



# Paper Calculator

presented by environmental paper network

## Lifecycle Environmental Impact

The following is a break down of the environmental impact of your choices. These impact estimates were made using the Environmental Paper Network Paper Calculator. For more information visit [www.papercalculator.org](http://www.papercalculator.org).

Remember to cite Environmental Paper Network when using information provided by the Paper Calculator. A sample citation is available at [www.papercalculator.org](http://www.papercalculator.org).

	Baseline 30% PCC Paper	Target I Paper
Wood Use	112 tons	<b>0 tons</b>
Net Energy	1,256 million BTU's	<b>933 million BTU's</b>
Greenhouse Gases	213,422 lbs CO2 eqv.	<b>151,378 lbs CO2 eqv.</b>
Water Consumption	835,056 gallons	<b>498,555 gallons</b>
Solid Waste	72,695 pounds	<b>50,170 pounds</b>
NOx	393 pounds	<b>360 pounds</b>
Purchased Energy	939 million BTU's	<b>911 million BTU's</b>
SO2	1,116 pounds	<b>1,051 pounds</b>
Particulates	225 pounds	<b>134 pounds</b>
Hazardous Air Pollutants (HAP)	95 pounds	<b>37 pounds</b>
Volatile Organic Compounds (VOCs)	109 pounds	<b>61 pounds</b>
Total Reduced Sulfur (TRS)	17 pounds	<b>11 pounds</b>
Total Suspended Solids (TSS)	651 pounds	<b>435 pounds</b>
Chemical Oxygen Demand (COD)	<b>961 pounds</b>	1,225 pounds
Biochemical Oxygen Demand (BOD)	383 pounds	<b>286 pounds</b>

## Explanation of Data Values

### 🌲 Wood Use

**Wood use** measures the amount of wood required to produce a given amount of paper. The number of typical trees assumes a mix of hardwoods and softwoods 6-8" in diameter and 40' tall. Calculated collaboratively by Conservatree, Environmental Defense Fund, and Environmental Paper Network.

The Baseline 30% PCC Paper Paper uses 112 tons, made from about 720 trees  
Target I Paper would use 112 tons less, made from about 720 fewer trees

## Net Energy

The Paper Calculator includes an energy credit for energy that is created by burning paper – or the methane that decomposing paper creates – at the end of its life. The Net Energy takes the total amount of energy required to make the paper over its life cycle, and subtracts this energy credit. If most of the energy used to make the paper is purchased, then the energy credit might make the Net Energy lower than the Purchased Energy. The average U.S. household uses 91 million BTUs of energy in a year.

The Baseline 30% PCC Paper Paper uses 1,256 million BTU's, the equivalent of about 14 homes/year  
Target I Paper Paper uses 323 million BTU's less, the equivalent of about 4 fewer homes/year

## Greenhouse Gases

**Greenhouse gases**, including carbon dioxide (CO<sub>2</sub>) from burning fossil fuels and methane from paper decomposing in landfills, contribute to climate change by trapping energy from the sun in the earth's atmosphere. The unit of measure is CO<sub>2</sub> equivalents. The average car emits 11,013 pounds of CO<sub>2</sub> in a year.

The Baseline 30% PCC Paper Paper uses 213,422 pounds CO<sub>2</sub> equiv., the equivalent of about 19 cars/year  
The Target I Paper Paper uses 62,044 fewer pounds CO<sub>2</sub> equiv., the equivalent of about 5 fewer cars/year

## Water Consumption

**Water Consumption** measures the amount of process and cooling water that is consumed or degraded throughout the life cycle of the paper product. The largest components of water consumption come from the production of purchased electricity, and the use of process and cooling water at pulp and paper mills. Water volume indicates both the amount of fresh water needed and the potential impact of discharges on the receiving waters. 1 Olympic-sized swimming pool holds 660,430 gallons.

The Baseline 30% PCC Paper Paper uses 835,056 gallons, the equivalent of about 1 swimming pools  
The Target I Paper Paper uses 336,501 gallons less, the equivalent of about 0 fewer swimming pools

## Solid Waste

**Solid Waste** includes sludge and other wastes generated during pulp and paper manufacturing, and used paper disposed of in landfills and incinerators. 1 fully-loaded garbage truck weighs an average of 28,000 pounds (based on a rear-loader residential garbage truck).

The Baseline 30% PCC Paper Paper uses 72,695 pounds, the equivalent of about 3 garbage trucks  
The Target I Paper Paper uses 22,525 pounds less, the equivalent of about 1 fewer garbage trucks

## Nitrogen oxides (NO<sub>x</sub>)

**Nitrogen Oxides** (NO<sub>x</sub>, which include NO and NO<sub>2</sub>) are products of the combustion of fuels that contain nitrogen. NO<sub>x</sub> contribute to acid rain and can react with volatile organic compounds and sunlight in the lower atmosphere to form ozone, a key component of urban smog. The average 18-wheel truck emits 261 pounds of NO<sub>x</sub> in a year.

The Baseline 30% PCC Paper Paper uses 393 pounds, the equivalent of about 2 18-wheelers/year  
The Target I Paper Paper uses 33 pounds less, the equivalent of about 1 fewer 18-wheelers/year

## Purchased Energy

A subset of total energy, **purchased energy** measures how much energy comes from purchased electricity and other fuels. The unit of measure is British Thermal Units (BTUs). The average U.S. household uses 91 million BTUs of energy in a year.

The Baseline 30% PCC Paper Paper uses 939 million BTU's, the equivalent of about 10 homes/year  
The Target I Paper Paper uses 28 million BTU's less, the equivalent of about 0 fewer homes/year

## Sulfur dioxide (SO<sub>2</sub>)

Chemical compound produced when boilers burn fuel that contains sulfur. Of the fuels used in the paper industry, oil and coal generally contain the highest quantities of sulfur. **Sulfur dioxide** contributes to air pollution problems like acid rain and smog. The average 18-wheel truck emits 5.5 pounds of SO<sub>2</sub> in a year.

The Baseline 30% PCC Paper Paper uses 1,116 pounds, the equivalent of about 203 18-wheelers/year  
The Target I Paper Paper uses 65 pounds less, the equivalent of about 12 fewer 18-wheelers/year

## Particulates

**Particulates** are small particles generated during combustion, and pose a range of health risks, including asthma and other respiratory problems, when inhaled. The average urban bus emits 11.2 pounds of particulate matter in a year.

The Baseline 30% PCC Paper Paper uses 225 pounds, the equivalent of about 20 buses/year  
The Target I Paper Paper uses 91 pounds less, the equivalent of about 8 fewer buses/year

## Hazardous Air Pollutants (HAP)

**Hazardous Air Pollutants** are any of a group of 188 substances identified in the 1990 Clean Air Act amendments because of their toxicity.

The Baseline 30% PCC Paper Paper uses 95 pounds  
The Target I Paper Paper uses 58 fewer pounds

## Volatile Organic Compounds (VOCs)

**Volatile Organic Compounds (VOCs)** are a broad class of organic gases, such as vapors from solvent and gasoline. VOCs react with nitrogen oxides (NOx) in the atmosphere to form ground-level ozone, the major component of smog and a severe lung irritant.

The Baseline 30% PCC Paper Paper uses 109 pounds  
The Target I Paper Paper uses 48 fewer pounds

## Total Reduced Sulfur (TRS)

**Total Reduced Sulfur** compounds 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.

The Baseline 30% PCC Paper Paper uses 17 pounds  
The Target I Paper Paper uses 6 fewer pounds

## Total Suspended Solids (TSS)

**Total suspended solids (TSS)** measure solid material 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. The average home discharges 207 pounds of Total Suspended Solids (TSS) in a year.

The Baseline 30% PCC Paper Paper uses 651 pounds, the equivalent of about 3 homes/year  
The Target I Paper Paper uses 216 pounds less, the equivalent of about 1 fewer homes/year

## Chemical Oxygen Demand (COD)

**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. The average home discharges 465 pounds of Chemical Oxygen Demand (COD) in a year.

The Baseline 30% PCC Paper Paper uses 961 pounds, the equivalent of about 2 homes/year  
The Target I Paper Paper uses 264 pounds more, the equivalent of about 1 more homes/year

## Biochemical Oxygen Demand (BOD)

**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. Average home discharges 186 pounds of Biochemical Oxygen Demand (BOD) in a year.

The Baseline 30% PCC Paper Paper uses 383 pounds, the equivalent of about 2 homes/year  
The Target I Paper Paper uses 97 pounds less, the equivalent of about 0 fewer homes/year

## Paper Content and Details:

<b>Paper Name:</b>	Baseline 30% PCC Paper	Target I Paper
<b>Paper Grade:</b>	Uncoated Freesheet	Uncoated Freesheet
<b>Quantity (per year)</b>	85700 pounds	85700 pounds
<b>Percent Recycled Content:</b>	30	100
<b>Total Pulp Content:</b>	84	84
<b>Pulp Types and Sources</b>		
<b>Percentage of Virgin Pulp:</b>	70	0
<b>Percentage Kraft Bleached:</b>	70	0
<b>Percentage Kraft Unbleached:</b>	0	0
<b>Stone or pressurized groundwood:</b>	0	0
<b>Thermomechanical:</b>	0	0
<b>Recycled Pulp Types</b>		
<b>Percentage of recycled Pulp:</b>	30	100
<b>Recycled Office Paper:</b>	30	100
<b>Recycled newspaper:</b>	0	0
<b>Recycled corrugated containers:</b>	0	0
<b>Recycled Mixed Paper/ Board:</b>	0	0
<b>Kraft Bleaching Technology</b>		
<b>Elemental Chlorine Free (ECF):</b>	42	0
<b>Enhanced EECF:</b>	28	0
<b>Kraft Unbleached Composition</b>		
<b>Linerboard:</b>	0	0
<b>Medium:</b>	0	0
<b>Integrated:</b>	0	0
<b>Non-integrated:</b>	0	0

The Paper Calculator is based on research done by the [Paper Task Force](#), a peer-reviewed study of the lifecycle environmental impacts of paper production and disposal. The underlying data in the Paper Calculator are updated regularly.

Questions? Comments?

[Contact Environmental Paper Network](#)

For more information visit [www.papercalculator.org](http://www.papercalculator.org).