ENV3: Design Ecological Products

Time of Effectiveness	Mid-Term
Repeatability	85% (17 reports out of 20)
Level of Confidence	**8.86/10**
Category	Environment
Outcomes	- More efficient management of raw materials - Reduced cost of raw materials - Less toxic or harmful products - Increased customer satisfaction - Reduced waste generation from operation - Reduced generation of e-waste
Metrics	- Proportion of reused materials in products (%) - Hazardous waste generation from operations (tons/year) - Non-Hazardous waste generation from operations (tons/year) - Amount of reused, refurbished or diverted products (tons/year) - Customer satisfaction (survey) - Money spent in raw materials ($/year)
Problematic	- UN SDG 12: Responsible consumption and production - UN SDG 13: Affordable and clean energy - UN SDG 15: Life on land
Additional Components	**Circular Economy (83%)**[1] - Reduce hazardous material (**76%**)

Description

In order to reduce their environmental impacts, companies decided to design more ecological products regarding the materials used to build them. This is concretely translated in two ways. First, reuse materials into the manufacturing process, also known as circular economy. Second, reduce or eliminate the proportion of toxic or harmful materials from the products. In order to be even more efficient, this strategy is most of the time combined with the implementation of an end of life management program (CONS1) which allows companies to directly refurbish, recycle or reuse the products they sold.

Example: Apple (p.18-21,23,24)

At Apple, they implement both aspects of designing ecological products. Indeed, they reduced their harmful or toxic material usage in their product. They claim that this reduction of materials, are better for the environment (air, water pollution), for the people who make them and those who use them by reducing their exposure to toxic products. The figure below shows all the different policies they took to reduce their use of what they identify as their most toxic materials.

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[1] This additional component had a high level of confidence (7.64) compare to others in every category
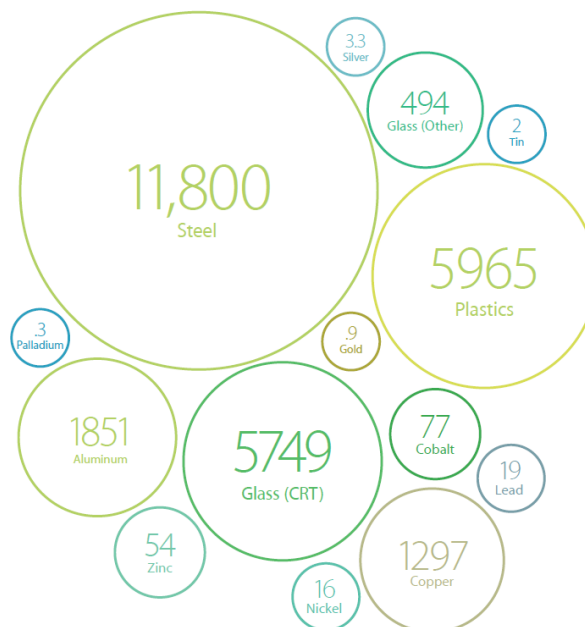
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The worst toxic offenders.

Be

Beryllium
Found in copper alloys used to make connectors and springs. iPhone 6, iPad Air 2, and MacBook were designed without the use of beryllium.

Hg

Mercury
Present in the fluorescent lamps that once backlit Mac displays. Eliminated from our displays since 2009.

Pb

Lead
Formerly used in display glass and solder. Phased out completely from our products in 2006.

As

Arsenic
Traditionally used for clarity in glass. Our display glass has been arsenic-free since 2008.

PVC

Polyvinyl Chloride (PVC)
Still widely used by other companies in computers, cables, and power cords. We began phasing out PVC in 1995.[9]

BFRs

Brominated Flame Retardants (BFRs)
Toxic compounds added to plastic enclosures, circuit boards, and connectors. Eliminated from our products in 2008.

Pht

Phthalates
Used to soften plastics in cables and powercords. We finished eliminating them from our cables and power cords in 2013.[9]

The different policies taken by Apple regarding different toxic materials

Moreover, through their take back program (**CONS1**), they were able to collect 40 396 tons of e-waste, from this quantity they were able to reuse around 85% of the materials as shown in the figure on the side. This practice is also known as circular economy, which allows Apple to reduce their raw material costs as well as their environmental impact since they reduce their waste generation.

Amount of material recovered for reuse in 2014 in metric tons

3.3 Silver
494 Glass (Other)
2 Tin
11,800 Steel
5965 Plastics
.3 Palladium
.9 Gold
1851 Aluminum
5749 Glass (CRT)
77 Cobalt
19 Lead
54 Zinc
16 Nickel
1297 Copper

Materials reused by Apple in 2014