

ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

A tool for understanding environmental decisions related to the pulp and paper industry



EFFECTS OF RECYCLED FIBER USE ON ENERGY USE

Energy Use in Manufacturing

Seemingly similar mills can have very different energy requirements. It is not unusual for the “best” and “worst” mills within a given production category to have energy requirements that differ by a factor of two (Paprican 2005). Nonetheless, in general, mills that produce paper or paperboard from recovered fiber use less total energy, considering fuel use and purchased power, than mills making similar products from virgin fiber. This is to be expected since much of the energy used by virgin mills is required to separate wood into individual fibers—a process requiring much more energy than separating recovered paper into individual fibers.

On the other hand, because chemical pulp mills derive a large fraction of their energy from biomass fuels, published studies often conclude that they use less fossil fuel energy than recycling mills making comparable products.

Data from a number of studies are summarized in the following table and illustrate that the differences in fossil energy are often very small, especially considering the differences expected between individual mills. It is important to note that the values in the table include both the fuel used at the mill and the fuel required to produce purchased electricity.

Table R7.

Product and Process Description	Total Manufacturing Energy Requirements*	Fossil Energy Requirements in Manufacturing*	Reference
Virgin newsprint	37.1 MMBtu/ton	25.1 MMBtu/ton	Paper Task Force (2002)
Recycled newsprint	19.8 MMBtu/ton	15.5 MMBtu/ton	
Recycled newsprint	5 to 19 MMBtu/ton less than virgin newsprint		Five studies reported in Denison (1996)
Virgin corrugated boxes	26.7 MMBtu/ton	12.0 MMBtu/ton	Paper Task Force (2002)
Recycled corr. boxes	17.9 MMBtu/ton	14.6 MMBtu/ton	
Virgin office paper	37.6 MMBtu/ton	13.4 MMBtu/ton	Paper Task Force (2002)
Recycled office paper	20.1 MMBtu/ton	15.6 MMBtu/ton	
Virgin coated unbleached board	27.4 MMBtu/ton	10.9 MMBtu/ton	Paper Task Force (2002)
Virgin bleached board	39.3 MMBtu/ton	13.6 MMBtu/ton	
Recycled paperboard	15.9 MMBtu/ton	12.1 MMBtu/ton	

*Includes fuel used at the mill and the fuel required to produce purchased power.

References

- Denison, R.A. 1996. Environmental lifecycle comparisons of recycling, landfilling and incineration: A review of recent studies. *Annual Review of Energy and the Environment* 21: 191-237.
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<http://epa.gov/epawaste/conserva/tools/warm/pdfs/EnvironmentalDefenseFund.pdf>
- Pulp and Paper Research Institute of Canada (PAPRICAN). 2005. Benchmarking energy use in pulp and paper mills. Appendix 5 in *The energy roadmap: Pulp and paper for a self-sufficient tomorrow: An industry strategy*. Natural Resources Canada.