



Life Cycle Assessment of Wheat Sheet

Executive Summary

November 2014



Project overview

Social Print Paper is launching a new paper product made primarily from wheat straw produced from a mill in India. Based on internal assessments, Social Print Paper believes this paper has superior environmental performance than conventional woodfiber based paper. TruCost has been commissioned by Social Print Paper to conduct a screening life cycle analysis to quantify the environmental performance of Social Print Paper's wheat straw paper (WheatSheet) and to answer the following two questions:

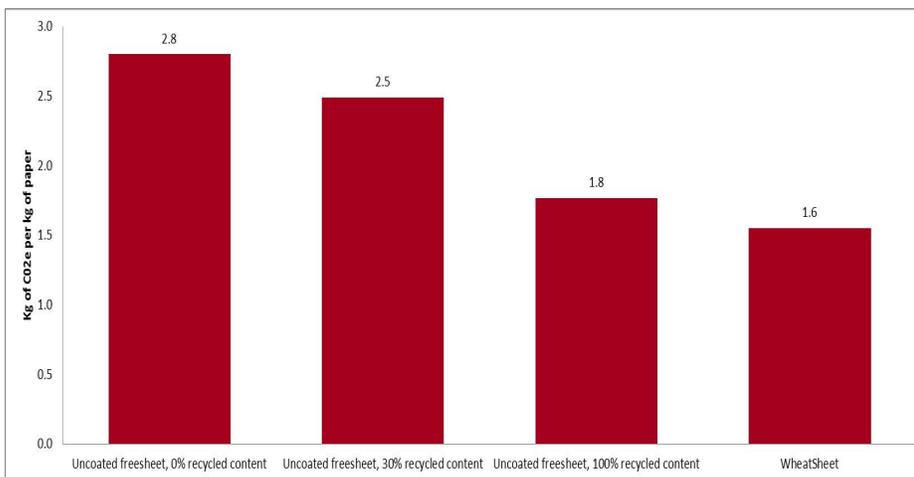
- What are the greenhouse gas emissions (GHG) emissions associated with the production of WheatSheet paper, and how do they compare with virgin and recycled paper (30% and 100%)?
- How many trees are saved by using WheatSheet, when compared with the production of conventional virgin paper, and recycled paper (30 and 100%)?

Environmental impact estimates for the 0%, 30% and 100% recycled content papers were calculated using the Environmental Paper Network Paper Calculator Version 3.2. For more information, visit www.papercalculator.org. Environmental impact estimates for the WheatSheet were calculated by Trucost.

Key findings

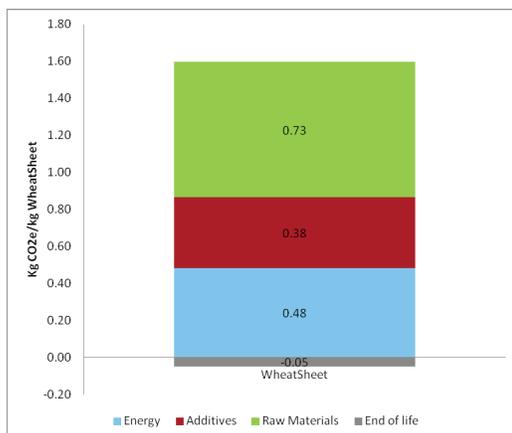
GREENHOUSE GAS EMISSIONS

What are the Greenhouse Gas (GHG) emissions associated with the production of WheatSheet paper, and how do they compare with virgin paper and recycled paper (30% and 100%)?



On average, the GHG footprint of WheatSheet is 1.6 kg of CO₂ per kg of paper over its entire life cycle, from the growing of the wheat in India to its end-of-life in North America. This compares with 2.8 kg CO₂ per kg of paper for an uncoated paper with no recycled content, 2.5 kg for an uncoated paper with 30% recycled content, and 1.8 kg for uncoated paper with 100% recycled content. Therefore, the GHG emissions associated with the production of WheatSheet are 45% lower than uncoated paper with no recycled content, 38% lower than paper with 30% recycled content and 12% lower than paper made entirely from recycled pulp.

Figure 2: GHG Emissions Footprint Comparison



The farming of the wheat and growing of the trees are responsible for over 47% of the total GHG footprint of the WheatSheet, or 0.7 kg of CO₂ per kg of paper. This remains true if the paper is made of waste wheat and waste wood because of the impact of the original growing of trees and wheat, which are allocated as “waste wheat” and “waste wood” respectively.

Energy generation and use account for 31% of the total GHG emissions, even though the on-site energy generated is cleaner than the grid energy available to the mill. Most of the GHG emissions of the on-site electricity generation results from the burning of coal in co-generation boilers. In addition, the manufacturing of additives, in particular chlorine dioxide and optical brightener agent, is responsible for 25% of the total GHG emissions. Finally, the end-of-life has a positive impact on the GHG footprint, primarily due to the elimination of emissions caused by sending waste to landfills either by recycling, or by generating energy from waste incineration with energy recovery.

Figure 3: GHG Footprint of WheatSheet per Life Cycle Stages (kg CO₂ per kg)

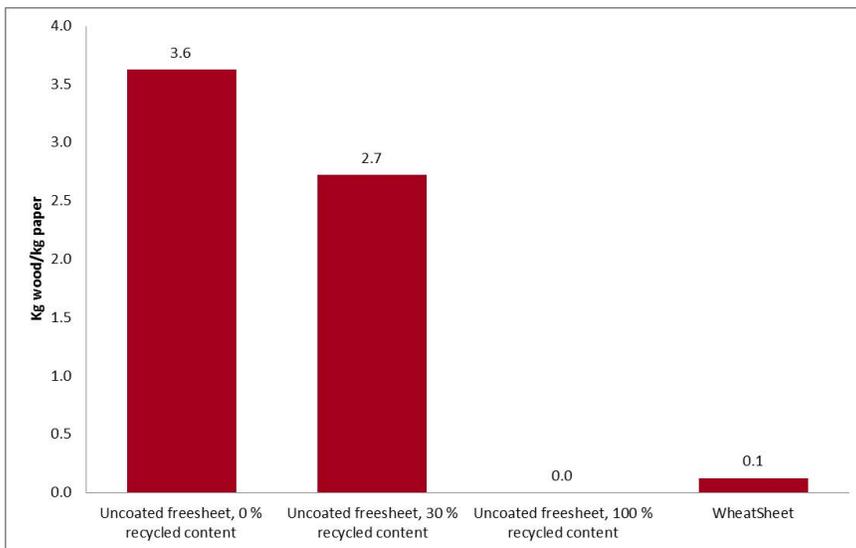
IMPACT ON FORESTS

How many trees are saved using WheatSheet, when compared with the production of conventional virgin paper, and recycled paper (30 and 100%)?

On average, one kg of WheatSheet uses 0.1 kilogram of wood. This is lower than traditional paper as WheatSheet is manufactured from waste wheat and waste wood from the plywood industry. Standing bark quantities have been allocated to WheatSheet based on mass allocation, as is explained in the methodology section of this report. This quantity of wood compares with 3.6 kilograms of wood use per kilogram of uncoated freesheet, 2.7 kilograms of wood per kilogram of uncoated freesheet with a 30% recycled content, and 0 kilograms of wood use per kilogram of 100% recycled uncoated freesheet as reported in the EPN Calculator. According to the EPN, 2,400 trees weigh 373 tons. Therefore, 1 ton of WheatSheet saves on average 25 trees compared with the baseline paper (0% recycled). The following table summarises these results.

Figure 4: Wood use

	Quantity of wood per type of paper (kg wood per kg paper)	% difference when compared with Wheat-Sheet	Number of trees per 1 ton of paper
Uncoated freesheet, 0 % recycled content	3.6	-97%	26
Uncoated freesheet, 30 % recycled content	2.7	-95%	19
Uncoated freesheet, 100 % recycled content	0.0	0%	0.0
WheatSheet	0.1	0%	0.9



The EPN modelling assumes that the 100% recycled content paper does not use wood. The WheatSheet uses 0.1 kg of wood per kg of paper, or 97% less than paper with no recycled content, and 95% less than paper made with 30% recycled content. These results are contingent on the allocation methodology used.

Figure 5: Wood use by paper type

In Summary

WheatSheet paper provides organizations an opportunity to reduce demands on forests, reduce greenhouse gas emissions and communicate these savings to customers, employees and community to drive business growth. The following chart summarizes the environmental savings of WheatSheet paper when compared to 1 metric ton of traditional wood fibre papers:

	0% Recycled content	30% Recycled content	100% Recycled
Trees Saved by WheatSheet	25 trees less	18 trees less	1 tree more
Greenhouse Gas Emission Reductions	1200 kg less	900 kg less	200kg less

Figure 6: Environmental Savings of 1 metric ton of Wheat sheet compared to wood fibre papers.

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