Carbon footprint

of

Eco-Baskets

for

eHomemakers

prepared by

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Content

Carbon footprint for eHomemakers Eco-baskets....3

Introduction....3

Production-cycle....3

Project-boundary....3

Key assumptions....5

Transportation....5

Glue and Varnish....5

Results....6

Uncertainties....6

References....7

Carbon footprint for eHomemakers Eco-baskets

Introduction

The purpose of this paper is to give a well documented estimate of the greenhouse gas (GHG) emissions related to the production of Eco-baskets. Eco-baskets are all hand-produced from return issues of magazines, made by women working out of their own homes. For further background on the baskets please refer to ehomemakers.net. All calculations mentioned in this paper are documented in the attached spreadsheet.
The paper is produced by Mathias Varming from YTL-SVCarbon Sdn. Bhd. on behalf of eHomemakers.

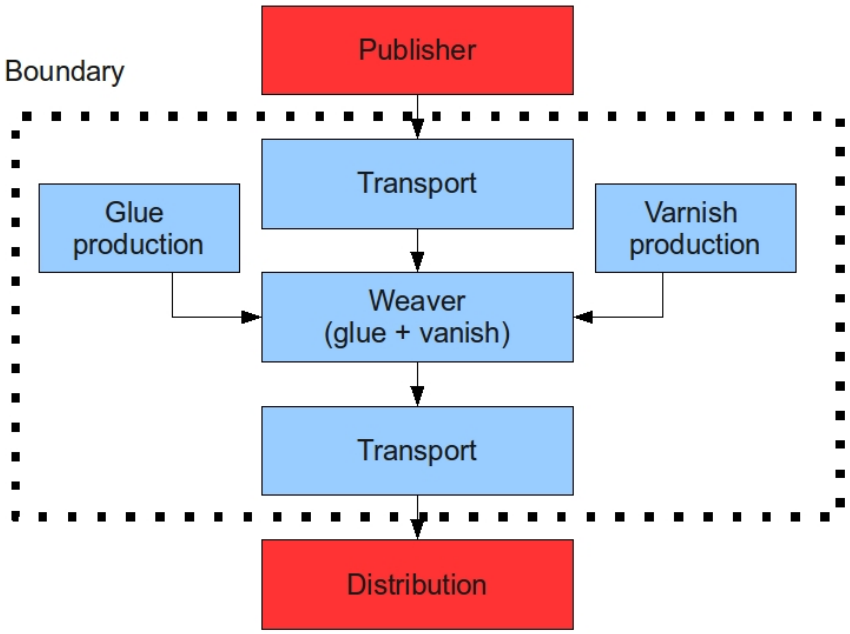
Production-cycle

The baskets start their life as unsold magazines returned to the publisher by retailers. These magazines are picked up by car, and distributed between the baskets-makers or weavers. The weavers then first make the magazines into "rolls." A roll is the building blocks of the baskets. It is a third of a magazine-page rolled tightly around a piece of lidi[1], and held together with glue. The wire is then removed, so only the paper roll is left. These rolls are then weaved into baskets by hand. Finally the baskets are then finished off with a coat of vanish, either clear or pigmented. From the weaver the baskets are then transported by car to the eHomemakers' office.

Project-boundary

The project-boundaries for this paper are as follows.

[1] The vein from a coconut palm leaf



As the magazines are a waste product, they are for these purposes considered carbon neutral. If the magazines had not been used for baskets they would have been most likely disposed of in a landfill or incinerated, thus releasing the carbon bound in the paper. Since there is no control with the baskets after distribution, and they go all over the world, there is no way of telling which mode of disposal will be used, but for the purpose of this paper it is assumed that the GHG-emissions from the disposal of the baskets is the same as it would have been for the magazines, and thus can be disregarded.

The final shipping of the baskets to consumers is kept out of this paper. This is done, because it is very random (as it is completely reliant on who orders the baskets) and varies widely (the baskets are sold both locally and shipped abroad), and thus would add very high uncertainties to the final result, and since it is out of the hands of eHomemakers it wouldn't add to paths of action open to them.

Since all of the production is done by hand without machinery in the weavers own homes, no emissions are counted for the production, beyond the upstream emissions from the materials used.

Therefore the equations for the calculations look as follows:

Basket emissions:
$E_{basket} = E_{roll} \times N_{rolls}$

Where:
E_{basket}: The total GHG emissions pr basket
E_{roll}: Total GHG emissions pr roll
N_{rolls}: Number of rolls in basket

$E_{roll} = E_{T\text{-}raw} + E_{paint} + E_{glue} + E_{T\text{-}fin}$

Where:
$E_{T\text{-}raw}$: Emissions from transporting the raw material, i.e. the magazines, from the publisher to the weaver.
E_{paint}: Life cycle emissions from the paint
E_{glue}: Life cycle emissions from the glue
$E_{T\text{-}fin}$: Emissions from transporting the finished basket

Key assumptions

In the following paragraph the key assumptions for each of the elements of the calculations are explained and justified.

Transportation

The transport distances are estimates provided by eHomemakers. There are no records kept on how much is driven to transport either the magazines to the weavers or the baskets from the weavers to the eHomemakers' office, so the estimate is based on experience only. Distance is estimated for 50 km each from publisher to weaver and weaver to office on average. On average 100 magazines are picked up from the publisher at a time, and 30 baskets are delivered at a time (reference basket is AOM-5, 100 rolls each)
The emission factor used for the transport is taken from (DEFRA, 2006:15) for a medium sized car.
It is assumed that bigger baskets are delivered fewer at a time and smaller ones more at a time. To account for that the transport emissions are calculated pr. roll and not pr. basket.

Glue and Varnish

The amount of glue and varnish used pr. roll is based on enquiries of the weavers done by eHomemakers.
The weavers' estimates are:

- 100 rolls will come from a single magazine (3 pr. page).
- 1 l can of paint is enough for 15 medium sized baskets (reference basket is BHM-11, 160 rolls each)
- 1.1 l can of glue is enough for around 20,000 rolls.

The emission factor for the varnish is from a life cycle study done by Sveff (the Swedish paint and ink makers association) (sveff.se(A)).

The glue manufacturer would not disclose the active ingredient of the glue, except that it is polymer based. The emission factor used is for urea formaldehyde, which is one type of polymer based adhesive. The factor comes from (Hammond & Jones, 2008:13).

Results

As it is stated in the spreadsheet, on the basis of these assumptions, the carbon footprint of the eco-baskets is approximately 5.54 grams of carbon dioxide equivalent pr. roll used in the basket. As the eHomemakers produce a wide selection, samples of some common basket-types are given below.

Description	Product-code	No. of rolls	Emissions pr. Basket (kg)
Medium round fruit basket (without handle)	AOM-5	100	0.54
Small Round Basket (with lid)	AOIS-12	140	0.78
X-large laundry basket (with lid)	FOIXL-24	1800	9.98

Uncertainties

As it is stated above this paper is based on qualitative data collected from the people involved in various stages of production and transportation and it is has been beyond the scope of this paper to verify these data. As such the uncertainty of the data is considerable, which should be acknowledged in further use of these results. However in assessing the order of magnitude of the carbon footprint, this paper should provide a reasonable estimate.

References

Hammond, Geoff & Jones, Craig, 2008: "*Inventory of Carbon and Energy (ICE)"* University of Bath, UK

Defra, 2008: "*2008 guidelines to Defra's GHG conversion factor"*, Department for Environment, Food and Rural Affairs, UK

Sveff.se (A): *"Lifecycle analysis of paint. Summary of report B1338-A"*, The Swedish paint and printing ink manufacturer's association, available at www.sveff.se