Google Pixel 2 XL
Product environmental report

Model G011C, introduced October 4, 2017

Environmental Sustainability at Google

At Google, operating in an environmentally sustainable way has been a core value from the beginning. As our business has evolved to include the manufacturing of electronic products, we've continually expanded our efforts to improve each product's environmental performance and minimize Google's impact on the world around us. This report details the environmental performance of Google Pixel 2 XL over its full life cycle, from design and manufacturing through usage and recycling.

Product highlights

The Pixel 2 XL phone is designed with the following key features to help reduce its environmental impact:

EPEAT registered with silver rating for sustainability[1]

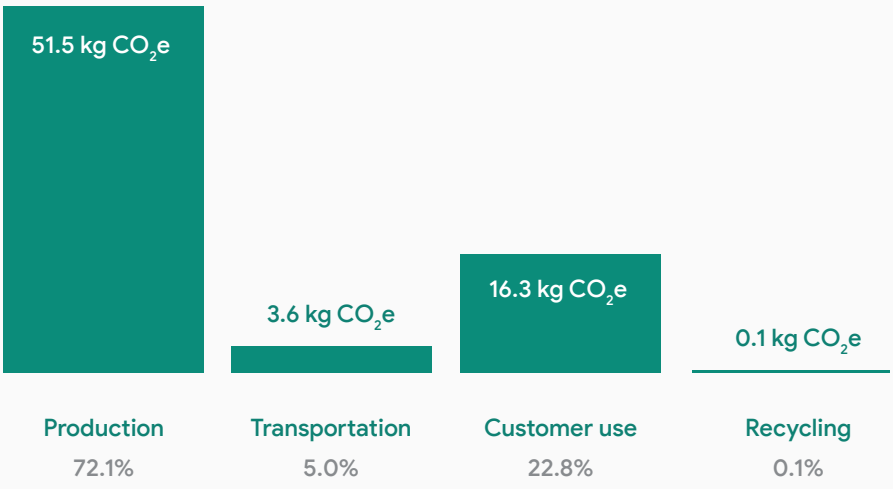
- Mercury-free pOLED display
- Arsenic-free glass
- PVC-free
- Brominated flame retardant-free
- 99% paper and fiber-based packaging
- Power adapter with Level VI efficiency rating
- Standby power less than 0.5 W

Greenhouse gas (GHG) emissions

The production, transportation, use, and recycling of electronic products generate GHG emissions that can contribute to rising global temperatures. Google conducts a life cycle assessment on products to identify materials and processes that contribute to GHG emissions, with the goal of minimizing these emissions.

Estimated GHG Emissions for Pixel 2 XL (64 GB Model)[2]

Total GHG emissions over three-year life cycle: 71.5 kg CO_2e



Energy efficiency

Pixel 2 XL uses a power adapter with a Level VI efficiency rating[3] and incorporates power-management software to maximize battery-charging efficiency and extend battery life during use.

Energy efficiency of Pixel 2 XL

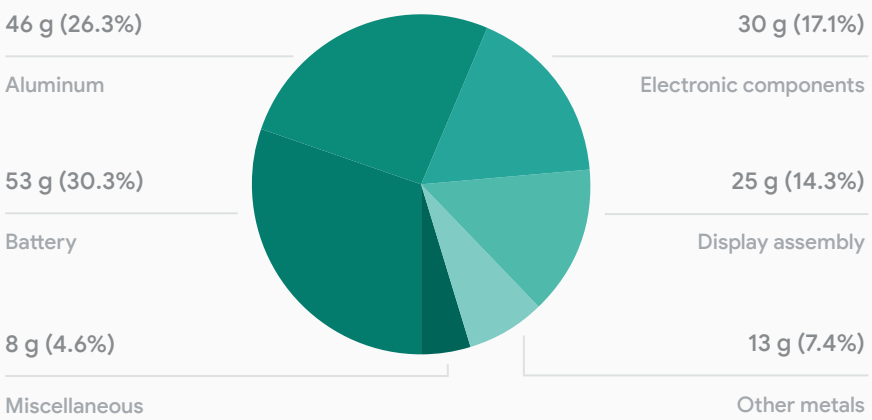
Mode	115 V, 60 Hz	230 V, 50 Hz
Power adapter average efficiency[4]	83.5% at 5 V output 86.0% at 9 V output	82.5% at 5 V output 85.9% at 9 V output
Power adapter no-load power[5]	0.016 W	0.017 W
Standby power (battery maintenance mode)[6]	0.39 W	0.38 W
Annual energy use estimate[7]	9.3 kWh	9.1 kWh
Annual cost of energy estimate	US$1.21[8]	€1.92[9]

Material use

Pixel 2 XL is designed to be light and compact. Minimizing the size and weight of Pixel 2 XL allows materials to be used more efficiently, thereby reducing the energy consumed during production and shipping as well as minimizing the amount of packaging.

Materials used in Pixel 2 XL

Total materials: 175 g[10]



Pixel 2 XL battery

- Lithium-ion polymer
- Free of cadmium, lead, and mercury

Restricted substances

Historically, many electronic devices contained materials such as lead, mercury, cadmium, and brominated flame retardants that pose environmental and health risks. We designed Pixel 2 XL to meet global regulations that restrict harmful substances, including the following:

- European RoHS Directive restrictions on lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)
- European Battery Directive restrictions on lead, mercury, and cadmium in batteries
- European Packaging Directive restrictions on lead, mercury, cadmium, and hexavalent chromium in packaging

Voluntary substance restrictions

Pixel 2 XL also meets the following Google voluntary substance restrictions:

- Mercury-free pOLED display
- Arsenic-free display glass
- PVC-free
- Brominated flame retardant–free

Packaging

Packaging for Pixel 2 XL uses 99% paper and fiber-based materials. The chipboard material that forms the underlying structural layer of the box base and lid is made of 100% recycled content. We have designed the Pixel 2 XL packaging to minimize its weight and volume, which helps conserve natural resources and allows more devices to be transported in a single shipping container.

Packaging materials for Pixel 2 XL

(U.S. configuration retail packaging)

Material	Weight
Paper	256 g
Plastics	2 g
Total packaging	258 g

Ethical sourcing

Google and its subsidiaries are committed to ensuring that working conditions in our operations and in our supply chains are safe, that all workers are treated with respect and dignity, and that business operations are environmentally responsible and ethically conducted. Learn more about our expectations for manufacturing partners in the Google Supplier Code of Conduct, our 2016 Creating a Responsible Supply Chain report, and our Conflict Minerals Policy.

Learn more

For more information about our environmental sustainability initiatives—including case studies, white papers, and blogs—please see our Environment website and our Environmental Report: 2017 Progress Update.

Learn how to recycle your used device in the Google Store Help section of our website.

Endnotes

1. This product is EPEAT registered in the United States only.
2. GHG emissions estimates are calculated in accordance with ISO 14040 and ISO 14044 requirements and guidelines for conducting life cycle assessments and include the production, transportation, use, and recycling of the product, accessories, and packaging.
3. Level VI is the highest available efficiency rating for power adapters as defined in the International Efficiency Marking Protocol for External Power Supplies Version 3.0.
4. This is the average efficiency of the power adapter when input and output power is measured at 25%, 50%, 75%, and 100% of rated output current and averaged as part of testing in accordance with the U.S. Department of Energy Uniform Test Method for Measuring the Energy Consumption of External Power Supplies.
5. Power is measured when the power adapter is plugged into an AC power source without being connected to the product. Testing is done in accordance with the U.S. Department of Energy Uniform Test Method for Measuring the Energy Consumption of External Power Supplies.
6. Power is measured with the phone in standby mode with a fully charged battery and while attached to the power adapter. Testing is done in accordance with the U.S. Department of Energy Uniform Test Method for Measuring the Energy Consumption of Battery Chargers.
7. Estimated energy use is based on fully charging the battery once per day with the phone attached to the power adapter for 12 hours and leaving the power adapter plugged into AC power without the phone attached (i.e., no load) for 12 hours. Testing is done in accordance with the U.S. Department of Energy Uniform Test Method for Measuring the Energy Consumption of Battery Chargers.
8. The average residential cost of energy for U.S. households is $0.13 per kWh (source: U.S. Energy Information Agency May 2017 report).
9. The average household cost of energy for consumers in the European Union was €0.211 per kWh in the second half of 2015 (source: Eurostat Statistics Explained).
10. Product material weights are for Google Pixel 2 XL only. For the U.S. configuration, an additional 91 g of electronic accessories can be included in-box.