Product Environmental Report

Apple Pro Display XDR

Date introduced
December 4, 2019

Tackling climate change

100%

of Pro Display XDR final assembly suppliers have committed to 100% renewable energy for Apple production

Made with better materials

100%

recycled tin in the solder of the main logic board

Energy efficient

40%

less energy consumed than the ENERGY STAR® energy efficiency limit

Smarter chemistry[1]

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant–free
- PVC-free
- Beryllium-free

Responsible packaging

100%

of the wood fiber comes from recycled and responsible sources

7%

plastic in packaging

Apple Trade In

Return your device through Apple Trade In, and we'll give it a new life or recycle it for free.

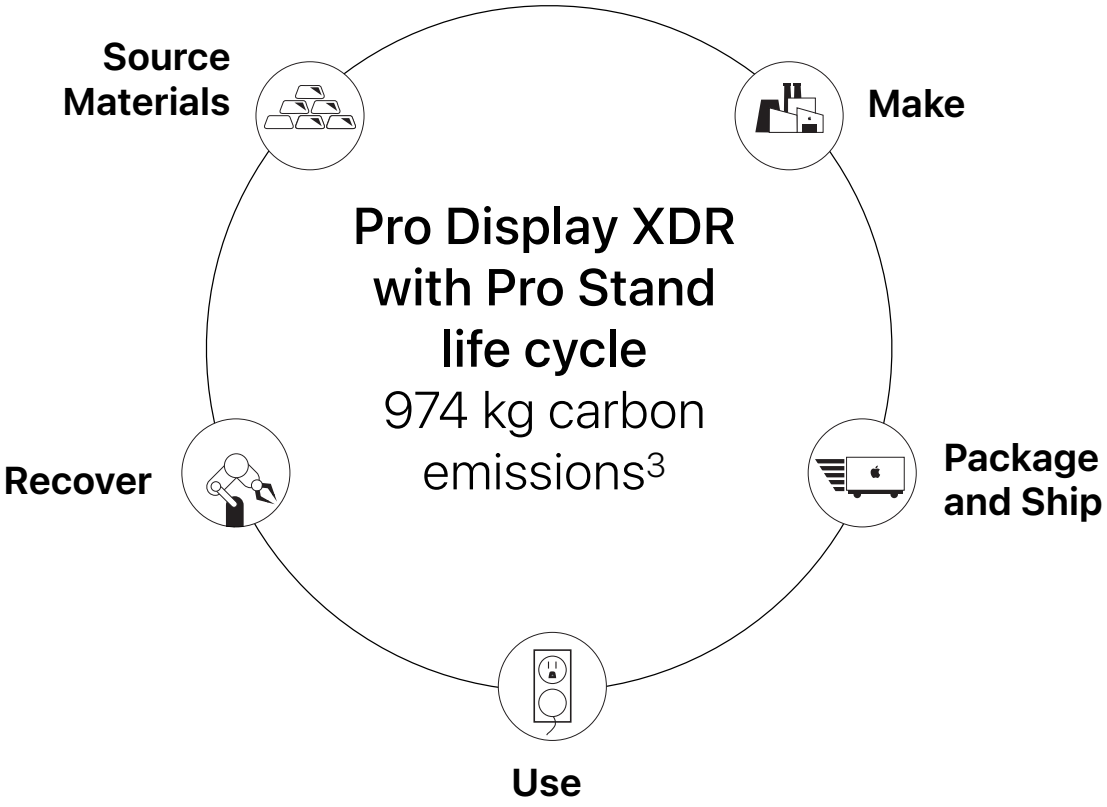
Enclosure made with low-carbon aluminum

This report includes data current as of product launch. Product evaluations are based on U.S. configuration of Pro Display XDR.

Taking responsibility for our products at every stage

We take responsibility for our products throughout their life cycles—including the materials they are made of, the people who assemble them, and how they are recycled at end of life. And we focus on the areas where we can make the biggest difference for our planet: reducing our impact on climate change, conserving important resources, and using safer materials.

We sell millions of products. So making even small adjustments can have a meaningful impact.



Carbon footprint

We continue to make progress in reducing Apple's contribution to climate change—by focusing on making energy-efficient products with renewable or recycled materials and with renewable energy. The low-carbon aluminum used in the Pro Display XDR enclosure is smelted using hydroelectricity rather than fossil fuels, which reduces the associated greenhouse gas emissions by 68 percent.[4] The enclosure also incorporates recycled content, further reducing its carbon impact. Apple is committed to using carbon life cycle assessments to identify opportunities to drive down product greenhouse gas emissions.

Pro Display XDR life cycle carbon emissions

51%	Production
6%	Transport
42%	Use
<1%	End-of-life processing

Source Materials

The tin in the solder of the main logic board is 100 percent recycled.

To conserve important resources, we work to reduce the material we use and aim to one day source only recycled or renewable materials in our products. And as we make this transition, we remain committed to the responsible sourcing of primary materials. We map many materials, some to the mineral source, and establish the strictest standards for smelters and refiners. We're proud to be recognized as a worldwide leader in the responsible sourcing of minerals in our products. Our product designs also consider the safety of those who make, use, and recycle our products, restricting the use of hundreds of harmful substances. Our standards go beyond what's required by law to protect people and the environment.

Aluminum

Our focus on Apple's carbon footprint extends to the materials we source. So we prioritized aluminum that was smelted using 100 percent hydroelectricity rather than fossil fuels for the enclosure, where the majority of the aluminum is located.

Plastic

We're transitioning to plastics from renewable or recycled sources as alternatives to fossil fuel–based plastics. For Pro Display XDR, we use 50 percent or more recycled plastic in multiple components.

Tin

We use 100 percent recycled tin in the solder of the main logic board. Apple also requires 100 percent of identified tin, tantalum, tungsten, gold, and cobalt smelters and refiners to participate in third-party audits.[5]

Smarter chemistry

Pro Display XDR is free of harmful substances like brominated flame retardants, PVC, and beryllium.[1] And 100 percent of the materials in Pro Display XDR are covered by our Regulated Substances Specification. We go beyond what's required by aiming to understand the non-regulated substances in every part of every product—an effort that requires an industry-leading level of transparency through the entire supply chain. So far, we've identified the makeup of over 85 percent by mass of Pro Display XDR.

Make

Every year, we assess our suppliers against our Supplier Code of Conduct, which requires suppliers to make workplaces better for employees and the environment.

We work closely with the suppliers that make our products to reduce their environmental impact, and to treat people making Apple products with dignity and respect, provide opportunities to advance, and maintain a safe work environment. Our Supplier Code of Conduct sets high expectations for our suppliers. With strong foundational standards, we can make further progress, from helping suppliers transition to renewable energy to providing educational opportunities for their employees. And in 2018, we achieved UL Zero Waste certification for all Mac final assembly test and packaging facilities.[6]

Greener chemicals

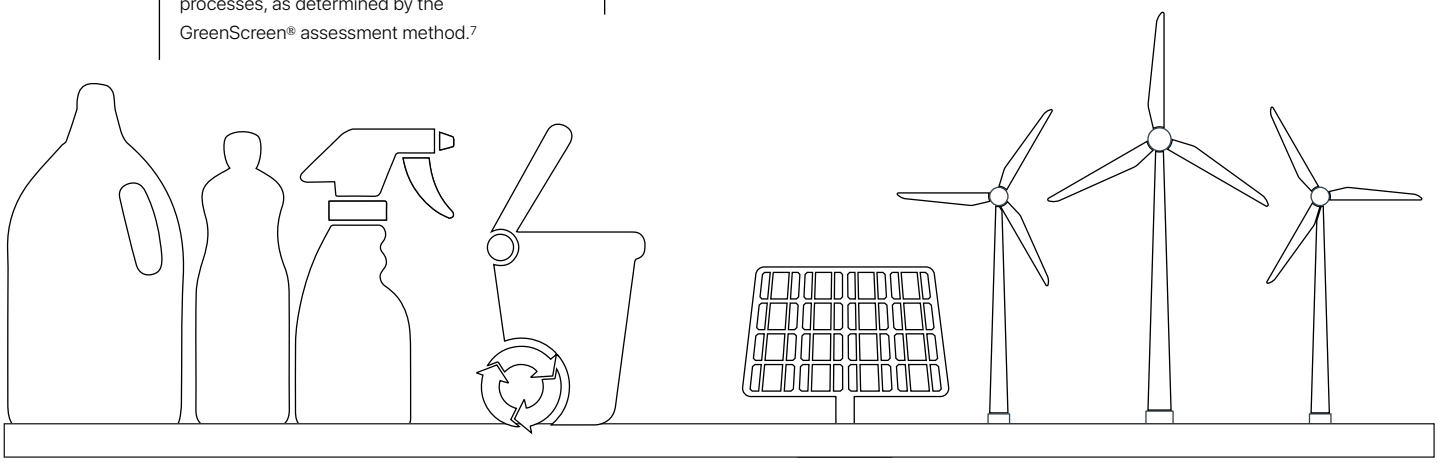
All Pro Display XDR final assembly supplier sites use safer cleaners and degreasers in their manufacturing processes, as determined by the GreenScreen® assessment method.[7]

Zero Waste to Landfill

Pro Display XDR final assembly supplier sites do not generate any waste sent to landfill.[6]

Supplier energy use

All Pro Display XDR final assembly suppliers have begun transitioning to 100 percent renewable energy for Apple production.



Package and Ship

Pro Display XDR packaging is made with recyclable, fiber-based materials.

To improve our packaging, we are working to eliminate plastics, increase recycled content, and use less packaging overall. All of the wood fiber in our packaging is either recycled or comes from responsibly managed forests.[8] And we have protected or created enough responsibly managed forests to cover all the virgin wood fiber we use in our packaging.[9] This ensures working forests are able to regrow and continue to clean our air and purify our water. To use fiber-based packaging for Pro Display XDR, we had to completely rethink our design. The resulting packaging provides needed cushioning and is more than 90 percent fiber based.

93%

of the packaging[10] is fiber based

66%

of the fiber content in packaging is recycled

100%

of the virgin wood fiber in the packaging comes from responsibly managed forests[8]

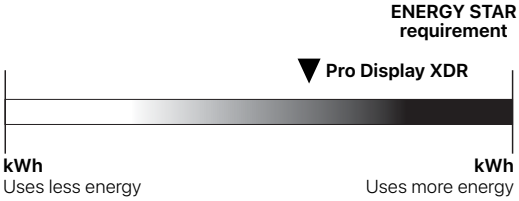
Use

Pro Display XDR uses 40 percent less energy than the requirement for ENERGY STAR.

We design our products to be energy efficient, long-lasting, and safe. Pro Display XDR uses power-efficient components that intelligently manage power consumption. We also run our own Reliability and Environmental Testing Labs, so our products go through rigorous testing before they leave our doors. Our support continues throughout each product's life cycle, with a network of authorized repair professionals to service them, if necessary.

Energy consumption of ENERGY STAR–rated products

Apple devices consistently rank among the high-performing products rated by ENERGY STAR—which was established to represent the 25 percent most energy-efficient computers on the market. Pro Display XDR consumes 40 percent less energy than the requirement for ENERGY STAR.[11]



Designed to last

To maximize durability, we assessed Pro Display XDR in our Reliability Testing Lab, using rigorous testing methods that simulate customers' experiences.

Made with smarter chemistry

We apply rigorous controls for materials users touch most—all based on recommendations from toxicologists and dermatologists.

Recover

Return your product with Apple Trade In, and we'll ensure it has a long life or recycle it for free.

When products are used longer, fewer resources are extracted from the earth. That's why we launched Apple Trade In—it offers customers a seamless way to return their old devices to Apple. Customers can trade in eligible devices for an Apple Store Gift Card.[12] If a device is not eligible for credit, we'll recycle it for free. We also offer and participate in product take-back and recycling programs for 99 percent of the countries where we sell products—and we hold our recyclers to high standards. Our efforts to keep harmful substances out of our products also mean our materials are safer to recover and reuse.

Apple Trade In

For more information on how to recycle your products at end of life, visit:

apple.com/shop/trade-in

Definitions

Bio-based plastics: Bio-based plastics are made from biological sources rather than from fossil-fuel sources. Bio-based plastics allow us to reduce reliance on fossil fuels.

Carbon footprint: Estimated emissions are calculated in accordance with guidelines and requirements as specified by ISO 14040 and ISO 14044. There is inherent uncertainty in modeling carbon emissions due primarily to data limitations. For the top component contributors to Apple's carbon emissions, Apple addresses this uncertainty by developing detailed process-based environmental models with Apple-specific parameters. For the remaining elements of Apple's carbon footprint, we rely on industry average data and assumptions. Calculation includes emissions for 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 manufacturing site to regional distribution hubs. Transport of products from distribution hubs to end customers is modeled using average distances based on regional geography.
- **Use:** Apple assumes a three- or four-year period for power use by first owners based on the product type. Product use scenarios are based on historical customer use data for similar products. Energy use is simulated in various ways; for example, by modeling daily battery drain or through performing activities like movie and music playback. Geographic differences in the power grid mix have been accounted for at a regional level.
- **End-of-life processing:** Includes transportation from collection hubs to recycling centers and the energy used in mechanical separation and shredding of parts. For more information on the carbon footprint, visit apple.com/environment/answers

Recycled materials: Recycling makes better use of finite resources by sourcing from recovered rather than mined materials. Recycled content claims for materials used in our products have been verified by an independent third party to a recycled content standard that conforms to ISO 14021.

Renewable materials: We define bio-materials as those that can be regenerated in a human lifespan, like paper fibers or sugarcane. Bio-materials can help us use fewer finite resources. But even though bio-materials have the ability to regrow, they are not always managed responsibly. Renewable materials are a type of bio-material managed in a way that enables continuous production without depleting the earth's resources. That's why we focus on sources that are certified for their management practices.

Supplier Clean Energy Program: Since the electricity used to make our products is the largest contributor to our overall carbon footprint, we're helping our suppliers become more energy efficient and transition to new renewable energy sources. We're committed to transitioning our entire manufacturing supply chain to 100 percent renewable electricity by 2030.

Endnotes

[1] Apple defines its restrictions on harmful substances, including definitions for what Apple considers to be "free of," in the Apple Regulated Substances Specification. Every Apple product is free of PVC and phthalates except for AC power cords in India, Thailand, and South Korea, where we continue to seek government approval for our PVC and phthalates replacement. Apple products comply with the European Union Directive 2011/65/EU and its amendments, including exemptions for the use of lead such as high-temperature solder. Apple is working to phase out the use of these exempted substances where technically possible.

[2] Apple Pro Display XDR achieved a Gold rating for EPEAT in the United States and Canada. Electronic Product Environmental Assessment Tool (EPEAT) is a program that ranks computers and displays based on environmental attributes in accordance with IEEE 1680.1-2018. For more information, visit www.epeat.net.

[3] Greenhouse gas emissions were calculated using a life cycle assessment methodology in accordance with ISO 14040 and 14044 standards and based on Pro Display XDR with Pro Stand.

Configuration	Carbon footprint
Pro Display XDR with Pro Stand	974 kg CO_2e

Endnotes

[4] Enclosure greenhouse gas emission reduction is based on a comparison to average primary aluminum ingot.

[5] Third-party assessments seek to confirm sourcing practices and are part of our responsible sourcing program. In addition, our efforts consider conflict, human rights, and other risks.

[6] Final assembly supplier sites for Pro Display XDR are third-party certified as Zero Waste by UL LLC (UL 2799 Standard). This means these final assembly supplier sites do not generate any waste sent to landfill.

[7] Only chemicals that meet GreenScreen® benchmark 3 or 4 are considered safer and preferred for use. Final assembly sites for Pro Display XDR are among the 18 final assembly supplier facilities that have adopted these safer cleaners. GreenScreen® is a comprehensive hazard assessment tool that evaluates substances against 18 different criteria. For more information, visit www.greenscreenchemicals.org.

[8] Responsible sourcing of wood fiber is defined in Apple's Sustainable Fiber Specification. We consider wood fibers to include bamboo.

[9] For more information about our work to protect and create responsibly managed forests, please read our Environmental Responsibility Report.

[10] Breakdown of U.S. retail packaging by weight.

[11] Energy consumption and energy efficiency values are based on the ENERGY STAR Program Requirements for Displays, including the max energy allowance for Pro Display XDR. For more information, visit www.energystar.gov. ENERGY STAR and the ENERGY STAR mark are registered trademarks owned by the U.S. Environmental Protection Agency.

- Standby (Sleep): Low power state that is entered after the display receives instructions from a connected host computer set to off/sleep. This mode is characterized by a blank screen.
- On—SDR brightness: The display is connected to a power source and a host computer. Display brightness was set as defined by ENERGY STAR Program Requirements for Displays. Auto-Brightness was turned off and the display was not providing charging power to the host computer or any other peripheral devices.
- On—XDR brightness: The display is connected to a power source and a host computer. Display brightness was set to 1,000 nits sustained (full screen). Auto-Brightness was turned off and the display was not providing charging power to the host computer or any other peripheral devices.
- Power supply efficiency: Average of the power supply's measured efficiency when tested at 100 percent, 50 percent, and 20 percent of the power supply's rated output power.

Mode	Power consumption for Pro Display XDR		
	100V	115V	230V
Standby (Sleep)	0.36W	0.36W	0.46W
On—SDR brightness	37.3W	37.3W	37.4W
On—XDR brightness	105W	105W	104W
Power supply efficiency	89.8%	90.2%	91.2%

[12] Trade-in values vary based on the condition, year, and configuration of your trade-in device, and may also vary between online and in-store trade-in. You must be at least 18 years old. In-store trade-in requires presentation of a valid, government-issued photo ID (local law may require saving this information). Additional terms from Apple or Apple's trade-in partners may apply.