Methodology for calculating the Environmental Profit & Loss Account

At Philips, we strive to make the world healthier and more sustainable through innovation. Our goal is to improve the lives of 3 billion people a year by 2030.

To guide our efforts and measure our progress, we take a two-dimensional approach – social and ecological – to improving people's lives.

Philips Group
Lives improved dimensions
2019

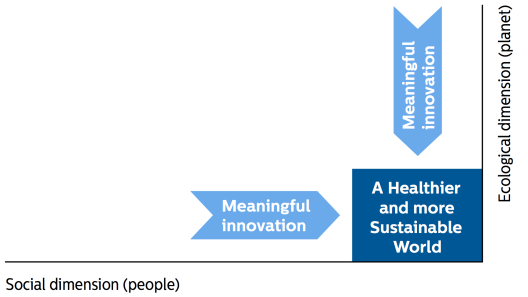

Figure 1: Lives improved dimensions

The Philips Environmental Profit & Loss (EP&L) account guides our efforts on the ecological dimension. It is an economic valuation in EUR of the impact that Philips has on the environment, or in other words: an environmental footprint of Philips' complete value chain expressed in monetary terms.

An EP&L account is based on Life-Cycle Assessment (LCA) methodology. Philips has been performing LCAs since 1990. The assessments are used to steer our EcoDesign efforts and to determine the Green Focal Areas (GFAs) of the Philips product portfolio. The GFAs are product characteristics like energy efficiency, weight and product lifetime that determine the environmental impact of our product portfolio. They form the basis of our steadily growing Green solutions portfolio.

The EP&L account is a logical next step to extend the scope from individual product value chains to Philips' complete value chain. It will support the direction of our sustainability strategy by providing insights into the main environmental hotspots from an overall business point of view.

The current EP&L account only includes the hidden environmental costs that are associated with our activities and products. It does not include the benefits ('profit') to society that Philips generates by improving people's lives through our products and solutions, e.g. our healthcare or healthy food preparation solutions. We have a well-established methodology to calculate the number of lives we positively touch with our products and solutions. It is our aim to look into valuating these societal benefits in monetary terms as well, and to include them in our future EP&L account where possible.

This document describes the methodology we used to calculate the 2019 EP&L account, including information on the scope, assumptions and data sources. The 'EP&L' metric is part of the assurance assignment of EY. EY's assurance report can be found here: chapter 13.5 of the Annual Report 2019.

Scope

The scope of the EP&L account comprises three parts:

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Scope if the Environmental Profit & Loss Account
2019

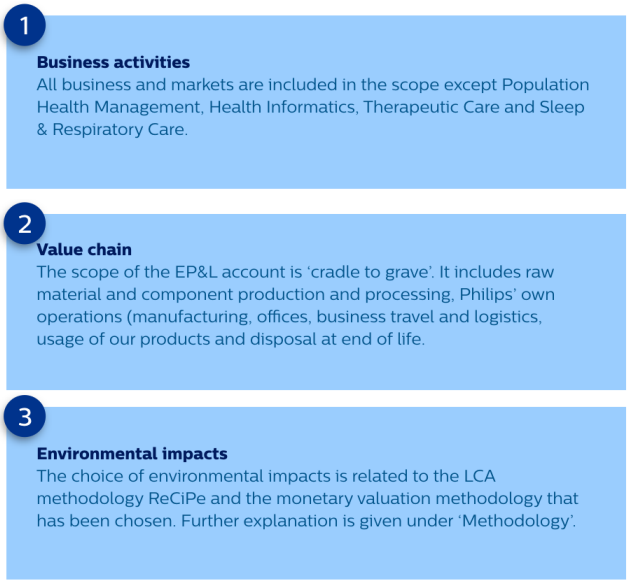

Figure 2: Scope of the EP&L

Business activities

For Personal Health, 94% of the product portfolio revenue is covered in the EP&L. Non covered products consist of non-energy consuming products with limited environmental impact compared to energy consuming products (e.g. toothpaste, cleansing), but also some discontinued products like the woodstove, and products with relatively low sales volume (e.g. professional whitening lamps and beer tender).

For Precision Diagnostics, Connected Care and Image Guide Therapy the medical systems and monitors have been included, i.e. medical systems and monitors (hardware). Sleep and respiratory products have not been included yet except for the Wake-up and Energy light products. Consumables, accessories and refurbishment and upgrades have also been excluded. Reason for the exclusion of consumables and accessories is that due to the large variety (e.g. sensors, ECG electrodes and cables, batteries, cuffs) it was not yet possible to accurately determine the overall material composition and weight. We expect to stepwise include this part of the portfolio in the next EP&L editions.

Refurbishment and (software) upgrades are 'add-ons' to medical systems already sold. The environmental impact of these medical systems is included in the scope. The material impact of the refurbishment and upgrade activities itself, e.g. replacing parts, is not included (yet).

Servicing (e.g. repair) activities are also excluded with the exception of the environmental impact of business travel of the service engineers which is included. The contribution of the servicing activities is negligible compared to the environmental impact of the medical systems itself and the large volume of consumables and accessories.

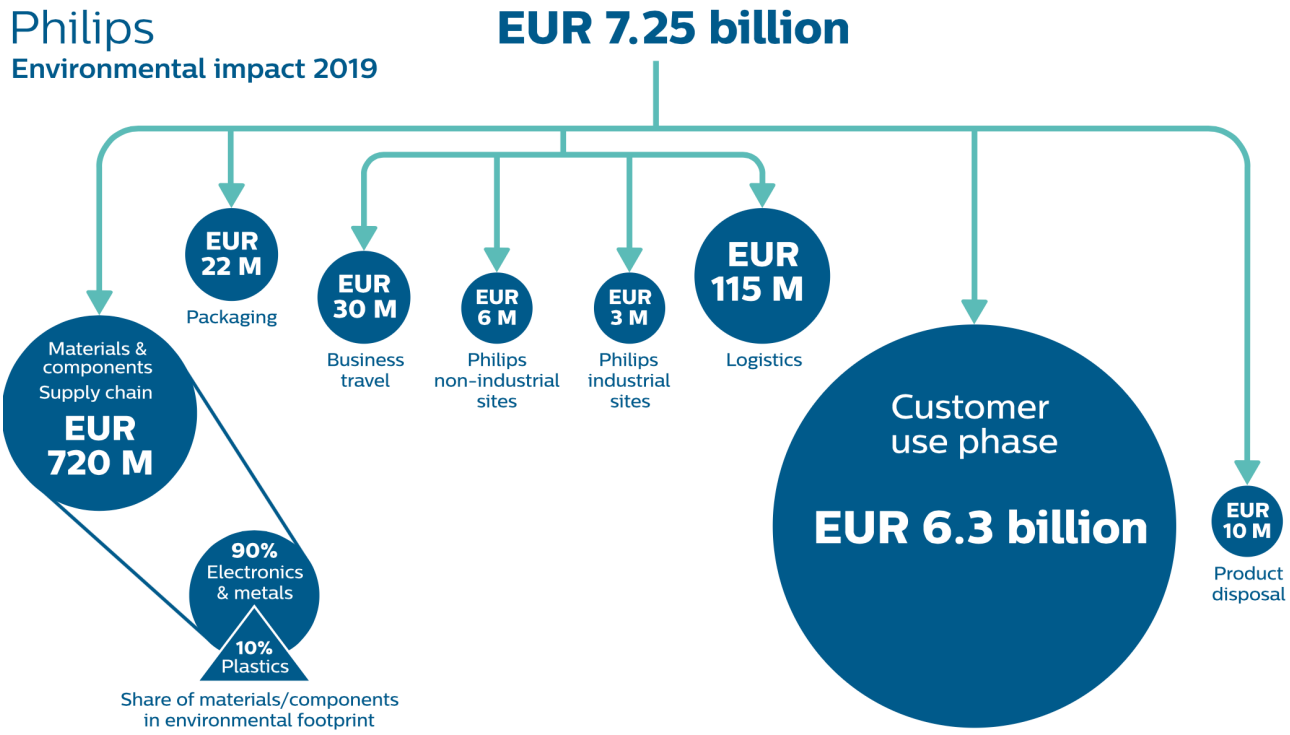

Figure 3: Environmental impact, results of EP&L

Value chain

The scope of the EP&L addresses the key environmental contributors. For extraction and processing of raw materials and production of components (e.g. plastics and printed circuit boards), generic environmental impact data from the LCA database Ecoinvent have been used. Construction of manufacturing facilities and energy infrastructure is not included in these impacts.

Energy consumption is by far the dominating contributor to the impact of our own operations and our products (>95% and > 85% respectively on average) and has been covered. Regarding product usage, the environmental impact of the full life-time of the products sold in 2019 is included. For example, the environmental impact of electricity needed to use a toothbrush during its full-life-time of an estimated seven years, so until 2026, is included in the 2019 EP&L account. This is a significant overestimate of the 2019 impact, however as the life-cycle impact is 'generated' in 2019 it has been decided to account for this impact in the year that the products are sold.

Consumables that are directly connected to consumer electronic products, such as dust bags and filters for vacuum cleaners and brush heads for toothbrushes, have been included based on the 2019 sales data.

Environmental impacts

The choice of environmental impacts is related to the LCA methodology (ReCiPe) and the monetary valuation method that has been chosen. Further explanation is found under 'Methodology'.

Out of scope

Not included in the EP&L are inputs- and outputs that have a negligible contribution to the EP&L account:

- Purchased materials that do not end up in final products (e.g. cutting wastes in our factories)
- Emissions to air and water, waste, consumption of water and process chemicals at Philips sites
- Waste and water consumption of non-industrial Philips sites (e.g. offices and warehouses)
- Consumables not directly attached to the product (e.g. shaving gel, coffee pads, toothpaste, water etc)
- Inbound transport of raw materials, components and subassemblies

Methodology

The method used to calculate the EP&L account is the ReCiPe methodology, version 2013, in combination with environmental pricing as provided by CE Delft. The insights we derived from the EP&L results when expressed in ReCiPe end scores (mPts) do not deviate from the results expressed in EUR. We also verified whether another LCA and pricing methodology, in particular the CML method in combination with shadow costs, would result in a significant change of outcome, but this is not the case.

Environmental impacts included in the assessment

- Climate change
- Ozone depletion
- Human toxicity
- Eutrophication (fresh/marine water)
- Photochemical oxidant formation
- Particulate matter formation
- Acidification
- Ionizing radiation
- Ecotoxicity (marine and freshwater/land)
- Land use

Figure 4: Environmental impact categories

Due to the innovative nature of the EP&L, assumptions such as the applied use cases may change over time. Future refinements in use cases and environmental prices may have substantial impact on the outcome of the EP&L. Due to changing priorities, the implementation of the "Product Lifecycle Management" system in 2019 has been delayed to 2020. For the 2019 EP&L we used the same use case data as in 2017 and 2018. Philips will refine the methodology and expand and validate the source data in future editions of the EP&L. The inherent uncertainties relevant to the further development of the EP&L are expressed in the related disclosures in the annual report.

The environmental pricing methodology of CE Delft is based on the internationally recognized ReCiPe methodology for LCA. The prices (see table 1) are so-called damage costs (as opposed to prevention or abatement costs) and represent the willingness of citizens to pay for not having to be exposed to an additional 1 kg of environmental pollution, expressed in EUR per 1 kg of emissions. The environmental prices are included as conversion factors ('weighing factors') in the LCA software at the midpoint level of environmental impacts.

The CE Delft pricing methodology does not yet include environmental prices for depletion of water, fossil fuels and metals and natural land transformation and hence these environmental impacts are excluded from the scope.

The environmental prices have been calculated for Dutch territory only. Many environmental impacts like human toxicity and ecotoxicity are specific to the local context. This means that the environmental prices cannot be automatically extrapolated to other regions outside of The Netherlands.

Theme	Unit	External costs	Weighting factor
Climate change	EUR /kg CO_2-eq	EUR 0.06	EUR 0.06
Ozone depletion	EUR /kg CFC-eq	EUR 30.40	EUR 123.00
Human toxicity	EUR /kg 1.4 DB-eq	EUR 0.16	EUR 0.16
Photochemical oxidant formation	EUR /kg NMVOC-eq	EUR 2.10	EUR 2.10
Particulate matter formation (chimney >100m)	EUR /kg PM_{10}-eq	EUR 35.12	EUR 35.12
Ionizing radiation	EUR /kg kBq U235-eq	EUR 0.05	EUR 0.05
Acidification	EUR /kg SO_2-eq	EUR 5.40	EUR 8.12
Freshwater eutrofication	EUR /kg P-eq	EUR 1.90	EUR 1.90
Marine eutrophication	EUR /kg N	EUR 3.11	EUR 3.11
Terrestrial ecotoxicity	EUR /kg 1.4 DB-eq	EUR 8.89	EUR 8.89
Freshwater ecotoxicity	EUR /kg 1.4 DB-eq	EUR 0.04	EUR 0.04
Marine toxicity	EUR /kg 1.4 DB-eq	EUR 0.01	EUR 0.01
Land use	EUR /m2*year	EUR 0.03	EUR 0.04

Table 1: Environmental prices of environmental impacts in the Netherlands

As can be derived from table 1, particulate matter formation (main contributor to results) has a relatively high weighting factor. This is due to the rather unique Dutch situation with relative low air quality and a high concentration of ammonia in the air. Ammonia is an important source of particulate matter formation. As mentioned, due to lack of environmental prices that are geographically differentiated, we used the Dutch data.

However, CE Delft does provide a differentiation in environmental price for particulate matter formation related to the source of emission. The environmental price for particulate matter formed via transportation exhaust gasses is higher than particulate matter formed via high chimneys of electricity generation plants.

Given the fact that electricity consumption is the main contributing factor to the Philips EP&L (around 85%), with particulate matter formation and climate change as the main environmental impacts, we used an adapted environmental price of particulate matter formation as provided by CE Delft (35.12 EUR/kg PM_{10} eq).

The LCA software used for the environmental impact assessment is EcoChain. Data models are based on the Swiss national LCI database Ecoinvent v.3.4, for background as well as foreground data.

Data quality

Several factors are influencing the bandwidth of the final EP&L account results:

- Accurateness of generic datasets
- Scope of data included
- Assumptions made (e.g. the use of reference products to cover all product categories)

Availability and quality of data is a challenge inherent to LCA and results in uncertainty of the EP&L outcome. Uncertainty also results from the LCA and monetary valuation methodology used, which is based on assumptions that will vary over time.

The figures reported are Philips' best possible estimate. As we gain new insights and retrieve more and better data, we may enhance the methodology and accuracy of results in the future.

Data	Source	Remark
Material extraction and processing upstream	Generic data from Eco-invent (LCA) database (industry averages)	No specific environmental data from suppliers have been collected. This might change for future EP&L accounts for those suppliers that contribute significantly. The EcoChain software that is used for modelling allows for easy and anonymous data retrieval upstream. Geographical scope of used Eco-invent datasets: Global (GLO) data for materials unless only European dataset (RER) is available.
Environmental data Philips sites	Energy consumption as registered in Credit360 software (used by Philips sites)	Waste, emissions to air and water, consumption of water and process chemicals excluded (negligible). Geographical scope of used Eco-invent datasets: country specific datasets used for energy processes. E.g. for China based plants the Chinese electricity mix is used.
Outbound transportation supplied and (semi)final goods	Invoices from our logistic providers	This includes transportation between Philips sites and from Philips sites to customers. These data are also used for our Carbon Footprint calculation and validated at reasonable assurance by an external auditor.
Material composition and weight Philips products	Bill of Materials (BOM) of representative reference products	For each business, within the mentioned scope, representative reference products with high sales were identified and material composition of these products have been derived. These data were used as proxy for the resembling other product categories Net BOM data have been used. This will be improved in the future and extended to gross BOM.
Production volumes 2019	2019 sales data	
Energy consumption non-industrial sites	Invoices from our energy providers.	As reported in our operation Carbon Footprint.
Business travel	Internal declaration system as used by Philips employees	As reported in our operation Carbon Footprint.
Use phase	Based on power (W)* and duration of usage per day or week. Life-time based on Lives Improved data	The environmental impact of the full life-time of products sold is included. The world average energy mix was used for all products sold, regardless the region of sales (see also paragraph Value chain in Chapter 2). *often max. power has been used for consumer electronic products to calculate the yearly energy consumption instead of the average power based on variation in use scenario by the customers. The latter requires extensive market research and is not available or not up-to-date for all consumer electronic products.
Final disposal	Generic WEEE mechanical treatment scenario in Eco-invent database	Assuming 50 km transportation by truck from disposal location (e.g. retailer or hospital) to waste treatment/ recycling facility

Table 2: Data sources

Next steps

Apart from our continuous efforts to improve the energy efficiency of our product, in the coming years, we expect to stepwise work towards:

- Including more Healthcare products, Sleep & Respiratory Care products, specifically consumables and accessories, in the scope of the EP&L;
- Including the less impacting contributions in the scope of our EP&L such as contributions from in-bound transportation and waste and emissions from our factories;
- Improving the environmental data of the highly impacting materials we use in our products by requesting LCA information from our suppliers (as opposed to using generic data from our LCA database);
- Monetizing and incorporating the benefits of our products to society in the EP&L;
- We aim to include the country-specific energy mix into our equations, measuring the impact of the energy consumption of our production based on the country-specific energy-mix;
- In cooperation with CE Delft, we aim to work towards global environmental prices. We have decided not to have an intermediate update of EP&L with the EU prices but, for reasons of better comparison, stick to the Dutch prices for now.

We will also closely follow (inter)national developments in the LCA methodology, e.g. the EU Product Environmental Footprint (PEF) project aimed at the development of an EU harmonized LCA method, and environmental pricing methodology, especially research aimed at the development of localized environmental pricing factors.