12-inch MacBook
Environmental Report

Models
MLH72, MLHA2, MLHE2, MMGL2,
MLH82, MLHC2, MLHF2, MMGM2
Date introduced April 19, 2016

Environmental Status Report

The 12-inch MacBook is designed with the following features to reduce environmental impact:

• Arsenic-free display glass

• Mercury-free LED-backlit display

• Brominated flame retardant–free

• PVC-free

• Beryllium-free

• Recyclable aluminum enclosure

• Keyboard hinge mechanism composed of bio-based material

Meets ENERGY STAR® Version 6.1 requirements

Achieves a Gold rating from EPEAT[2]

Apple and the Environment

Apple believes that improving the environmental performance of our business starts with our products. The careful environmental management of our products throughout their life cycles includes controlling the quantity and types of materials used in their manufacture, improving their energy efficiency, and designing them for better recyclability. The information below details the environmental performance of the 12-inch MacBook as it relates to climate change, energy efficiency, material efficiency, and restricted substances.[1]

Climate Change

Greenhouse gas emissions have an impact on the planet's balance of land, ocean, and air temperatures. Most of Apple's corporate greenhouse gas emissions come from the production, transport, use, and recycling of its products. Apple seeks to minimize greenhouse gas emissions by setting stringent design-related goals for material and energy efficiency. The chart below provides the estimated greenhouse gas emissions for the 12-inch MacBook over its life cycle.

Greenhouse Gas Emissions for 12-inch MacBook
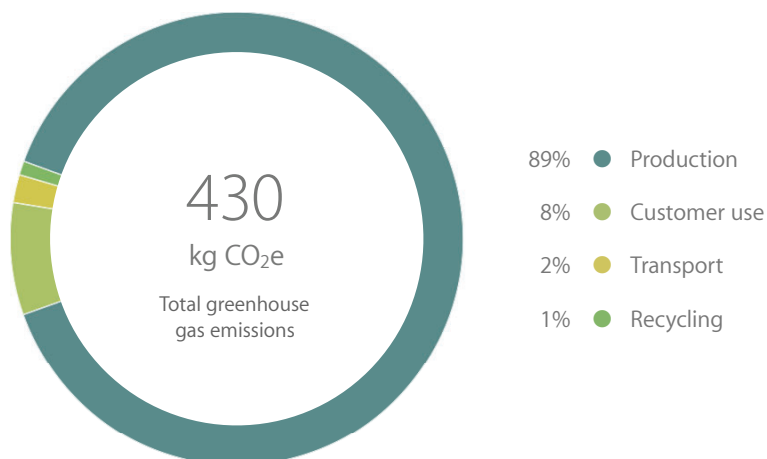
430
kg CO_2e
Total greenhouse gas emissions

89% ● Production

8% ● Customer use

2% ● Transport

1% ● Recycling

Energy Efficiency

Because one of the largest portions of product-related greenhouse gas emissions results from actual use, energy efficiency is a key part of each product's design. Apple products use power-efficient components and software that can intelligently power them down during periods of inactivity. The result is that MacBook is energy efficient right out of the box. The 12-inch MacBook uses less than 0.5W in Sleep—the lowest of any Mac.

The 12-inch MacBook outperforms the stringent requirements of the ENERGY STAR Program Requirements for Computers Version 6.1. The following table details power consumed in different use modes.
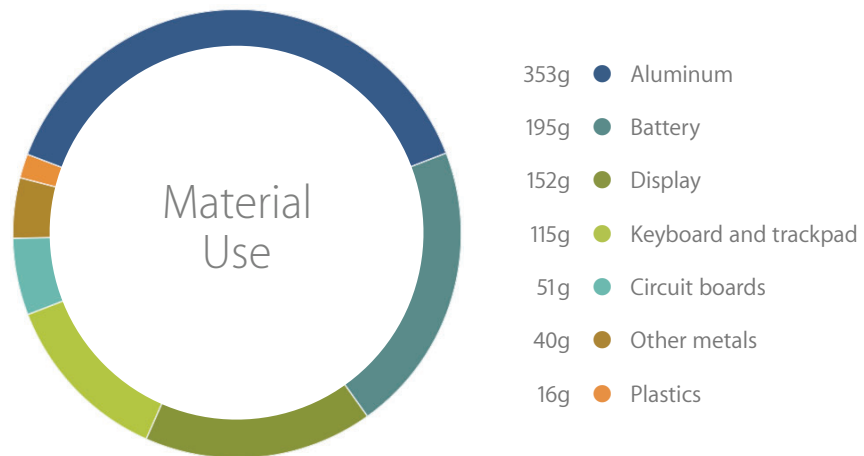
Power Consumption for 12-inch MacBook

Mode	100V	115V	230V
Off	0.11W	0.11W	0.14W
Sleep	0.32W	0.32W	0.36W
Idle—Display on	5.54W	5.54W	5.66W
Power adapter, no-load	0.038W	0.025W	0.038W
Power adapter efficiency	87.4%	87.7%	87.0%

Material Efficiency

Apple's ultracompact product and packaging designs lead the industry in material efficiency. Reducing the material footprint of a product helps maximize shipping efficiency. It also helps reduce energy consumed during production, and material waste generated at the end of the product's life. Waste is further minimized through the use of batteries that last up to three times longer than typical notebook batteries. The 12-inch MacBook enclosure is made of aluminum, a material highly desired by recyclers. In addition, the keyboard hinge mechanism is made from plastic containing 67 percent bio-based content, which reduces dependence on petroleum-based plastics. The chart below details the materials used in this model.

Material Use for 12-inch MacBook

353g	Aluminum
195g	Battery
152g	Display
115g	Keyboard and trackpad
51g	Circuit boards
40g	Other metals
16g	Plastics

The 12-inch MacBook packaging is extremely material efficient and contains over 70 percent recycled content.

Packaging

The packaging for the 12-inch MacBook uses corrugated cardboard made from over 70 percent recycled content. In addition, the retail box contains over 30 percent recycled content. The following table details the materials used in its packaging.

Packaging Breakdown for 12-inch MacBook (U.S. Configurations)

Material	Retail box	Retail and shipping box
Paper (corrugate, paperboard)	255g	625g
High-impact polystyrene	110g	110g
Other plastics	12g	12g

Restricted Substances

Apple has long taken a leadership role in restricting harmful substances from its products and packaging. As part of this strategy, all Apple products comply with the strict European Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, also known as the RoHS Directive. Examples of materials restricted by RoHS include lead, mercury, cadmium, hexavalent chromium, and the brominated flame retardants (BFRs) PBB and PBDE. The 12-inch MacBook goes even further than the requirements of the RoHS Directive by incorporating the following more aggressive restrictions:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- BFR-free
- Beryllium-free
- PVC-free

Recycling

Through ultra-efficient design and the use of highly recyclable materials, Apple has minimized material waste at the product's end of life. Apple also operates or participates in recycling programs in 99 percent of the countries where we sell our products. For more information on how to take advantage of these programs, visit www.apple.com/recycling.

Definitions

Electronic Product Environmental Assessment Tool (EPEAT): A program that ranks computers and displays based on environmental attributes in accordance with IEEE 1680.1-2009. For more information, visit www.epeat.net.

Greenhouse gas emissions: Estimated emissions are calculated in accordance with guidelines and requirements as specified by ISO 14040 and ISO 14044. Calculation includes emissions from the following life-cycle phases contributing to Global Warming Potential (GWP 100 years) in CO_2 equivalency factors (CO_2e):

- **Production:** Includes the extraction, production, and transportation of raw materials, as well as the manufacture, transport, and assembly of all parts and product packaging.

- **Transport:** Includes air and sea transportation of the finished product and its associated packaging from the manufacturing site to regional distribution hubs. Transport of products from distribution hubs to end customer is modeled using average distances based on regional geography.

- **Use:** User power consumption assumes a four-year period. Product use scenarios are based on historical customer use data. Geographic differences in the power grid mix have been accounted for at a regional level.

- **Recycling:** Includes transportation from collection hubs to recycling centers, and the energy used in mechanical separation and shredding of parts.

Energy efficiency terms: MacBook is tested with a fully charged battery and powered by the 29W USB-C Power Adapter with the USB-C Charge Cable (2m). The energy values in this report are based on the ENERGY STAR Program Requirements for Computers Version 6.1. For more information, visit www.energystar.gov.

- **Off:** Lowest power mode of the system. System is shutdown. Also referred to as Standby.

- **Sleep:** Low-power state that is entered automatically after 10 minutes of inactivity (default), or by selecting Sleep from the Apple menu. Wake for network access enabled.

- **Idle—Display on:** System is on and has completed loading OS X. Display brightness was set as defined by ENERGY STAR Program Requirements for Computers Version 6.1, and Auto-Brightness was turned off. Connected to Wi-Fi.

- **Power adapter, no-load:** Condition in which the 29W USB-C Power Adapter with the USB-C Charge Cable (2m) is connected to AC power, but not connected to the system.

- **Power adapter efficiency:** Average of the 29W USB-C Power Adapter with the USB-C Charge Cable (2m) measured efficiency when tested at 100 percent, 75 percent, 50 percent, and 25 percent of the power adapter's rated output current.

Restricted substances: Apple defines a material as BFR-free and PVC-free if it contains less than 900 parts per million (ppm) of bromine and of chlorine. Apple defines a material as beryllium-free if it contains less than 1000 parts per million (ppm) of beryllium. A complete list of Apple's restrictions on hazardous substances is available at www.apple.com/environment/toxins.

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1. Product evaluations based on U.S. configurations of Model MLH82.

2. The 12-inch MacBook achieved a Gold rating from EPEAT in the United States and Canada.