

Estimated environmental impacts were calculated using the Environmental Paper Network's Paper Calculator(tm). When used publicly, it is required that the information is properly cited as "Environmental impact estimates were calculated using the Environmental Paper Network Paper Calculator Version 4.0. For more information visit [www.papercalculator.org](http://www.papercalculator.org)".

	ECO TAPE CARTA - 100% RECYCLED	ECO TAPE CARTA - 100% VIRGIN
Paper Type:	Linerboard	Linerboard
Quantity:	330.693 Pounds	330.693 Pounds
% Recycled:	100%	0%
 Wood Use	0 U.S. short tons	0.7 U.S. short tons <i>0.7 U.S. short tons more</i>
 Total Energy	2.3 million BTUs	4.8 million BTUs <i>2.5 million BTUs more</i>
 GHG	791 pounds CO <sub>2</sub> equiv.	3,030 pounds CO <sub>2</sub> equiv. <i>2,239 pounds CO<sub>2</sub> equiv. more</i>
 Water Usage	1,950 gallons	2,930 gallons <i>980 gallons more</i>
 Solid Waste	60.7 pounds	66.8 pounds <i>6.1 pounds more</i>
NITROGEN OXIDES (NO <sub>x</sub> )	203 O <sub>3</sub> equiv/m <sup>3*</sup>	96.4 O <sub>3</sub> equiv/m <sup>3*</sup> <i>106.6 less</i>
PURCHASED ENERGY	2.3 million BTUs	2.7 million BTUs <i>0.4 million BTUs more</i>
PARTICULATES	91.3 PM <sub>2.5</sub> equiv/m <sup>3*</sup>	40.2 PM <sub>2.5</sub> equiv/m <sup>3*</sup> <i>51.1 less</i>
SULFUR DIOXIDE (SO <sub>2</sub> )	0.7 pounds	1.4 pounds <i>0.7 pounds more</i>
VOLATILE ORGANIC COMPOUNDS (VOCs)	0.01 pounds	0.03 pounds <i>0.02 pounds more</i>
TOTAL REDUCED SULFUR (TRS)	0.02 pounds	0.03 pounds <i>0.02 pounds more</i>
HAZARDOUS AIR POLLUTANTS (HAPs)	0.2 pounds	0.3 pounds <i>0.09 pounds more</i>
CHEMICAL OXYGEN DEMAND (COD)	2.9 pounds	4.3 pounds <i>1.5 pounds more</i>
BIOCHEMICAL OXYGEN DEMAND (BOD)	1.05 pounds	1.5 pounds <i>0.4 pounds more</i>
TOTAL SUSPENDED SOLIDS (TSS)	0.9 pounds	3.2 pounds <i>2.3 pounds more</i>
FOREST DISTURBANCE	0 acres	0.1 acres <i>0.1 acres more</i>

THREATENED SPECIES	0 species	11 species <i>11 more</i>
OCEAN ACIDIFICATION	230 pounds H <sub>2</sub> CO <sub>3</sub>	688 pounds H <sub>2</sub> CO <sub>3</sub> <i>458 pounds more</i>
MERCURY EMISSIONS	5.0 milligrams	7.07 milligrams <i>2.1 milligrams more</i>
DIOXIN EMISSIONS	74.5 micrograms	204 micrograms <i>129.5 micrograms more</i>
FRESHWATER DISTURBANCE	See below	See below
HERBICIDES	See below	See below
OCEAN WARMING	See below	See below
WETLAND DISTURBANCE	See below	See below

## Explanation of Data Values



**Wood use** measures the amount of wood required to produce a given amount of paper. Results are reported in fresh/green U.S. short tons of wood. The methodology does not include the forest residues left behind during pulpwood harvest in the forests (i.e., slash, roots). If forest residues were included it could be twice the number, as roughly 50% of biomass is left after harvest.

- ECO TAPE CARTA - 100% recycled uses 0 U.S. short tons, made from about 0 trees
- ECO TAPE CARTA - 100% virgin uses 0.7 U.S. short tons, made from about 4.05 trees  
ECO TAPE CARTA - 100% virgin uses 0.7 U.S. short tons more



**Total energy** measures all energy required over the paper's life cycle, including all renewable and nonrenewable resource use, including black liquor and all wood sources.

- ECO TAPE CARTA - 100% recycled uses 2.3 million BTUs, equivalent to 2.7 residential refrigerators operated/year
- ECO TAPE CARTA - 100% virgin uses 4.8 million BTUs, equivalent to 5.7 residential refrigerators operated/year  
ECO TAPE CARTA - 100% virgin uses 2.5 million BTUs more, a difference of 3.0 residential refrigerators operated/year



**Greenhouse gases/climate change impacts** measures carbon dioxide or CO<sub>2</sub> from burning fossil fuels, methane from paper decomposing in landfills and short-lived climate pollutants (such as black carbon and organic carbon) which contribute to climate change by trapping energy from the sun in the earth's atmosphere. This impact category also includes forest carbon storage loss from logged forests.

- ECO TAPE CARTA - 100% recycled produces 791 pounds of CO<sub>2</sub> equiv., equivalent to 0.07 cars/year
- ECO TAPE CARTA - 100% virgin produces 3,030 pounds of CO<sub>2</sub> equiv., equivalent to 0.3 cars/year  
ECO TAPE CARTA - 100% virgin produces 2,239 pounds CO<sub>2</sub> equiv. more, a difference of 0.2 cars/year



**Water consumption** measures the amount of process and cooling water that is consumed or degraded throughout the life cycle of the paper product.

- ECO TAPE CARTA - 100% recycled uses 1,950 gallons, equivalent to 1.4 clothes washers operated/year
- ECO TAPE CARTA - 100% virgin uses 2,930 gallons, equivalent to 2.1 clothes washers operated/year  
ECO TAPE CARTA - 100% virgin uses 980 gallons more, a difference of 0.7 clothes washers operated/year



**Solid waste** measures sludge and other wastes generated during pulp and paper manufacturing, and used paper disposed of in landfills and incinerators.

- ECO TAPE CARTA - 100% recycled produces 60.7 pounds of solid waste, equivalent to 13.9 people generating solid waste/day
- ECO TAPE CARTA - 100% virgin produces 66.8 pounds of solid waste, equivalent to 15.3 people generating solid waste/day  
ECO TAPE CARTA - 100% virgin produces 6.1 pounds more, a difference of 1.4 people generating solid waste/day

**Nitrogen oxides/ground level ozone** (NO<sub>x</sub>, which includes NO and NO<sub>2</sub>) measures products of the combustion of fuels that contain nitrogen. NO<sub>x</sub> can react with volatile organic compounds and sunlight in the lower atmosphere to form ozone, a key component of urban smog. NO<sub>x</sub> forms ozone and can also, in parallel, lead to acid rain. \*The measurement of NO<sub>x</sub> in this calculator is a complex equation that takes into account human exposure across a sample of locations of pulp and paper mills. For more information please see the *Methodology* document under the Resources tab of this website (<https://c.environmentalpaper.org/pdf/SCS-EPN-PC-Methods.pdf>).

- ECO TAPE CARTA - 100% recycled produces 203 persons x hrs. x pounds O<sub>3</sub> equiv/m<sup>3</sup>, equivalent to 0.3 gasoline powered passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 96.4 persons x hrs. x pounds O<sub>3</sub> equiv/m<sup>3</sup>, equivalent to 0.1 gasoline powered passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 106.6 persons x hrs. x pounds O<sub>3</sub> equiv/m<sup>3</sup> less, a difference of 0.1 gasoline powered passenger cars/year

**Purchased energy** is a subset of total energy, and measures how much energy comes from purchased electricity and other fuels.

- ECO TAPE CARTA - 100% recycled uses 2.3 million BTUs, equivalent to 2.7 residential refrigerators operated/year
- ECO TAPE CARTA - 100% virgin uses 2.7 million BTUs, equivalent to 3.2 residential refrigerators operated/year
- ECO TAPE CARTA - 100% virgin uses 0.4 million BTUs more, a difference of 0.5 residential refrigerators operated/year

**Particulates/PM<sub>2.5</sub> impacts** measures the effect of particulate matter (PM) emissions from pulp/paper production, contributing to smog. Particulates are small airborne particles generated during combustion, and pose a range of health risks, including asthma and other respiratory problems, when inhaled. \*The measurement of particulates in this calculator is a complex equation that takes into account human exposure across a sample of locations of pulp and paper mills. For more information please see the *Methodology* document under the Resources tab of this website (<https://c.environmentalpaper.org/pdf/SCS-EPN-PC-Methods.pdf>).

- ECO TAPE CARTA - 100% recycled produces 91.3 persons x hrs. x pounds PM<sub>2.5</sub> equiv/m<sup>3</sup>, equivalent to 3.5 gasoline powered passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 40.2 persons x hrs. x pounds PM<sub>2.5</sub> equiv/m<sup>3</sup>, equivalent to 1.5 gasoline powered passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 51.1 persons x hrs. x pounds PM<sub>2.5</sub> equiv/m<sup>3</sup> less, a difference of 1.9 gasoline powered passenger cars/year

**Sulfur Dioxide (SO<sub>2</sub>) and other acidifying emissions/regional acidification** measures chemical compounds such as sulfur dioxide, nitrogen oxides, and other acids (e.g. ammonia) that are produced when boilers burn fuel containing sulfur and other acid-producing substances. Of the fuels used in the paper industry, oil and coal generally contain the highest quantities of sulfur. These acidifying emissions contribute to air pollution problems like acid rain and smog. This category includes SO<sub>2</sub> emissions, but also other acids and emissions like NO<sub>x</sub>.

- ECO TAPE CARTA - 100% recycled produces 0.7 pounds SO<sub>2</sub> equiv., equivalent to 0.2 eighteen-wheelers/year
- ECO TAPE CARTA - 100% virgin produces 1.4 pounds SO<sub>2</sub> equiv., equivalent to 0.5 eighteen-wheelers/year
- ECO TAPE CARTA - 100% virgin produces 0.7 pounds SO<sub>2</sub> equiv. more, a difference of 0.2 eighteen-wheelers/year

**Volatile organic compounds (VOCs)** measure a broad class of organic gases, such as vapors from solvent and gasoline. VOCs react with nitrogen oxides (NO<sub>x</sub>) in the atmosphere to form ground-level ozone, the major component of smog and a severe lung irritant.

- ECO TAPE CARTA - 100% recycled produces 0.01 pounds, equivalent to 49.5 miles driven in a car/year
- ECO TAPE CARTA - 100% virgin produces 0.03 pounds, equivalent to 115 miles driven in a car/year
- ECO TAPE CARTA - 100% virgin produces 0.02 pounds more, a difference of 65.5 miles driven in a car/year

**Total reduced sulfur (TRS)** measures emissions of the compounds that cause the odor associated with kraft pulp mills. Exposure to TRS emissions has been linked to symptoms including headaches, watery eyes, nasal problems, and breathing difficulties.

- ECO TAPE CARTA - 100% recycled produces 0.02 pounds
- ECO TAPE CARTA - 100% virgin produces 0.03 pounds
- ECO TAPE CARTA - 100% virgin produces 0.02 pounds more

**Hazardous air pollutants (HAPs)** measures any of a group of 188 substances identified in the 1990 U.S. Clean Air Act

amendments because of their toxicity. Two of the most common occurring in air are formaldehyde and acrolein.

- ECO TAPE CARTA - 100% recycled produces 0.2 pounds, equivalent to 0.04 passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 0.3 pounds, equivalent to 0.06 passenger cars/year
- ECO TAPE CARTA - 100% virgin produces 0.09 pounds more, a difference of 0.02 passenger cars/year

**Chemical oxygen demand (COD)** measures the amount of oxidizable organic matter in the mill's effluent. Since wastewater treatment removes most of the organic material that would be degraded naturally in the receiving waters, the COD of the final effluent provides information about the quantity of more persistent substances discharged into the receiving water.

- ECO TAPE CARTA - 100% recycled produces 2.9 pounds COD, equivalent to 0.02 homes/year
- ECO TAPE CARTA - 100% virgin produces 4.3 pounds COD, equivalent to 0.03 homes/year
- ECO TAPE CARTA - 100% virgin produces 1.5 pounds more, a difference of 0.009 homes/year

**Biochemical oxygen demand (BOD)** measures the amount of oxygen that microorganisms consume to degrade the organic material in the wastewater. Discharging wastewater with high levels of BOD can result in oxygen depletion in the receiving waters, which can adversely affect fish and other organisms.

- ECO TAPE CARTA - 100% recycled produces 1.05 pounds BOD, equivalent to 0.006 homes/year
- ECO TAPE CARTA - 100% virgin produces 1.5 pounds BOD, equivalent to 0.008 homes/year
- ECO TAPE CARTA - 100% virgin produces 0.4 pounds more, a difference of 0.002 homes/year

**Total Suspended Solids (TSS)/Freshwater eutrophication** measures solid materials suspended in mill effluent, which can adversely affect bottom-living organisms upon settling in receiving waters and can carry toxic heavy metals and organic compounds into the environment.

- ECO TAPE CARTA - 100% recycled produces 0.9 pounds TSS, equivalent to 0.004 homes/year
- ECO TAPE CARTA - 100% virgin produces 3.2 pounds TSS, equivalent to 0.02 homes/year
- ECO TAPE CARTA - 100% virgin produces 2.3 pounds more, a difference of 0.01 homes/year

**Forest disturbance** measures the impact of paper production on forest ecosystems and biodiversity. The indicator compares the ecosystem integrity of a harvested site to intact forests over 80 years old in the region, using on-the-ground measurements. It also considers the recovery potential which would be possible on the site if harvesting were halted, reflecting the long-term implication of forest management at suppressing ecosystem integrity.

- ECO TAPE CARTA - 100% recycled disturbs 0 acres, equivalent to the size of 0 football fields
- ECO TAPE CARTA - 100% virgin disturbs 0.1 acres, equivalent to the size of 0.1 football fields
- ECO TAPE CARTA - 100% virgin uses 0.1 acres more

**Threatened species** measures the possible number of species affected by logging for paper production in the North American region that are listed as Critically Endangered, Endangered, or Vulnerable in the IUCN Red List of Threatened Species (<http://www.iucnredlist.org>), though the exact impact will vary by forest of origin. The number of species is based on correlation with logging threats assessed by IUCN and the fiber basket of pulp and paper mills in the region. For more information see the Methodology Document (<https://c.environmentalpaper.org/pdf/SCS-EPN-PC-Methods.pdf>).

- ECO TAPE CARTA - 100% recycled impacts 0 species
- ECO TAPE CARTA - 100% virgin impacts 11 species
- ECO TAPE CARTA - 100% virgin impacts 11 more

**Ocean acidification** measures increased ocean acidity caused by CO<sub>2</sub>, which has detrimental consequences for many marine organisms. This indicator considers CO<sub>2</sub> emitted during the production of pulp and paper, but also evaluates the amount of CO<sub>2</sub> that could be sequestered in trees if forest harvests used for papermaking were halted.

- ECO TAPE CARTA - 100% recycled produces 230 pounds H<sub>2</sub>CO<sub>3</sub>, equivalent to 0.06 cars/year
- ECO TAPE CARTA - 100% virgin produces 688 pounds H<sub>2</sub>CO<sub>3</sub>, equivalent to 0.2 cars/year
- ECO TAPE CARTA - 100% virgin produces 458 pounds H<sub>2</sub>CO<sub>3</sub> more, a difference of 0.1 cars/year

**Mercury emissions** measure the amount of emissions during the production of pulp and paper. Mercury is a very toxic substance that persists in the environment for long periods of time. Emissions can therefore lead to contamination in the environment, including freshwater bodies and oceanic systems, subsequently exposing flora and fauna to elevated concentrations.

- ECO TAPE CARTA - 100% recycled produces 5.0 milligrams, equivalent to 1.2 compact fluorescent lights
- ECO TAPE CARTA - 100% virgin produces 7.07 milligrams, equivalent to 1.8 compact fluorescent lights
- ECO TAPE CARTA - 100% virgin produces 2.1 milligrams more, a difference of 0.5 compact fluorescent lights

**Dioxin emissions** measure the amount of dioxin emissions that are released to air and water from pulp and paper mills. Dioxins are persistent and bioaccumulative, and even small amounts of emission can contaminate local waterways and bioaccumulate in fish.

- ECO TAPE CARTA - 100% recycled produces 74.5 micrograms
- ECO TAPE CARTA - 100% virgin produces 204 micrograms
- ECO TAPE CARTA - 100% virgin produces 129.5 micrograms more

**Freshwater disturbance** measures the number of freshwater systems possibly affected by logging. Logging can impact streams, rivers and creeks by increasing erosion, removing riverside vegetation and removing large woody debris that many fish species require for habitat. Although this impact is important and relevant, no data is currently available to calculate results. Reflecting the critical nature of this impact category, it is reported here as relevant to pulp/paper production, although results cannot be evaluated at this time.

**Herbicides** measures the amount of toxic herbicides used in growing trees for paper production. Herbicides are applied to control the spread of non-desirable species. Although this impact is important and relevant, no data is currently available to calculate results. Reflecting the critical nature of this impact category, it is reported as relevant to pulp/paper production, although results cannot be evaluated at this time.

**Ocean warming** measures increased ocean temperatures linked to emissions of greenhouse gases. Although this impact is important and relevant to emissions and foregone growth from logging, no algorithm is currently available to calculate results. Reflecting the critical nature of this impact category, it is reported as relevant to pulp/paper production, although results cannot be evaluated at this time.

**Wetland disturbance** measures the acreage of wetlands possibly affected by logging. Logging can increase erosion, which will cause changes in the sediment, temperature and other characteristics of wetlands. Although this impact is important and relevant, no data is currently available to calculate results. Reflecting the critical nature of this impact category, it is reported as relevant to pulp/paper production, although results cannot be evaluated at this time.

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If you have questions or would like more information about Paper Calculator V4.0, please see the Life Cycle Assessment Methodology document under the "Resources" tab of this website (<https://c.environmentalpaper.org/resources.html>) or contact us at [info@environmentalpaper.org](mailto:info@environmentalpaper.org).

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