

Life Cycle Assessment for Display Products

● Background

Samsung has recently performed the life cycle assessment(LCA) of its 55-inch UHD display and 24-inch monitor product to better understand potential environmental impacts may caused from the product through its whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. The assessment has been completed according to international standard ISO 14040 series. Samsung has used Simapro7 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material (BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 12 potential environment impact categories including; global warming; abiotic depletion; eutrophication; ozone layer depletion and water consumption; where each impact category has been assessed for each life cycle stage. Critical review of this study result was done by an expert from Underwriters Laboratory(UL).

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 2.2
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2001 as provided in the SimaPro 7.1.5 LCA tool
LCA software	SimaPro 7.1.5

● System boundary of LCA

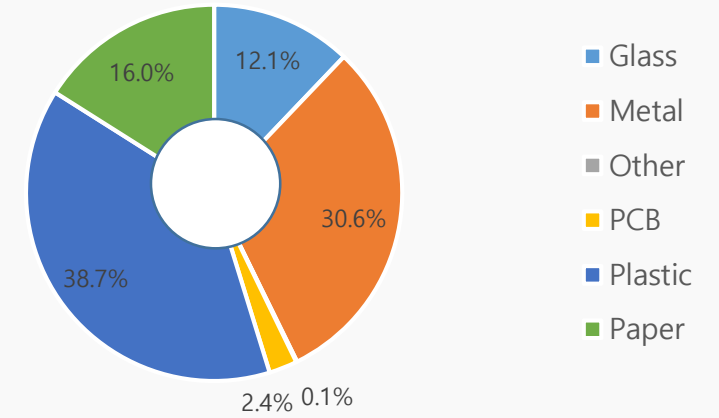
Pre-manufacturing	Parts and materials constituting the products
Manufacturing	Product assembly by Samsung Electronics (Data collection from 3 Plants)
Distribution	From Mexico/Vietnam/Slovakia/China to America, Europe and Asia countries
Usage	7 years use
Disposal	Waste treatment of parts and material

● Product Features

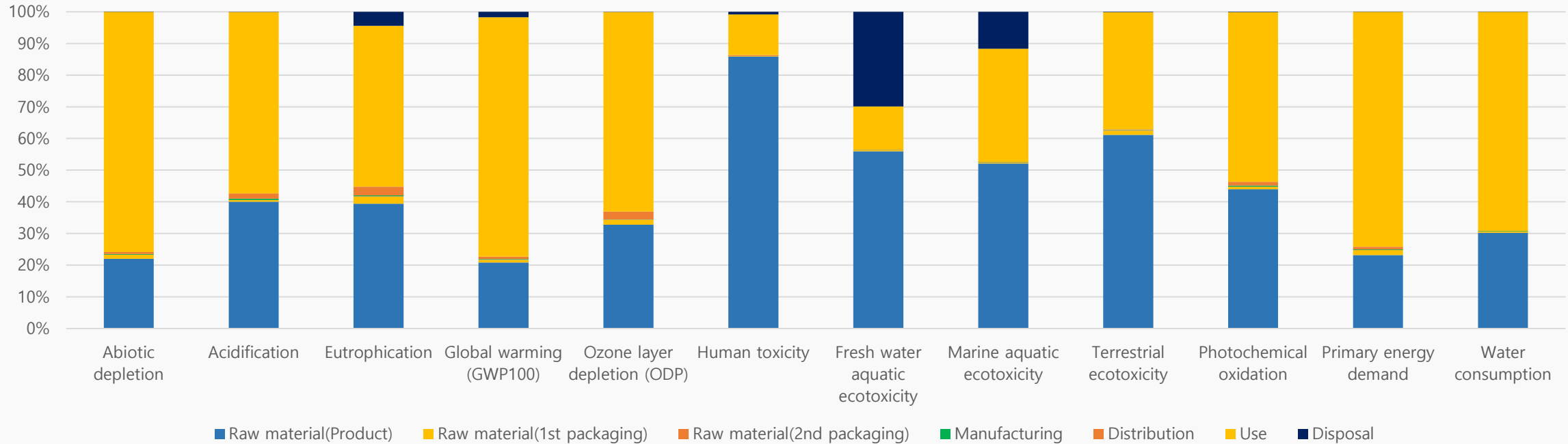


Model name	S24E650PL
Screen Size	24 inch
Resolution	1920x1080
Brightness	250cd/m2
Viewing Angle	178°/178°
Power Supply	AC 100~240V, 50/60Hz
Wt.(kg)	12.4 lb. (Product Weight with stand)

● Material Use



● Characterized Environment Impact

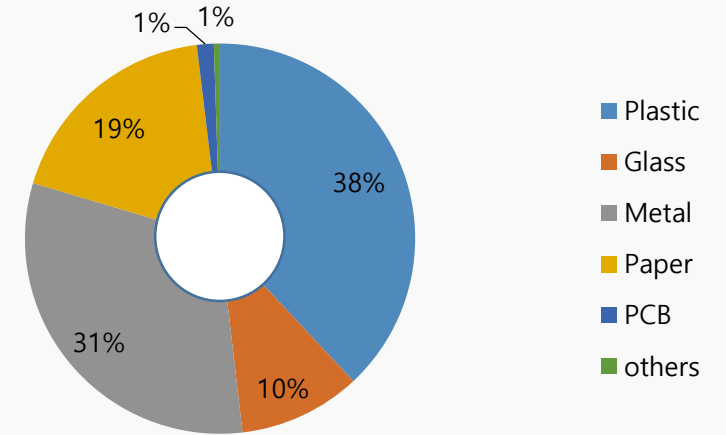


● Product Features

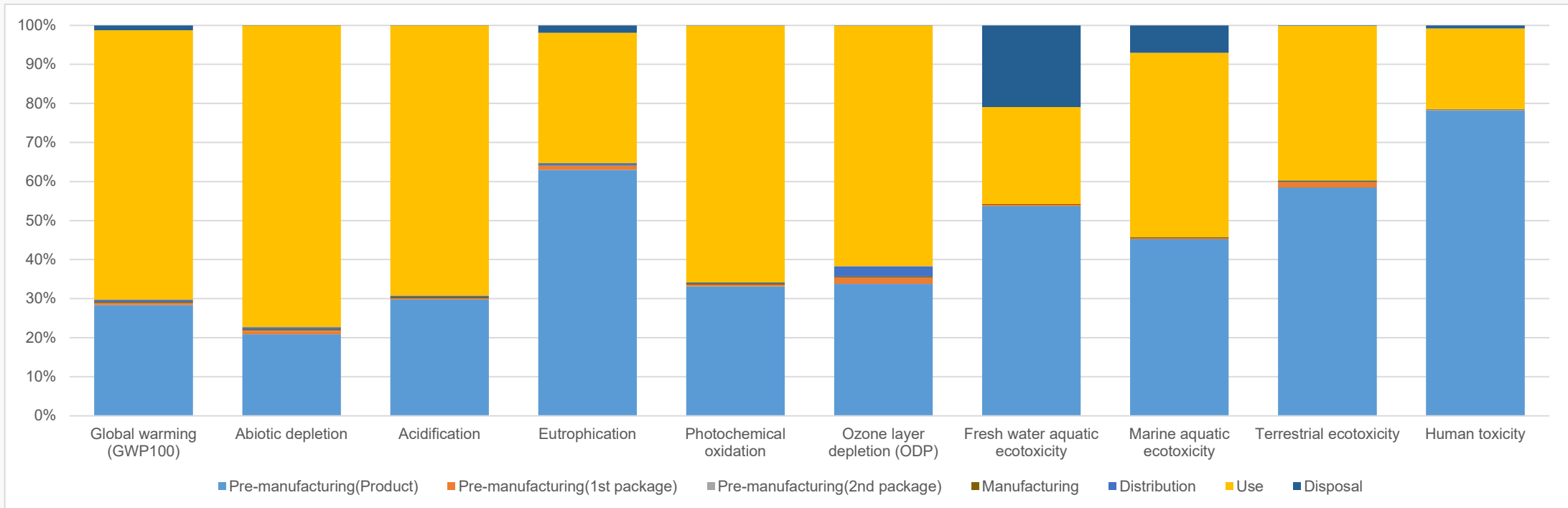


Model name	QM55N
Screen Size	55 inch
Resolution	4k UHD (3840*2160)
Brightness	500 nit (H/V)
Viewing Angle	178°/178°
Power Supply	AC 100 - 240 V, 50/60 Hz
Wt.(kg)	17.4 (Package 23)

● Material Use



● Characterized Environment Impact



Life Cycle Assessment for Mobile Products

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The most recent life cycle assessment (LCA) has been for the Samsung Galaxy S6; Note5; TAB E; J1x; On5x; Tab S2; Tab A 7.0; Note8; Galaxy Book model. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase.

To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used Simapro7 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material (BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 12 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 2.2
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2001 as provided in the SimaPro 7.1.5 LCA tool
LCA software	SimaPro 7.1.5

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation (from supplier to Samsung factory)
Manufacturing	Product assembly by Samsung Electronics (Data collection period : 3 months ahead of assessment)
Distribution	From China or Vietnam to United States
Usage	2 years use
Disposal	Waste treatment of parts and material

Critical review for Galaxy S6 LCA study was done by an expert from Korean Society for Life Cycle Assessment. (kslca@naver.com)

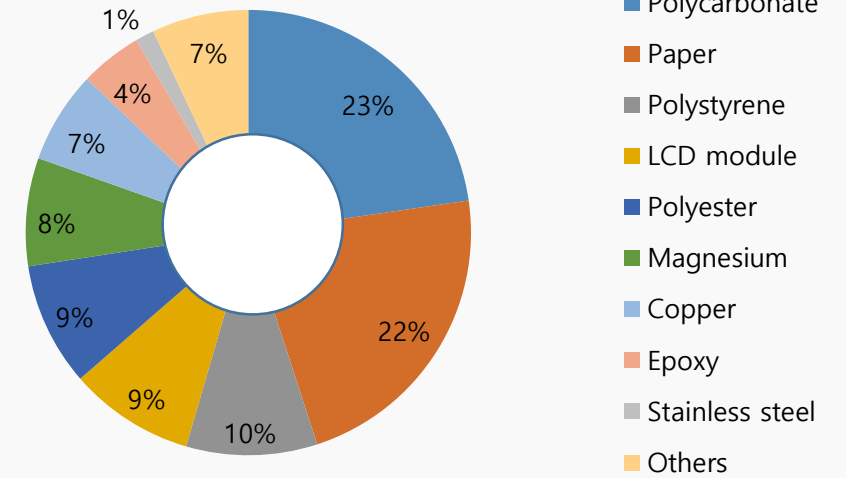
For the rest, it was done by internal expert in Global CS Center of Samsung Electronics. (ecodesign@samsung.com)

● Product Features

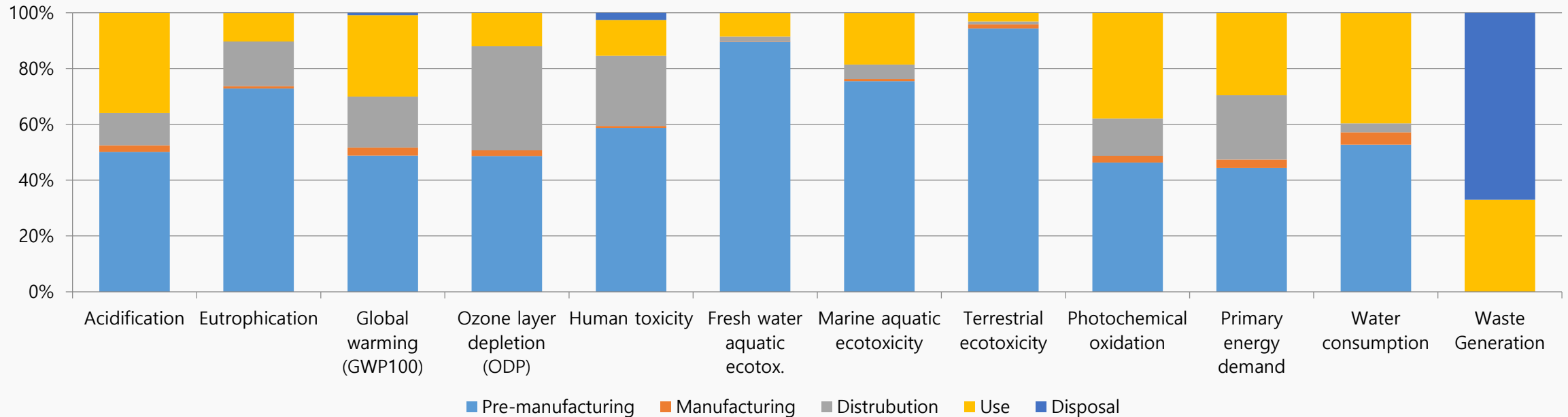


Model name	SM-W727V (Galaxy Book)
Processor	Intel, Core i5, 3.1GHz Dual-Core 64bit
Dimension	199.8 * 291.3 * 7.4(H*W*D)
Display	AMOLED, OCTA, SDC, 2160 x 1440 (FHD+) 12.0", 303.7mm 16M
Battery	Li-Ion 5070 mAh
Camera	13 MP / 5MP
Wt.(g)	1881.9g

● Material Use



● Characterized Environment Impact

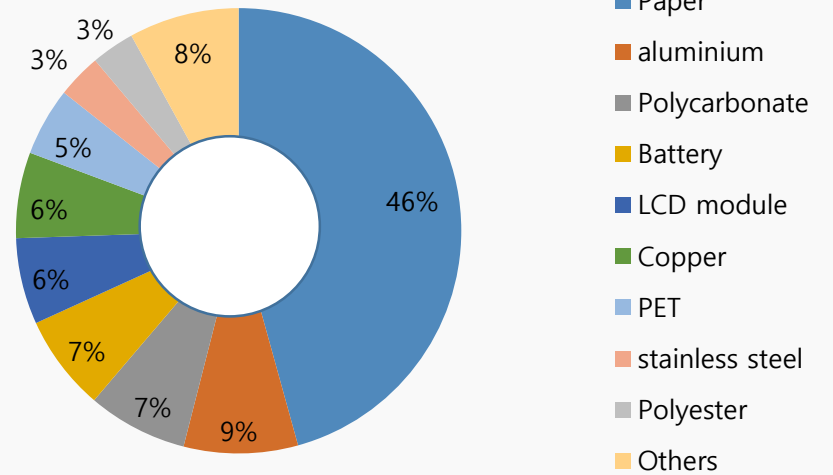


● Product Features

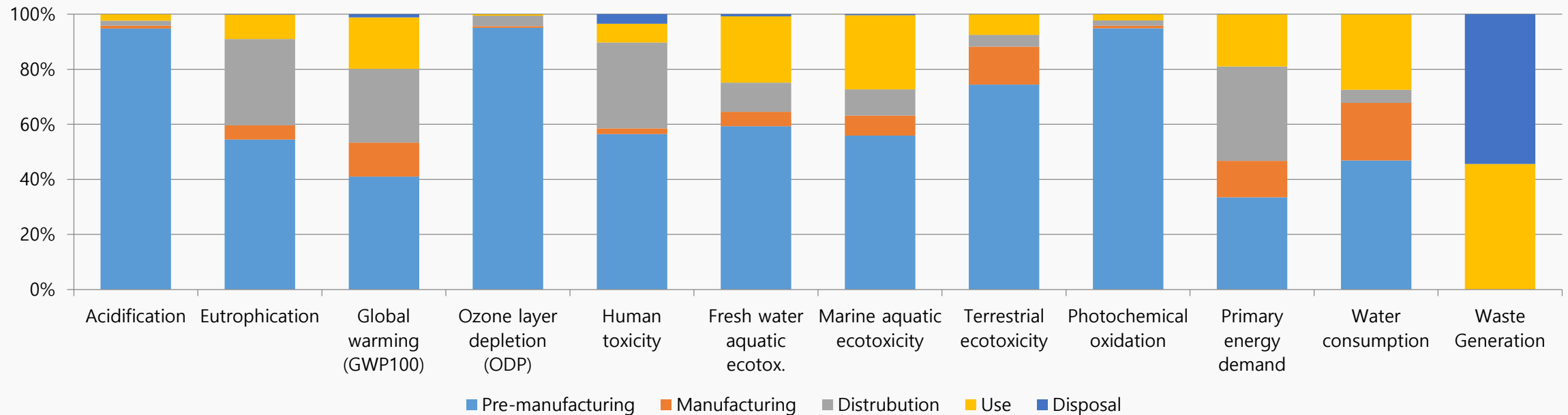


Model name	SM-N950U (Galaxy Note8)
Processor	Qualcomm 2.35GHz, 1.9GHz Octa-Core 64bit
Dimension	162.5 x 74.8 x 8.6 mm
Display	6.3" 2960 x 1440, 16M In-Cell Touch LCD
Battery	Li-Ion 3300 mAh
Camera	12 MP / 5MP
Wt.(g)	186.34g

● Material Use



● Characterized Environment Impact

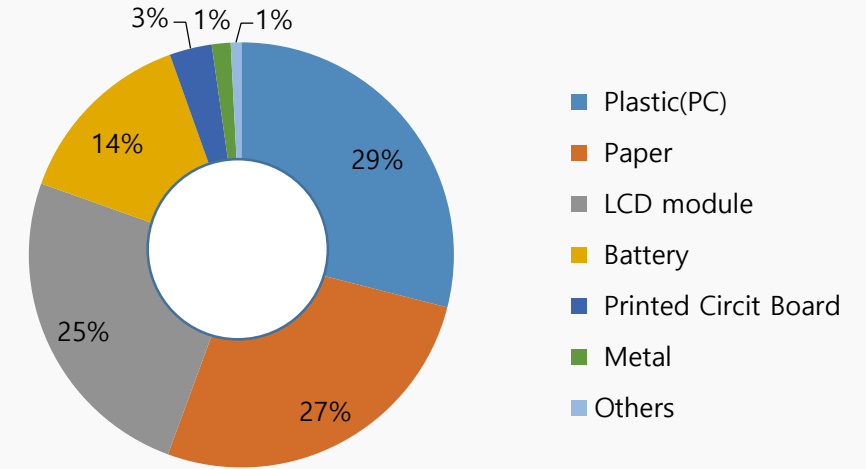


● Product Features

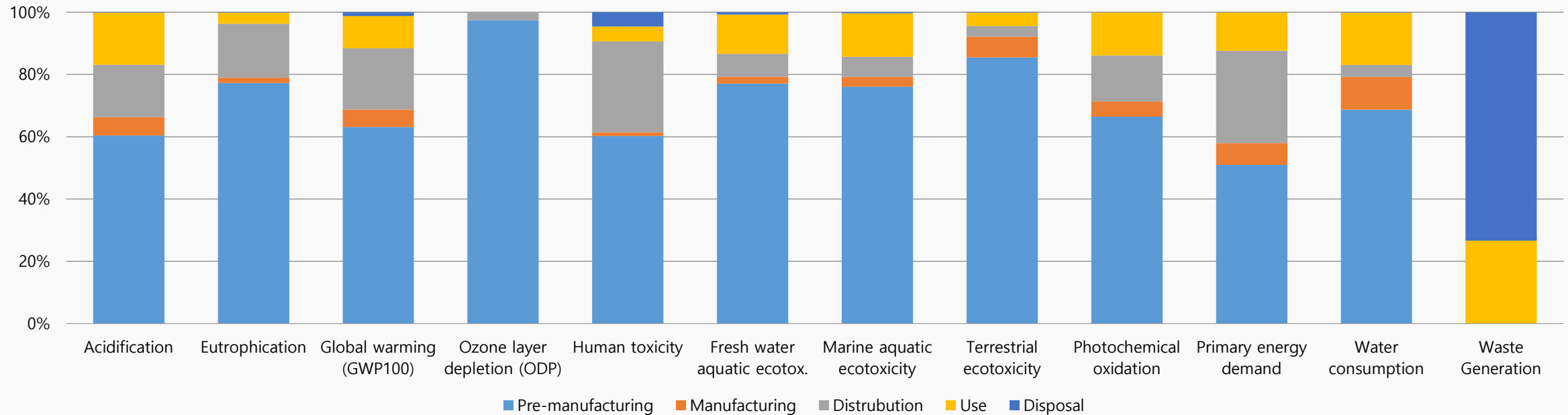


Model name	SM-T280 (Galaxy Tab A 7.0)
Processor	Quad-Core
Dimension	186.9 x 108.8 x 8.7 mm
Display	1280 x 800 (WXGA) TFT
Battery	Li-Ion 4000mAh
Camera	5.0 MP / 2.0 MP
Wt.(g)	283 g

● Material Use



● Characterized Environment Impact

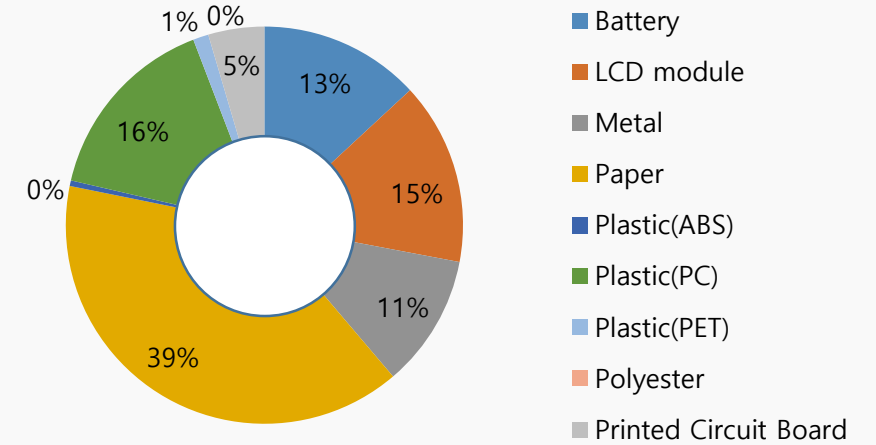


● Product Features

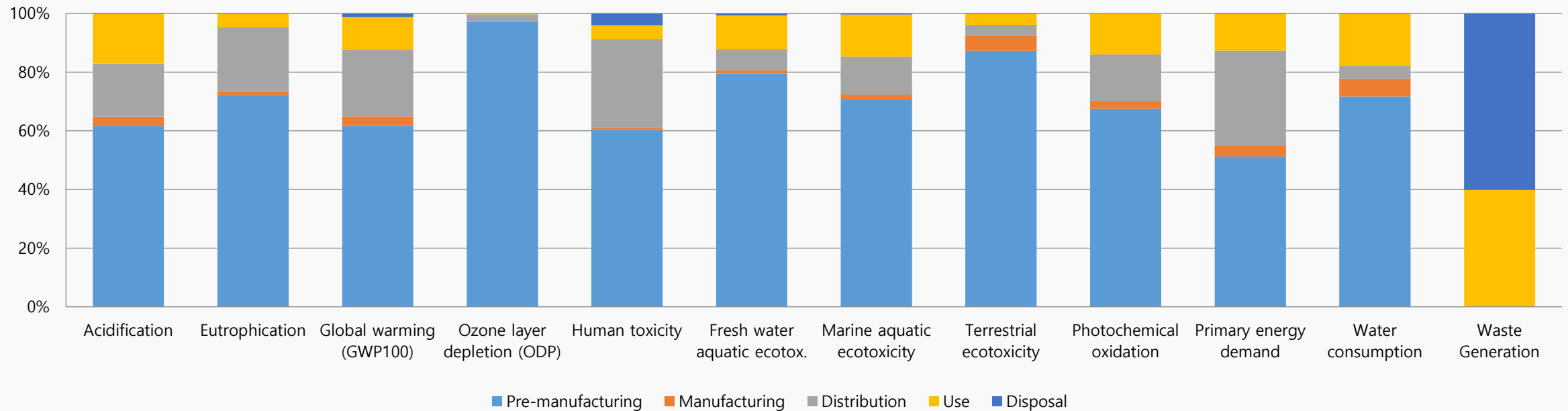


Model name	SM-T817V (Galaxy Tab S2)
Processor	Octa-Core 1.9 GHz, 1.3 GHz
Dimension	237.3 x 169.0 x 5.6 mm
Display	AMOLED 10.1"
Battery	Li-Ion 5870mAh
Camera	8 MP / 2.1MP
Wt.(g)	379 g

● Material Use



● Characterized Environment Impact

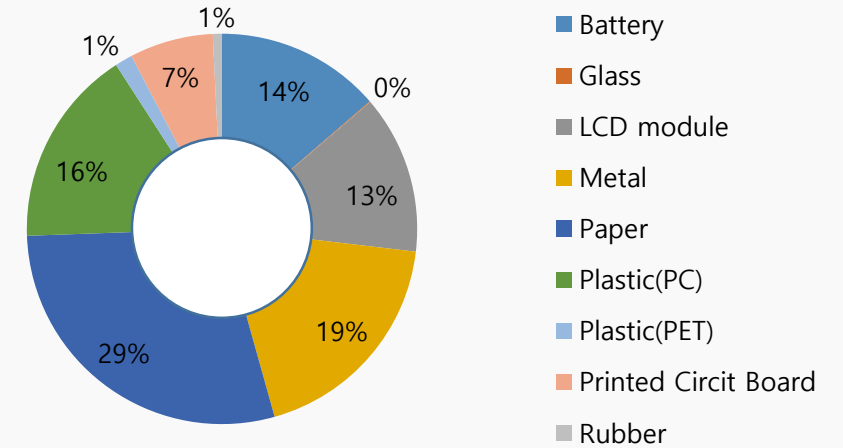


● Product Features

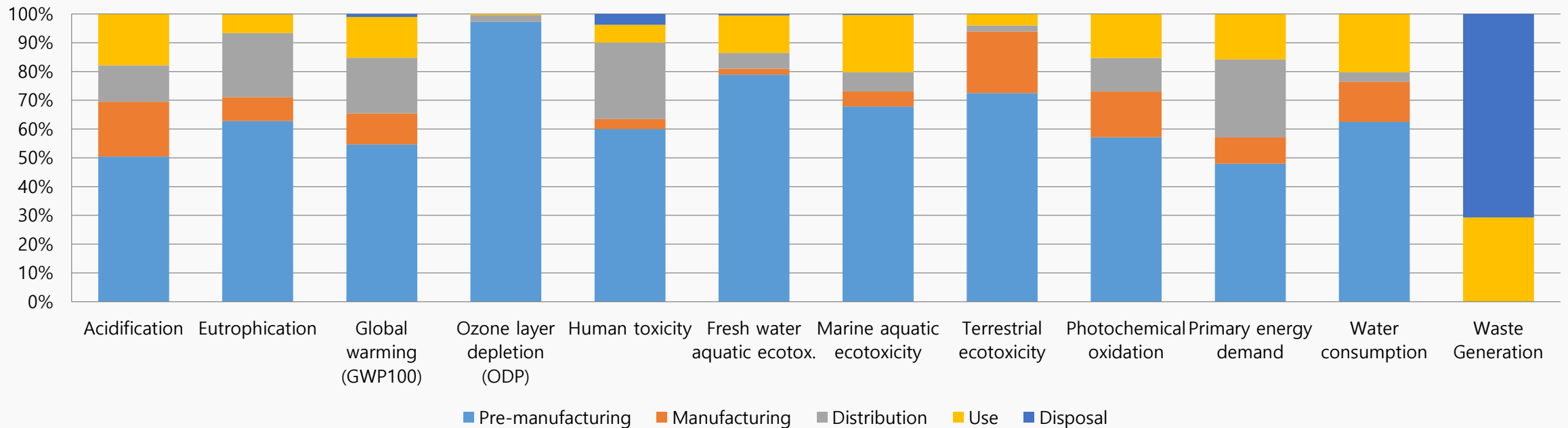


Model name	SM-G5510 (Galaxy On5x)
Processor	Quad-Core1.4GHz
Dimension	142.8 x 69.5 x 8.1 mm
Display	LCD 5"
Battery	Li-Ion 2600 mAh
Camera	12 MP / 5MP
Wt.(g)	149 g

● Material Use



● Characterized Environment Impact

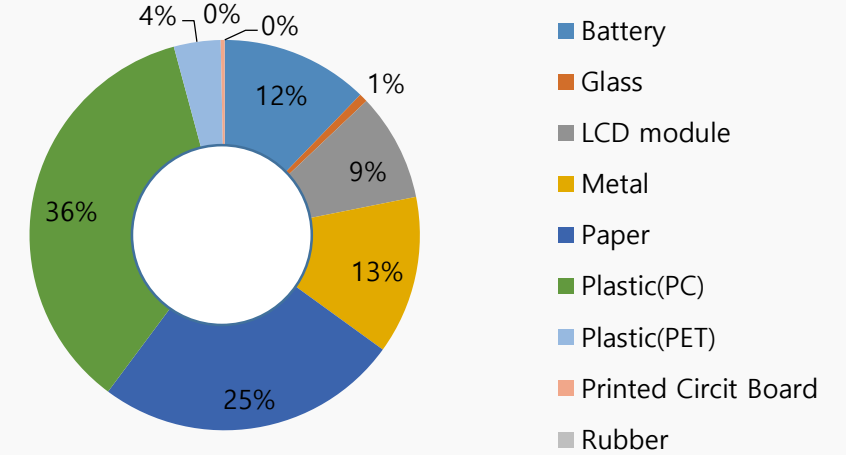


● Product Features

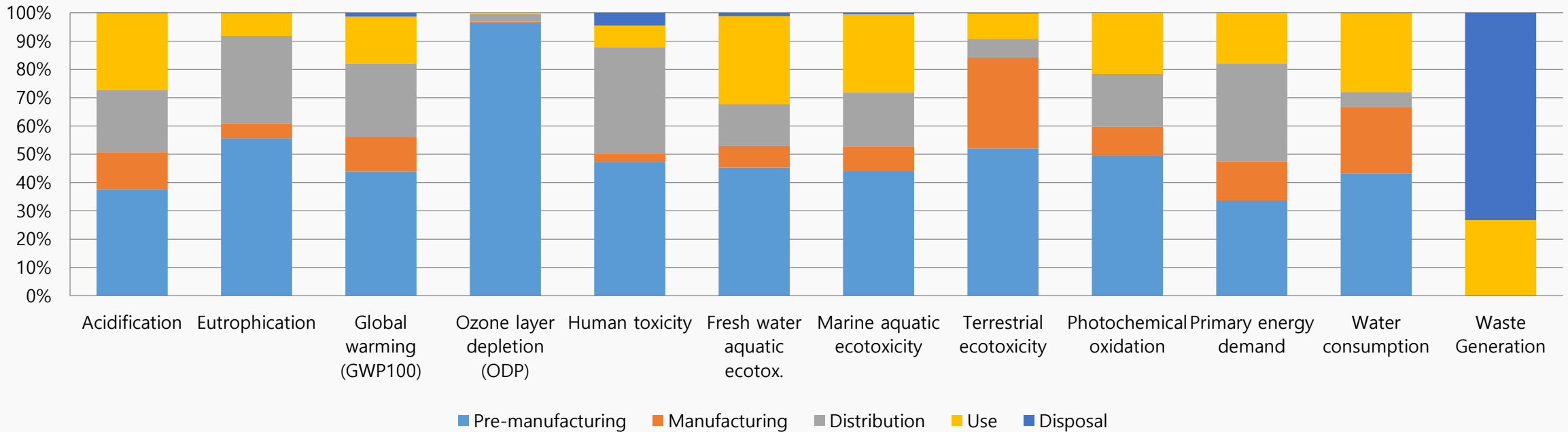


Model name	SM-J120A (Galaxy J1x)
Processor	Quad-core 1.2 GHz
Dimension	132.6 x 69.3 x 8.9 mm
Display	AMOLED 4.5"
Memory	microSD, up to 128 GB
Battery	Li-Ion 2050 mAh
Camera	5 MP
Wt.(g)	132 g

● Material Use



● Characterized Environment Impact

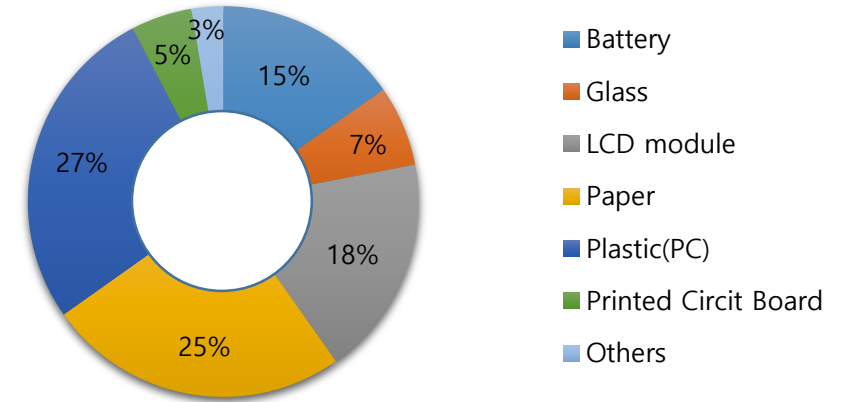


● Product Features

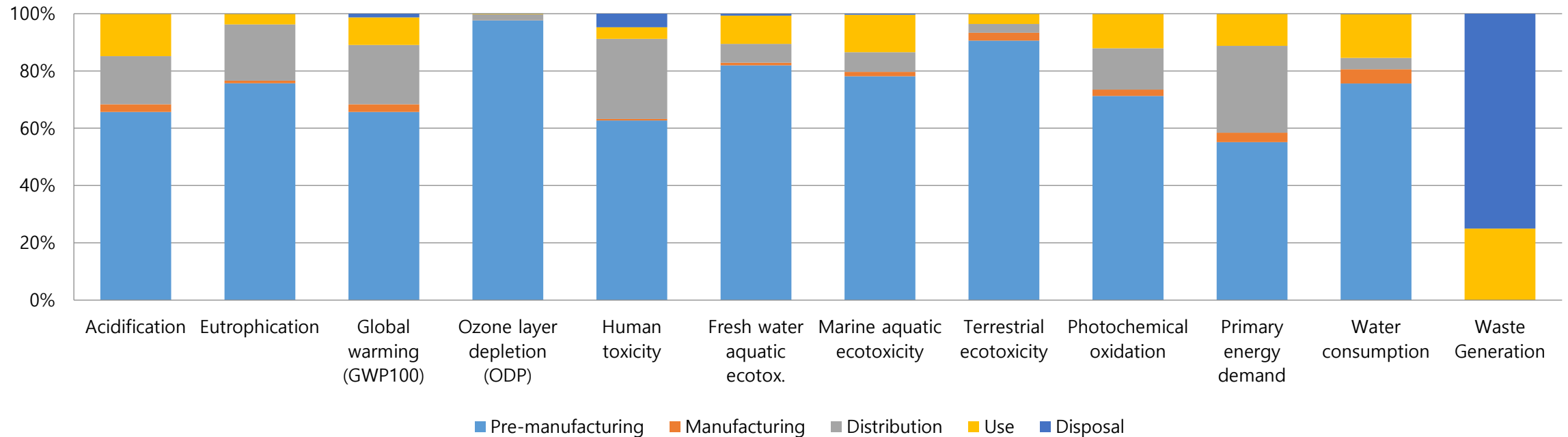


Model name	SM-T377P (Galaxy TAB E)
Processor	Quad-Core 1.2GHz
Dimension	212.1 x 126.0 x 8.9 mm
Display	TFT 8.0"
Memory	1.5GB RAM
Battery	5000mAh
Camera	Main : 5M pixel / Front : 2M pixel
Wt.(g)	Product : 192g / Packaging 259g

● Material Use



● Characterized Environment Impact

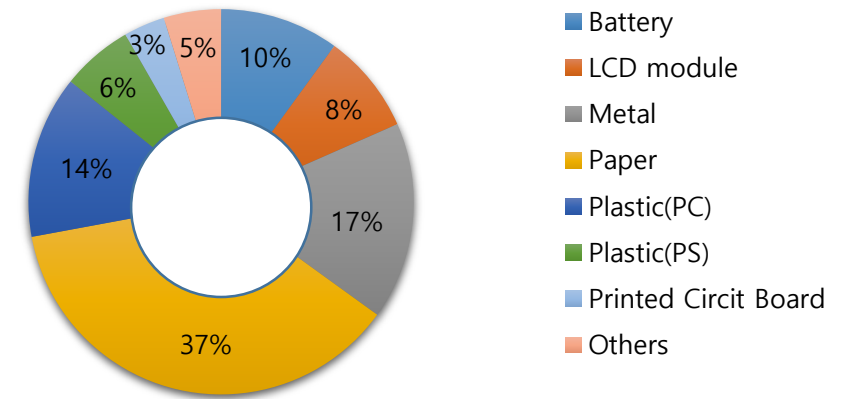


● Product Features

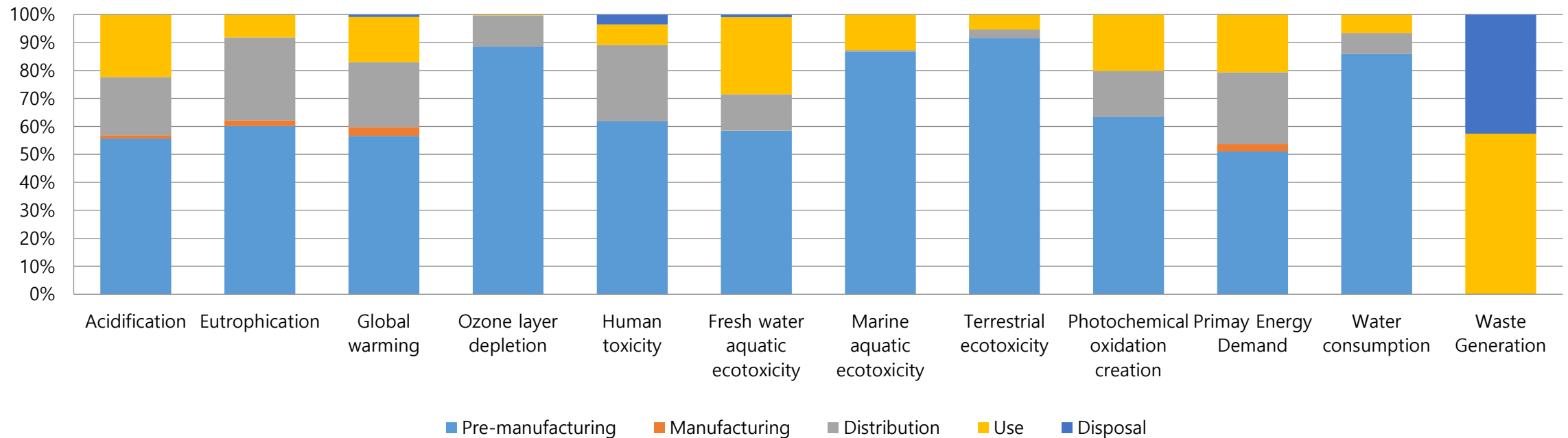


Model name	SM-N920V (Galaxy Note5)
Processor	Octa-Core 2.1GHz, 1.5GHz
Dimension	153.2 x 76.2 x 7.62 mm
Display	Super AMOLED 5.7"
Memory	32GB, 4GB RAM
Battery	3000mAh
Camera	Main : 16M pixel / Front : 5M pixel
Wt.(g)	Product : 192g / Packaging 259 g

● Material Use



● Characterized Environment Impact

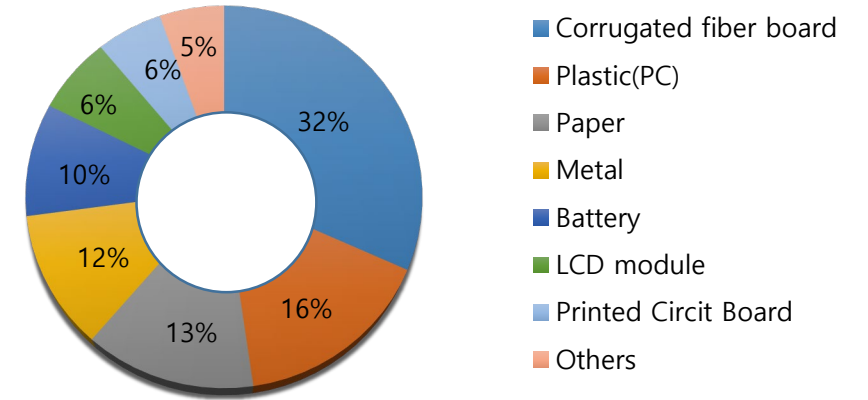


● Product Features

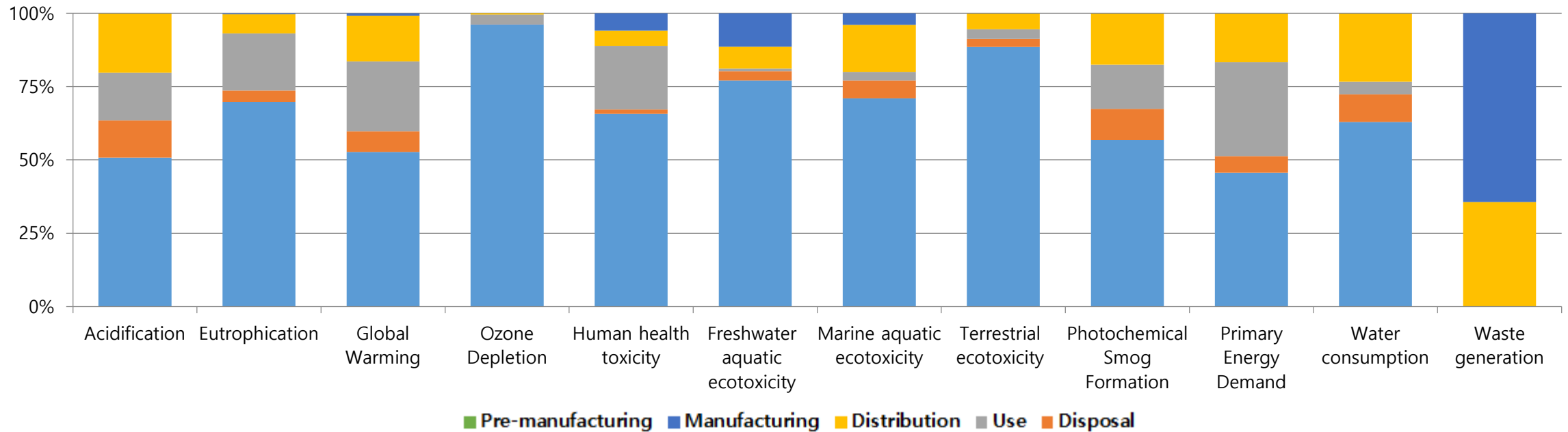


Model name	SM-G920V (Galaxy S6)
Processor	Octa-Core 2.1GHz, 1.5GHz
Dimension	143.4 x 70.5 x 6.8 mm
Display	Super AMOLED 5.1"
Memory	32GB
Battery	2550mAh
Camera	Main : 16M pixel / Front : 5M pixel
Wt.(g)	Product : 138g / Packaging 261 g

● Material Use



● Characterized Environment Impact



Life Cycle Assessment for Galaxy Note20 Ultra

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

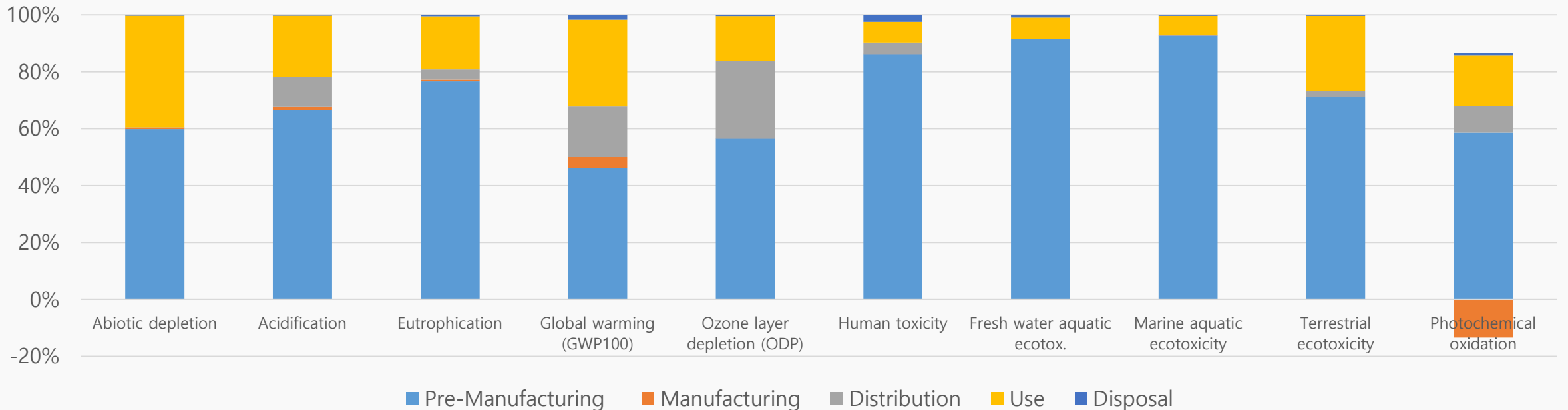


Model name	SM-N986B (Galaxy Note20 Ultra)
Processor	Octa-Core 3.09GHz,2.4GHz,1.8GHz
Dimension	164.8 × 77.2 × 8.1mm
Display	OLED 6.9"
Memory	ROM 256GB, RAM 12GB
Battery	4500 mAh
Camera	Main : 108M pixel / Sub : 10M pixel
Weight	Product&Acc. : 303.79g / PKG 252.14g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	1.69E-01	kg Sb eq.	1.01E-01	1.05E-03	1.00E-05	6.63E-02	5.22E-04
Acidification	1.88E-01	kg SO ₂ eq.	1.25E-01	2.17E-03	2.01E-02	4.03E-02	5.63E-04
Eutrophication	9.56E-02	kgPO ₄ ³⁻ eq.	7.33E-02	5.72E-04	3.43E-03	1.78E-02	5.24E-04
Global warming (GWP100)	2.97E+01	kg CO ₂ eq.	1.37E+01	1.18E+00	5.28E+00	9.10E+00	5.02E-01
Ozone layer depletion (ODP)	2.46E-06	kg CFC-11 eq.	1.39E-06	3.27E-11	6.72E-07	3.85E-07	1.13E-08
Human toxicity	1.06E+02	kg 1,4-DB eq.	9.12E+01	5.03E-05	4.26E+00	7.68E+00	2.62E+00
Fresh water aquatic ecotox.	8.71E+01	kg 1,4-DB eq.	7.98E+01	1.03E-04	3.76E-02	6.43E+00	8.40E-01
Marine aquatic ecotoxicity	1.31E+05	kg 1,4-DB eq.	1.21E+05	8.60E-02	3.71E+02	8.80E+03	5.11E+02
Terrestrial ecotoxicity	2.09E-01	kg 1,4-DB eq.	1.49E-01	3.13E-06	4.60E-03	5.50E-02	7.38E-04
Photochemical oxidation	6.59E-03	kg C ₂ H ₄ eq.	5.27E-03	-1.21E-03	8.52E-04	1.60E-03	7.47E-05

● Characterized Environment Impact



Life Cycle Assessment for Galaxy Tab S7+

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its Tablets. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

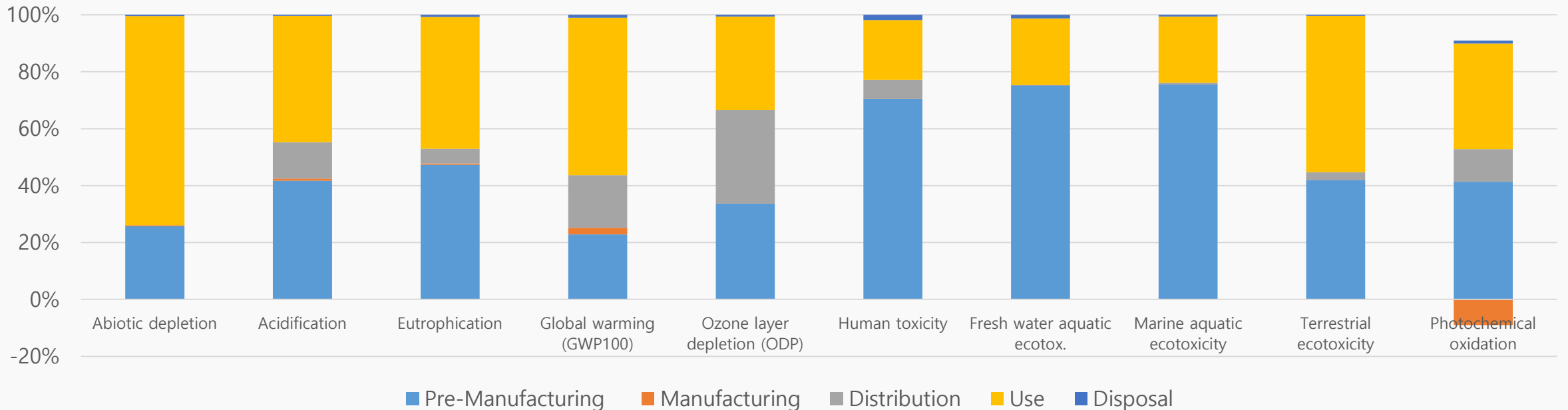


Model name	SM-T976B (Galaxy Tab S7+)
Processor	Qualcomm, SM8250 Pro, 3.09GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	185.0 × 285.0 × 5.7mm
Display	AMOLED 12.4"
Memory	ROM 128GB, RAM 6GB
Battery	9800 mAh
Camera	Main : 13.0M pixel / Sub : 8.0M pixel
Weight	Product&Acc. : 644.83g / PKG : 301.80g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	2.81E-01	kg Sb eq.	7.22E-02	1.05E-03	1.80E-05	2.06E-01	1.22E-03
Acidification	2.83E-01	kg SO ₂ eq.	1.18E-01	2.17E-03	3.61E-02	1.25E-01	1.09E-03
Eutrophication	1.19E-01	kgPO ₄ ³⁻ eq.	5.65E-02	5.72E-04	6.17E-03	5.53E-02	8.61E-04
Global warming (GWP100)	5.12E+01	kg CO ₂ eq.	1.17E+01	1.18E+00	9.49E+00	2.83E+01	5.44E-01
Ozone layer depletion (ODP)	3.66E-06	kg CFC-11 eq.	1.23E-06	3.27E-11	1.21E-06	1.20E-06	2.23E-08
Human toxicity	1.14E+02	kg 1,4-DB eq.	8.05E+01	5.03E-05	7.66E+00	2.39E+01	2.16E+00
Fresh water aquatic ecotox.	8.55E+01	kg 1,4-DB eq.	6.43E+01	1.03E-04	6.76E-02	2.00E+01	1.11E+00
Marine aquatic ecotoxicity	1.18E+05	kg 1,4-DB eq.	8.90E+04	8.60E-02	6.67E+02	2.74E+04	7.06E+02
Terrestrial ecotoxicity	3.12E-01	kg 1,4-DB eq.	1.31E-01	3.13E-06	8.27E-03	1.71E-01	1.23E-03
Photochemical oxidation	1.10E-02	kg C ₂ H ₄ eq.	5.54E-03	-1.21E-03	1.53E-03	4.97E-03	1.48E-04

● Characterized Environment Impact



Life Cycle Assessment for Galaxy Tab S7

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its Tablets. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

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LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

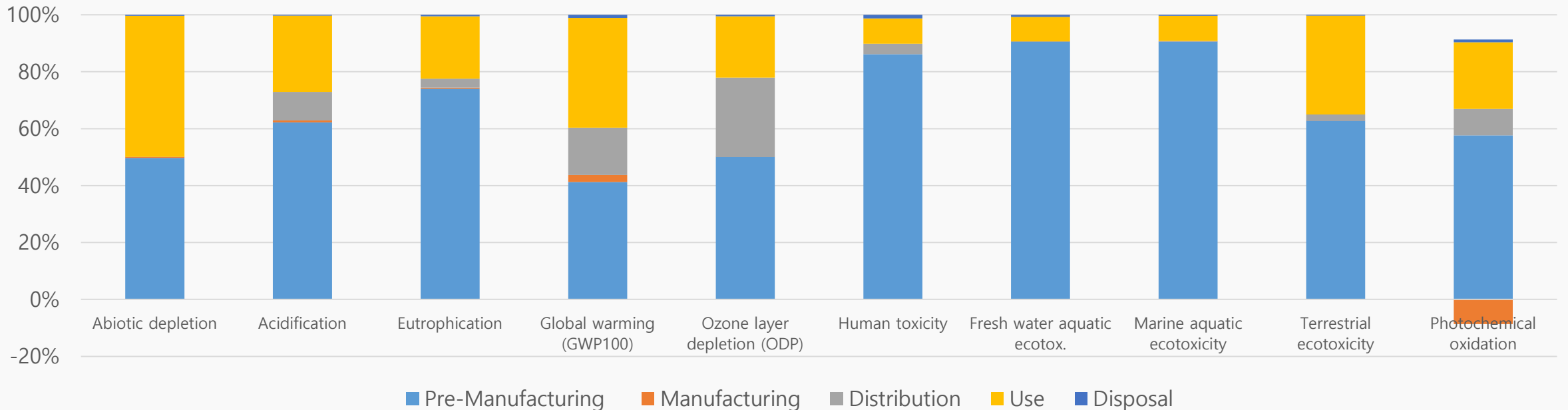


Model name	SM-T875 (Galaxy Tab S7)
Processor	Qualcomm, SM8250 Pro, 3.09GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	165.3 × 253.8 × 6.3mm
Display	In-Cell Touch LCD 10.95"
Memory	ROM 128GB, RAM 6GB
Battery	7760 mAh
Camera	Main : 13.0M pixel / Sub : 8.0M pixel
Weight	Product&Acc. : 574.49g / PKG : 270.26g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	2.73E-01	kg Sb eq.	1.36E-01	1.05E-03	1.52E-05	1.35E-01	9.71E-04
Acidification	3.06E-01	kg SO ₂ eq.	1.90E-01	2.17E-03	3.05E-02	8.21E-02	8.80E-04
Eutrophication	1.65E-01	kg PO ₄ ³⁻ eq.	1.22E-01	5.72E-04	5.21E-03	3.62E-02	8.17E-04
Global warming (GWP100)	4.82E+01	kg CO ₂ eq.	1.99E+01	1.18E+00	8.02E+00	1.86E+01	5.34E-01
Ozone layer depletion (ODP)	3.65E-06	kg CFC-11 eq.	1.82E-06	3.27E-11	1.02E-06	7.86E-07	1.97E-08
Human toxicity	1.76E+02	kg 1,4-DB eq.	1.52E+02	5.03E-05	6.47E+00	1.57E+01	2.18E+00
Fresh water aquatic ecotox.	1.53E+02	kg 1,4-DB eq.	1.39E+02	1.03E-04	5.71E-02	1.31E+01	1.18E+00
Marine aquatic ecotoxicity	2.02E+05	kg 1,4-DB eq.	1.83E+05	8.60E-02	5.63E+02	1.79E+04	7.03E+02
Terrestrial ecotoxicity	3.23E-01	kg 1,4-DB eq.	2.03E-01	3.13E-06	6.99E-03	1.12E-01	1.03E-03
Photochemical oxidation	1.15E-02	kg C ₂ H ₄ eq.	8.03E-03	-1.21E-03	1.29E-03	3.26E-03	1.34E-04

● Characterized Environment Impact



Life Cycle Assessment for Galaxy Z Fold3

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

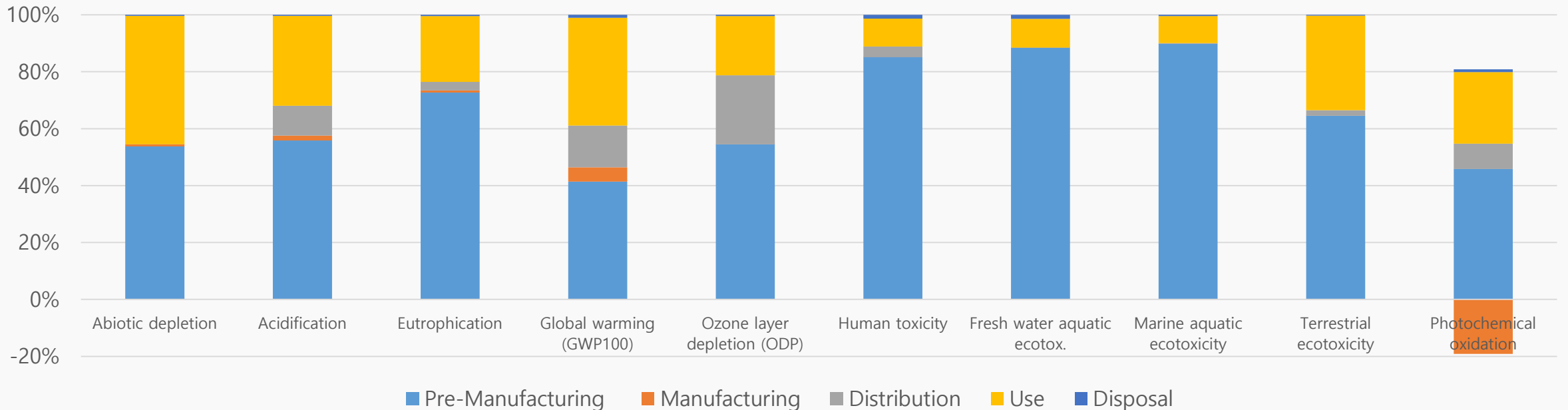


Model name	SM-F926B (Galaxy Z Fold3)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	158.2 * 128.1 * 6.4mm
Display	Main OLED 7.6", SUB 6.2"
Memory	ROM 256GB, RAM 12GB
Battery	4275 mAh
Camera	Main : 12.0M pixel / Sub : 4.0M pixel
Weight	Product&Acc. : 290.16g / PKG : 209.87g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	1.97E-01	kg Sb eq.	1.06E-01	1.42E-03	8.99E-06	8.92E-02	6.64E-04
Acidification	1.72E-01	kg SO ₂ eq	9.58E-02	2.95E-03	1.80E-02	5.41E-02	6.35E-04
Eutrophication	1.03E-01	kg PO ₄ ³⁻ eq	7.51E-02	7.78E-04	3.08E-03	2.39E-02	4.95E-04
Global warming (GWP100)	3.23E+01	kg CO ₂ eq	1.34E+01	1.61E+00	4.74E+00	1.22E+01	3.38E-01
Ozone layer depletion (ODP)	2.49E-06	kg CFC11 eq	1.36E-06	4.45E-11	6.03E-07	5.18E-07	1.18E-08
Human toxicity	1.05E+02	kg 1,4-DB eq	8.98E+01	6.84E-05	3.83E+00	1.03E+01	1.40E+00
Fresh water aquatic ecotox.	8.56E+01	kg 1,4-DB eq	7.57E+01	1.39E-04	3.38E-02	8.64E+00	1.20E+00
Marine aquatic ecotoxicity	1.25E+05	kg 1,4-DB eq	1.12E+05	1.17E-01	3.33E+02	1.18E+04	5.53E+02
Terrestrial ecotoxicity	2.22E-01	kg 1,4-DB eq	1.44E-01	4.26E-06	4.13E-03	7.39E-02	6.96E-04
Photochemical oxidation	5.27E-03	kg C ₂ H ₄ eq.	3.92E-03	-1.64E-03	7.65E-04	2.15E-03	8.25E-05

● Characterized Environment Impact



Life Cycle Assessment for Galaxy Z Flip3

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

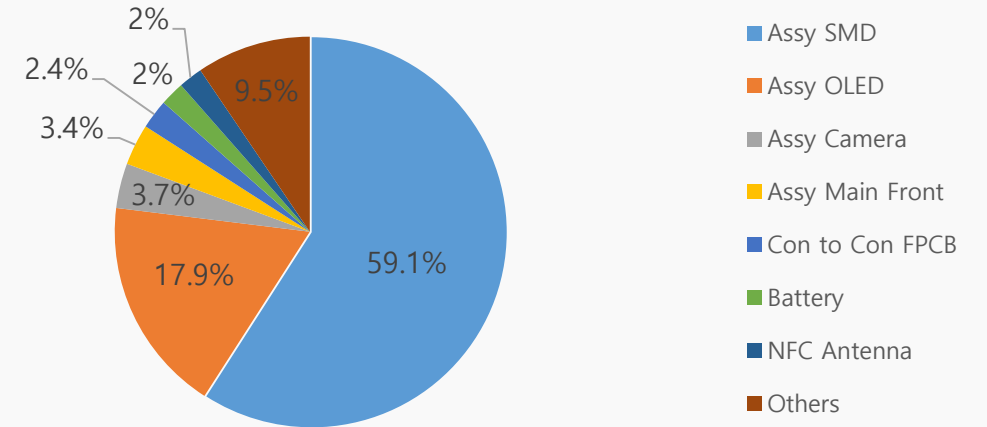
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

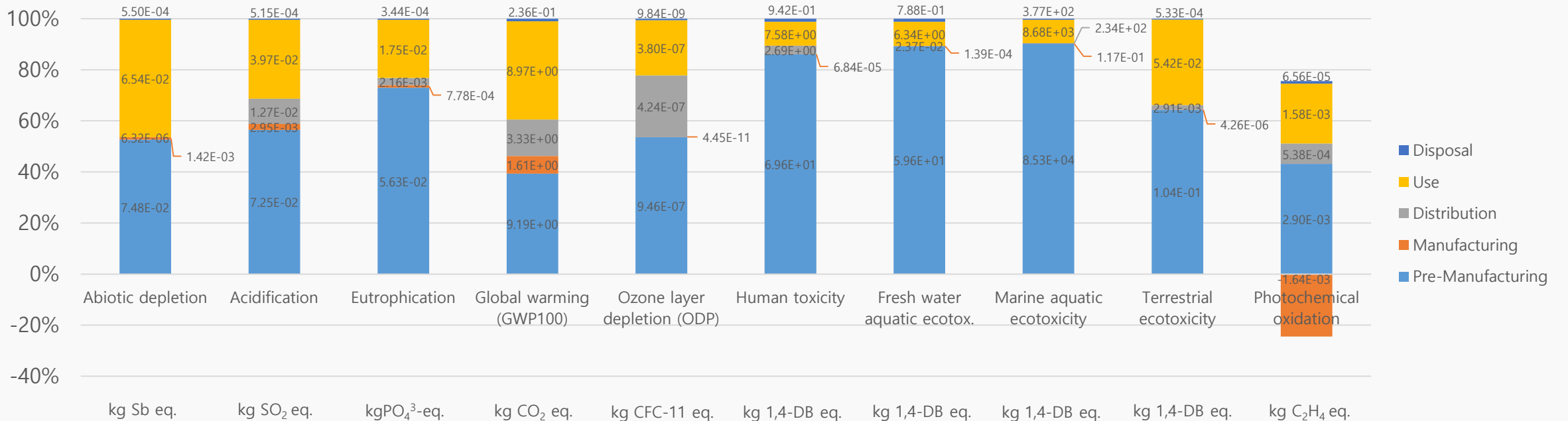


Model name	SM-F711B (Galaxy Z Flip3)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	166.0 * 72.2 * - mm
Display	Main OLED 6.7", SUB 1.9"
Memory	ROM 128GB, RAM 8GB
Battery	3300 mAh
Camera	Main : 12.0M pixel / Sub : 10.0M pixel
Weight	Product&Acc. : 209.49g / PKG : 142.25g

● Global Warming Impact of Part



● Characterized Environment Impact



Life Cycle Assessment for Galaxy A12

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

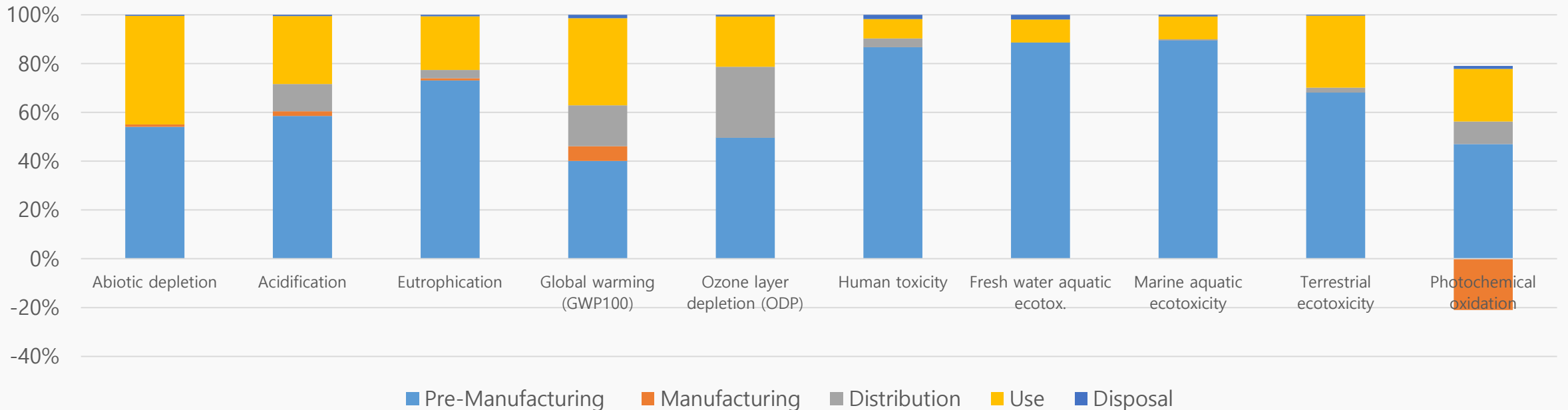


Model name	SM-A127F (Galaxy A12)
Processor	SEC, S5E3830(Exynos 850), 2GHz Octa-Core 64bit
Dimension	164 × 75.8 × 8.9mm
Display	In-Cell Touch LCD 6.5"
Memory	ROM 32GB, RAM 3GB
Battery	4900 mAh
Camera	Main : 48.0M pixel / Sub : 8.0M pixel
Weight	Product&Acc. : 268.45g / PKG : 93.77g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	1.20E-01	kg Sb eq.	6.49E-02	1.08E-03	6.52E-06	5.34E-02	5.31E-04
Acidification	1.16E-01	kg SO ₂ eq.	6.81E-02	2.25E-03	1.31E-02	3.24E-02	5.67E-04
Eutrophication	6.51E-02	kgPO ₄ ³⁻ eq.	4.76E-02	5.94E-04	2.23E-03	1.43E-02	3.96E-04
Global warming (GWP100)	2.05E+01	kg CO ₂ eq.	8.24E+00	1.23E+00	3.44E+00	7.32E+00	2.92E-01
Ozone layer depletion (ODP)	1.51E-06	kg CFC-11 eq.	7.48E-07	3.39E-11	4.37E-07	3.10E-07	1.10E-08
Human toxicity	7.76E+01	kg 1,4-DB eq.	6.73E+01	5.22E-05	2.77E+00	6.18E+00	1.32E+00
Fresh water aquatic ecotox.	5.51E+01	kg 1,4-DB eq.	4.89E+01	1.06E-04	2.45E-02	5.17E+00	1.06E+00
Marine aquatic ecotoxicity	7.52E+04	kg 1,4-DB eq.	6.74E+04	8.92E-02	2.41E+02	7.08E+03	4.96E+02
Terrestrial ecotoxicity	1.50E-01	kg 1,4-DB eq.	1.02E-01	3.25E-06	3.00E-03	4.42E-02	5.83E-04
Photochemical oxidation	3.47E-03	kg C ₂ H ₄ eq.	2.81E-03	-1.25E-03	5.54E-04	1.29E-03	7.23E-05

● Characterized Environment Impact



Life Cycle Assessment for Galaxy S20 FE

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

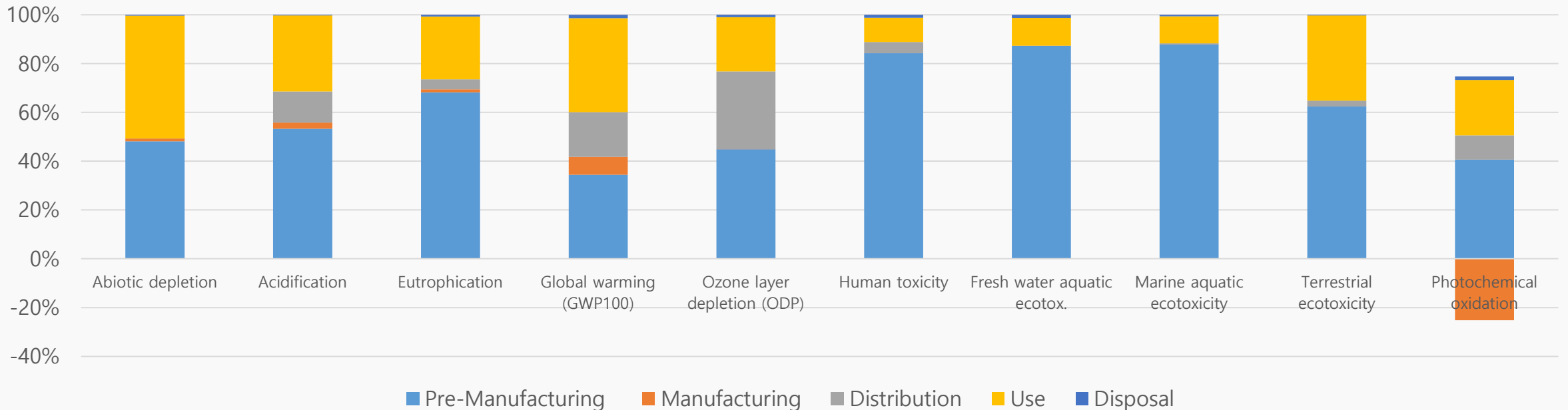


Model name	SM-G781B (Galaxy S20 FE)
Processor	Qualcomm, SM8250, 2.8GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	159.8 * 74.5 * 8.4mm
Display	On-Cell Touch AMOLED, 6.5"
Memory	ROM 128GB, RAM 6GB
Battery	4370 mAh
Camera	Main : 12.0M pixel / Sub : 32.0M pixel
Weight	Product&Acc. : 253.74g / PKG : 229.66g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	1.40E-01	kg Sb eq.	6.72E-02	1.62E-03	8.69E-06	7.03E-02	4.74E-04
Acidification	1.37E-01	kg SO ₂ eq.	7.29E-02	3.37E-03	1.74E-02	4.27E-02	3.07E-04
Eutrophication	7.30E-02	kg PO ₄ ³⁻ eq.	4.98E-02	8.88E-04	2.97E-03	1.88E-02	5.15E-04
Global warming (GWP100)	2.50E+01	kg CO ₂ eq.	8.63E+00	1.84E+00	4.58E+00	9.64E+00	3.56E-01
Ozone layer depletion (ODP)	1.83E-06	kg CFC-11 eq.	8.22E-07	5.08E-11	5.83E-07	4.08E-07	1.72E-08
Human toxicity	8.20E+01	kg 1,4-DB eq.	6.92E+01	7.81E-05	3.69E+00	8.14E+00	1.03E+00
Fresh water aquatic ecotox.	6.02E+01	kg 1,4-DB eq.	5.25E+01	1.59E-04	3.26E-02	6.81E+00	8.05E-01
Marine aquatic ecotoxicity	8.41E+04	kg 1,4-DB eq.	7.40E+04	1.33E-01	3.22E+02	9.33E+03	4.84E+02
Terrestrial ecotoxicity	1.67E-01	kg 1,4-DB eq.	1.04E-01	4.86E-06	3.99E-03	5.83E-02	4.36E-04
Photochemical oxidation	3.70E-03	kg C ₂ H ₄ eq.	3.03E-03	-1.88E-03	7.39E-04	1.69E-03	1.14E-04

● Characterized Environment Impact



Life Cycle Assessment for Galaxy Tab Active Pro

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its Tablets. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

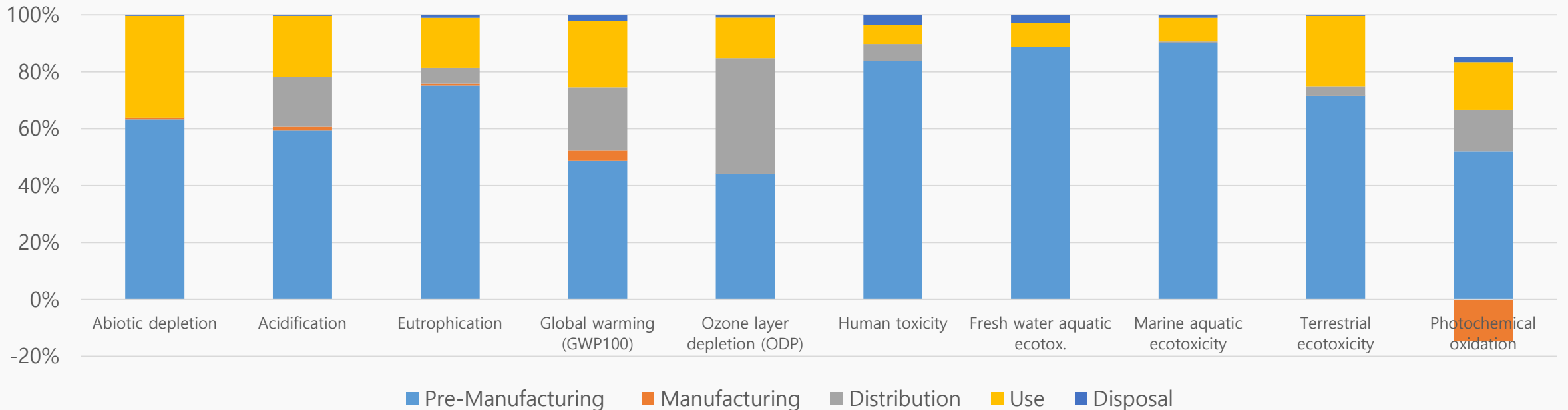


Model name	SM-T545 (Galaxy Tab Active Pro)
Processor	Qualcomm, SDM670, 2GHz, 1.7GHz Oct a-Core 64bit
Dimension	170.2 * 243.5 * 9.9mm
Display	LCD, 10.1"
Memory	ROM 64GB, RAM 4GB
Battery	7400 mAh
Camera	Main : 13.0M pixel / Sub : 8.0M pixel
Weight	Product&Acc. : 948.94g / PKG : 520.43g

● Numerical environmental impact

Impact category	Total	Unit	Pre-Manu facturing	Manu facturing	Distribution	Use	Disposal
Abiotic depletion	2.99E-01	kg Sb eq.	1.89E-01	1.97E-03	2.65E-05	1.07E-01	1.19E-03
Acidification	3.02E-01	kg SO ₂ eq.	1.79E-01	4.09E-03	5.30E-02	6.48E-02	1.10E-03
Eutrophication	1.63E-01	kgPO ₄ ³⁻ eq.	1.22E-01	1.08E-03	9.06E-03	2.86E-02	1.67E-03
Global warming (GWP100)	6.28E+01	kg CO ₂ eq.	3.06E+01	2.23E+00	1.40E+01	1.46E+01	1.39E+00
Ozone layer depletion (ODP)	4.37E-06	kg CFC-11 eq.	1.93E-06	6.16E-11	1.78E-06	6.20E-07	4.23E-08
Human toxicity	1.86E+02	kg 1,4-DB eq.	1.56E+02	9.47E-05	1.13E+01	1.24E+01	6.71E+00
Fresh water aquatic ecotox.	1.22E+02	kg 1,4-DB eq.	1.08E+02	1.93E-04	9.94E-02	1.03E+01	3.36E+00
Marine aquatic ecotoxicity	1.71E+05	kg 1,4-DB eq.	1.54E+05	1.62E-01	9.80E+02	1.42E+04	1.84E+03
Terrestrial ecotoxicity	3.59E-01	kg 1,4-DB eq.	2.57E-01	5.90E-06	1.22E-02	8.85E-02	1.39E-03
Photochemical oxidation	1.08E-02	kg C ₂ H ₄ eq.	8.01E-03	-2.28E-03	2.25E-03	2.57E-03	2.86E-04

● Characterized Environment Impact



Life Cycle Assessment for Galaxy S21 FE

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its smart phones. The assessment considers potential environmental impacts across the whole life cycle including; pre-manufacturing; product manufacturing; distribution; product use; and disposal phase. To ensure technical quality; the analysis methodology has been completed according to international standard ISO 14040 series. Samsung has used SimaPro 9.1.1.1 software and a dedicated LCA S/W database to measure environmental impacts using a wide range of data categories including; Product bill of material(BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data in order to attain the highest level of accuracy. The outcome of the LCA confirmed and quantified 10 potential environment impact categories including; global warming; abiotic depletion; ocean acidification; eutrophication; and ozone layer depletion; where each impact category has been assessed for each life cycle stage. These LCA results will continue to be considered during product development phase as we aspire to improve the environmental specifications of our products.

● Calculation basis

Standard	ISO 14040:2006 and 14044:2006
Database	Ecoinvent 3.6
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 / the Netherlands, 1997 as provided in the SimaPro 9.1.1.1 LCA tool
LCA software	SimaPro 9.1.1.1

● System boundary of LCA

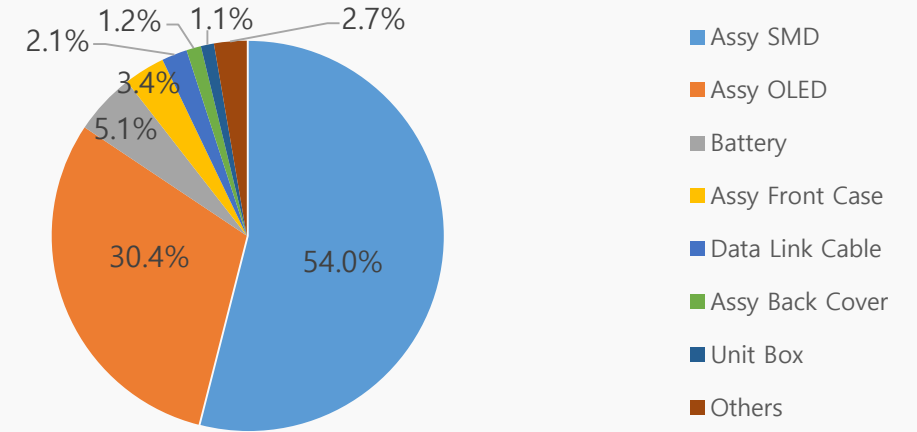
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features



Model name	SM-G990B (Galaxy S21 FE)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	155.7 * 74.5 * 7.9mm
Display	OLED 6.4"
Memory	ROM 128GB, RAM 6GB
Battery	4370 mAh
Camera	Main : 12.0M pixel / Sub : 32.0M pixel
Weight	Product&Acc. : 202.11g / PKG : 136.43g

● Global Warming Impact of Part



● Characterized Environment Impact

