

Product Environmental Report

Neo QLED 8K QN900D

2024. 7. 15



At Samsung, we work to integrate eco-conscious technology and innovation in 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.



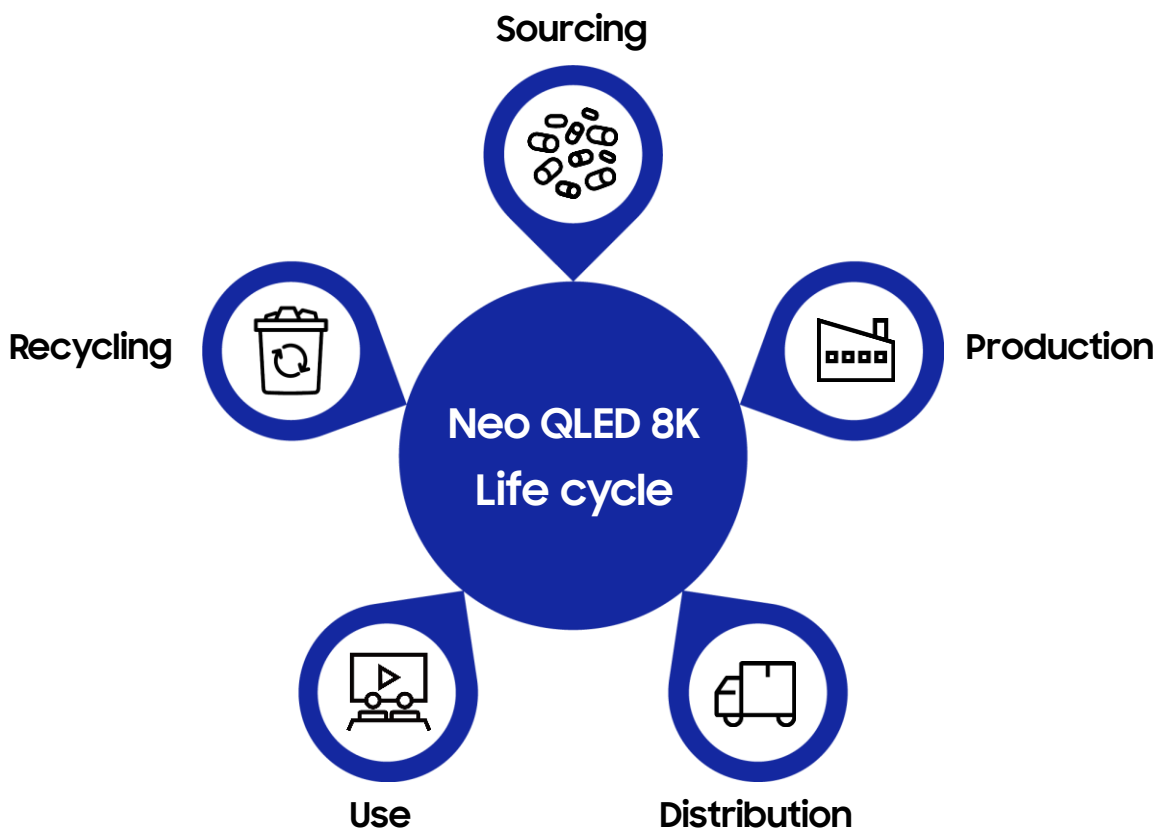
[1]

* Certified Model : **65QN900D**** / **65QND900**** (65 inch),
75QN900D** / **75QND900**** (75 inch),
85QN900D** / **85QND900**** (85 inch)

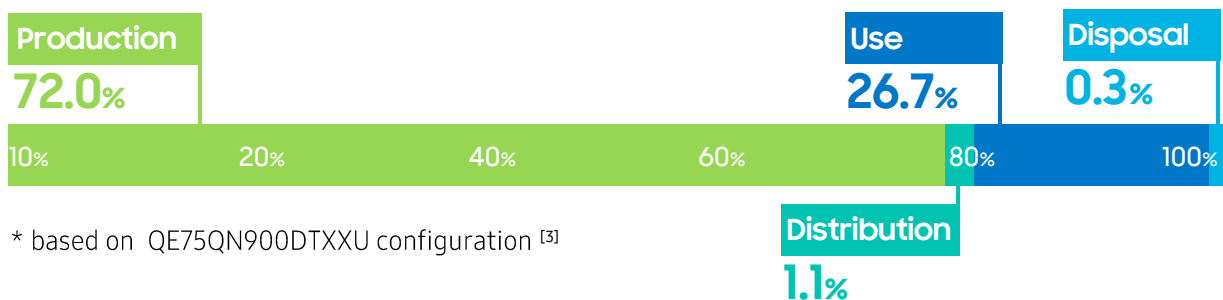
Product Carbon Footprint

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 greenhouse gas emissions. Through improving product energy efficiency, we are trying to improve the environmental impact at the use stage.



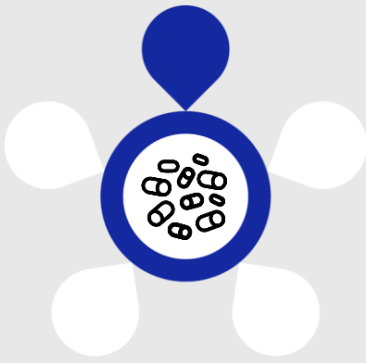
Neo QLED 8K 75QN900D Life Cycle carbon emissions : 2,388 kg CO₂eq. ^[2]



* based on QE75QN900DTXXU configuration ^[3]

※ The figure above calculates the environmental impact of one product over the entire life cycle as CO₂ emission.^[4]

Sourcing

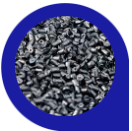


Samsung Electronics is committed to improving resource circulation throughout the life cycle of electronic products, from raw materials to disposal and recycling.

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 plan to increase to 100%.

Samsung Electronics uses the recycled materials for parts in the Neo QLED 8K QN900D 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

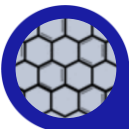


QN900D's rear cover/ holder stand/ speaker cover contain a minimum of 10 of post recycled materials.^[4]

The rear frame/rear frame chassis inside the product applies 10% recycled plastic made from waste cooking oil/waste vinyl based raw materials.^[5]

Furthermore, the remote control contains at least of 24 of recycled plastic in the total plastic used.^[6]

Graphite



The graphite sheets used for heat dissipation inside the product are recycled graphite materials collected from waste batteries.^[7] Among the 5 out of 6 sheets are 100% recycled materials.

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^[8] list and are avoided in our management of the mineral supply chain.

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 "Standard for Control of Substances Used in Products" ^[9] 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.



Chemical Mgmt.

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. ^[10]



On-site Waste

We are constantly trying to reduce waste and expand recycling. We plan to obtain a platinum-level zero Waste to Landfill Certification, issued by safety certification organization Underwriters Laboratories (UL), for all our 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). ^[11]



Reducing material & Scrap recycling

Samsung Electronics is increasing the efficiency of using raw materials to reduce environmental impact during the production stage. We are using External Gas Molding (EGM) technology, which uses air instead of plastic to shape parts, thus reducing the amount of plastic used in the injection process.



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.



Packaging

We have applied recycled materials for the package of QN900D. (EPS cushion, Accessory bag, PP band, Stand bag). Not only for product components but for the packaging, we are expanding the range of application and increasing the percentage of recycled materials.

In 2023, the recycling material content rates for the EPS cushion and stand bag were 5% and 10% respectively, which increased to 10% and 30% respectively for models released in 2024.^[12]

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.^[13]

Metal staple removal

100%

The recycling of the paper box was enhanced by removing the metal staples used in the side joints of the box.^[14]



Use



Environmental experts provide consultation during 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.



Energy Efficiency

To reduce greenhouse gas emissions during the use of our key products, we set our plan to reduce power consumption by an avg. of 30% by 2030, compared to products with the same specifications in 2019^[15]

* Power consumption of the 75QN900D^[16]

Using a light sensor, TV detects its surroundings and automatically adjusts brightness accordingly. It also enters power saving mode when there is no user movement, helping to save energy.^[17]



Solarcell Remote

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^[18]



Repair & Reuse

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.^[19]



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 2023 about 640,000 parts were recovered from 30 countries, and 180,000 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^[20]



Endnotes

Disclaimer

1. Germany's TUV Rheinland has certified that Samsung Electronics has correctly measured carbon footprints by applying the "ISO 14067 2018 standard. In particular, 'Product Carbon Reduction' certification can be obtained when carbon generation is reduced compared to existing equivalent models

Certified model : **65QN900D**** / **65QND900**** (65 inch),
 75QN900D** / **75QND900**** (75 inch),
 85QN900D** / **85QND900**** (85 inch)

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

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

- Database : Ecoinvent 3.9.1, Korea LCI DB

- ISO 14067:2018 Carbon footprint of products

※ TUV Rheinland has certified that Samsung Electronics' carbon emissions calculation method conforms to ISO 14067:2018 guidelines (Review of Product Carbon Footprint Method)

3. Life Cycle Assessment System Boundary

- Production : Pre-manufacturing (parts and materials that makes up the product) and assembling the product at Samsung Electronics

- Distribution : from Hungary to the U.K.

- Use : 7 years

- Disposal : Waste disposal of parts and materials

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

- Verification method : ECV Procedure for Recycled content, UL ECVP 2809-2, Second Edition

- PCM PC contained parts : Rear cover/ Stand holder / Speaker cover

(It contains a minimum of 10% of recycled PCM PC in total plastic, based on weight)

※ PCM : Post-Consumer Material (Recycled plastic from waste products used by consumers)

※ PC : PolyCarbonate

※ UL : Underwriters Laboratories (Global Environmental Safety Certification Authority)

※ ECV : Environmental Claim Validation

5. ISCC PLUS was obtained from Control Union.

- Recycled plastic parts made from waste cooking oil/waste vinyl : Rear frame/ Rear frame chassis
 (It contains 10% in total plastic parts, based on Mass balance method certified by Control Union)

※ Control Union : One of the Global Certification Authorities

※ ISCC PLUS : International Sustainability & Carbon Certification Plus

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

- Verification method : ECV Procedure for Recycled content, UL ECVP 2809-2, Second Edition for PCR PC / UL ECVP 2809, Fifth Edition for PCR PET

- Cover-Top, Cover-Bottom : Contains 30% PCR PC (based on weight)

- Bottom-Navigation, Bottom-Volume, Cover-Battery Bottom : Contains 28% of PCR PET (based on weight)

※ PCR : Post-Consumer Recycled material

※ PET : Poly Ethylene Terephthalate

7. Graphite is a material recycled from the disposing process of lithium ion secondary batteries.

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

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

Endnotes

9. Standards for Control of Substances Used in Products

<https://www.samsung.com/global/sustainability/digital-library/policy-document/>

10. Shifting to 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 within five years. 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.
<https://www.samsung.com/global/sustainability/planet/climate-action/#anchor2>

11. Shifting Electronics adopts global standards such as environmental management (ISO1401) and energy management system (ISO5001), 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.

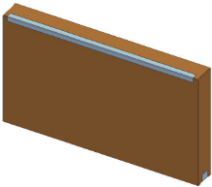
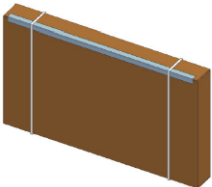
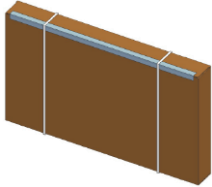
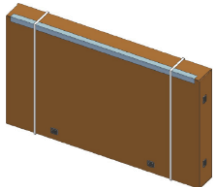
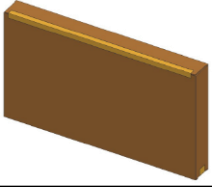
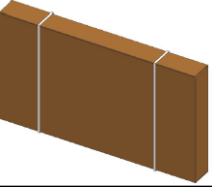
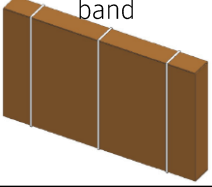
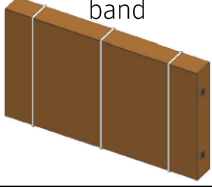
Except for one small production subsidiary (SSAP) in South Africa, all of Samsung Electronics' workplaces have obtained the certification as of 2022, and 90% of partners that are subject to comprehensive evaluation.

12. 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 30% Recycled Plastics : Stand Bag
- Subsidiary Materials Containing 10% Recycled Plastics : EPS Cushion

※ PP : Polypropylene, EPS : Expandable Polystyrene

13. 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 

14. 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.

15. We plan to reduce power consumption by an avg. of 30% 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

16. Average power consumption of 75QN900D is 137.0W.

Measurement criteria model: QE75QN900DTXXU

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.

17. It requires separate settings.

18. SolarCell Remote Open License

<https://www.samsung.com/global/sustainability/focus/story/solar-cell-remoteControl/>

19. It may vary by country, by applying about 370,000 single product repairs in 107 countries of about 51 subsidiaries in 2023 we are trying to reduce the burden of repair costs on consumers by reducing about \$61 compared to the previous average repair costs, as well as reducing environmental impact by extending the life of products.

20. Providing drawings for Upcycle Packaging

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

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/global/sustainability/main/>

Environmental Strategy

Samsung Electronics announced the New Environmental Strategy in September 2022 with the aim of addressing global environmental issues through our innovative technologies. This paradigm shift is essential for our sustainable growth and will create meaningful momentum to reinforce our competitiveness.

The New Environmental Strategy was developed based on our commitment to achieve net zero by 2050, joining the world's effort to combat climate change, maximize resource circularity to advance towards a circular economy, and continuously address environmental challenges with technological innovation. This effort is expected to bring positive change to the broader ecosystem of the ICT industry as we engage in the manufacturing and supply of an extensive range of products and services..

<https://www.samsung.com/global/sustainability/planet/environmental-strategy/>

Circular Economy

We aim to create a more sustainable resource cycle by using recycled materials and researching methods to extract and re-use resources from e-waste.

<https://www.samsung.com/global/sustainability/planet/circular-economy/>

Appendix [A] Carbon Reduction Certificate (1/2)

Zertifikat *Certificate*

Zertifikatsnummer *Certificate No.:*
Q 50614796 0001

Berichtsnummer *Report No.:*
CN234LTU 001

Genehmigungsinhaber *License Holder:*
Samsung Electronics
Co., Ltd.
129, Samsung-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do 16677
Republic of Korea

Fertigungsstätte *Manufacturing Site:*
6 Fertigungsstätten auf Folgeseiten
Listing of 6 factories on following pages

Prüfzeichen *Test Mark:*



Geprüft nach *Tested according to:*
2 PFG Q2880/09.23
ISO 14067:2018

Geräteidentifikation
Product Identification

Produkt: **Display Unit**
Product: (NeoQLED 8K TV)

Modell: Modelle sind auf nächste(r) Seite(n) gelistet
Type: *Type designation(s) are listed on the next page(s)*

Technische Daten: Trademark : SAMSUNG
Technical Data: Key information:
1. Functional unit/Declared unit:using one television produced for 7year
2. Life cycle boundary: Cradle-to-grave
3. PCF software and database: Refer to the test report
4. Evaluation time span: 2022.10.01 - 2023.09.30
5. Previous year product carbon footprint CO2e: Refer to the test report
6. Current year product carbon footprint CO2e: Refer to the test report

Gültig bis: 2026-01-03
Date of expiry:

Gültig ab: 2024-01-04
Valid from:

Ausstellungsdatum: 2024-01-04
Date of issue:

Zertifizierungsstelle:
Certification body:



(Signature)

Yonggang Li

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht.
This certificate is based on our Testing and Certification Regulation. The product
fulfills above mentioned requirements, the production is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
<http://www.tuv.com/safety> E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

www.tuv.com



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Appendix [A] Carbon Reduction Certificate (2/2)

Zertifikat *Certificate*

Zertifikatsnummer Certificate No.:

Q 50614796 0001

Berichtsnummer Report No.:

CN234LTU 001

Produkt Product: Display Unit
(NeoQLED 8K TV)

Modell Type: **Bezeichnung Designation:**

- 1) Neo QLED 8K TV QN900C 65 inch (QNC900 65)
- 2) Neo QLED 8k TV QN900C 75 inch (QNC900 75)
- 3) Neo QLED 8k TV QN900C 85 inch (QNC900 85)
- 4) Neo QLED 8K TV QN900D 65 inch (QND900 65)
- 5) Neo QLED 8k TV QN900D 75 inch (QND900 75)
- 6) Neo QLED 8k TV QN900D 85 inch (QND900 85)



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Appendix [B] Review of Product Carbon Footprint Method

CERTIFICATE

Certificate-ID: C01-2023-12-21260216

Certificate for: **Review of Product Carbon Footprint Method of Samsung Electronics Co., Ltd.**

SAMSUNG

Certified: Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeoungtong-Gu, Suwon-Si, Gyeonggi-Do, Korea

Accounting scope: Methodology for assessing the potential climate change impacts of Samsung electronic products

Applied Standard: ISO 14067: 2018

Review Report: ADTR-PCF-0027

Valid until: December 31st 2024

Based on the standard ISO 14067: 2018 the reviewer concludes that the PCF Methodology developed by Samsung Electronics Co., Ltd. is scientifically based and reflects the state of the art. The approach and principles behind the methodology are generally appropriate for the assessment of potential Climate Change impacts of the considered electronic products. Furthermore the data used are appropriate for the goal and scope of the method. Necessary recommendations for the documentation and calculation tool were discussed and implemented by Samsung Electronics Co., Ltd.. For the future, TÜV Rheinland recommends to continually enhance the methodology in line with the developments in science, technology and corresponding industry and to adapt the methodology report accordingly. Specifications and assessment limits can be found in the review report. The validity can be authenticated using the QR code, or the test mark ID at www.certipedia.com.

Cologne, December 13, 2023

Ran Tao

Ran Tao
TÜV Rheinland Group
Sustainability and Carbon Services

S. Jorre

Susanne Jorre

