



## **PRESS KIT**

# **Environmental Key Performance Indicators**

## **Methodology**

(except Land Use)

The product level EP&L uses numerous primary and secondary data sources to quantify the Environmental Key Performance Indicators (eKPIs) across the value chain of each product from raw materials through to disposal. The eKPIs quantified in this analysis are: greenhouse gases (GHGs), water consumption, air pollution (sulphur dioxide, nitrogen oxides, particulates, carbon monoxide and ammonia), volatile organic compounds (VOCs) and waste generation.

This methodology is expanded on below for each stage of the value chain:

### **Tier 3 and Tier 4**

Tier 3 and Tier 4 involve the processing and production of raw materials and packaging. For each material in the product bill of materials (BOM), Trucost has combined primary data provided by PUMA on the type and weight of each material used, with secondary data on environmental impacts sourced from numerous publicly available life cycle assessments (LCAs) and academic studies. An example for cotton is provided below:

At Tier 4, the eKPIs were influenced by the type of cotton being produced (conventional, organic and Cotton Made in Africa (CmiA)) and the sourcing location. For all types of cotton, Trucost used geo-specific water consumption data to quantify the water required to grow cotton in each sourcing location. Based on a literature review, organic cotton is assumed to use 8.1% more water than conventional cotton. CmiA is assumed to use only rain-fed irrigation. For GHGs, Trucost used geo-specific data on fertiliser application rates to regionalise the GHG impact associated with synthetic fertiliser use and production.

At Tier 3, secondary LCAs were used to quantify the eKPIs associated with yarn production, fabric production and fabric finishing processes. For each of these processes, the weight of cotton specified in the BOM was transformed using weight conversion factors that accounted for material loss through the cotton production value chain.

## **Tier 2**

Tier 2 eKPIs were calculated using a combination of Trucost's proprietary econometric modelling techniques and primary data collected by PUMA. Trucost's modelling techniques were used initially to quantify expenditure by Tier 1 suppliers with outsourced providers. The model was then used to understand associated environmental impacts for each Tier 1 supplier. Trucost assumed that the processes outsourced to Tier 2 suppliers were similar to those performed at Tier 1; therefore, once the magnitude of expenditure was determined at Tier 2, a percentage of each Tier 1 supplier's environmental impacts were apportioned to these processes.

## **Tier 1**

The eKPI data for Tier 1 suppliers was sourced from supplier audits carried out by PUMA in 2011. Data collected from these suppliers included operational fuel use in buildings and vehicles, purchased electricity and steam, water consumption and waste generation by type and waste management route. This data covered GHG emissions, water consumption and waste generation attributed to the production of PUMA's products. Trucost used its proprietary econometric modelling techniques to calculate the air pollution quantities associated with each Tier 1 supplier. Total eKPI quantities for Tier 1 suppliers were apportioned to each product by normalising each eKPI by the total production volume to give an intensity factor by pair or piece produced.

## **Operational**

Operational eKPI data was sourced from PUMA's environmental management system. Data covers all operations in which PUMA owns more than a 50% stake and has more than 10 employees. The system covers the carbon dioxide (CO<sub>2</sub>) emissions, derived from operational fuel use in buildings and vehicles, purchased electricity and steam, logistics and business travel. It also covers all direct water use and all non-hazardous and hazardous waste generation. Air pollution from PUMA's operations was considered negligible. Operational eKPIs were attributed uniformly across all products.

## **Logistics**

Energy and fuel use from logistics were calculated based on a) the distance between each stage of the value chain b) the weight and volume of the shipment and c) transportation type. Total energy and fuel consumption was then converted to GHGs and air pollution using latest available conversion factors.

## **Customer use**

It was assumed that all products were used in Germany and secondary data sources were Germany-specific where possible. Impacts for apparel use include transportation between the retail outlet and customer home, washing machine water use and energy use, cleaning detergent use, dryer energy use, and ironing energy use. The key variables that drive these eKPIs are the lifetime of the product, the efficiency of appliances, the load factor and temperature during washing and the amount of detergent used. Impacts for footwear use only include transportation between the retail outlet and customer home.

## **Disposal**

It was assumed that all apparel and footwear products were purchased and consumed in Germany. Landfill, incineration, recycling, and donation (re-use) rates for end-of-life treatment of apparel in Germany were used. PUMA assumed that footwear is never recycled and therefore disposal of footwear products was split between landfill, incineration, and donation (re-use) using the same ratio as apparel. The only exceptions to the aforementioned disposal rates were the two Cradle-to-Cradle products, which were assumed to be 100% composted.

Landfill and Incineration: All eKPIs associated with products routed to landfill and incineration facilities were calculated using secondary LCA studies. This includes transportation to waste treatment facilities.

Recycling and donation (re-use): Transportation emissions between local donation bins and sorting facilities were calculated using secondary LCA studies. Clothing which is recycled into fibres and secondary materials is considered the 'raw material' for a new product under the cut-off-approach, therefore only transportation and sorting were included in disposal for recycled materials. It was assumed that re-used clothing is sent to a landfill or incinerated after its second life. Country and region specific rates of landfill and incineration were applied for all apparel and footwear in this category. These impacts include transportation.