

# Specific carbon factors for health products – availability and application of data for ARVs and LLINs



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Authors: Keith Robertson<sup>1</sup> | Dr. Kristian Steele<sup>2</sup> | Dr. Christoph Hamelmann<sup>2</sup>

<sup>1</sup>Senior Sustainability Consultant & Lead Analyst, Arup

<sup>2</sup>Senior Analyst, Advanced Technology & Research, Arup

<sup>3</sup>Regional Practice Leader HIV, Health and Development, UNDP Regional Centre, Europe and the CIS

# ARUP



## Introduction

Previous studies looking at the embodied carbon of the UNDP-GF health programmes have demonstrated the magnitude of impacts from procurement of goods – both in absolute terms, and as a proportion of overall programme carbon footprints. Especially relevant are those grants where large quantities of a single product category are procured, which can be up to 40% in some case studies.

In the context of using carbon as a metric for measuring environmental impact of such grants it then becomes increasingly important to identify product-specific carbon factors, rather than using broader industrial sector factors which reflect a wide range of products and processes.

As a key global purchaser of large volumes of medicines and medical equipment the

UN has considerable opportunity to influence how carbon footprinting can be used in the context of supplier selection, and through this to encourage greater transparency and reporting of environmental impact from product manufacture. *The United Nations Informal Inter-Agency Task Team (IATT) on Sustainable Procurement in the Health Sector*<sup>1</sup> has been established to develop and implement an action plan on this topic,

i.e. providing a systematic approach for incorporating environmental impact quantification into procurement. This paper reports a preliminary review of data availability, and contextual information gathered during discussions with suppliers, for two specific categories of procurement which feature significantly in Global Fund (GF) health programmes in Zimbabwe, and implications of data availability on future reporting.

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## Study scope

For the purposes of this study two categories of goods have been identified as of priority interest:

- The procurement of antiretroviral (ARV) pharmaceuticals for the treatment of HIV/AIDS; and
- The procurement of long lasting insecticide treated nets (LLINs) for malaria vector control.

These products feature significantly in the health programmes in Zimbabwe:

- the Round 8 Phase 2 HIV/AIDS programme in Zimbabwe allocated approximately 40% of its budget to procuring various ARV medicines;
- LLINs represent around 10% of the Round 8 grant budgets for Malaria in Zimbabwe.

Given the prominence of these goods in the grant programmes studied, and also the broader importance attached to them (which includes supporting quality and price monitoring schemes within the UN/WHO) these are of primary importance to this initial study of data availability.

## Challenge

The challenge was to investigate what information is available on the two categories which might inform the footprinting process and help strengthen efforts to reduce emissions, this included:

- where are manufacturers of these goods located;
- have individual suppliers developed product-specific environmental or carbon footprinting data for their products;
- are there any mechanisms/drivers to encourage manufacturers to identify and report carbon or environmental impacts at a product scale;
- if not, then is there appetite from manufacturers to carry out this type of analysis; and
- how could UN organisations influence manufacturer reporting, given the volumes of procurement undertaken.

Information to investigate these questions was to be drawn from publicly available information, any information available from WHO/UN, and through direct discussions with manufacturing firms.

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<sup>1</sup>The IATT comprises representatives from UNDP, UNFPA, WHO, UNICEF, UNHCR, UNOPS and UNEP

## Assessment of ARV manufacturing information

### Existing sources of supply

The term ‘ARV’ refers to a category of medicines containing a number of sub-classes. They are usually used in various recommended combinations to treat HIV infection. This paper does not investigate in detail differences between ARV medicines, and their sources, although it should be understood that there is complexity contained within referring simply to “ARVs”.

ARVs, and other pharmaceuticals used as part of antiretroviral treatment (ART), must go through an approval process within UN/WHO before being available for use in Global Fund projects. The list of ARVs used for the projects studies in Zimbabwe include:

- Abacavir
- Didanosine
- Atazanavir/Ritonavir
- Ritonavir
- Efavirenz
- Zidovudine
- Lopinavir
- Tenofovir

The World Health Organisation list of Prequalified Medicinal Products<sup>2</sup> provides some information on the manufacturing locations for many of these. In broad terms large quantities of these are manufactured in India with smaller proportions manufactured in South America, US, and Europe. There is some mention of suppliers within Africa, but only for one ARV type. The World Health Organisation list does not provide an indication of actual volumes sourced from each of these suppliers.

The procurement of ARVs is affected by the complex area of patenting, resulting in restrictions of procurement options for ARVs under patent. This study does not examine this topic except to report comments made during discussions with manufacturers.

### Availability of environmental impact data

A review was carried out to identify what information was readily available relating to the environmental and/or carbon performance of manufacturers, and

specifically to the production of ARVs.

A review of publicly available information for large international manufacturers of ARVs found that manufacturers (often with manufacturing locations based around the world) typically report on corporate environmental performance (often in line with Global Reporting Initiative requirements or similar). This type of reporting provides environmental performance data (energy, water, waste etc.) at a corporate level, and often down to the level of detail of a specific manufacturing facility (such as annual carbon emissions or similar).

No information was found on the specific impacts of product lines or categories. It is expected that manufacturing firms are likely to have basic information on the production of specific medicines – e.g. manufacturing energy – but this is not publicly available, and there is no indication that such firms carry out Life Cycle Assessment (LCA) studies/or similar in line with recognised standards.

### Discussion

To some extent the findings on product level reporting are unsurprising. The Association of the British Pharmaceutical Industry (ABPI) has only recently produced a carbon footprint tool for UK pharmaceutical supply<sup>3</sup>. This is against a backdrop of increased interest in the UK regarding the carbon footprint of medicines, based on the UK NHS Carbon Reduction Strategy (2009) and Sustainable Development Strategy (2014). Discussions with the UK NHS Sustainable Development Unit (SDU) indicated that there is very little granularity in pharmaceutical life cycle data at present – something which forms a priority area for the UK NHS in order to inform their national assessment of carbon footprint. The UK NHS is currently trying to work with suppliers to develop this information in order to inform its understanding of the carbon impact of pharmaceutical provision in the UK.

Guidance for Pharmaceutical and Medical Device Product Life Cycle Accounting<sup>4</sup> was produced in late 2012 with participation of UNDP. It is not clear how widely these are now being applied or considered by manufacturers to develop product-specific environmental data.

One area which was given some consideration was what benefits may accrue from sourcing key goods from locations closer to their point of use. As noted above, most ARVs procured by the UN for Global

<sup>2</sup><http://apps.who.int/prequal/>

<sup>3</sup><http://www.abpi.org.uk/our-work/mandi/Pages/sustainability.aspx>

<sup>4</sup><http://www.ghgprMAGNetocol.org/feature/pharmaceutical-and-medical-device-sector-guidance-product-life-cycle-accounting>





UNDP

Fund projects in Zimbabwe are manufactured in India. An initial review within UNDP identified one approved manufacturer in Zimbabwe, and one located in South Africa. Enquiries to the Zimbabwe-based manufacturer provided little information, and there was some uncertainty about whether the firm was still producing ARVs.

Discussions were held with the South Africa manufacturer to ascertain if any LCA information (or similar) was available. It was noted during the discussion that the manufacturing of ARVs by this firm had initially been established with the support of UN/WHO, which under Intellectual Property agreements had allowed a manufacturing facility to be constructed specifically to support the supply of ARVs to the region. However it was noted that the ending of patents on key medicine categories had now seen increasing supply from India and China, and that this facility was now focussing on manufacturing under license those ARVs still under patent restrictions rather than generics with low profit margins and strong competition from areas where production costs are lower.

The discussion also confirmed that they do not have product-specific carbon footprint information for their medicines. The firm is reporting carbon performance for the purposes of corporate reporting and compliance with Global Reporting Initiative (GRI) and Carbon Disclosure Project (CDP) requirements, but not in more detail than at manufacturing centre level. During discussions it was noted that they are currently researching, and identifying, methods for reporting at a greater level of detail, but that this is still an area of

early development. *They would be interested to explore the potential for this with UNDP-GF.*

Based on the findings set out above, the indication is that there is no strong driver at present for product-specific carbon reporting. As noted, the IATT has been formed precisely to address this issue through a process of engagement with suppliers as a precursor to developing standard GHG reporting protocols for key product categories with an aim of then integrating this information into supplier selection.

## Assessment of long lasting insecticide treated net (LLIN) manufacturing information

### Existing sources of supply

Global health initiatives procure very large volumes of LLINs for health programmes around the world. Between 2006 and 2012 UNICEF procured over 160 million LLINs.

The supply chain for LLINs is well documented, being a key component of the Roll Back Malaria (RBM) project. Through the WHO there is a system for identifying LLIN suppliers and product quality standards, through which a list of suppliers has been identified.

The following table is taken from the most recent update from WHOPES (WHO Pesticide Evaluation Scheme) 2013 price data<sup>5</sup>.

<sup>5</sup>[http://www.unicef.org/supply/files/LLINs\\_price\\_transparency\\_August\\_2013.pdf](http://www.unicef.org/supply/files/LLINs_price_transparency_August_2013.pdf)

Manufacturer	Product name	Product type
Tana Netting	DawaPlus® 2.0	Deltamethrin coated on polyester
Clarke/Shobika	Duranet®	Alpha-cypermethrin incorporated into polyethylene
BASF	Interceptor®	Alpha-cypermethrin coated on polyester
Bayer	LifeNet®	Deltamethrin incorporated into polypropylene
VKA Polymers	MAGNet™	Alpha-cypermethrin incorporated into polyethylene
Bestnet	Netprotect	Deltamethrin incorporated into polyethylene
NetHealth / A to Z Textile Mills; Sumitomo Chemical	Olyset Net®	Permethrin incorporated into polyethylene
Vestergaard Frandsen	PermaNet® 2.0	Deltamethrin coated on polyester
Vestergaard Frandsen	PermaNet® 3.0	Combination of deltamethrin coated on polyester with
Disease Control Technologies	Royal Sentry®	Alpha-cypermethrine incorporated into polyethylene
Yorkool	Yorkool® LN	Deltamethrine coated on polyester

It is important to appreciate that the current supply chains for LLINs includes a range of products of different materials (primarily polyethylene, polypropylene and polyester) which, depending on material, are either impregnated or coated with insecticide. The material used, and the resulting method of applying insecticide, have implications for the lifetime of a net (which is a product of its physical robustness, and the longevity of the insecticide effectiveness).

#### Availability of environmental impact data

Initial enquiries were made to all of the suppliers in the WHOPES list. Direct contact was made with three suppliers of nets:

- BASF
- Bayer
- Bestnet

Similar to what was seen in the ARV study all companies provide corporate environmental reporting.

- BASF noted that they carry out ‘eco-efficiency’ studies for some of their products, but do not have one for their LLINs;
- Bestnet provide basic supply chain information (observing environmental legislation for example) as part of the tender process to the UN, but do not hold

product-specific environmental data;

- Bayer could provide information on the Life Cycle impacts of their LLINs – although only summary data was provided to inform this study<sup>6</sup>.

#### Discussion

Of the firms which responded, two held information on the life cycle impacts of their LLINs. It is not known whether other manufacturers hold such information, although an initial review of publicly available information did not identify any.

The discussions with Bayer provided useful information on the broader context behind this. Bayer’s main driver for publishing information on the life cycle impacts of their LLINs is that it offers a way to demonstrate the benefits of certain product lines which are more expensive than other LLINs. Bayer had demonstrated through its own analysis that over the lifetime of their polypropylene LifeNet product the carbon footprint of their use is lower than equivalent polyethylene or polyester nets, mainly through the extra robustness of this product.

The discussions with Bayer and other suppliers gave an indication of the current relative unimportance of life cycle information, in that it is not used as a selection criterion for LLINs. The approval and procurement

<sup>6</sup>[http://www.vectorcontrol.bayer.com/bayer/cropscience/bes\\_vectorcontrol.nsf/id/EN\\_Public\\_Health\\_Journal\\_No\\_23/\\$file/PHJ\\_23.pdf](http://www.vectorcontrol.bayer.com/bayer/cropscience/bes_vectorcontrol.nsf/id/EN_Public_Health_Journal_No_23/$file/PHJ_23.pdf)

process undertaken by WHO/UN is largely based on identifying nets which:

- meet the required performance standard;
- can be supplied in sufficient quantities; and
- can be provided at lowest price.

The opinion being that there is little value in firms identifying environmental impacts of their LLINs as this information is not a criterion for product selection. Production is largely carried out in countries such as India, Malaysia and Vietnam to minimise manufacturing costs. Bayer actively promote the footprint of their LifeNet specifically because this product is more costly than alternative products.

## Concluding points

There is little product specific carbon footprint information available for ARVs, although there is better information available for LLINs. At present the drivers for developing this information for products are weak – there is little benefit in suppliers carrying out the necessary work to identify life cycle impacts and to make these available.

The IATT and global health financing institutions like the Global Fund and bilateral development partners have the power to increase the importance of this in their supplier selection process, which would offer several benefits:

1. **Better understanding of grant programme carbon footprints:** for key categories, where large volumes are procurement (or items are procured at large cost) the overall footprint estimation accuracy can be significantly improved using product-specific footprint data.

achieved by a product (and further to a competitive procurement process) the supplier is listed by the WHO as approved, and is then available for use as a provider. While basic environmental performance information is included in the procurement process, no comparative figures on environmental impact of one good compared to another are available. Changing this situation, to one where suppliers provide LCA data or equivalent, would begin to provide a mechanism for including environmental impact in the procurement of goods and services.

3. **Demonstrating the trade-off between environmental impact and cost:** it was noted by one manufacturer of LLINs that the primary criteria for selection as a supplier is purchase price. In order to encourage manufacturers to consider the environmental cost of their products it will be necessary to include this as part of the procurement process, firstly by engaging with suppliers to develop standard methods of reporting environmental impact, and subsequently by incorporating this reporting into selection criteria.
4. **Comparative assessment of different product types:** there are several different types of LLINs, using different materials, and with different effective lifetimes (which are a factor of physical robustness, and also longevity of insecticidal action). Use of LCA data would inform the identification of preferred technologies on cost, lifetime, and environmental impact measures.

The various UN agencies are well placed to contribute to a significant change in the carbon footprinting landscape for key areas of procurement through the considerable leverage they gain from volumes of procurement. The IATT has begun the programme of work required to move towards more sustainable procurement, beginning the process of identifying

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