



ENVIRONMENTAL COMPARISON CHART

Mineral Paper, Virgin Pulp Paper and Recycled Pulp Paper

Material	Production (MT)	Wood Use (MT) ¹	Trees Cut ¹	Energy (BTU)	CO ₂ Equivalent (MT) ⁴	Water Consumption (Gallons)	Solid Waste (MT)
100% Virgin Paper	1	2.7	20	19,315,100 ²	1.5	15,658 ⁵	0.15 ⁷
100% Recycled Paper	1	0	0	17,934,920 ²	1.4	5,842 ⁵	0.19 ⁷
Stone Paper® material	1	0	0	2,968,563³	0.6	0⁶	0⁸

*Data table is based on a per metric ton basis. Some figures have been converted to metric system.

*100% Recycled paper calculations do not include trees cut and wood used for making original virgin paper or take into account for degrading fiber quality.

1. Trees cut: Assume tree is 6-8 inches in diameter, 40ft tall, is mix of hardwood and softwood. (Reference: www.papercalculator.org)

3 tons of wood = about 20trees; 3 ton = 2.7 metric tons

Wood Use: Average tons of trees used to produce 1 ton of final paper sourced from: Paper Task Force, Table 15, pg. 121, 2002, <http://goo.gl/Wu4Cd>

2. Paper energy is based on average energy purchased during manufacturing process, sourced from: Paper Task Force, C-2, pg. 131, 2002, <http://goo.gl/Wu4Cd>

3. Please refer to "[CALCULATION BREAKDOWN] ENERGY CONSUMPTION" page for calculations of mineral paper energy usage.

4. Please See "[CALCULATION BREAKDOWN] CO₂ RELEASE" page

5. Paper water consumption is based on average effluent flow during manufacturing process, sourced from: Paper Task Force, Table C-4, pg. 133, 2002, <http://goo.gl/Wu4Cd>

6. Mineral Paper Water Consumption: Circulating 27 gallons of water, which is reutilized for cooling machines only,

7. Paper solid waste is based on average solid waste output during manufacturing process, sourced from: Paper Task Force, Table C-1, pg. 130 2002, <http://goo.gl/Wu4Cd>

8. Mineral Paper waste is 100% recycled in-house to make more stone paper!

ENVIRONMENTAL COMPARISON CHART

Replacing 1 MT of Virgin Pulp Paper with 1 MT of Stone Paper® Material

Trees Saved	20 Trees	Equivalent to the oxygen released for 40 people to breathe
Energy Saved	16,346,537 BTU	Equivalent to 66 days of energy use for an average U.S. household
CO ₂ Emission Saved	900 Kilograms	Equivalent to the CO ₂ emission from a car driven 3.7 times around the circumference of the Earth or emission from 37 home barbeque propane cylinders
Water Saved	15,658 Gallons	Equivalent to the water used for taking a shower for 74.6 hours or 3,131 office dispenser bottles
Solid Waste	150 Kilograms	Equivalent to 6.6 full large trash bags

*For calculations please refer to the "Equivalents" page.

ENVIRONMENTAL COMPARISON CHART

Replacing 1 MT of Recycled Pulp Paper with 1 MT of Stone Paper® Material

Energy Saved	14,966,357 BTU	Equivalent to 61 days of energy use for an average U.S. household
CO ₂ Emission Saved	800 Kilograms	Equivalent to the CO ₂ emission from a car driven 3.5 times around the circumference of the Earth or emission from 28 home barbeque propane cylinders
Water Saved	5,842 Gallons	Equivalent to the water used for taking a shower for 27.8 hours or 1168 office dispenser bottles
Solid Waste	190 Kilograms	Equivalent to 8.4 full large trash bags

*For calculations please refer to the "Equivalents" page.

[CALCULATION BREAKDOWN] ENERGY CONSUMPTION

ENERGY CONSUMPTION FOR PRODUCING 1 MT OF STONE PAPER® MATERIAL

Item	Electricity Consumption	Oil Consumption	Total Energy (BTU)
Amount	750 kWh	10 kg	
Conversion Rate	3412.14163 ¹	40,946 ²	
Total Energy	2,559,106	409,457	2,968,563

1. 1 kWh = 3412.14163 BTU sourced from: Google, <http://goo.gl/Wl1LN>

2. 1 kg oil = 12 kWh sourced from: ENS, <http://goo.gl/UGS2T>

Double Check with kWh Conversion

Electricity (kWh/MT)	Oil (kWh/MT)	Total (kWh/MT)
750	120	<u>870</u>

□ 870 kWh converts to 2,968,563 BTU

Therefore, producing 1 MT of Stone Paper® material requires 2,968,563 BTU of energy

[CALCULATION BREAKDOWN] CO₂ RELEASE

CO₂ EQUIVALENT RELEASE FOR PRODUCING 1 MT OF STONE PAPER® MATERIAL

Item	Energy Consumption	Oil Consumption	Total
Amount	750 kWh	10 kg	
Conversion Rate	1	12 ¹	
Energy (kWh)	750	120	870
CO ₂ Equivalent ² (MTCO ₂)	0.529	0.085	0.6

1. 1 kg oil = 12 kWh sourced from: ENS, <http://goo.gl/UGS2T>

2. CO₂ Equivalent conversion utilizes the EPA Greenhouse Gas Equivalent Calculator: <http://goo.gl/CF9u>

Therefore, the total CO₂ output is 0.6 MT CO₂

CO₂ EQUIVALENT RELEASE FOR PRODUCING 1 MT OF PAPER

Item	CO ₂ Equivalent (lbsCO ₂)	CO ₂ Equivalent (MTCO ₂)
Paper virgin	3,313	1.5
Paper recycled	3,178	1.4

*Virgin Paper and Recycled Paper based on Average GHG output during manufacturing, data sourced from: Paper Task Force, Table-C-3, pg. 132, 2002, <http://goo.gl/Wu4Cd>

The total CO₂ output for virgin and recycled paper respectively is 1.5MT CO₂ and 1.4MT CO₂

[CALCULATION BREAKDOWN] EQUIVALENCE CALCULATIONS BREAKDOWNS

STONE PAPER® MATERIAL

Energy Use for Average U.S. Household (BTU's)			
	per Year	per Day	per MT
Energy use for average household (BTU)	90,000,000	246,575	
Energy use to produce 1 MT of Stone Paper® Material			2,968,563
Equivalent to 12 days of energy use for an average U.S. household			

*Yearly energy use for average household in 2009 sourced from US EIA website, <http://goo.gl/ylllx>

*Numbers are rounded to the nearest digit

CO ₂ Emissions for an Average Car (MT)				
	per Year	per Day	per Hour	per MT
CO ₂ emissions for average car (MT)	5	0.014	0.00058	
CO ₂ emission to produce 1 MT of Stone Paper® Material				0.6
CO ₂ equivalent to an average car driven for 1,034.48 hours				
1,034.48 hours is equivalent to an average car driving at 60 mph driven 62,068.8 miles				
62,068.8 miles is equivalent to driving around the world 2.5 times				

*CO₂ emissions for an average car sourced from: Paper Calculator, www.papercalculator.org

*Equatorial circumference of the world is: 40,075.017km or 24,901.5miles sourced from: Wikipedia, <http://en.wikipedia.org/wiki/Earth>

CO₂ emissions from 25.6 propane cylinders used for home barbeques

*CO₂ emissions for propane cylinders are based on 1,353lbs or 0.614MT, Sourced from: EPA GHG Calculator, <http://goo.gl/XkrWy>

Hours of Shower Time for Water Usage	
	Gallons
Average water use for a 5 min shower	17.5
Water use for a 1 min shower	3.5
Average water use for a 1 hr shower	210
Water use for 1 MT of Stone Paper® material	0
Average hours of shower time	0

*Average water use for 5 min of shower time is sourced from: US EPA website, <http://goo.gl/Zo8gY>

[CALCULATION BREAKDOWN] EQUIVALENCE CALCULATIONS BREAKDOWNS

VIRGIN PULP PAPER

Energy Use for Average U.S. Household			
	per Year	per Day	per MT
Energy use for an average household (BTU)	90,000,000	246,575	
Energy use to produce 1 MT of Virgin Pulp Paper			19,315,100
Equivalent to 78 days of energy use for an average U.S. household			

*Yearly energy use for average household in 2009 sourced from US EIA website, <http://goo.gl/ylllx>

*Numbers are rounded to the nearest digit

CO ₂ Emissions for Average Car (MT)				
	per Year	per Day	per Hour	MT
CO ₂ emissions for an average car (MT)	5	0.014	0.00058	
CO ₂ emission to produce 1 MT of Virgin Pulp Paper				1.5
CO ₂ equivalent to an average car driven for 2,586.21 hours				
2,586.21 hours is equivalent to an average car driven at 60 mph for 158,172.60 miles				
158,172.60 miles is equivalent to driving around the world 6.2 times				

*CO₂ emissions for an average car sourced from: Paper Calculator, www.papercalculator.org

*Equatorial circumference of the world is: 40,075.017km or 24,901.5miles sourced from: Wikipedia, <http://en.wikipedia.org/wiki/Earth>

CO₂ emissions from 62.5 propane cylinders used for home barbeques

*CO₂ emissions for propane cylinders are based on 3,313lbs or 1.5MT, Sourced from: EPA GHG Calculator, <http://goo.gl/XkrWy>

Hours of Shower Time for Water Usage	
	Gallons
Average water use for a 5 min shower	17.5
Water use for a 1 min shower	3.5
Average water use for a 1 hr shower	210
Water use for 1 MT of Virgin Pulp Paper	15,658
Average hours of shower time	74.6

*Average water use for 5 min of shower time is sourced from: US EPA website, <http://goo.gl/Zo8gY>

[CALCULATION BREAKDOWN] EQUIVALENCE CALCULATIONS BREAKDOWNS

RECYCLED PULP PAPER

Energy Use for Average U.S. Household

	per Year	per Day	per MT
Energy use for an average household (BTU)	90,000,000	246,575	
Energy use to produce 1 MT of Recycled Pulp Paper			17,934,920
Equivalent to 73 days of energy use for an average U.S. household			

*Yearly energy use for average household in 2009 sourced from US EIA website, <http://goo.gl/ylllx>

*Numbers are rounded to the nearest digit

CO₂ Emissions for Average Car (MT)

	per Year	per Day	per Hour	MT
CO ₂ emissions for an average car (MT)	5	0.014	0.00058	
CO ₂ emission to produce 1 MT of Recycled Pulp Paper				1.4
CO ₂ equivalent to an average car driven 2,413.79 hours				
2,413.79 hours is equivalent to an average car driven at 60 mph for a distance of 144,827.4 miles				
144,827.4 miles is equivalent to driving around the world 5.8 times				

*CO₂ emissions for an average car sourced from: Paper Calculator, www.papercalculator.org

*Equatorial circumference of the world is: 40,075.017km or 24,901.5miles sourced from: Wikipedia, <http://en.wikipedia.org/wiki/Earth>

CO₂ emissions from 58.3 propane cylinders used for home barbeques

*CO₂ emissions for propane cylinders are based on 3,178lbs or 1.4MT, Sourced from :EPA GHG Calculator, <http://goo.gl/XkrWy>

Hours of Shower Time for Water Usage

	Gallons
Average water use for a 5 min shower	17.5
Water use for a 1 min shower	3.5
Average water use for a 1 hr shower	210
Water use for 1 MT of Recycled Pulp Paper	5,842
Average hours of shower time	27.8

*Average water use for 5 min of shower time is sourced from: US EPA website, <http://goo.gl/Zo8gY>

[CALCULATION BREAKDOWN] EQUIVALENCE CALCULATIONS BREAKDOWNS

OTHER EQUIVALENTS

"One large tree can provide a supply of oxygen for two people."

*Quote Sourced from American Forests.org, <http://goo.gl/YxPE1>

Larger dispenser bottles in the US is about 5 gallons

*Sourced from Wikipedia, 2.1 Bottle, <http://goo.gl/DN8Bh>

"The Glad bag held about 50 pounds."

*Sourced from 6abc.com, Consumer Reports: Testing garbage bags, May 10, 2012, <http://goo.gl/N91WB>

[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

ENVIRONMENTAL COMPARISON CHART TAB REFERENCES

Trees Cut: Assume tree is 6-8inches in diameter, 40ft tall, is mix of hardwood and softwood,
3 tons of wood = about 20 trees
Sourced from Paper Calculator, www.papercalculator.org

The screenshot shows the website c.environmentalpaper.org/baseline. The page is titled "EPN Projects" and lists several projects: "What's in Your Paper?", "The Paper Steps", "Pulp Watch.org", "The Paper Calculator", "RePaper Project", and "Forest Carbon Counts".

Explanation of Data Values
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.

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 Paper uses 3 tons, made from about 20 trees.

Net Energy
The Paper Calculator includes an energy credit for energy that decomposing paper creates – at the end of its life. The Net Energy is the energy credit minus the energy credit purchased, then the energy credit might make the Net Energy negative. The average household uses 91 million BTUs of energy in a year.
The Baseline Paper uses 31 million BTU's, the equivalent of about 1 car's worth of energy.

Greenhouse Gases
Greenhouse gases, including carbon dioxide (CO₂) 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 CO₂ equivalents. The average car emits 11,013 pounds of CO₂ in a year.
The Baseline Paper uses 5,673 pounds CO₂ equiv., the equivalent of about 1 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 Paper uses 20,361 gallons, the equivalent of < 1 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 Paper uses 2,196 pounds, the equivalent of < 1 garbage trucks.

Nitrogen oxides (NOx)
Nitrogen Oxides (NOx, which include NO and NO₂) are products of the combustion of fuels that contain nitrogen. NOx 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 NOx in a year.

The number of typical trees assumes a mix of hardwoods and softwoods 6-8inches in diameter and 40' tall. Calculated collaboratively by Conservatree and Environmental Paper Network based on data from Tom Soder, Pulp & Paper Technology Program, University of Maine, as reported in Recycled Papers: The Essential Guide, by Claudia G. Thompson, The MIT Press, 1992.

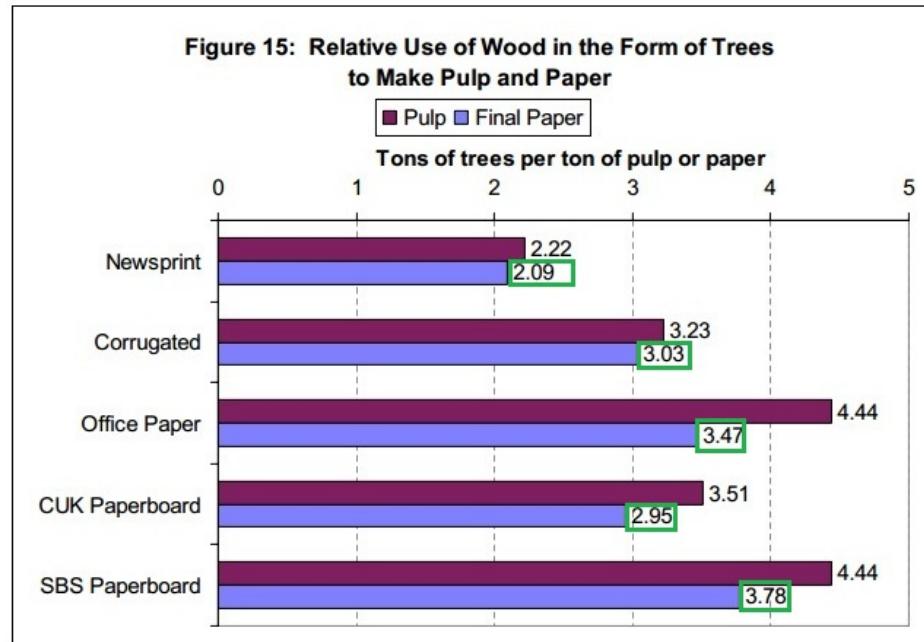
javascript:void(0)

Wood Use: Average tons of trees used to produce 1 ton of final paper

Sourced from Paper Task Force, Table 15, pg. 121, 2002, <http://goo.gl/Wu4Cd>



c.environmentalpaper.org/documents/1618_WP3.pdf



Paper energy is based on average energy purchased during manufacturing process
Sourced from Paper Task Force, C-2, pg. 131, 2002, <http://goo.gl/Wu4Cd>

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Paper water consumption is based on average effluent flow during manufacturing process
Sourced from Paper Task Force, Table C-4, pg. 133, 2002, <http://goo.gl/Wu4Cd>

Table C-4: Waterborne Wastes from Recycled and Virgin Fiber-Based Systems Used to Manage and Produce Various Grades of Paper																		
		Virgin Production • Landfilling								Virgin Production • Incineration								
	(Notes)	Tree Harvesting/Transport [1]	Virgin Milling [3]	Utility Releases [2]	Collection Vehicle & Landfill Equipment	MSW Landfill [5]	MSW	Total (per ton of paper landfilled)		Tree Harvesting/Transport [1]	Virgin Milling [3]	Utility Releases [2]	MSW	W-T-E Combustion Process	Avoided Utility Releases [6]	Ash Landfill Disposal [8]	Total (per ton of paper combusted)	
Newsprint																		
BOD		0.0008	3.0	0.0024	0.0003	0	3.0			0.0008	3.0	0.0024	0.0002	0	0.0007	0.0000	3.0	
COD		0.0031	43.3	0.0073	0.0016	0	43.3			0.0031	43.3	0.0073	0.0008	0	0.0019	0.0000	43.3	
Suspended solids		0.0008	5.8	0.0048	0.0003	0	5.8			0.0008	5.8	0.0048	0.0002	0	0.0014	0.0000	5.8	
Effluent Flow (gal.)	[11]	14,106					14,106			14,106							14,106	
Comrigated																		
BOD		0.0011	3.9	0.0006	0.0003	0	3.9			0.0011	3.9	0.0006	0.0002	0	0.0006	0.0000	3.9	
COD		0.0044	43.2	0.0019	0.0016	0	43.2			0.0044	43.2	0.0019	0.0008	0	0.0017	0.0001	43.2	
Suspended solids		0.0011	6.1	0.0013	0.0003	0	6.1			0.0011	6.1	0.0013	0.0002	0	0.0012	0.0000	6.1	
Effluent Flow (gal.)	[11]	10,893					10,893			0.0000	10,893						10,893	
Office paper																		
AKR	[11]	1.7					1.68			1.7							1.68	
BOD		0.0013	6.3	0.0012	0.0003	0	6.3			0.0013	6.3	0.0012	0.0002	0	0.0006	0.0001	6.3	
COD		0.0051	91.7	0.0036	0.0016	0	91.8			0.0051	91.7	0.0036	0.0008	0	0.0017	0.0001	91.8	
Suspended solids		0.0013	10.1	0.0024	0.0003	0	10.1			0.0013	10.1	0.0024	0.0002	0	0.0012	0.0001	10.1	
Effluent Flow (gal.)	[11]	20,520					20,520			20,520							20,520	
Paperboard (CUK)																		
BOD		0.0012	3.4	0.0006	0.0003	0	3.4			0.0012	3.4	0.0006	0.0002	0	0.0007	0.0001	3.4	
COD		0.0049	37.0	0.0018	0.0016	0	37.6			0.0049	37.0	0.0018	0.0008	0	0.0019	0.0001	37.0	
Suspended solids		0.0012	5.5	0.0012	0.0003	0	5.5			0.0012	5.5	0.0012	0.0002	0	0.0006	0.0000	5.5	
Effluent Flow (gal.)	[11]	11,078					11,078			11,078							11,078	
Paperboard (SBG)																		
AKR	[11]	1.8		0.0011	0.0003	0	1.84			1.8					0.0007	0.0001	1.84	
BOD		0.0013	6.9	0.0011	0.0016	0	6.9			0.0013	6.9	0.0011	0.0002	0	0.0007	0.0001	6.9	
COD		0.0051	100.0	0.0032	0.0016	0	100.0			0.0051	100.0	0.0032	0.0008	0	0.0019	0.0001	100.0	
Suspended solids		0.0013	11.1	0.0021	0.0003	0	11.1			0.0013	11.1	0.0021	0.0002	0	0.0006	0.0000	11.1	
Effluent Flow (gal.)	[11]	21,697					21,697			21,697							21,697	
<div><div></div><div></div><div></div></div>																		
		Virgin Production • Waste Management								Recycled Production • Recycling								
	(Notes)	Tree Harvesting/Transport [1]	Virgin Milling [3]	Utility Releases [2]	Collection Vehicle & Landfill Equipment	MSW Landfill [5]	MSW Collection	W-T-E Combustion Process	Avoided Utility Releases [6]	Ash Landfill Disposal [8]	Total (per ton of paper disposed)	Recyclables Collection [7]	MGP Process [9]	Residue Landfill Disposal	Transportation to Market	Utility Releases [2]	Recycled Milling	Total (per ton of paper recycled)
Newsprint																		
BOD		0.0008	3.0	0.0024	0.0002	0	0.0000	0	0.0001	0.0000	3.0	0.0006	0.0002	0.0000	0.0002	0.0012	6.1	6.1
COD		0.0031	43.3	0.0073	0.0013	0	0.0002	0	0.0004	0.0000	43.3	0.0006	0.0005	0.0001	0.0006	0.0037	27.6	27.6
Suspended solids		0.0008	5.8	0.0048	0.0002	0	0.0000	0	0.0003	0.0000	5.8	0.0006	0.0000	0.0000	0.0002	0.0024	6.9	6.9
Effluent Flow (gal.)	[11]	14,106									14,106						13,026	13,026
Comrigated																		
BOD		0.0011	3.9	0.0006	0.0002	0	0.0000	0	0.0001	0.0000	3.9	0.0006	0.0002	0.0000	0.0002	0.0009	3.6	3.6
COD		0.0044	43.2	0.0019	0.0013	0	0.0002	0	0.0003	0.0000	43.2	0.0006	0.0005	0.0001	0.0006	0.0027	20.0	20.0
Suspended solids		0.0011	6.1	0.0013	0.0002	0	0.0000	0	0.0002	0.0000	6.1	0.0006	0.0000	0.0000	0.0002	0.0016	6.7	6.7
Effluent Flow (gal.)	[11]	10,893									10,893						7,080	7,080
Office paper																		
AKR	[11]	1.7					0.0000	0	0.0001	0.0000	1.68	0.0000	0.0005	0.0000	0.0000	0.0000	0.0	0.0
BOD		0.0013	6.3	0.0012	0.0002	0	0.0000	0	0.0003	0.0000	6.3	0.0006	0.0002	0.0000	0.0002	0.0013	6.1	6.1
COD		0.0051	91.7	0.0036	0.0013	0	0.0002	0	0.0003	0.0000	91.8	0.0030	0.0005	0.0001	0.0006	0.0039	27.6	27.6
Suspended solids		0.0013	10.1	0.0024	0.0002	0	0.0000	0	0.0002	0.0000	10.1	0.0006	0.0000	0.0000	0.0002	0.0026	6.9	6.9
Effluent Flow (gal.)	[11]	20,520									20,520						10,325	10,325
Paperboard (CUK)																		
BOD		0.0012	3.4	0.0006	0.0002	0	0.0000	0	0.0001	0.0000	3.4	0.0000	0.0002	0.0000	0.0000	0.0002	2.1	2.1
COD		0.0049	37.0	0.0018	0.0013	0	0.0002	0	0.0004	0.0000	37.0	0.0030	0.0005	0.0001	0.0006	0.0034	20.0	20.0
Suspended solids		0.0012	5.5	0.0012	0.0002	0	0.0000	0	0.0000	0.0000	5.5	0.0006	0.0000	0.0000	0.0002	0.0022	1.7	1.7
Effluent Flow (gal.)	[11]	11,078									11,078						1,830	1,830
Paperboard (SBG)																		
AKR	[11]	1.8					0.0000	0	0.0001	0.0000	1.84	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
BOD		0.0013	6.9	0.0011	0.0002	0	0.0000	0	0.0001	0.0000	6.9	0.0006	0.0002	0.0000	0.0002	0.0011	2.1	2.1
COD		0.0051	100.0	0.0032	0.0016	0	0.0002	0	0.0004	0.0000	100.0	0.0030	0.0005	0.0001	0.0006	0.0034	20.0	20.0
Suspended solids		0.0013	11.1	0.0021	0.0002	0	0.0000	0	0.0000	0.0000	11.1	0.0006	0.0000	0.0000	0.0002	0.0022	1.7	1.7
Effluent Flow (gal.)	[11]	21,697									21,697						1,930	1,930

Paper solid waste is based on average solid waste output during manufacturing process

Sourced from Paper Task Force, Table C-1, pg. 130, 2002, <http://goo.gl/Wu4Cd>

← → ↻ c.environmentalpaper.org/documents/1618_WP3.pdf



Table C-1: Solid Waste Output from Recycled and Virgin Fiber-Based Systems Used to Manage and Produce Various Grades of Paper

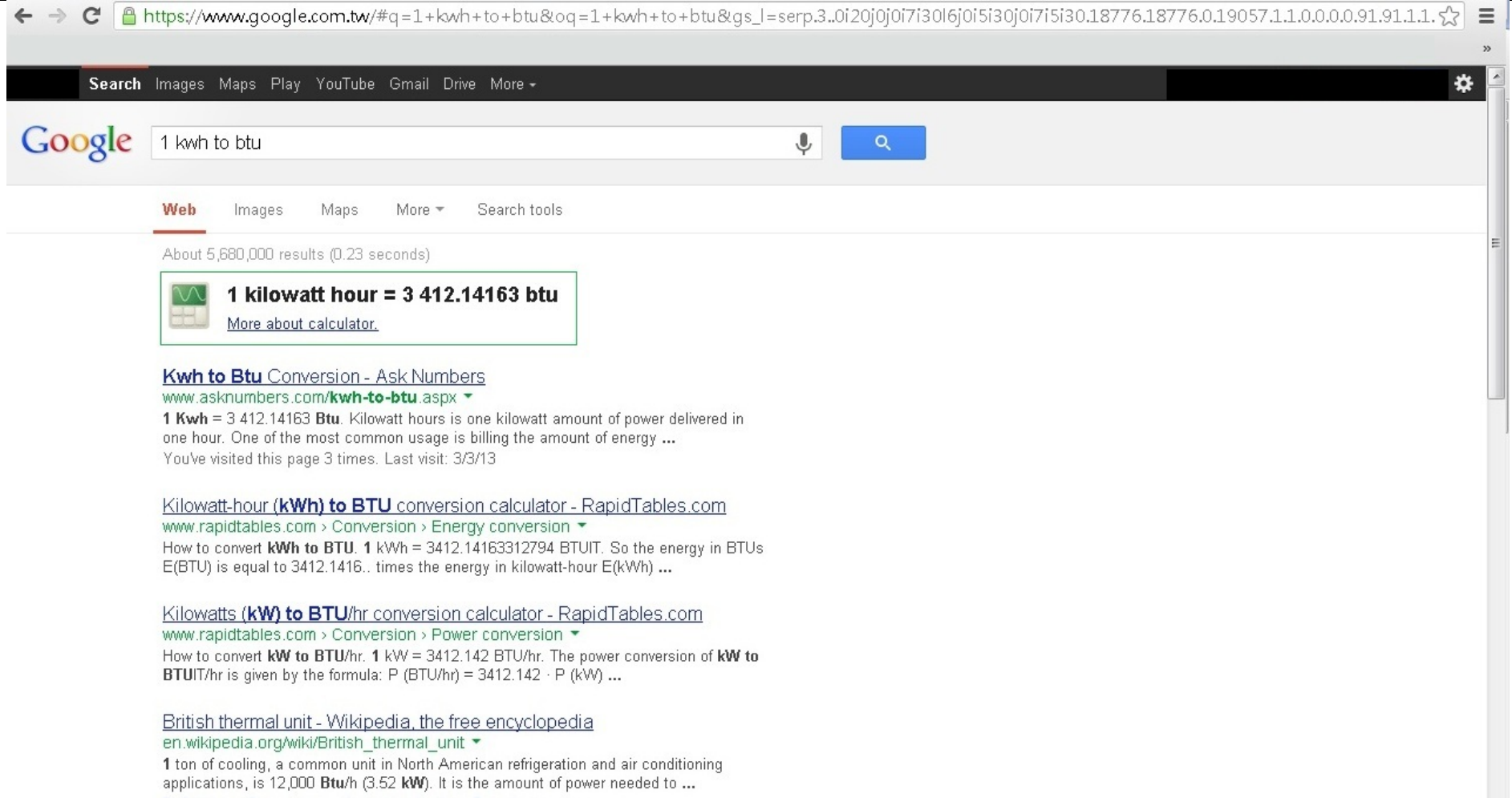
	Virgin Production + Landfilling						Virgin Production + Incineration												
	Tree Harvesting/ Transport [1]	Virgin Mfg't'ing	Utility Waste [2]	Collection Vehicle & Landfill Equipment	MSW Landfill	Total (per ton of paper landfilled)		Tree Harvesting/ Transport [1]	Virgin Mfg't'ing	Utility Waste [2]	MSW Collection	W-T-E Combustion Process	Avoided Utility Waste [5]	Ash Landfill Disposal [6]	Total (per ton of paper combusted)				
[Notes]																			
Newsprint	0.6	430.7	444.2	0.3	2,000	2,876		0.6	430.7	444.2	0.1	180.0	(122.6)	0.02	933.0				
Corrugated	0.8	215.2	117.6	0.3	2,000	2,334		0.8	215.2	117.6	0.1	180.0	(107.3)	0.02	406.5				
Office paper	1.0	393.8	217.7	0.3	2,000	2,613		1.0	393.8	217.7	0.1	500.0	(107.3)	0.05	1,005.3				
Paperboard (CUK)	0.9	171.8	107.9	0.3	2,000	2,281		0.9	171.8	107.9	0.1	248.4	(117.0)	0.02	412.2				
Paperboard (SBS)	1.0	429.1	193.6	0.3	2,000	2,624		1.0	429.1	193.6	0.1	248.4	(117.0)	0.02	755.3				
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[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

ENERGY TAB REFERENCES

1 kWh = 3412.14163 BTU

Sourced from Google, <http://goo.gl/Wl1LN>



The screenshot shows a Google search results page for the query "1 kwh to btu". The search bar at the top contains the text "1 kwh to btu". Below the search bar, the results are displayed. The first result is a calculator icon with the text "1 kilowatt hour = 3 412.14163 btu" and a link "More about calculator.". Below this, there are three search results listed:

- Kwh to Btu Conversion - Ask Numbers**
www.asknumbers.com/kwh-to-btu.aspx
1 Kwh = 3 412.14163 Btu. Kilowatt hours is one kilowatt amount of power delivered in one hour. One of the most common usage is billing the amount of energy ...
You've visited this page 3 times. Last visit: 3/3/13
- Kilowatt-hour (kWh) to BTU conversion calculator - RapidTables.com**
www.rapidtables.com/Conversion/Energy_conversion
How to convert kWh to BTU. 1 kWh = 3412.14163312794 BTUIT. So the energy in BTUs E(BTU) is equal to 3412.1416.. times the energy in kilowatt-hour E(kWh) ...
- Kilowatts (kW) to BTU/hr conversion calculator - RapidTables.com**
www.rapidtables.com/Conversion/Power_conversion
How to convert kW to BTU/hr. 1 kW = 3412.142 BTU/hr. The power conversion of kW to BTUIT/hr is given by the formula: P (BTU/hr) = 3412.142 · P (kW) ...
- British thermal unit - Wikipedia, the free encyclopedia**
en.wikipedia.org/wiki/British_thermal_unit
1 ton of cooling, a common unit in North American refrigeration and air conditioning applications, is 12,000 Btu/h (3.52 kW). It is the amount of power needed to ...

1 kg oil = 12 kWh

Sourced from ENS, <http://goo.gl/UGS2T>

← → ↻ www.euronuclear.org/info/encyclopedia/f/fuelcomparison.htm ☆ ☰



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european nuclear society

largest nuclear society for science and industry

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Fuel comparison

« scroll »»

With a complete combustion or fission, approx. 8 kWh of heat can be generated from 1 kg of coal, approx. 12 kWh from 1 kg of mineral oil and around 24,000,000 kWh from 1 kg of uranium-235. Related to one kilogram, uranium-235 contains two to three million times the energy equivalent of oil or coal. The illustration shows how much coal, oil or natural uranium is required for a certain quantity of electricity. Thus, 1 kg natural uranium - following a corresponding enrichment and used for power generation in light water reactors - corresponds to nearly 10,000 kg of mineral oil or 14,000 kg of coal and enables the generation of 45,000 kWh of electricity.



Energy Carrier	0	10,000	20,000	30,000	40,000	50,000
kWh						
bn joule		100	200	300	400	
kg coal equivalent		5,000	10,000	15,000		
kg mineral oil		5,000	10,000			
kg natural uranium	0.2	0.4	0.6	0.8	1.0	

Comparison of the input volumes of various primary energy carriers for the generation of a certain quantity of electricity

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[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

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1 kg oil = 12 kWh sourced from: ENS, <http://goo.gl/UGS2T>


← → ↻ www.euronuclear.org/info/encyclopedia/f/fuelcomparison.htm ☆ ≡



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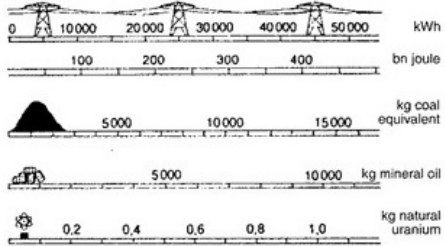
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Search



Fuel comparison

With a complete combustion or fission, approx. 8 kWh of heat can be generated from 1 kg of coal, approx. 12 kWh from 1 kg of mineral oil, and around 24,000,000 kWh from 1 kg of uranium-235. Related to one kilogram, uranium-235 contains two to three million times the energy equivalent of oil or coal. The illustration shows how much coal, oil or natural uranium is required for a certain quantity of electricity. Thus, 1 kg natural uranium - following a corresponding enrichment and used for power generation in light water reactors - corresponds to nearly 10,000 kg of mineral oil or 14,000 kg of coal and enables the generation of 45,000 kWh of electricity.



Comparison of the input volumes of various primary energy carriers for the generation of a certain quantity of electricity

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CO2 equivalent conversion utilizes the EPA greenhouse gas equivalent calculator

Sourced from EPA GHG Calculator, <http://goo.gl/CF9u>

← → ↻ www.epa.gov/cleanenergy/energy-resources/calculator.html#results ☆ ☰

2. Enter a quantity and pick the desired unit below; and
3. Click on the "Calculate Equivalent" button to convert your value to [Carbon Dioxide Equivalent](#).
4. If you are entering kilowatt-hours of electricity, please be sure to read the caveats and explanations on the [Calculations and Reference page](#).
5. Please note that these estimates are approximate and should not be used for emission inventory or formal carbon footprinting exercises.

[? Click Here for Calculations and References](#)

Option 2: If You Already Know the Quantity of Emissions

If you have already estimated the quantity of emissions (e.g., metric tons of carbon dioxide equivalent), you can input the amount of emissions and select the appropriate units for the corresponding greenhouse gas type.

Amount	Unit	Gas
<input type="text" value="0.614"/>	<input type="text" value="Metric Tons"/>	CO ₂ - Carbon Dioxide or CO₂ Equivalent*
<input type="text"/>	<input type="text" value="Metric Tons"/>	Carbon or Carbon Equivalent
<input type="text"/>	<input type="text" value="Metric Tons"/>	CH ₄ - Methane
<input type="text"/>	<input type="text" value="Metric Tons"/>	N ₂ O - Nitrous Oxide
<input type="text"/>	<input type="text" value="Metric Tons"/>	<input type="text" value="HFC-23"/> - Hydrofluorocarbon gases
<input type="text"/>	<input type="text" value="Metric Tons"/>	<input type="text" value="CF4"/> - Perfluorocarbon gases
<input type="text"/>	<input type="text" value="Metric Tons"/>	SF ₆ - Sulfur Hexafluoride

*If your estimated emissions of methane, nitrous oxide, or other non-CO₂ gases are already expressed in [CO₂ equivalent or carbon equivalent](#), please enter your figures in the row for CO₂ or carbon equivalent.

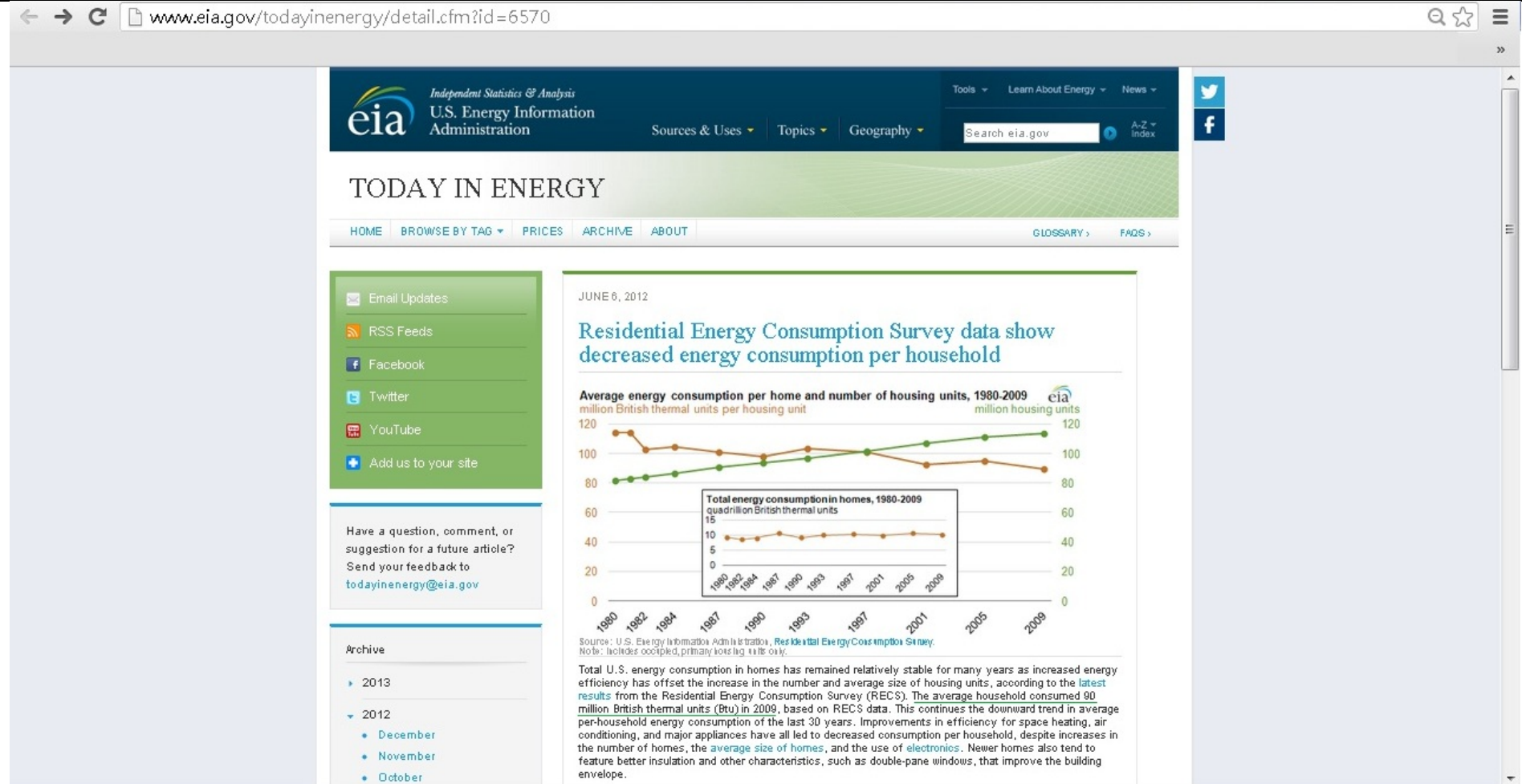
The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent.

Virgin paper and recycled paper based on average GHG output during manufacturing.
Data sourced from: Paper Task Force, Table-C-3, pg. 132, 2002, <http://goo.gl/Wu4Cd>

		Virgin Production + Landfilling							Virgin Production + Incineration							Recycled Production + Recycling						
		(lb/ton)	Tree Harvesting/Transport [1]	Virgin Milling [2]	Collection Vehicle & Landfill Equipment [3]	MSW Landfill [4]	MSW Collection [5]	W-T-E Combustion Process [6]	Total (per ton of paper landfilled) [7]	Tree Harvesting/Transport [1]	Virgin Milling [2]	MSW Collection [3]	W-T-E Combustion Process [4]	Avoided Utility Emissions [5]	Ash Landfill Disposal [6]	Total (per ton of paper combusted) [7]	Recyclables Collected [1]	MRF Processing [2]	Residue Landfill Disposal [3]	Recycling Market [4]	Recycling [5]	Total (per ton of paper recycled) [6]
Newsprint	Net Greenhouse Gases (CO ₂ Equivalents)	(10)	183.8	5,476.0	84.1	3,280.0	6,029.9		183.8	5,476.0	47.3	5.3	(1,024.9)	5.7	4,696.1							
	Nitrogen oxides	(10)	0.2	0.3	0.2	0.3	0.2		0.2	0.3	0.1	0.2	(4.7)	0.5	0.5							
	Particulates	(10)	0.5	13.5	0.23	14.3	0.3		0.5	13.5	0.3	0.27	(3.4)	0.02	11.1							
	Sulfur oxides	(11)	0.3	0.3	0.14	0.4	0.3		0.3	0.3	0.08	0.39	(8.8)	0.01	30.0							
	Hazardous Air Pollutants (HAPs)	(11)	0.3	0.4	0.14	0.4	0.2		0.3	0.4	0.2	0.39	(8.8)	0.01	0.42							
	Volatile Organic Chemicals (VOCs)	(11)	0.3	0.4	0.14	0.4	0.2		0.3	0.4	0.2	0.39	(8.8)	0.01	0.42							
Corrugated	Net Greenhouse Gases (CO ₂ Equivalents)	(10)	262.5	2,799.3	84.1	3,280.0	6,426.0		262.5	2,799.3	47.3	5.3	(909.4)	5.7	3,210.7							
	Nitrogen oxides	(10)	3.2	12.0	1.0	16.2	0.3		3.2	12.0	0.7	1.3	(4.1)	0.07	13.1							
	Particulates	(10)	0.7	8.3	0.23	9.3	0.3		0.7	8.3	0.13	0.27	(2.8)	0.02	9.5							
	Sulfur oxides	(11)	0.4	24.0	0.14	24.6	0.4		0.4	24.0	0.08	0.39	(7.7)	0.01	17.2							
	Hazardous Air Pollutants (HAPs)	(11)	0.7	8.3	0.23	9.3	0.3		0.7	8.3	0.13	0.27	(2.8)	0.02	9.5							
	Volatile Organic Chemicals (VOCs)	(11)	0.7	8.3	0.23	9.3	0.3		0.7	8.3	0.13	0.27	(2.8)	0.02	9.5							
Office paper	Net Greenhouse Gases (CO ₂ Equivalents)	(10)	305.0	2,995.4	84.1	3,280.0	6,664.5		305.0	2,995.4	47.3	5.3	(909.4)	15.9	2,459.3							
	Nitrogen oxides	(10)	3.7	14.6	1.0	19.3	0.3		3.7	14.6	0.7	1.3	(4.1)	0.17	16.3							
	Particulates	(10)	0.8	12.0	0.23	13.1	0.3		0.8	12.0	0.13	0.27	(2.8)	0.04	10.4							
	Sulfur oxides	(11)	0.5	27.6	0.14	28.2	0.5		0.5	27.6	0.08	0.39	(7.7)	0.03	20.9							
	Hazardous Air Pollutants (HAPs)	(11)	0.5	27.6	0.14	28.2	0.5		0.5	27.6	0.08	0.39	(7.7)	0.03	20.9							
	Volatile Organic Chemicals (VOCs)	(11)	0.5	27.6	0.14	28.2	0.5		0.5	27.6	0.08	0.39	(7.7)	0.03	20.9							
Paperboard (CLK)	Net Greenhouse Gases (CO ₂ Equivalents)	(10)	350.1	3,336.0	84.1	3,280.0	6,689.3		350.1	3,336.0	47.3	5.3	(909.4)	15.9	2,459.3							
	Nitrogen oxides	(10)	3.6	13.0	1.0	19.6	0.3		3.6	13.0	0.7	1.3	(4.1)	0.17	16.3							
	Particulates	(10)	0.8	7.7	0.23	8.6	0.3		0.8	7.7	0.13	0.27	(3.2)	0.02	9.1							
	Sulfur oxides	(11)	0.5	26.0	0.14	26.6	0.5		0.5	26.0	0.08	0.39	(8.4)	0.01	12.8							
	Hazardous Air Pollutants (HAPs)	(11)	0.5	26.0	0.14	26.6	0.5		0.5	26.0	0.08	0.39	(8.4)	0.01	12.8							
	Volatile Organic Chemicals (VOCs)	(11)	0.5	26.0	0.14	26.6	0.5		0.5	26.0	0.08	0.39	(8.4)	0.01	12.8							
Paperboard (SBS)	Net Greenhouse Gases (CO ₂ Equivalents)	(10)	305.0	2,995.9	84.1	3,280.0	6,626.9		305.0	2,995.9	47.3	5.3	(902.0)	7.8	2,341.2							
	Nitrogen oxides	(10)	3.7	14.6	1.0	19.6	0.3		3.7	14.6	0.7	1.3	(4.1)	0.17	16.3							
	Particulates	(10)	0.8	12.0	0.23	13.6	0.3		0.8	12.0	0.13	0.27	(3.2)	0.02	10.5							
	Sulfur oxides	(11)	0.5	27.6	0.14	28.6	0.5		0.5	27.6	0.08	0.39	(8.4)	0.01	20.5							
	Hazardous Air Pollutants (HAPs)	(11)	0.5	27.6	0.14	28.6	0.5		0.5	27.6	0.08	0.39	(8.4)	0.01	20.5							
	Volatile Organic Chemicals (VOCs)	(11)	0.5	27.6	0.14	28.6	0.5		0.5	27.6	0.08	0.39	(8.4)	0.01	20.5							
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[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS EQUIVALENTS TAB REFERENCES – RECYCLED PULP PAPER


The average U.S. household consumed 90 million BTU in 2009.
Sourced from US EIA website, <http://goo.gl/ylllx>




The average car emits 11,013 pounds (or 5 MT) of CO₂ in a year.
Sourced from Paper Calculator, www.papercalculator.org

← → ↻ c.environmentalpaper.org/baseline#tEC ☆ ≡ »


The Baseline Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

 **Greenhouse Gases**
Greenhouse gases, including carbon dioxide (CO₂) 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 CO₂ equivalents. The average car emits 11,013 pounds of CO₂ in a year.

The Baseline Paper uses < 1 pounds CO₂ equiv., the equivalent of < 1 [cars/year](#)

 **Water Consumption**
Water Consumption measures the amount of process and cooling water that is consumed during the life cycle of the paper product. The largest components of water consumption are process water, 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 Paper uses < 1 gallons, the equivalent of < 1 [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 Paper uses < 1 pounds, the equivalent of < 1 [garbage trucks](#)

Nitrogen oxides (NO_x)
Nitrogen Oxides (NO_x, which include NO and NO₂) are products of the combustion of fuels that contain nitrogen. NO_x 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_x in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [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 Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

Sulfur dioxide (SO₂)
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 SO₂ in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [18-wheelers/year](#)

evscript:void(0)

Sourced from Wikipedia, <http://en.wikipedia.org/wiki/Earth>

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CO2 emissions based on 1,353lbs or 0.614MT is equivalent to 25.6 home barbeque propane cylinders.
Sourced from EPA GHG Calculator, <http://goo.gl/XkrWy>

← → ↻ ☆ ☰

The sum of the greenhouse gas emissions you entered above is Metric Tons ▾ of Carbon Dioxide Equivalent.

This is equivalent to one of the following:

Equivalency Results

Click on the question mark ? link to read the explanation of that particular calculation. [Read about all calculations.](#)

The information you entered above is equivalent to one of the following statements:

Annual greenhouse gas emissions from passenger vehicles ? *(click to read more about this calculation)*

CO₂ emissions from gallons of gasoline consumed ?

CO₂ emissions from barrels of oil consumed ?

CO₂ emissions from tanker trucks' worth of gasoline ?

CO₂ emissions from the *electricity* use of homes for one year ?

CO₂ emissions from the *energy* use of homes for one year ?

Carbon sequestered by tree seedlings grown for 10 years ?

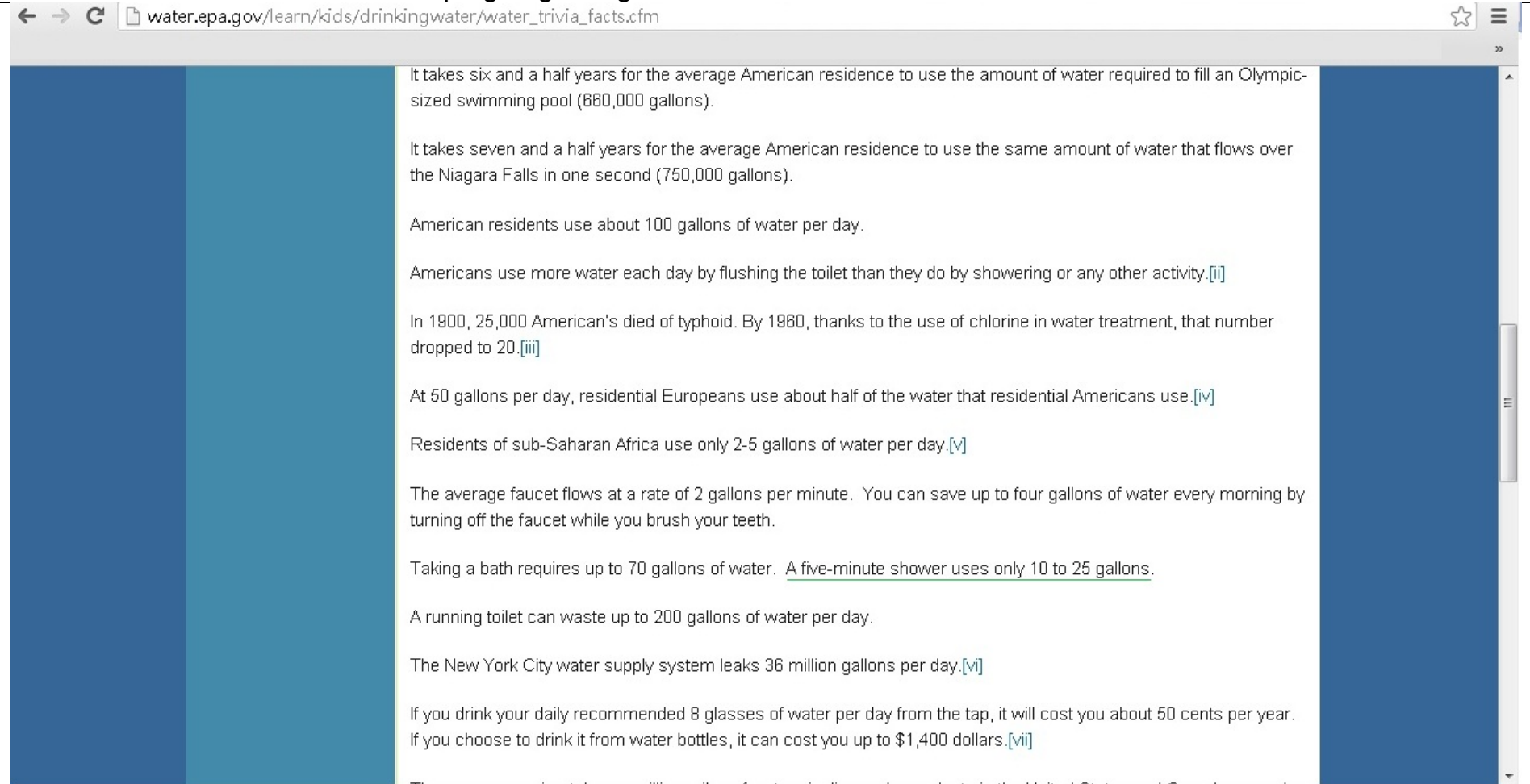
Carbon sequestered annually by acres of U.S. forests ?

Carbon sequestered annually by acres of U.S. forest preserved from conversion to cropland ?

CO₂ emissions from propane cylinders used for home barbeques ?

Average water use for 5 min of shower time is 10 to 25 gallons.

Sourced from US EPA website, <http://goo.gl/Zo8gY>



The image is a screenshot of a web browser window. The address bar shows the URL water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm. The page content is framed by a dark blue sidebar on the left and a dark blue vertical bar on the right. The main content area has a light blue background and contains several paragraphs of text about water usage. The text is as follows:

It takes six and a half years for the average American residence to use the amount of water required to fill an Olympic-sized swimming pool (860,000 gallons).

It takes seven and a half years for the average American residence to use the same amount of water that flows over the Niagara Falls in one second (750,000 gallons).

American residents use about 100 gallons of water per day.

Americans use more water each day by flushing the toilet than they do by showering or any other activity.^[ii]

In 1900, 25,000 American's died of typhoid. By 1960, thanks to the use of chlorine in water treatment, that number dropped to 20.^[iii]

At 50 gallons per day, residential Europeans use about half of the water that residential Americans use.^[iv]

Residents of sub-Saharan Africa use only 2-5 gallons of water per day.^[v]

The average faucet flows at a rate of 2 gallons per minute. You can save up to four gallons of water every morning by turning off the faucet while you brush your teeth.

Taking a bath requires up to 70 gallons of water. A five-minute shower uses only 10 to 25 gallons.

A running toilet can waste up to 200 gallons of water per day.

The New York City water supply system leaks 36 million gallons per day.^[vi]

If you drink your daily recommended 8 glasses of water per day from the tap, it will cost you about 50 cents per year. If you choose to drink it from water bottles, it can cost you up to \$1,400 dollars.^[vii]

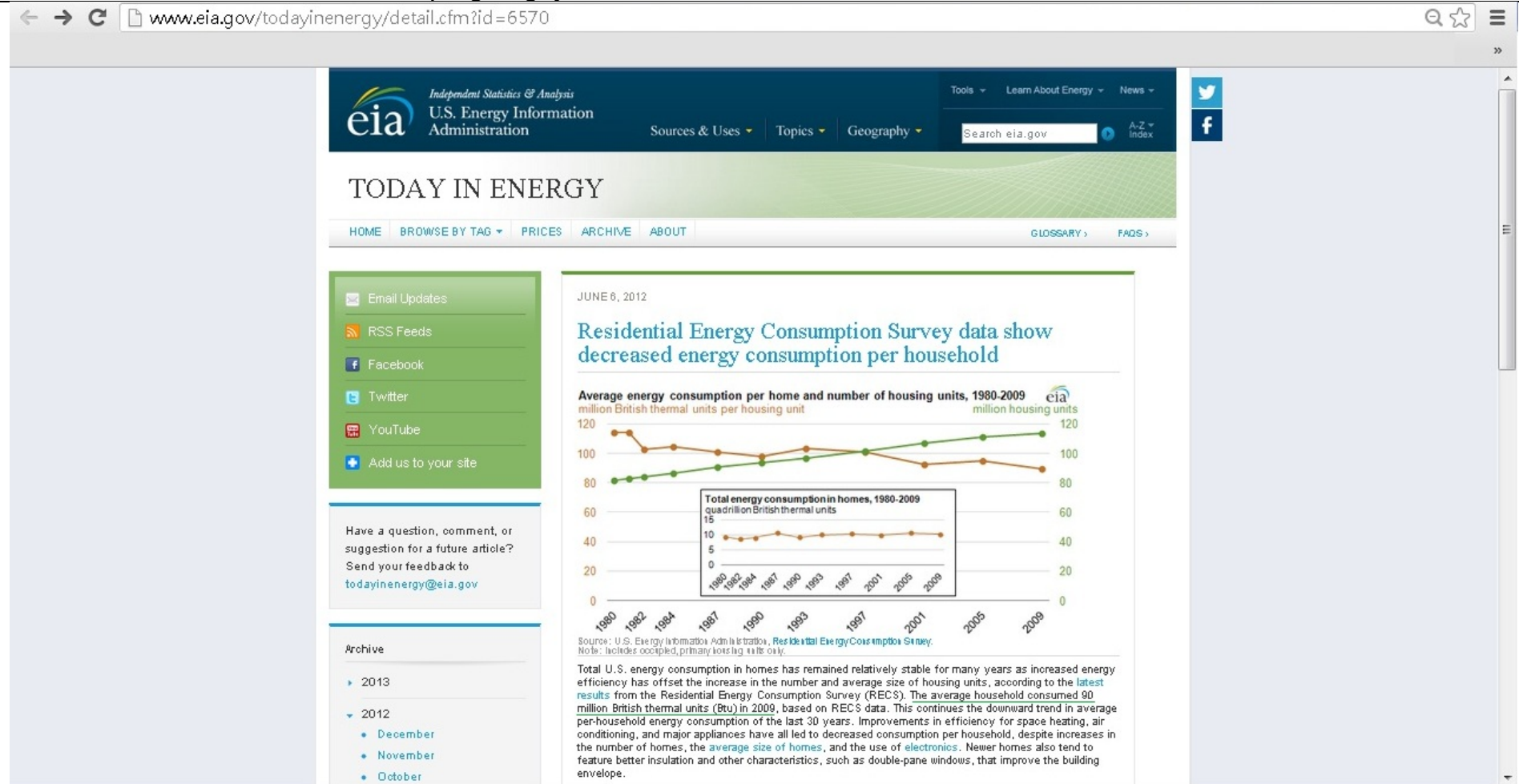
The following information was taken from the EPA's "Water Wasting" page.

[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

EQUIVALENTS TAB REFERENCES – VIRGIN PULP PAPER

The average U.S. household consumed 90 million BTU in 2009.


Sourced from US EIA website, <http://goo.gl/ylllx>




The average car emits 11,013 pounds (5 MT) of CO₂ in a year.
Sourced from Paper Calculator, www.papercalculator.org

← → ↻ c.environmentalpaper.org/baseline#tEC ☆ ≡ »


The Baseline Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

 **Greenhouse Gases**
Greenhouse gases, including carbon dioxide (CO₂) 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 CO₂ equivalents. The average car emits 11,013 pounds of CO₂ in a year.

The Baseline Paper uses < 1 pounds CO₂ equiv., the equivalent of < 1 [cars/year](#)

 **Water Consumption**
Water Consumption measures the amount of process and cooling water that is consumed in the life cycle of the paper product. The largest components of water consumption are process water, 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 Paper uses < 1 gallons, the equivalent of < 1 [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 Paper uses < 1 pounds, the equivalent of < 1 [garbage trucks](#)

Nitrogen oxides (NO_x)
Nitrogen Oxides (NO_x, which include NO and NO₂) are products of the combustion of fuels that contain nitrogen. NO_x 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_x in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [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 Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

Sulfur dioxide (SO₂)
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 SO₂ in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [18-wheelers/year](#)

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Sourced from Wikipedia, <http://en.wikipedia.org/wiki/Earth>

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CO2 emissions based on 3,313lbs or 1.5MT is equivalent to 62.5 home barbeque propane cylinders.
Sourced from EPA GHG Calculator, <http://goo.gl/XkrWy>

← → ↻ www.epa.gov/cleanenergy/energy-resources/calculator.html#results ☆ ≡

The sum of the greenhouse gas emissions you entered above is Metric Tons of Carbon Dioxide Equivalent.

This is equivalent to one of the following:

Equivalency Results

Click on the question mark ? link to read the explanation of that particular calculation. [Read about all calculations.](#)

The information you entered above is equivalent to one of the following statements:

Annual greenhouse gas emissions from passenger vehicles ? *(click to read more about this calculation)*

CO₂ emissions from gallons of gasoline consumed ?

CO₂ emissions from barrels of oil consumed ?

CO₂ emissions from tanker trucks' worth of gasoline ?

CO₂ emissions from the *electricity* use of homes for one year ?

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Carbon sequestered by tree seedlings grown for 10 years ?

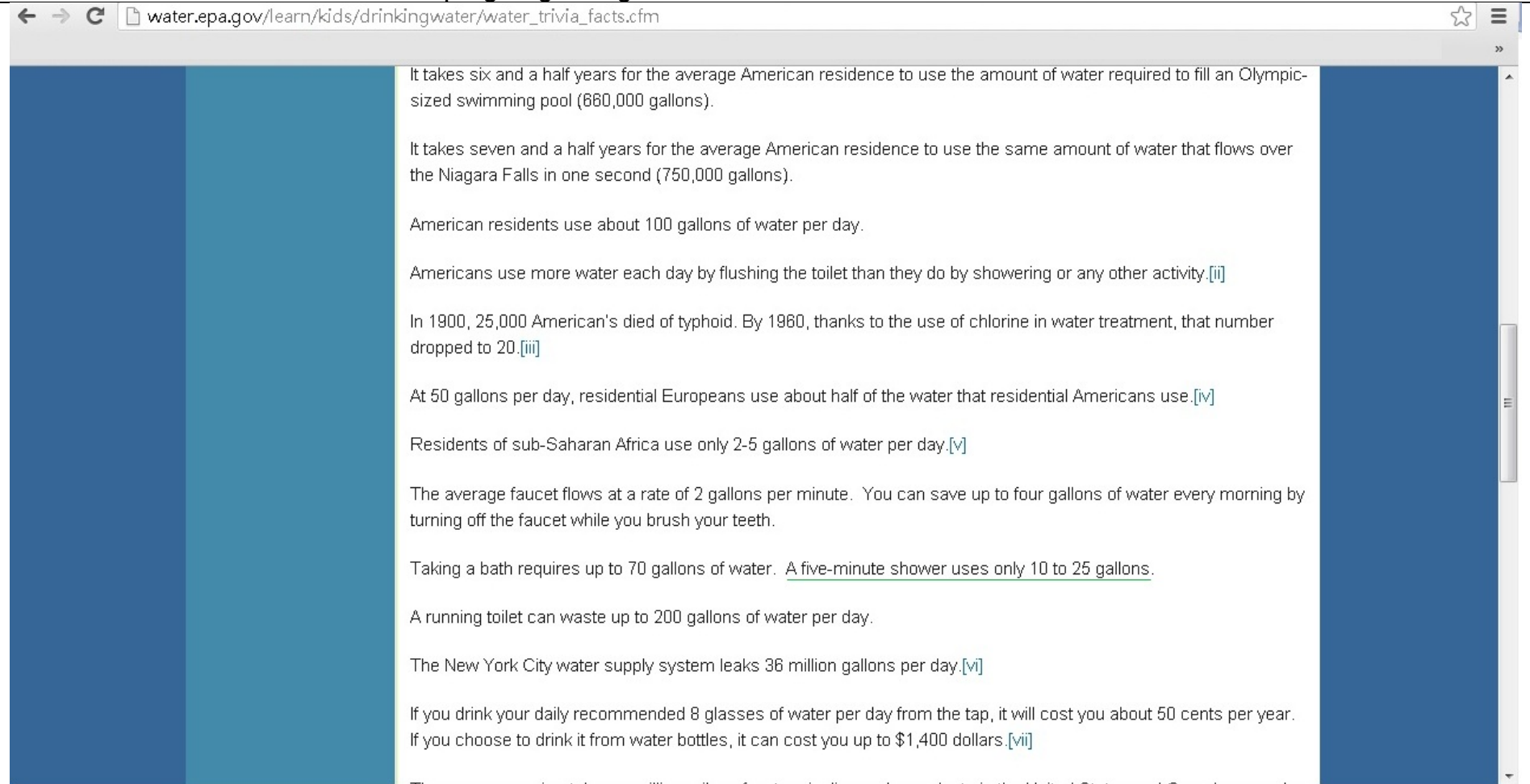
Carbon sequestered annually by acres of U.S. forests ?

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CO₂ emissions from propane cylinders used for home barbeques ?

Average water use for 5 min of shower time is 10 to 25 gallons.

Sourced from US EPA website, <http://goo.gl/Zo8gY>



The screenshot shows a web browser window with the address bar displaying "water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm". The page content is framed by a dark blue border. The text on the page is as follows:

It takes six and a half years for the average American residence to use the amount of water required to fill an Olympic-sized swimming pool (860,000 gallons).

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A running toilet can waste up to 200 gallons of water per day.

The New York City water supply system leaks 36 million gallons per day.^[vi]

If you drink your daily recommended 8 glasses of water per day from the tap, it will cost you about 50 cents per year. If you choose to drink it from water bottles, it can cost you up to \$1,400 dollars.^[vii]

The following information was taken from the EPA's "Water Wasting Wonders" website.

[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

EQUIVALENTS TAB REFERENCES – RECYCLED PULP PAPER

The average U.S. household consumed 90 million BTU in 2009.


Sourced from US EIA website, <http://goo.gl/ylllx>




The average car emits 11,013 pounds (5 MT) of CO₂ in a year.
Sourced from Paper Calculator, www.papercalculator.org

← → ↻ c.environmentalpaper.org/baseline#tEC ☆ ≡ »


The Baseline Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

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Greenhouse gases, including carbon dioxide (CO₂) 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 CO₂ equivalents. The average car emits 11,013 pounds of CO₂ in a year.

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 **Water Consumption**
Water Consumption measures the amount of process and cooling water that is consumed during the life cycle of the paper product. The largest components of water consumption are process water, 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 Paper uses < 1 gallons, the equivalent of < 1 [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 Paper uses < 1 pounds, the equivalent of < 1 [garbage trucks](#)

Nitrogen oxides (NO_x)
Nitrogen Oxides (NO_x, which include NO and NO₂) are products of the combustion of fuels that contain nitrogen. NO_x 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_x in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [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 Paper uses 0 million BTU's, the equivalent of < 1 [homes/year](#)

Sulfur dioxide (SO₂)
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 SO₂ in a year.

The Baseline Paper uses 0 pounds, the equivalent of < 1 [18-wheelers/year](#)

evscript:void(0)

Equatorial circumference of Earth is 40,075.017 km or 24,901.5 miles.
Sourced from Wikipedia, <http://en.wikipedia.org/wiki/Earth>

en.wikipedia.org/wiki/Earth

অসমীয়া

Asturianu

Avañe'ê

Aymar aru

Azerbaycanca

বাংলা

Bân-lâm-gú

Basa Banyumasan

Беларуская

Беларуская (тарашкевіца)

भोजपुरी

Bikol Central

★ Български

Boarisch

བོད་སྐད་

Bosanski

Brezhoneg

Català

ЧӀвашла

Cebuano

Česky

Chavacano de Zamboanga

ChiShona

Cymraeg

★ Dansk

Deutsch

دۆڭريش

Diné bizaad

Dolnoserbski

Eesti

Ελληνικά

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Semi-major axis

149,598,261 km

1.00000261 AU^[1]

Eccentricity

0.01671123^[1]

Orbital period

365.256363004 days^[2]

1.000017421 yr

Average orbital speed

29.78 km/s^[3]

107,200 km/h

Mean anomaly

357.51716°^[3]

Inclination

7.155° to Sun's equator

1.57869°^[4] to invariable plane

Longitude of ascending node

348.73936°^[3][note 4]

Argument of perihelion

114.20783°^[3][note 5]

Satellites

1 natural (the Moon),

8,300+ artificial (as of

1 March 2001)^[5]

Physical characteristics

Mean radius

6,371.0 km^[6]

Equatorial radius

6,378.1 km^[7][8]

Polar radius

6,356.8 km^[9]

Flattening

0.0033528^[10]

Circumference

40,075.017 km (equatorial)^[8]

40,007.86 km (meridional)^[11][12]

Surface area

510,072,000 km²[13][14][note 6]

148,940,000 km² land (29.2 %)

361,132,000 km² water (70.8 %)

Volume

1.08321 × 10¹² km³[3]

Mass

5.9736 × 10²⁴ kg^[3]

Mean density

5.515 g/cm³[3]

CO2 emissions based on 3,178lbs or 1.4MT is equivalent to 58.3 home barbeque propane cylinders.
Sourced from EPA GHG Calculator, <http://goo.gl/XkrWy>

← → ↻ www.epa.gov/cleanenergy/energy-resources/calculator.html#results ☆ ☰

The sum of the greenhouse gas emissions you entered above is Metric Tons of Carbon Dioxide Equivalent.

This is equivalent to one of the following:

Equivalency Results

Click on the question mark ? link to read the explanation of that particular calculation. [Read about all calculations.](#)

The information you entered above is equivalent to one of the following statements:

Annual greenhouse gas emissions from passenger vehicles ? *(click to read more about this calculation)*

CO₂ emissions from gallons of gasoline consumed ?

CO₂ emissions from barrels of oil consumed ?

CO₂ emissions from tanker trucks' worth of gasoline ?

CO₂ emissions from the *electricity* use of homes for one year ?

CO₂ emissions from the *energy* use of homes for one year ?

Carbon sequestered by tree seedlings grown for 10 years ?

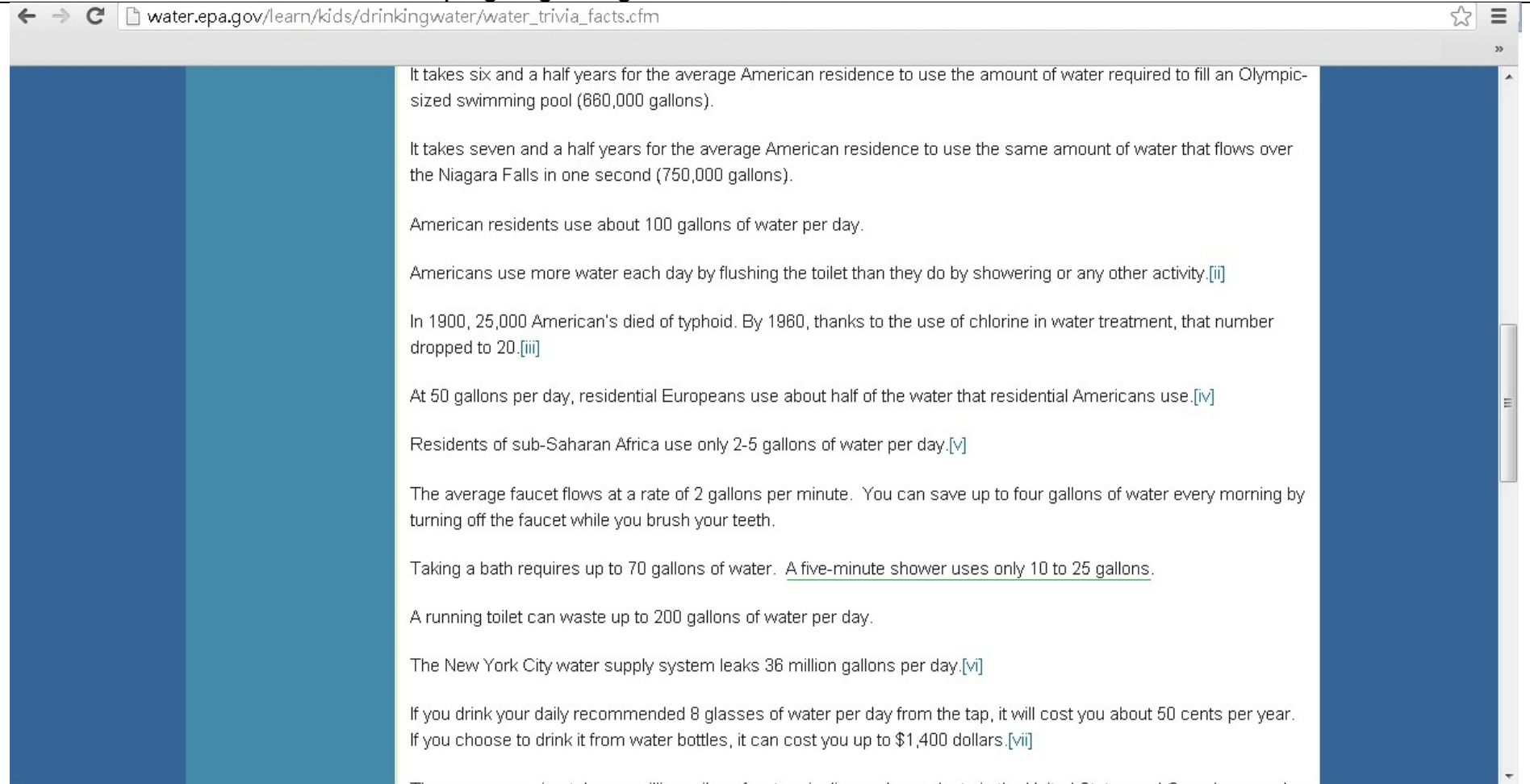
Carbon sequestered annually by acres of U.S. forests ?

Carbon sequestered annually by acres of U.S. forest preserved from conversion to cropland ?

CO₂ emissions from propane cylinders used for home barbeques ?

Average water use for 5 min of shower time is 10 to 25 gallons.

Sourced from US EPA website, <http://goo.gl/Zo8gY>



The image is a screenshot of a web browser displaying a page titled "water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm". The page has a blue header and a white main content area. The content consists of several paragraphs of text providing water-related trivia facts. The browser's address bar shows the URL, and the page has a star icon in the top right corner. The text on the page includes facts about water usage, such as the amount of water required to fill an Olympic-sized swimming pool, the amount of water that flows over Niagara Falls in one second, and the amount of water used by Americans per day. It also mentions historical water treatment improvements and compares water usage between different regions and activities.

← → ↻ water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm ☆ ≡

It takes six and a half years for the average American residence to use the amount of water required to fill an Olympic-sized swimming pool (860,000 gallons).

It takes seven and a half years for the average American residence to use the same amount of water that flows over the Niagara Falls in one second (750,000 gallons).

American residents use about 100 gallons of water per day.

Americans use more water each day by flushing the toilet than they do by showering or any other activity.^[ii]

In 1900, 25,000 American's died of typhoid. By 1960, thanks to the use of chlorine in water treatment, that number dropped to 20.^[iii]

At 50 gallons per day, residential Europeans use about half of the water that residential Americans use.^[iv]

Residents of sub-Saharan Africa use only 2-5 gallons of water per day.^[v]

The average faucet flows at a rate of 2 gallons per minute. You can save up to four gallons of water every morning by turning off the faucet while you brush your teeth.

Taking a bath requires up to 70 gallons of water. A five-minute shower uses only 10 to 25 gallons.

A running toilet can waste up to 200 gallons of water per day.

The New York City water supply system leaks 36 million gallons per day.^[vi]

If you drink your daily recommended 8 glasses of water per day from the tap, it will cost you about 50 cents per year. If you choose to drink it from water bottles, it can cost you up to \$1,400 dollars.^[vii]

The amount of water used in the United States is equivalent to the amount of water used in the rest of the world.

[APPENDIX] REFERENCE LINKS AND SCREEN SHOTS

EQUIVALENTS TAB REFERENCES – OTHER EQUIVALENTS

“One large tree can provide a supply of oxygen for two people.”
Quote Sourced from American Forests.org, <http://goo.gl/YxPE1>

← → ↻ ☆ ≡

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Tree Facts

Carbon sequestration, air quality, and climate change

- A tree can absorb as much as 48 pounds of carbon dioxide per year, and can sequester one ton of carbon dioxide by the time it reaches 40 years old. [1]
- One large tree can provide a supply of oxygen for two people. [2]

Energy

- According to the USDA Forest Service, "Trees properly placed around buildings can reduce air conditioning needs by 30 percent and save 20-50 percent in energy used for heating." [3]
- The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day. [4]

Water

- In one day, one large tree can lift up to 100 gallons of water out of the ground and discharge it into the air. [5]
- For every five percent of tree cover added to a community, stormwater runoff is reduced by approximately two

Switch to Stone

Larger dispenser bottles in the US is around 5 gallons
Sourced from Wikipedia, 2.1 Bottle, <http://goo.gl/DN8Bh>

en.wikipedia.org/wiki/Water_cooler

A free-standing design generally involves bottles of water placed spool-down into the dispensing machine.

Table top or kitchen worktop versions are available which utilise readily available five liter water bottles from supermarkets. These coolers use air pumps to push the water into the cooling chamber and [Peltier devices](#) to chill the water.

A new development within the water cooler market is the advent of countertop appliances which are connected to the mains and provide an instant supply of not only chilled water but also boiling hot and hot water.

Water source and purification [\[edit\]](#)

Bottle [\[edit\]](#)

See also: *Carboy*

To install the bottle, the bottle is tipped upside down and set onto the dispenser, a probe punctures the cap of the bottle and allows the water to flow into the machine's internal reservoir. These gravity-powered systems have a device to dispense water in a controlled manner.

These machines come in different sizes and vary from table units, intended for occasional use to floor-mounted units intended for heavier use. Bottled Water normally is delivered to the household or business on a regular basis, where empty bottles are exchanged for full ones. The bottle size varies with the size of the unit with the larger versions in the US using 5-US-gallon (19 L) bottles. This is also the most common size elsewhere, labelled as 18.9 litres in countries that use the [metric system](#). These units usually do not have a place to dump excess water, only offering a small [basin](#) to catch minor spills. On the front, a lever or push button dispenses the water into a cup.

When the water container is empty, it is lifted off the top of the dispenser, and automatically seals to prevent any excess water still in the

Plumbed with purification [\[edit\]](#)

See also: *Water purification*

Plumbed water coolers use tap water and therefore do not need bottles. Usually some method of purification is used.

Filtration [\[edit\]](#)

Filtration methods include reverse osmosis, ion exchange and activated carbon.

Distillation [edit]

Cooling and heating methods [\[edit\]](#)



Freestanding water cooler with bottle

“The Glad bag held about 50 pounds.”

Sourced from 6abc.com, Consumer Reports: Testing garbage bags, May 10, 2012, <http://goo.gl/N91WB>


← → ↺ abclocal.go.com/wpvi/story?section=news/consumer&id=8656632 ☆ ☰


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Action News

May 10, 2012 (WPVI) -- Americans generate 250 million tons of garbage each year, and that means we use a lot of garbage bags.

So, Consumer Reports tested the leading brands, including new Glad bags, which promise to be more environmentally friendly.

To see just how strong the new Glad bags are, Consumer Reports' Bob Karpel put them through some tough tests.

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In all he compared ten tall kitchen bags from big-name brands like Hefty, Kirkland Signature from Costco and Great Value from Walmart.

Karpel built a contraption to measure just how much weight each bag can hold. Once he loaded the bag with weights, he lifted it higher and higher.


The Glad bag held about 50 pounds!


"You'll notice that the bag has stretched but it hasn't broken," Karpel said.



Since, at home, you have to lift garbage bags out of a pail, Karpel also tested how well the bags work for that. He put 20 pounds of small cans into each bag, then loaded more weight on top. The best bags could hold around 50 pounds!

Those winners are Hefty's The Gripper for 16 cents a bag, and that new Glad bag for 15 cents, the one that promises it's stronger than plastic.

So, the Glad bag is good for heavy kitchen use and may just be better for the environment.

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