000 admt/year) and the total indirect emission allocation is 61,200 mt CO₂eq/year (0.402 MWh/admt * 0.6 mt CO₂eq/MWh * average(250,000 and 260,000 admt/year). Use of average direct and indirect carbon factor is supposed to be the method to ratchet down energy use since entities that have larger than average direct or indirect emission won't receive sufficient free emissions allowances to cover use, and will have to purchase additional carbon allowances. If emission allowance requests exceed available emission allowances within the trade vulnerable industry category, free allowances are reduced on a pro rata basis.

⁶ DOE Updated State-level Greenhouse Gas Emission Coefficients for Electricity Generation 1998-2000 report

- Appendix 1- Congressional Budget Office Overview Description of H.R. 2454 and Estimates of Allowance Prices Under H.R. 2454 –

MAJOR PROVISIONS

The major provisions of H.R. 2454 are described in the following sections.

CAP-AND-TRADE PROGRAMS FOR GREENHOUSE GASES

This legislation would designate as GHGs: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons, nitrogen trifluoride, and HFCs from a chemical manufacturing process at a stationary industrial source. EPA would be required to establish two cap-and-trade programs aimed at reducing the emission of GHGs in the United States over the 2012–2050 period. One program would cover emissions of GHGs other than HFCs. A second program would cover the production and importation of HFCs and the importation of products containing HFCs. (Although HFCs are considered to be greenhouse gases, this cost estimate will subsequently refer to the larger program as the GHG cap-and-trade program and the smaller program specific to HFCs as the HFC cap and-trade program). A cap-and-trade program is a regulatory policy aimed at controlling pollution emissions from specific sources. The legislation would set a limit on total emissions for each year and would require regulated entities to hold rights, or allowances, to the emissions permitted under that cap. Each allowance would entitle companies to emit the equivalent of one metric ton of carbon dioxide equivalent (mtCO_{2e}).⁷ After the allowances for a given period were distributed, entities would be free to buy and sell allowances.

ENTITIES COVERED BY CAP-AND-TRADE PROGRAMS

Based on information from EPA, CBO estimates that about 7,400 facilities would be affected by the cap-and-trade programs established by the bill. The specific details regarding coverage, attribution of emissions to covered entities, and the timing of implementation vary by type of entity and sector of the economy:

- Beginning in 2012, all electricity generators would be required to submit allowances for all GHG emissions from their sites, with the exception of emissions from the combustion of liquid fuels, coke, and renewable biomass;
- Also beginning in 2012, any facility or entity that produces or imports petroleum- or coal-based liquids, petroleum coke, or natural gas liquids would be required to submit allowances for the GHG emissions that would result from the combustion of those fuels, if combustion of the fuel resulted in the emission of more than 25,000 mtCO_{2e} per year. Similarly, all facilities or entities that produce or import GHGs for direct use would be required to submit allowances for the emissions that would result when those gases were released into the atmosphere. Emissions from sites that geologically sequester CO₂ also would be covered beginning in 2012;
- Beginning in 2014, industrial facilities that manufacture a wide variety of products or that burn fossil fuels would be required to submit allowances for all GHG emissions from their sites—with the exception of emissions from the combustion of various types of liquid fuels, coke, and renewable biomass—if their activities result in more than 25,000 mtCO_{2e} of emissions;
- Beginning in 2016, natural gas distributors that deliver at least 460 million cubic feet of natural gas to customers that are not covered by the cap-and-trade provisions of the bill would need to submit allowances for the GHG emissions that would result from the combustion of the gas delivered to those customers; and
- Under a separate cap, beginning in 2012, producers and importers of HFCs, and importers of products containing HFCs, would be required to submit allowances for the carbon dioxide-equivalent tons of HFC they produce or import.

According to CBO's estimates, the programs would cover about 72 percent of U.S. emissions of GHGs in 2012, about 78 percent in 2015, and about 86 percent in 2020.

OPERATION OF THE GHG CAP-AND-TRADE PROGRAM

⁷ A carbon dioxide equivalent is defined for each GHG as the quantity of that gas that makes the same contribution to global warming as one metric ton of carbon dioxide, as determined by EPA.

H.R. 2454 would not restrict the types of entities or individuals who could purchase, hold, exchange, or retire emission allowances under the GHG cap-and-trade program. An unlimited number of allowances obtained in one year could be saved or “banked” by market participants indefinitely to be used or sold in future years. Limited borrowing of allowances (that is, the use in one year of an allowance that has been established for use in a future year) also would be permitted. The program would allocate to covered entities 4,627 million mtCO_{2e} allowances in 2012—about 97 percent of the amount of such emissions by covered entities in 2005. The number of allowances would increase to as high as 5,482 million mtCO_{2e} in 2016 to account for certain covered entities that would not begin compliance until that time, and then decline by 100 million to 150 million mtCO_{2e} per year—falling to 1,035 million mtCO_{2e} in 2050, about 14 percent of projected emissions from covered entities in the absence of and regulation of such emissions.

The legislation also would require EPA to create a “strategic reserve” of about 2.7 billion allowances by setting aside a small number of allowances authorized to be issued each year. EPA would auction allowances from its strategic reserve only if the market price of allowances rose to unexpectedly high levels. A portion of an entity’s compliance obligation under the bill could be met by purchasing domestic or international “offsets” in lieu of purchasing an allowance. An offset would be created by activities (as certified by EPA) that are not directly related to the emissions of the facilities covered under the bill, but would reduce GHG emissions or increase the amount of such gases that are captured from the atmosphere and stored (this process is referred to as sequestration). Examples of such offset activities include reducing emissions of methane gas from solid waste landfills, sequestering GHGs on agricultural lands, rangelands, and forests, altering agricultural tillage practices, planting winter crops, and reducing the use of nitrogen fertilizer. Under the bill, such offsets could occur domestically or in another country if the United States is a party to a bilateral or multilateral agreement or arrangement with the relevant country. Those international agreements or arrangements would specify the types of qualifying projects and methods for verifying the validity of offset activities. Covered entities could also purchase GHG emission allowances established by other countries or international organizations if approved by EPA. The cap for the GHG cap-and-trade program would take effect in 2012. Of the emission allowances established for this program less the amount set aside for the strategic reserve (4,581 million mtCO_{2e} in 2012), 29.6 percent would initially be auctioned for sale from that vintage year (that is, the calendar year for which an allowance is established) to covered industries and other entities that wish to purchase them. Auctions would occur four times a year, with the first auction occurring no later than March 31, 2011. Emission allowances not specified for auction in the bill would be distributed free of charge to covered entities, states, and other specified recipients, who could then retire, sell, or use such allowances to meet the annual obligation for their own emissions. The percentage of emission allowances auctioned and freely allocated by vintage years 2012 through 2019 is provided in Table 1. By 2022, the percentage of allowances auctioned would increase to 18.4 percent and gradually increase to about 70 percent in 2031 and remain at that level through 2050.

TABLE 3 -- GHG EMISSION ALLOWANCES UNDER H.R. 2454 AND THE PERCENTAGE AUCTIONED AND FREELY ALLOCATED

	By vintage year --							
	2012	2013	2014	2015	2016	2017	2018	2019
Quantity of Emission Allowance Less Amount Available for Strategic Reserve (In Million of metric tons)	4,581	4,499	5,048	4,953	5,427	5,321	5,216	5,110
Percentage Auctioned	29.6	29.6	17.9	17.9	17.5	17.5	17.5	17.5
Percentage Free Allocated	70.4	70.4	82.1	82.1	82.5	82.5	82.5	82.5

Note: Vintage year is the calendar year for which an allowance is established

Revenues resulting from cap-and-trade programs

The impact of H.R. 2454 on net federal revenues would largely be determined by the value of allowances created by the bill less the resulting reductions in receipts from income and payroll taxes. Penalties for noncompliance and fees collected to administer the legislation would add a small amount to total revenues, and tax credits available to low-income individuals would reduce federal revenues. The following sections discuss how CBO estimated the allowance prices for GHG and HFC cap-and-trade programs and detail other revenue impacts of the bill. Estimating the Prices for Emission Allowances. CBO estimates that the price of GHG allowances would rise from about \$15 per mtCO_{2e} of emissions in 2011 to about \$26 per mtCO_{2e} in 2019. Table 3 provides CBO’s estimate of annual allowance prices for the separate GHG and HFC cap-and-trade programs that would be created by the bill.

TABLE 3 – CBO ESTIMATES OF ALLOWANCE PRICES UNDER H.R. 2454

	By fiscal year, in dollars --								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Estimated GHG Allowance Prices	15	16	17	18	19	21	22	24	26
Estimated HFC Allowance Price	n.a.	2	3	4	10	12	13	19	20

Note: n.a. = not applicable

1Prices provided are the weighted average of the estimate auction prices and fixed-prices sales.

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- Appendix 2: NAICS Codes Pertinent to the Pulp and Paper Industry -

322 Paper Manufacturing

Industries in the Paper Manufacturing subsector make pulp, paper, or converted paper products. The manufacturing of these products is grouped together because they constitute a series of vertically connected processes. More than one is often carried out in a single establishment. There are essentially three activities. The manufacturing of pulp involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet. Converted paper products are made from paper and other materials by various cutting and shaping techniques and includes coating and laminating activities.

The Paper Manufacturing subsector is subdivided into two industry groups, the first for the manufacturing of pulp and paper and the second for the manufacturing of converted paper products. Paper making is treated as the core activity of the subsector. Therefore, any establishment that makes paper (including paperboard), either alone or in combination with pulp manufacturing or paper converting, is classified as a paper or paperboard mill. Establishments that make pulp without making paper are classified as pulp mills. Pulp mills, paper mills and paperboard mills comprise the first industry group.

Establishments that make products from purchased paper and other materials make up the second industry group, Converted Paper Product Manufacturing. This general activity is then subdivided based, for the most part, on process distinctions. Paperboard container manufacturing uses corrugating, cutting, and shaping machinery to form paperboard into containers. Paper bag and coated and treated paper manufacturing establishments cut and coat paper and foil. Stationery product manufacturing establishments make a variety of paper products used for writing, filing, and similar applications. Other converted paper product manufacturing includes, in particular, the conversion of sanitary paper stock into such things as tissue paper and disposable diapers.

An important process used in the Paper Bag and Coated and Treated Paper Manufacturing industry is lamination, often combined with coating. Lamination and coating makes a composite material with improved properties of strength, impermeability, and so on. The laminated materials may be paper, metal foil, or plastics film. While paper is often one of the components, it is not always. Lamination of plastics film to plastics film is classified in the NAICS Subsector 326, Plastics and Rubber Products Manufacturing, because establishments that do this often first make the film. The same situation holds with respect to bags. The manufacturing of bags from plastics only, whether or not laminated, is classified in Subsector 326, Plastics and Rubber Products Manufacturing, but all other bag manufacturing is classified in this subsector.

Excluded from this subsector are photosensitive papers. These papers are chemically treated and are classified in Industry 32599, All Other Chemical Product and Preparation Manufacturing.

322110 Pulp Mills

This industry comprises establishments primarily engaged in manufacturing pulp without manufacturing paper or paperboard. The pulp is made by separating the cellulose fibers from the other impurities in wood or other materials, such as used or recycled rags, linters, scrap paper, and straw.

Cross-References. Establishments primarily engaged in--

- Manufacturing both pulp and paper--are classified in Industry [32212](#), Paper Mills; and
- Manufacturing both pulp and paperboard--are classified in Industry [322130](#), Paperboard Mills.

2007 NAICS	2002 NAICS	1997 NAICS	Corresponding Index Entries
322110	322110	322110	Deinking plants
322110	322110	322110	Deinking recovered paper
322110	322110	322110	Groundwood pulp manufacturing
322110	322110	322110	Pulp manufacturing (i.e., chemical, mechanical, or semichemical processes) without making paper
322110	322110	322110	Pulp manufacturing (made from bagasse, linters, rags, straw, wastepaper, or wood) without making paper
322110	322110	322110	Pulp mills not making paper or paperboard
322110	322110	322110	Wood pulp manufacturing

322121 Paper (except Newsprint) Mills

This U.S. industry comprises establishments primarily engaged in manufacturing paper (except newsprint and uncoated groundwood paper) from pulp. These establishments may manufacture or purchase pulp. In addition, the establishments may also convert the paper they make.

Cross-References. Establishments primarily engaged in--

- Manufacturing newsprint and uncoated groundwood paper--are classified in U.S. Industry [322122](#), Newsprint Mills;
- Converting paper without manufacturing paper--are classified in Industry Group [3222](#), Converted Paper Product Manufacturing;
- Manufacturing paperboard--are classified in Industry [322130](#), Paperboard Mills;
- Manufacturing pulp without manufacturing paper--are classified in Industry [322110](#), Pulp Mills; and

- Manufacturing photographic sensitized paper from purchased paper--are classified in U.S. Industry [325992](#), Photographic Film, Paper, Plate, and Chemical Manufacturing.

2007 NAICS	2002 NAICS	1997 NAICS	Corresponding Index Entries
322121	322121	322121	Absorbent paper stock manufacturing
322121	322121	322121	Asphalt paper made in paper mills
322121	322121	322121	Bond paper made in paper mills
322121	322121	322121	Book paper, coated, made in paper mills
322121	322121	322121	Bristols paper stock manufacturing
322121	322121	322121	Building paper stock manufacturing
322121	322121	322121	Cigarette paper made in paper mills
322121	322121	322121	Construction paper, school and art, made in paper mills
322121	322121	322121	Cotton fiber paper stock manufacturing
322121	322121	322121	Diapers, disposable, made in paper mills
322121	322121	322121	Facial tissues made in paper mills
322121	322121	322121	Felts, asphalt, made in paper mills
322121	322121	322121	Glassine wrapping paper made in paper mills
322121	322121	322121	Groundwood paper, coated, laminated, or treated in paper mills
322121	322121	322121	Groundwood paper, coated, made in paper mills
322121	322121	322121	Kraft paper stock manufacturing
322121	322121	322121	Looseleaf fillers and paper made in paper mills
322121	322121	322121	Napkins, table, made in paper mills
322121	322121	322121	Office paper (e.g., computer printer, photocopy, plain paper) made in paper mills
322121	322121	322121	Paper (except newsprint, uncoated groundwood) manufacturing
322121	322121	322121	Paper (except newsprint, uncoated groundwood) products made in paper mills
322121	322121	322121	Paper (except newsprint, uncoated groundwood), coated, laminated or treated, made in paper mills
322121	322121	322121	Paper mills (except newsprint, uncoated groundwood paper mills)

322121	322121	322121	Paper stock for conversion into paper products (e.g., bag and sack stock, envelope stock, tissue stock, wallpaper stock) manufacturing
322121	322121	322121	Paper towels made in paper mills
322121	322121	322121	Paper, asphalt, made in paper mills
322121	322121	322121	Pulp and paper (except groundwood, newsprint) combined manufacturing
322121	322121	322121	Pulp mills producing paper (except groundwood, newsprint)
322121	322121	322121	Sanitary napkins and tampons made in paper mills
322121	322121	322121	Sanitary paper products (except newsprint, uncoated groundwood) made in paper mills
322121	322121	322121	Sanitary paper stock manufacturing
322121	322121	322121	Sanitary products made in paper mills
322121	322121	322121	Saturated felts made in paper mills
322121	322121	322121	Sheathing paper (except newsprint, uncoated groundwood) made in paper mills
322121	322121	322121	Tablets (e.g., memo, note, writing) made in paper mills
322121	322121	322121	Tar paper, building and roofing, made in paper mills
322121	322121	322121	Tissue paper stock manufacturing
322121	322121	322121	Toilet paper made in paper mills
322121	322121	322121	Towels, paper, made in paper mills
322121	322121	322121	Writing paper made in paper mills

322122 Newsprint Mills

This U.S. industry comprises establishments primarily engaged in manufacturing newsprint and uncoated groundwood paper from pulp. These establishments may manufacture or purchase pulp. In addition, the establishments may also convert the paper they make.

Cross-References. Establishments primarily engaged in--

- Manufacturing paper (except newsprint and uncoated groundwood)--are classified in U.S. Industry [322121](#), Paper (except Newsprint) Mills;
- Converting paper without manufacturing paper--are classified in Industry Group [3222](#), Converted Paper Product Manufacturing;
- Manufacturing paperboard--are classified in Industry [322130](#), Paperboard Mills; and
- Manufacturing pulp without manufacturing paper--are classified in Industry [322110](#), Pulp Mills.

2007 NAICS	2002 NAICS	1997 NAICS	Corresponding Index Entries
322122	322122	322122	Groundwood paper products (e.g., publication and printing paper, tablet stock, wallpaper base) made in newsprint mills
322122	322122	322122	Groundwood paper, newsprint, made in paper mills
322122	322122	322122	Newsprint mills
322122	322122	322122	Newsprint paper, manufacturing
322122	322122	322122	Paper mills, newsprint
322122	322122	322122	Paper mills, uncoated groundwood
322122	322122	322122	Paper, newsprint and uncoated groundwood, manufacturing
322122	322122	322122	Pulp and newsprint combined manufacturing
322122	322122	322122	Pulp mills and groundwood paper, uncoated and untreated, manufacturing
322122	322122	322122	Pulp mills producing newsprint paper
322122	322122	322122	Uncoated groundwood paper mills

322130 Paperboard Mills

This industry comprises establishments primarily engaged in manufacturing paperboard from pulp. These establishments may manufacture or purchase pulp. In addition, the establishments may also convert the paperboard they make.

Cross-References. Establishments primarily engaged in--

- Manufacturing pulp without manufacturing paperboard--are classified in Industry [322110](#), Pulp Mills;

- Converting paperboard without manufacturing paperboard--are classified in Industry Group [3222](#), Converted Paper Product Manufacturing; and
- Manufacturing insulation board and other reconstituted wood fiberboard--are classified in U.S. Industry [321219](#), Reconstituted Wood Product Manufacturing.

2007 NAICS	2002 NAICS	1997 NAICS	Corresponding Index Entries
322130	322130	322130	Binder's board manufacturing
322130	322130	322130	Bristols board stock manufacturing
322130	322130	322130	Cardboard stock manufacturing
322130	322130	322130	Chipboard (i.e., paperboard) stock manufacturing
322130	322130	322130	Coated board made in paperboard mills
322130	322130	322130	Container board stock manufacturing
322130	322130	322130	Folding boxboard stock manufacturing
322130	322130	322130	Kraft liner board manufacturing
322130	322130	322130	Leatherboard (i.e., paperboard based) made in paperboard mills
322130	322130	322130	Milk carton board made in paperboard mills
322130	322130	322130	Paperboard (e.g., can/drum stock, container board, corrugating medium, folding carton stock, linerboard, tube) manufacturing
322130	322130	322130	Paperboard coating, laminating, or treating in paperboard mills
322130	322130	322130	Paperboard mills
322130	322130	322130	Paperboard products (e.g., containers) made in paperboard mills
322130	322130	322130	Pulp and paperboard combined manufacturing
322130	322130	322130	Pulp mills producing paperboard
322130	322130	322130	Setup boxboard stock manufacturing
322130	322130	322130	Wet machine board mills