Nest Learning Thermostat (4th gen)

Product environmental report

## 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 the Nest Learning Thermostat (4th gen) over its full life cycle, from design and manufacturing through usage and recycling.

## Product highlights



ENERGY STAR®
for Connected
Thermostats
Version 1.0[4]

The Nest Learning Thermostat (4th gen) is designed with the following key features to help reduce its environmental impact:

- ⊘ PVC-free[1]

- ⊘ Brominated Flame Retardant (BFR)-free[1]

- ↻ Nest Learning Thermostat and Temperature Sensor bundle is made with recycled plastic, metal, and cobalt[2]

- ↻ 100% plastic-free packaging[3]

- ⚡ ENERGY STAR®[4]

## Greenhouse Gas (GHG) emissions

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

Estimated GHG emissions for Nest Learning Thermostat (4th gen) assuming ten years of use:[5]  23 kg $CO_2$e

| | |
|---|---|
| Production | 73% |
| Transportation | 8% |
| Customer Use | 18% |
| Recycling | 1% |
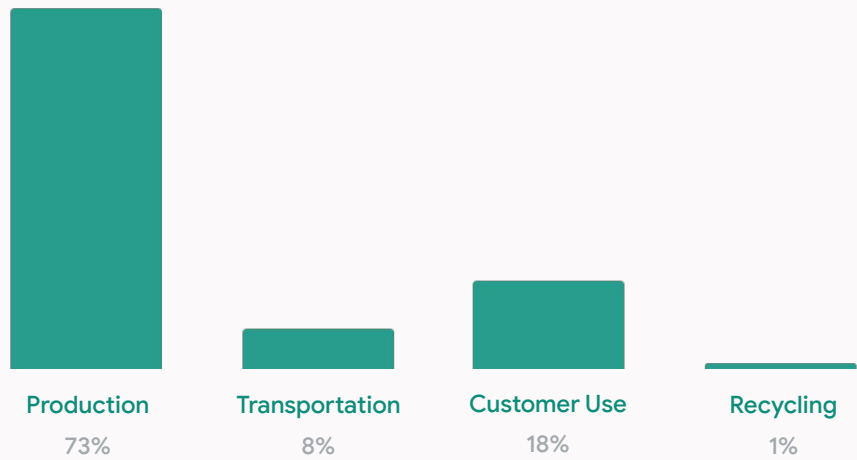
## Energy efficiency of Nest Learning Thermostat (4th gen)

| | 24 V, 60Hz |
|---|---|
| Standby mode | 0.11 W |
| Active mode | 0.24 W |
| Annual energy use estimate[6] | 1 kWh |
| Annual cost of energy estimate | US$0.16[7] |

## Material use

Nest Learning Thermostat (4th gen) is designed to be light and compact. Minimizing the size and weight of the Nest Learning Thermostat (4th gen) 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 Nest Learning Thermostat (4th gen)

Total materials:[8]
232 g

64 g
Steel

63 g
Plastic

5 g
Other

26 g
Electronics

28 g
Battery

46 g
Display
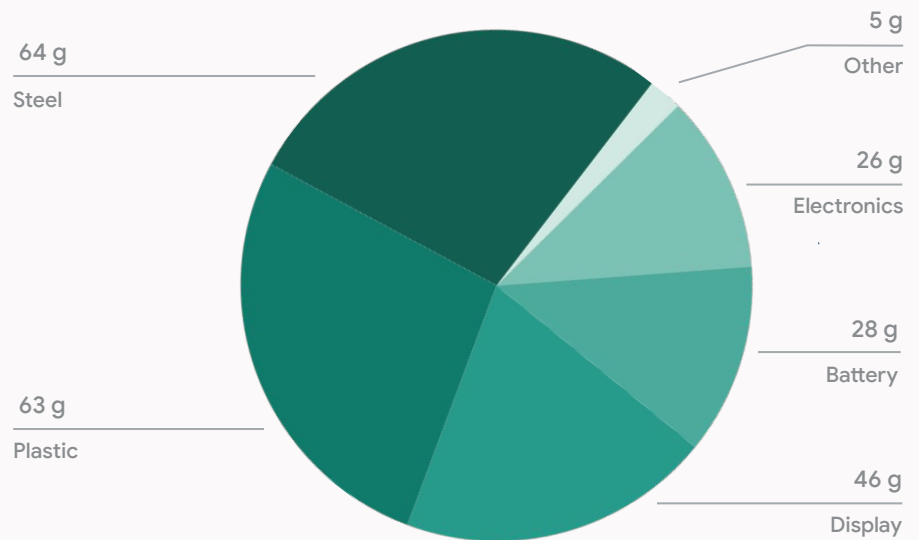
## Recycled materials

↻ The Nest Learning Thermostat and Temperature Sensor bundle is made with 48% recycled materials[9]

↻ The Nest Learning Thermostat and Temperature Sensor bundle is made with recycled plastic, metal, and cobalt[2]

↻ The Thermostat battery contains 100% recycled cobalt[10]

## Battery

⊘ Lithium-ion polymer

## 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 Nest Learning Thermostat (4th gen)[11] to meet global regulations that restrict harmful substances, including the following:

- ⊘ European RoHS Directive restrictions on lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE), and four different phthalates (DEHP, BBP, DBP, DIBP)

- ⊘ 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

Nest Learning Thermostat (4th gen)[11] also meets the following voluntary substance restrictions:[12]

- ⊘ PVC-free[1]

- ⊘ Brominated Flame Retardant (BFR)-free[1]

## Packaging

Nest Learning Thermostat (4th gen) comes in more consciously designed packaging. Our lighter and more compact packaging is built with recycled and responsibly sourced fibers and continues to be 100% plastic-free, improving recyclability.[13]

## 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 2023 Supplier Responsibility 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 Sustainability website and our 2024 Environmental Report.

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

# Endnotes

1. Google defines its restrictions on harmful substances in the Google Restricted Substances Specification.

2. Recycled content is 48% of combined product weight.

3. Based on retail packaging (excluding adhesive materials and required plastics stickers) as shipped by Google. To meet the request of some retail partners, stickers and/or security tags are applied to some packaging variations and may contain plastic.

4. This product is ENERGY STAR® certified in the United States and Canada. ENERGY STAR® and ENERGY STAR® mark are registered trademarks owned by the U.S. Environmental Protection Agency.

5. 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, in-box accessories, and packaging.

6. Estimated energy use is based on 24 hours of operation per day.

7. The average residential cost of energy for U.S. households was $0.16 per kWh in May 2024 (source: U.S. Energy Information Agency).

8. Product material masses are for the Nest Learning Thermostat (4th gen) and Temperature sensor only, excluding packaging and accessories.

9. Based on combined product weight.

10. Cobalt is at least 15% of the battery weight.

11. Includes Nest Learning Thermostat and Temperature Sensor and all other in-box accessories unless otherwise specified.

12. Google continues to restrict arsenic content in glass, mercury in displays, and heavy metals (lead, cadmium, and mercury) in batteries as listed in Google's Restricted Substances Specification.

13. Compared to Google Nest Learning Thermostat (3rd gen) box packaging. Based on retail box packaging weight, volume reduction and absence of plastic (excluding adhesive materials and required plastic stickers) as shipped by Google. To meet the request of some retail partners, stickers and/or security tags are applied to some packaging variations and may contain plastic. Google defines responsibly sourced fibers as those derived from recycled content, FSC-certified suppliers, or reclaimed industrial residues (such as bagasse). Recyclability improvement based on fiber yield recovered certified by the Fibre Box Association voluntary standard.