

Product Environmental Report

Neo QLED QN90C

12/28/2023



At Samsung, we work to integrate eco-conscious technology and innovation in all our products. By considering sustainability at every step of the product life cycle, we aim to empower our customers to join us in our journey to build a better tomorrow together.

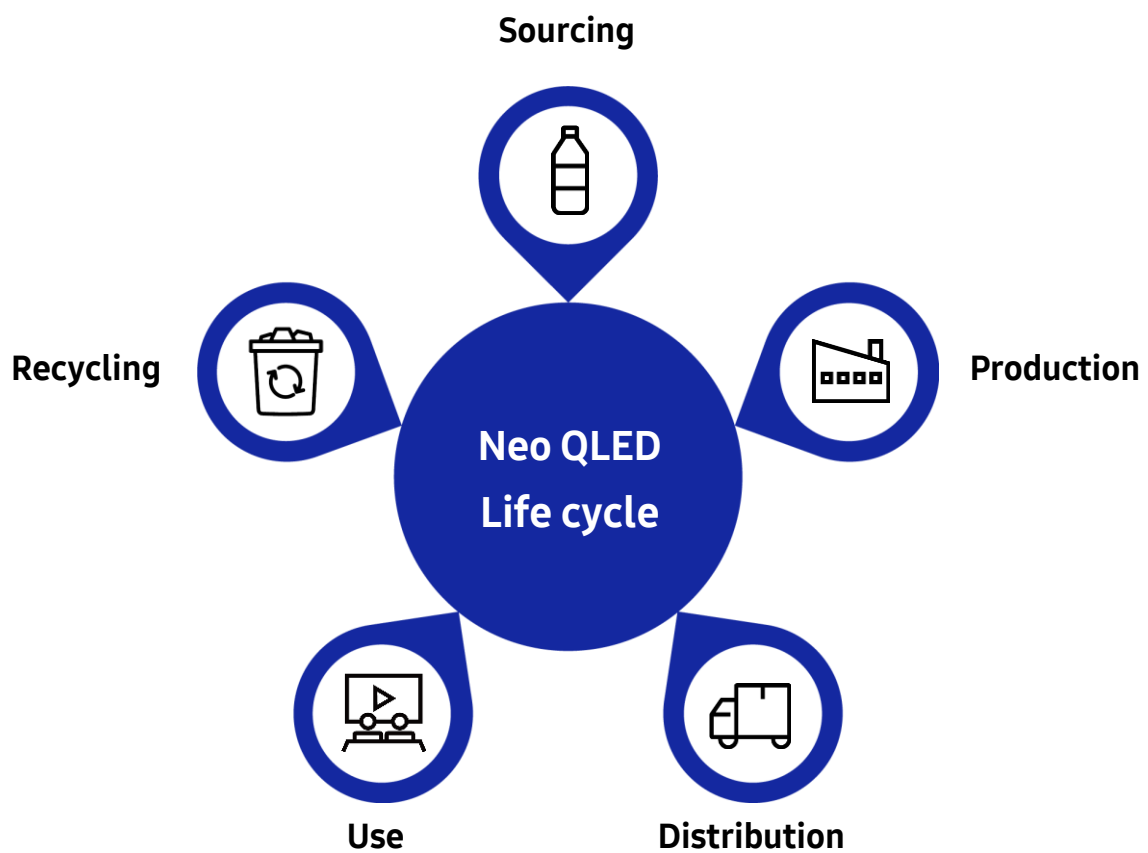


- [1] • Certification acquisition: **75QN95C**** / **75QNC95****, **75QN90C**** / **75QNC90****, **75QN85C**** / **75QNC85****

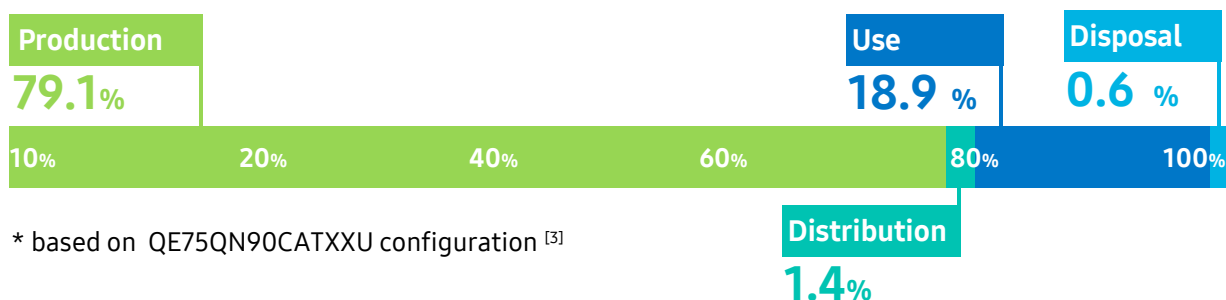
Product Carbon Footprint

At Samsung Electronics, we assess a product’s entire life cycle, including the sourcing, production, distribution, product use, and recycling phases, to understand the environmental impacts of our products.

At the production stage, we are aiming to expand the development and application of recycled materials with a lower carbon footprint. At the distribution stage, we are working to minimize packaging volume and weight to reduce carbon emissions. Through improving product energy efficiency, we are trying to improve the environmental impact at the use stage.



Neo QLED 75QN90C Life Cycle carbon emissions : 1,852 kg CO₂eq. ^[2]



* based on QE75QN90CATXXU configuration ^[3]

※ The figure above calculates the environmental impact of one product over the entire life cycle as CO₂ emissions. ^[3]

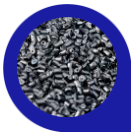


Sourcing

Samsung Electronics is committed to improving resource circulation throughout the life cycle of electronic products, from raw materials to disposal and recycling.

To build toward a circular system, we are endeavoring to use recycled materials and collecting e-waste to extract materials for reuse. By 2030, we aim for 50% of the plastic used in our DX products to incorporate recycled resin. By 2050, we will see this figure increase to 100%.

Samsung Electronics uses recycled materials for parts in the Neo QLED 4K products. In addition, we are trying to manage its supply chain so that minerals used in its products are mined in accordance with OECD due diligence guidelines.



Plastic

The Neo QLED 4K's rear cover contains a minimum of 10% of post recycled materials. Furthermore, the remote control contains at least of 24% of recycled plastic in the total plastic used.^[4]



Responsible minerals

For internationally disputed minerals such as tantalum, tin, tungsten, and gold, we elect to only use minerals supplied by smelters that have obtained global third-party certifications. Minerals that raise human rights violations or environmental destruction issues during mining are included in the management^[5] list and are avoided in our management of the mineral supply chain.



Chemical Mgmt.

To prevent hazardous substances from entering our products, we rigorously inspect manufactured parts and raw materials through our chemical management system.

Our standards for the "Product Environment Management Substances Operation Rules"^[6] are based on global regulations and standards. We voluntarily established reduction plans for the use of potentially hazardous substances as well as legally regulated substances.

Production



We are expanding the use of renewable energy at our business sites around the world.

Energy infrastructure and regulations vary widely by jurisdiction and require region-specific transition plans.



Renewable Energy

We plan to run all operations of the DX division on renewable energy by 2027.^[7]

We are constantly trying to reduce waste and expand recycling. Company-wide, we plan to obtain a platinum-level Zero Waste to Landfill certification, issued by safety certification organization Underwriters Laboratories (UL), for all global operations by 2025.

Most sites that produce Samsung Electronics TV, audio, and display products have been certified for environmental management (ISO14001) and energy management (ISO50001).^[8]

Samsung Electronics is increasing the efficiency of using raw materials to reduce the environmental impact during the production stage. We're using *External Gas Molding (EGM) technology, thus reducing the amount of plastic used in the injection process.

*Technology which uses air instead of more plastic to shape parts



Reducing material & Scrap recycling



Distribution



To reduce the environmental impact of our product packaging, we are replacing plastic packaging and vinyl wraps with paper and recycled materials.

We are also reducing the volume and weight of packaging to mitigate greenhouse gas emissions in the transportation and shipping process.



We plan to remove plastic from packages (except cushions) of all TV, audio, and display products by 2030 and replace them with paper.

The Neo QLED 75QN90C has reduced the size and weight of the product and also reduced the packaging box, improving container loading efficiency by 20% compared to the previous equivalent model. ^[9]

Recycled materials are applied to accessory bags, PP band, and stand bags, which are subsidiary materials for product packaging. ^[10]

Plastic tape/band removal **100%**

The plastic tape that seals the packaging box has been removed or replaced with paper, and the plastic band that binds the accessory cable has been changed to paper. ^[11]

Metal staple removal **100%**

Recyclability of the paper box was enhanced by removing the metal staples used in the side joints of the box. ^[12]



Use



Environmental experts support product development at Samsung Electronics so we can empower our customers to use our products more sustainably. During the product development phase, our stress tests help ensure the longevity and consistent performance of our products.



To reduce use-phase carbon emissions, we set our plan to reduce power consumption by 30% on average by 2030, compared to products with the same specifications in 2019. ^[13]
 * Power consumption of the 75QN90C ^[14]



Samsung Electronics' SolarCell Remote operates using energy from solar power or indoor lighting, eliminating the need for disposable batteries. It is designed not only to enhance convenience by eliminating the need for users to replace batteries or perform separate charging operations but also to reduce waste.



Furthermore, Samsung Electronics is actively engaging in cross-industry collaborations to achieve a sustainable society, and its technology of the SolarCell Remote has been made accessible to everyone through open licensing as part of this initiative. ^[15]

For the parts of TV and display products that have been replaced by modules, we are changing the design so that they can be separately repaired. ^[16]



Recycling



To promote the circular economy and a low-carbon society, we are expanding responsible recycling in more than 50 countries around the world.

Samsung’s local recycling programs provide collection services tailored to each region for customers disposing e-waste, and we take back electrical and electronic waste regardless of product brand.



Repair & Reuse

We are trying to reuse parts to reduce waste even in the repair process of TV and display products. In 2022, about 550,000 parts were recovered from 36 countries, and 230,000 of them have been reused after quality verification.



Upcycle Packaging

Upcycle packaging is designed to allow consumers to upcycle the box that is usually discarded after transporting the product. By removing promotional stickers that were attached to the box surface and reducing ink usage, packaging recyclability was increased, and we are striving to reduce the impact on the environment.

Customers can make their own props such as magazine stands and pet products using dot patterns printed on the surface of the packaging box. We are diversifying props designed through campaigns and contests and releasing drawings of props. [17]



Endnotes

Disclaimer

1. The Carbon Trust of the U.K. calculated greenhouse gas generated in the entire process from production to disposal of products in accordance with evaluation standards, and Samsung obtained a "carbon footprint" certification that evaluates carbon emissions of products.

Certification acquisition model: **75QN95C**** / **75QNC95****, **75QN90C**** / **75QNC90****,
75QN85C** / **75QNC85****

※ In model name notation, ' * ' consists of numbers (0 to 9) or alphabets (A to Z).

※ In particular, "Carbon Footprint-Reducing CO₂" certification can be obtained when carbon generation is reduced compared to previous equivalent models.

2. Guidelines and conditions applied to the calculation of carbon emissions

- PAS 2050:2011 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
- Product Carbon Footprints : Requirements for Certification v2
- Database : Ecolinvent 3.8, Korea LCI DB

3. Life Cycle Assessment System Boundary

- Production: Pre-manufacturing (parts and materials that make up the product) and assembling the product at Samsung Electronics
- Distribution: Distribution from Hungary to the United Kingdom
- Use: Used for 7 years
- Disposal: Waste disposal of parts and materials

4. Environmental Claim Validation (ECV) verification was obtained from UL for recycled materials.

Verification method: Environmental Claim Validation Procedure for Recycled Content, UL 2809 – Fifth Edition

- Rear cover: Contains a minimum of 10% of recycled PCM PC (based on weight)
- Remote control: Contains at least 24% of PCM in the total plastic used (based on weight)

※ PCM: Post Consumer Material (recycled plastic from waste products)

PC: polycarbonate

5. Samsung Electronics operates a mineral management process based on OECD due diligence guidelines for responsible minerals.

<https://www.samsung.com/sec/sustainability/people/supply-chain/#anchor4>

6. Product Environment Management Substances Operation Rules

<https://www.samsung.com/sec/sustainability/environment/environment-data/>

Endnotes

7. Details of the conversion of renewable energy

Samsung Electronics joined RE100, a global initiative, to reduce carbon indirect emissions (Scope 2) caused by power use and decided to push for the conversion of renewable energy to used power by 2050. First, Samsung Electronics is pushing to achieve its renewable energy target at all overseas operations by 2027. The U.S., China and Europe, which have already achieved their renewable energy goals, have decided to expand their renewable energy supply contracts (PPAs) that are signed directly with renewable energy generation operators. The DX division is pushing to achieve its renewable energy target by 2027, both at home and abroad.

※ Samsung Electronics' Device eXperience (DX) division is in the business of producing and selling TVs, monitors, refrigerators, washing machines, air conditioners, smartphones, tablets, PCs, and wearable products.

8. Samsung Electronics adopts global standards such as environmental management (ISO14001) and energy management system (ISO50001), mandates all workplaces to obtain the certification, and recommends partner companies to obtain related international certifications to spread environmental safety management, which is reflected in the comprehensive evaluation of partner companies.

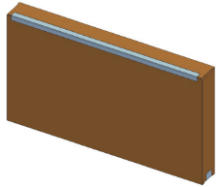
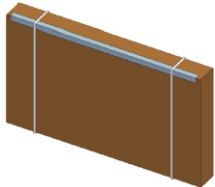
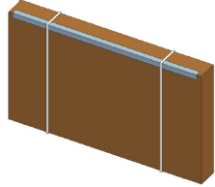
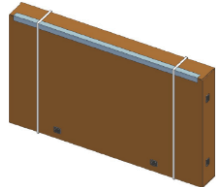
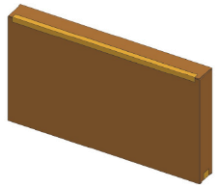
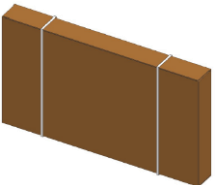
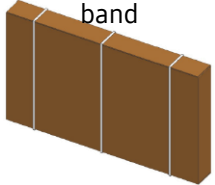
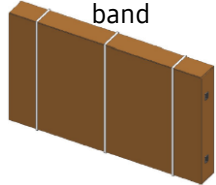
Except for one small production subsidiary in South Africa (SSAP), all of Samsung Electronics' workplaces have obtained the certification as of 2021, and 86% of partners that are subject to comprehensive evaluation.

9. Based on the 40ft High Cube container, 144 Neo QLED 75QN90C models can be loaded, an improvement of 20% compared to 120 previous equivalent models.

10. The recycled materials applied to the product packaging subsidiary materials are as follows.

- Subsidiary Materials Containing 50% Recycled Plastics: Accessories Bag, PP Band
- Subsidiary Materials Containing 10% Recycled Plastics: Stand Bag

11. The plastic tape for box sealing has been deleted or changed to paper, and it is applied separately as shown in the table below according to the product size.

	~ 55"	58" ~ 65"	70" ~ 75"	82" ~
Before				
After (2023~)	Replacing tape with paper 	Plastic tape removal 	Plastic tape removal Adding a central PP band 	Plastic tape removal Adding a central PP band 

12. Recyclability of paper boxes was increased by removing metal staples and replacing them with glue. The reduction of box assembly process time also reduced energy consumption in the manufacturing process.

13. We plan to improve power consumption by 30% on average in 2030 compared to the same performance model in 2019 by applying low power technology to representative models of seven major electronic products such as TVs, monitors, smartphones, refrigerators, washing machines, air conditioners, and PCs. We are conducting twice/yearly implementation checks on the annual improvement goals of the representative models for each product line, and we are trying to spread the energy efficiency technology applied to the representative models horizontally to other models.

Endnotes

15. Average power consumption of the Neo QLED 75QN90C is 115.0 W.

Measurement criteria model: QE75QN90CATXXU

Power consumption measurement criteria: Regulation (EU) No 2019/2021 (as amended) and EN 50564:2011

Power consumption is calculated based on the power measured in our laboratory based on the initial shipment status product.

Different countries have different regulatory conditions or measurement standards, and measurement methods may be updated to change measurements when each country's regulatory conditions change.

The model name/model code of the product may vary by region or country where Samsung Electronics sells the product.

16. SolarCell Remote Open License

<https://solarcellremote.samsung.com/>

17. It may vary by country, by applying about 230,000 single-product repairs in 102 countries of about 49 subsidiaries in 2022, we are trying to reduce the burden of repair costs on consumers by reducing about \$151 compared to the previous average repair costs, as well as reducing environmental impact by extending the life of products.

18. Providing drawings for upcycle packaging

<https://www.samsung-upcyclepackaging.com>

Recycling

Samsung established waste collection systems in each region as we work tirelessly to enhance the collection and recycling of waste products. We also offer product take-back and recycling services for Samsung products in countries with local take-back legislation. We are always looking to expand to additional locations.

<https://www.samsung.com/sec/sustainability/environment/environment-data/>

Eco-Management

Samsung Electronics set the foundation for eco-management as a philosophy for the 21st century through the commitments made in the Samsung Environmental Declaration. We have put eco-management into action and are leading the way to a sustainable future by offering our customers eco-friendly products. We believe a healthy environment is essential to the future of society.

Corporate Sustainability Management

Samsung is constantly striving to deliver innovative products and services across the value chain. This is rooted in our core values in economy, society and environment. Therefore, we monitor the financial and non-financial impacts that we exert on society in order to maximize our positive impacts while minimizing any negative ones.

<https://www.samsung.com/sec/sustainability/main/>

Appendix



Certificate of Achievement

Samsung Electronics

has measured and achieved a reduction in the product carbon footprints of their

NEO QLED 4K Television

(**75QN85C**** / **75QNC85****, **75QN90C***** /
75QNC90*** and
75QN95C*** / **75QNC95*****)

Carbon Trust Assurance Limited certifies that Samsung Electronics has calculated and achieved a reduction in 219 Listed Carbon Footprints of the following 6 Listed Stock Keeping Units (SKUs) (across 73 geographies) and 3 Listed Products sold Cradle-to-Grave (Business-to-Consumer) and marketed in Geographical Areas, in accordance with:

- PAS 2050:2011 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
- Product Carbon Footprints: Requirements for Certification v2

A detailed list of certified Carbon Footprints and Reductions results can be found in the associated Certification Letter cert-no 13455.

Awarded: 12 April 2023

Valid Until: 11 April 2025

for and on behalf of Carbon Trust Assurance Ltd,

Martin Hockaday,
Head of Assurance