

Life Cycle Assessment for Galaxy Z Fold4

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

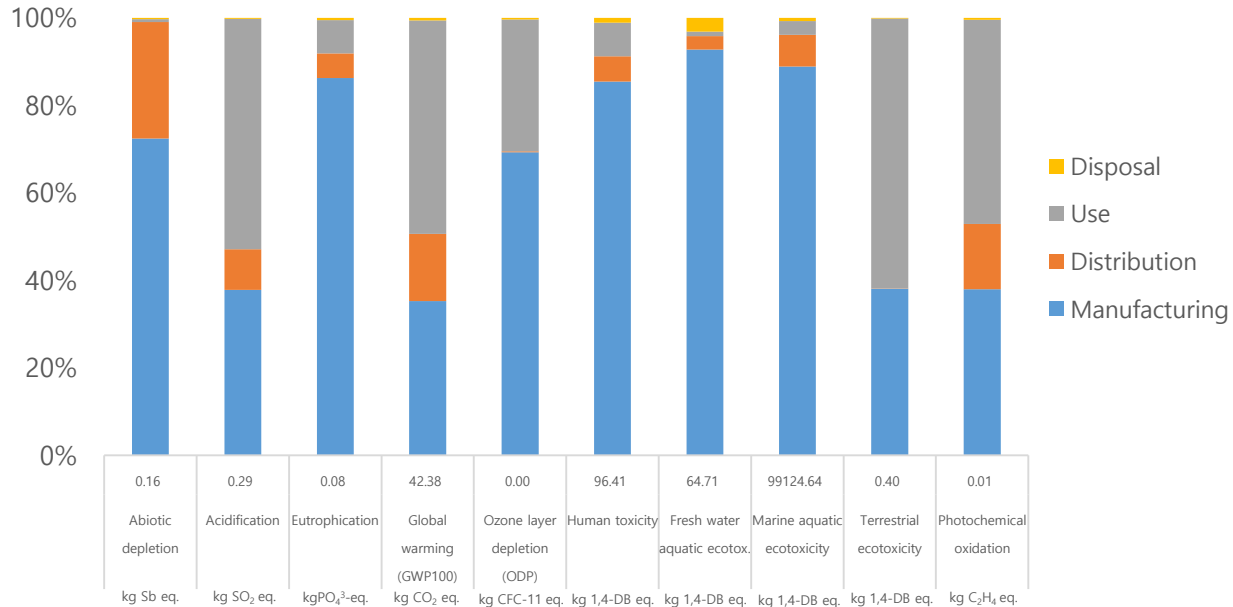
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

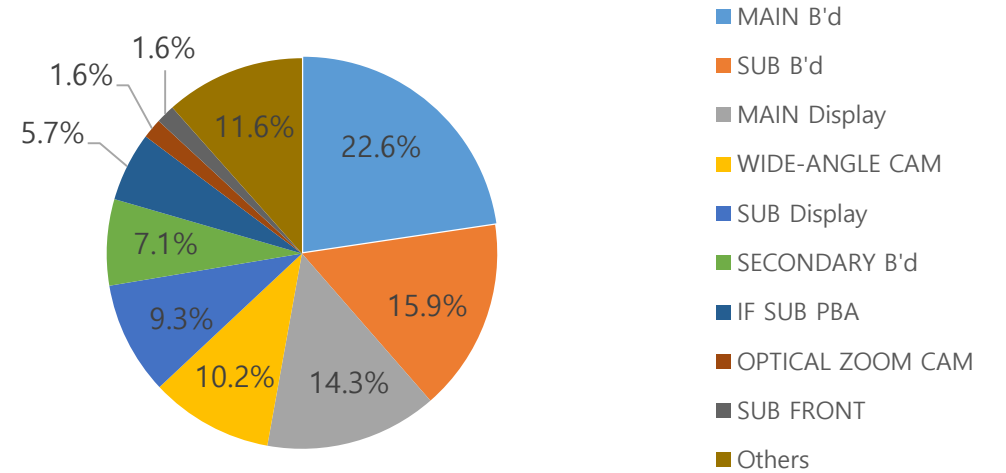


Model name	Galaxy Z Fold4
Dimension	155.1 x 130.1 x 6.3 mm
Display (Main / Sub)	OLED 7.6" / 6.2"
Weight	Product&Acc. : 284.72 g Packages : 189.03 g

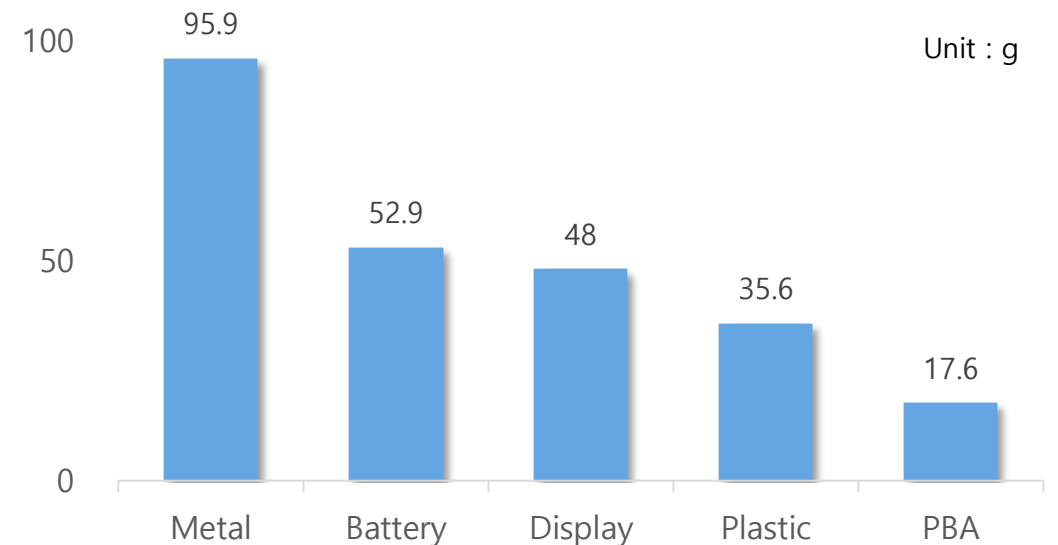
● Characterized Environment Impact



● Global Warming Impact Profile



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy Z Flip4

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

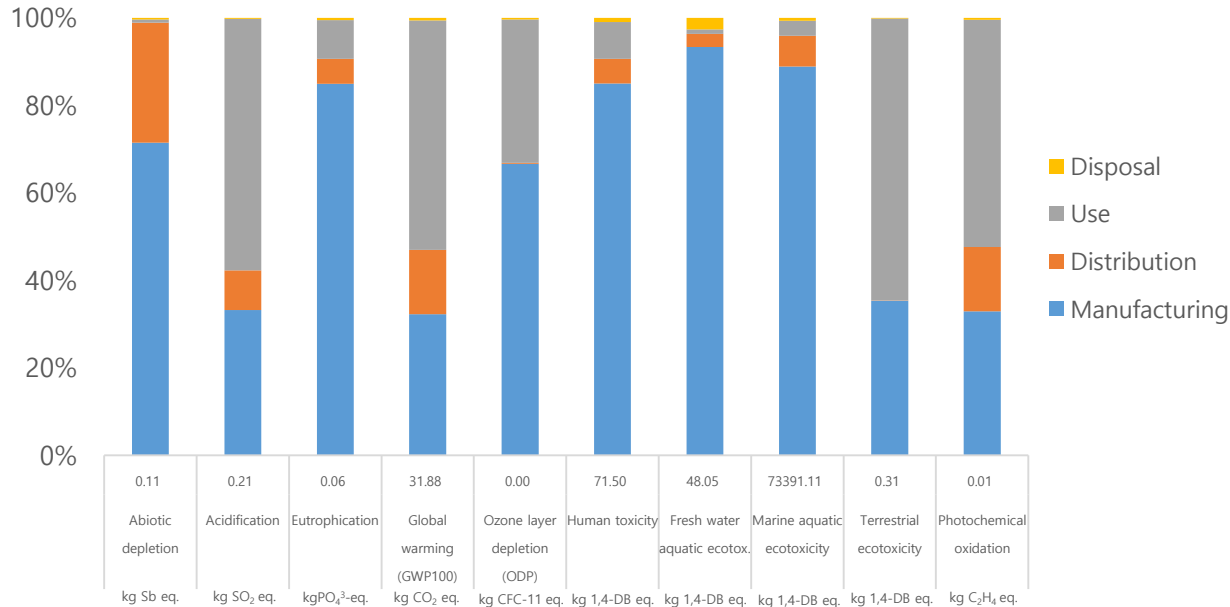
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

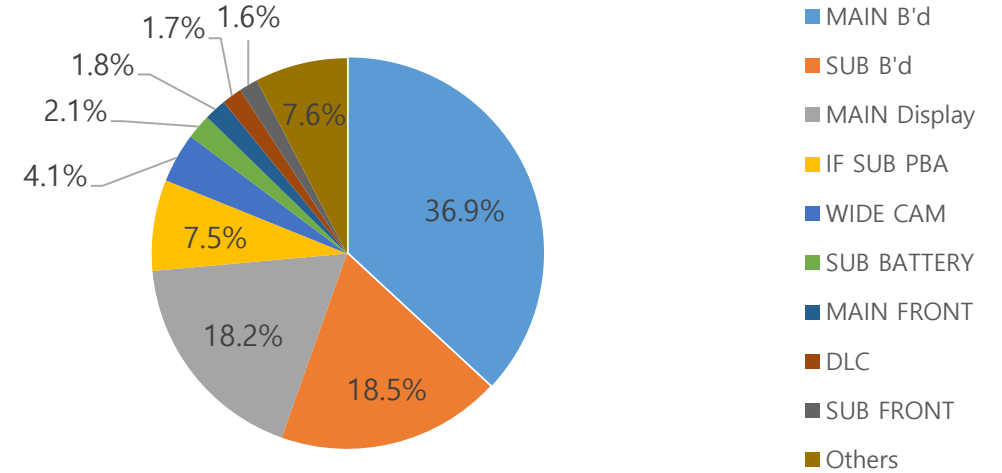


Model name	Galaxy Z Flip4
Dimension	165.2 x 71.9 x 6.9 mm
Display (Main / Sub)	OLED 6.7" / 1.9"
Weight	Product&Acc. : 208.72 g Packages : 132.34 g

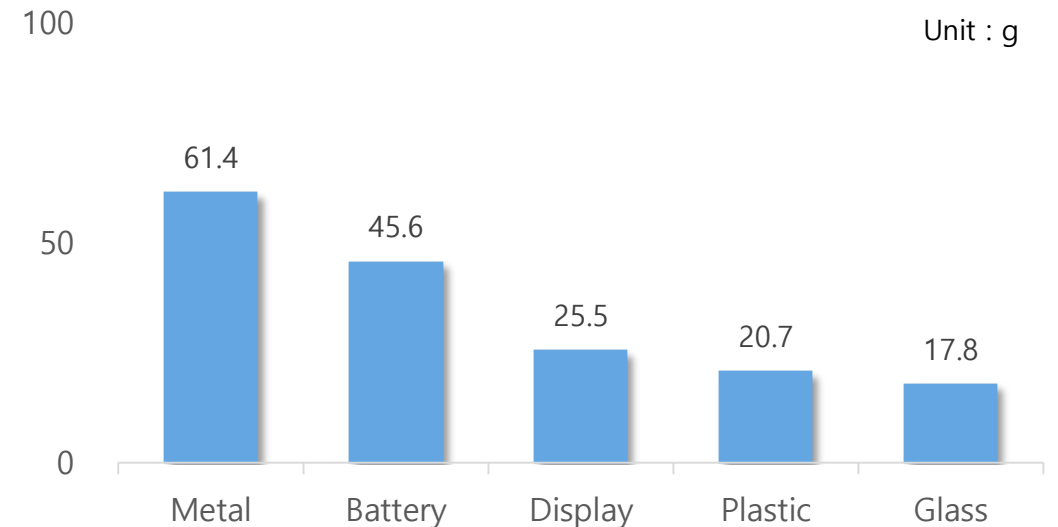
● Characterized Environment Impact



● Global Warming Impact Profile



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy XCover6 Pro

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

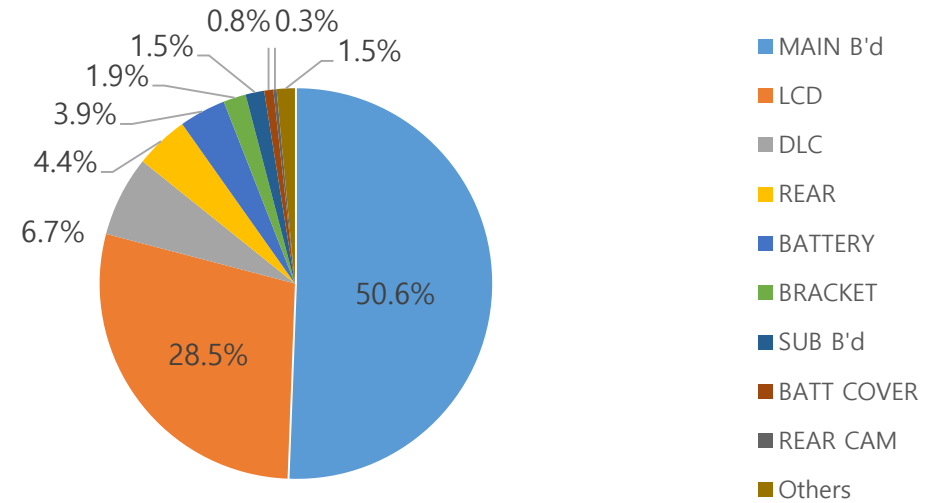
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

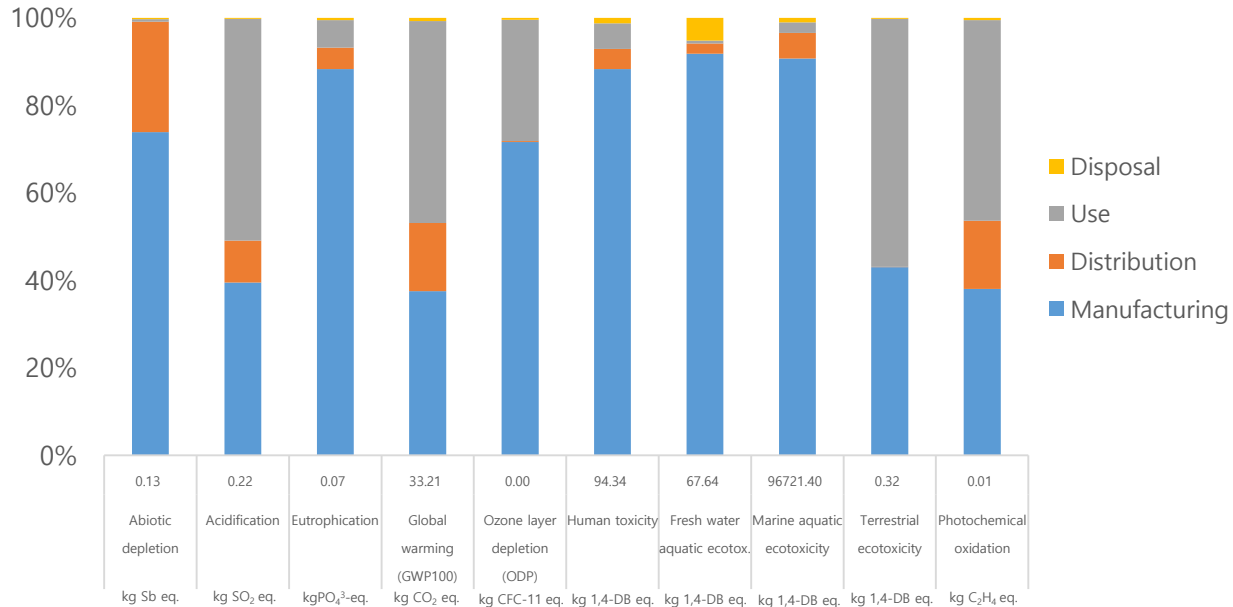


Model name	Galaxy XCover6 Pro
Dimension	168.8 x 79.9 x 9.9 mm
Display	6.6" LCD
Weight	Product&Acc. : 260.11 g Packages : 115.50 g

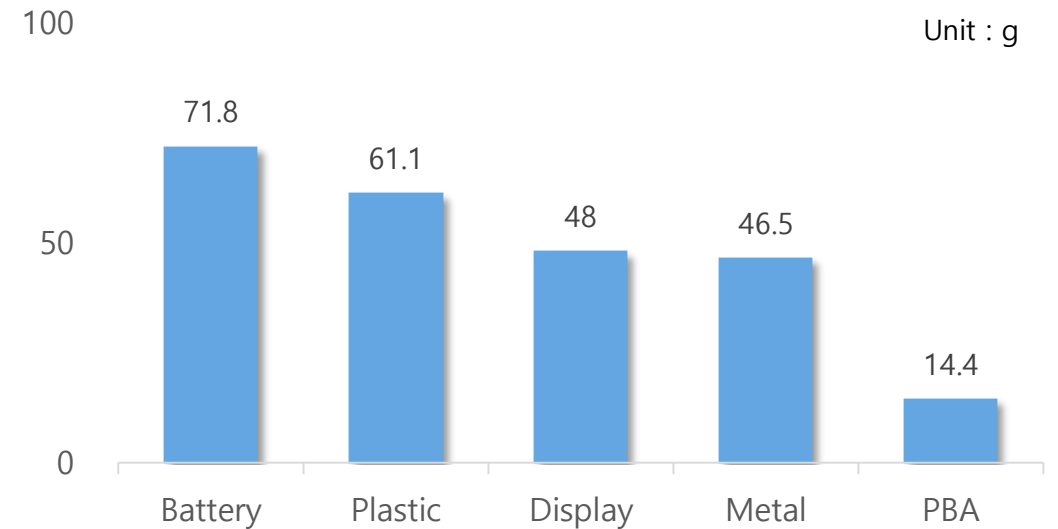
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy M13

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

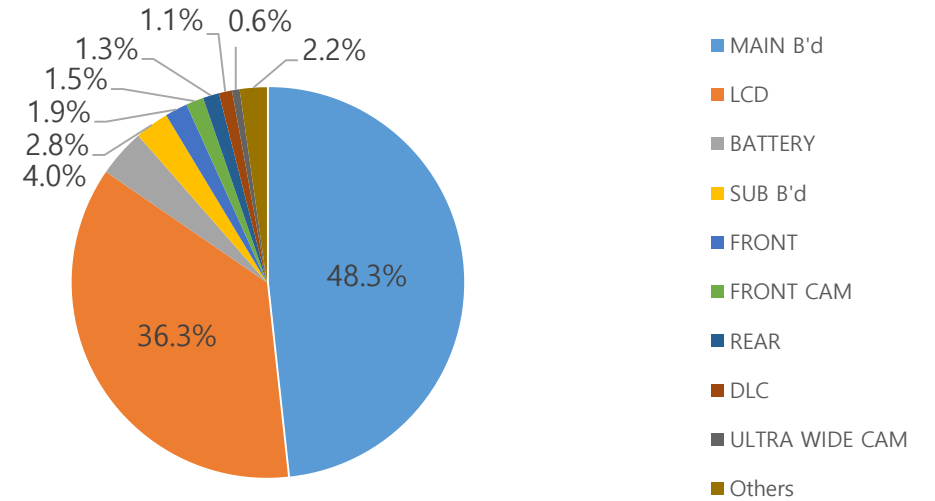
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

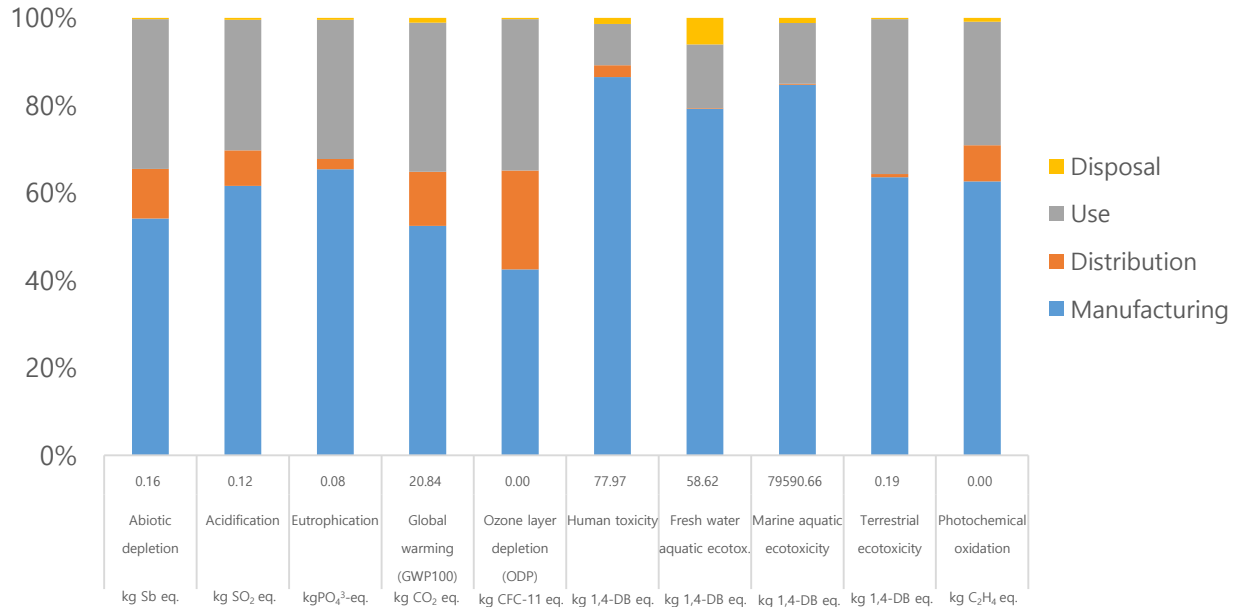


Model name	Galaxy M13
Dimension	165.4 x 76.9 x 8.4 mm
Display	6.6" LCD
Weight	Product&Acc. : 212.35 g Packages : 78.94 g

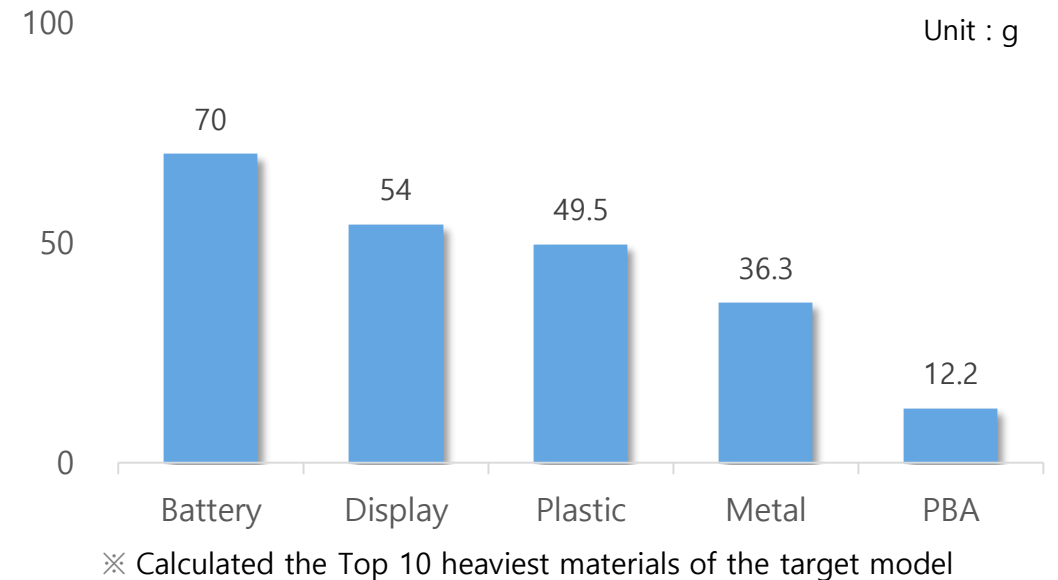
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



Life Cycle Assessment for Galaxy A73

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

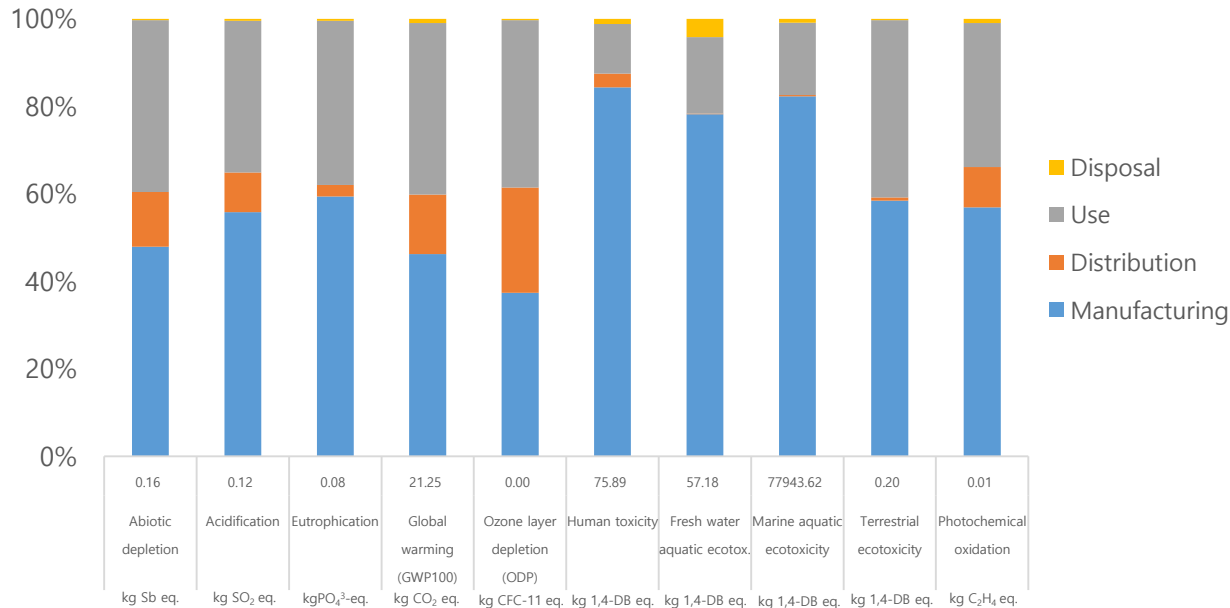
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

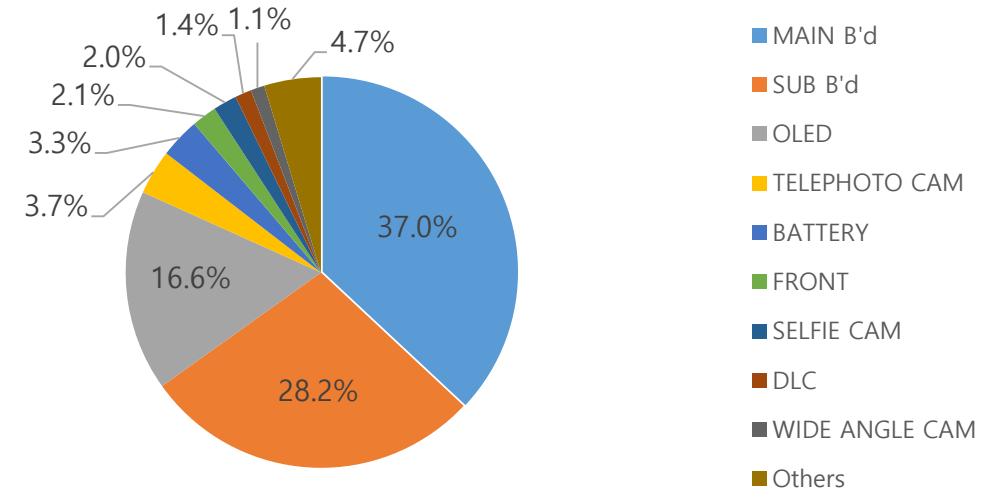


Model name	Galaxy A73
Dimension	163.7 * 76.1 * 7.6mm
Display	6.7" LCD
Weight	Product&Acc. : 205.15 g Packages : 121.67 g

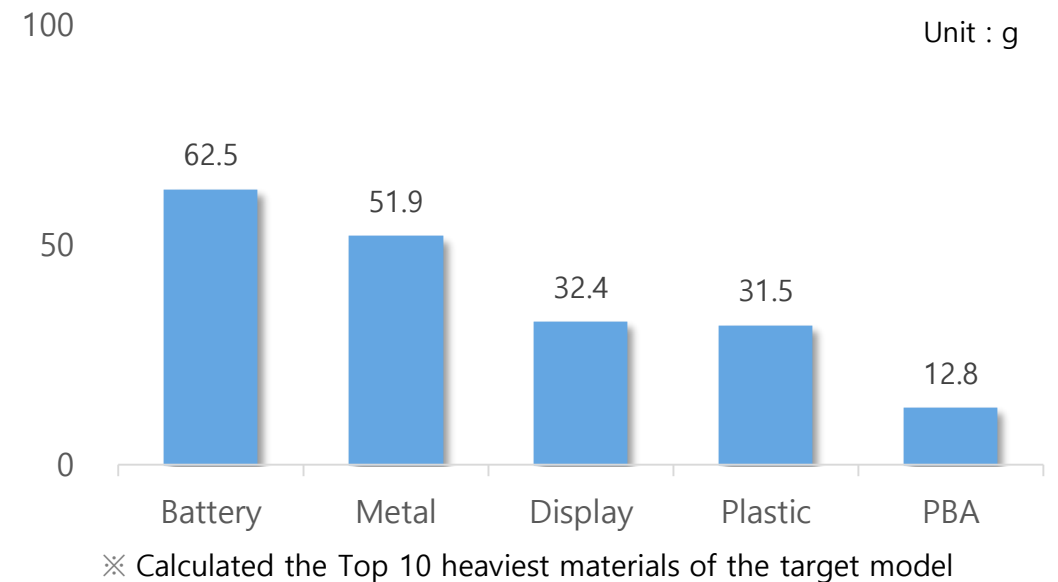
● Characterized Environment Impact



● Global Warming Impact Profile



● Top 5 Substances of Target model



Life Cycle Assessment for Galaxy A23

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

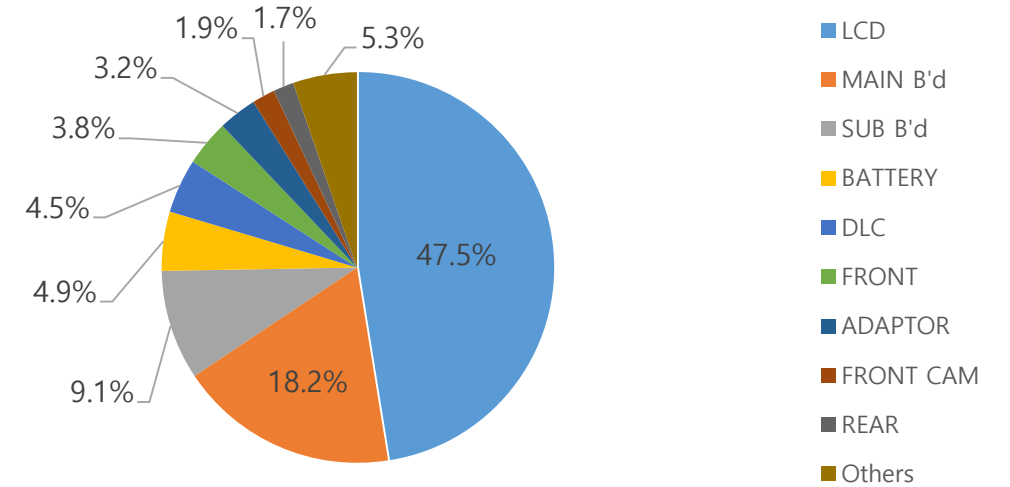
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

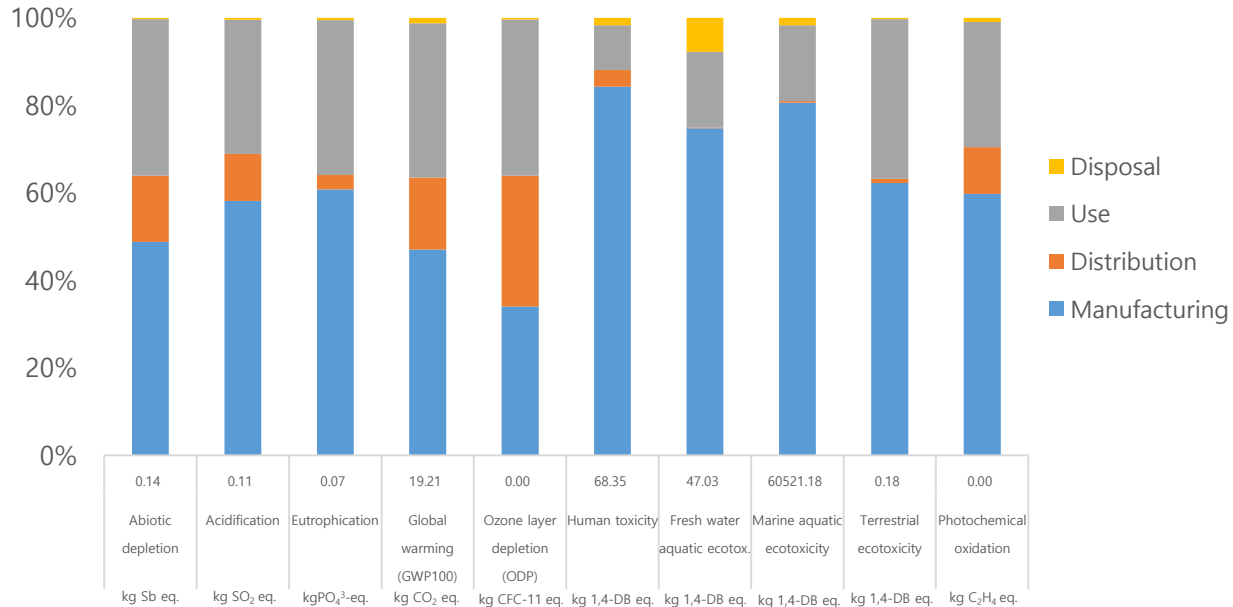


Model name	Galaxy A23
Dimension	165.4 * 76.9 * 8.4mm
Display	6.6" LCD
Weight	Product&Acc. : 205.29 g Packages : 102.65 g

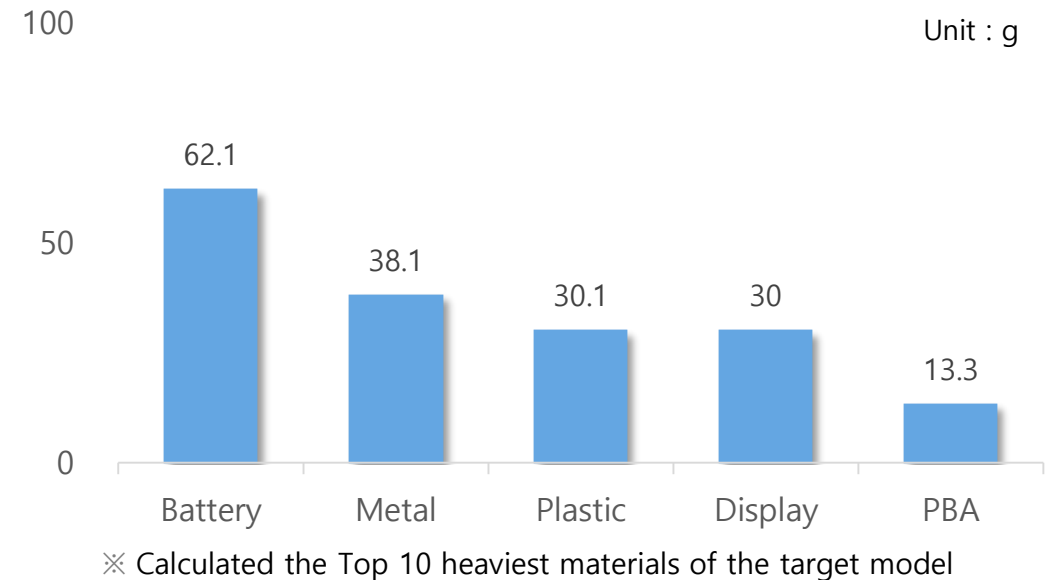
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



Life Cycle Assessment for Galaxy M53

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

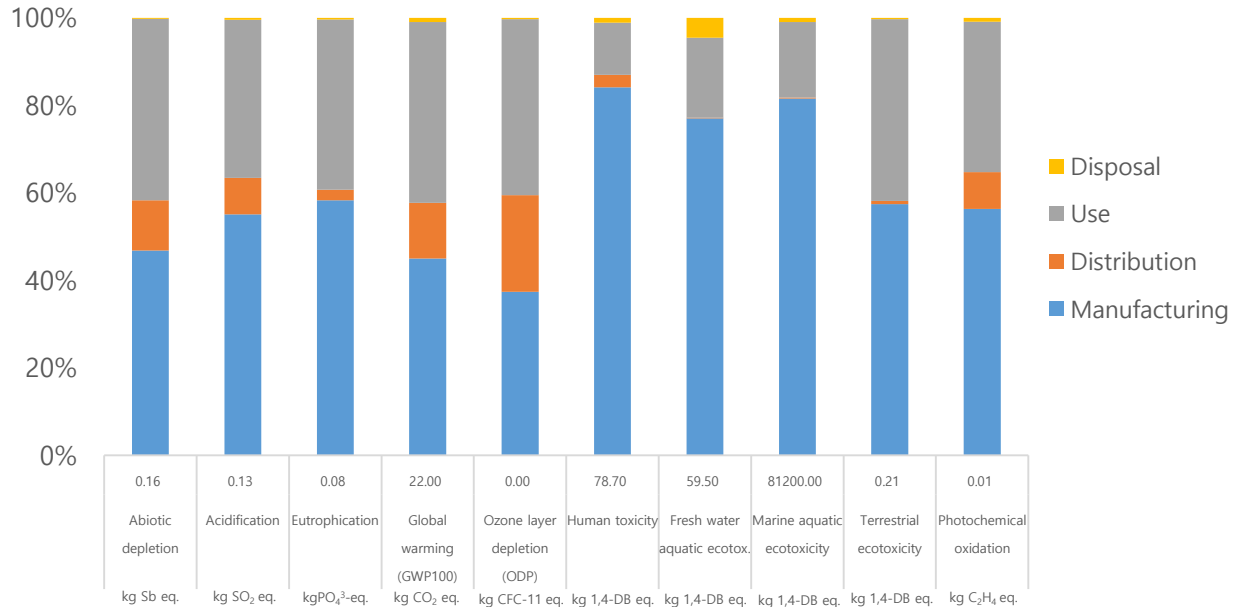
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

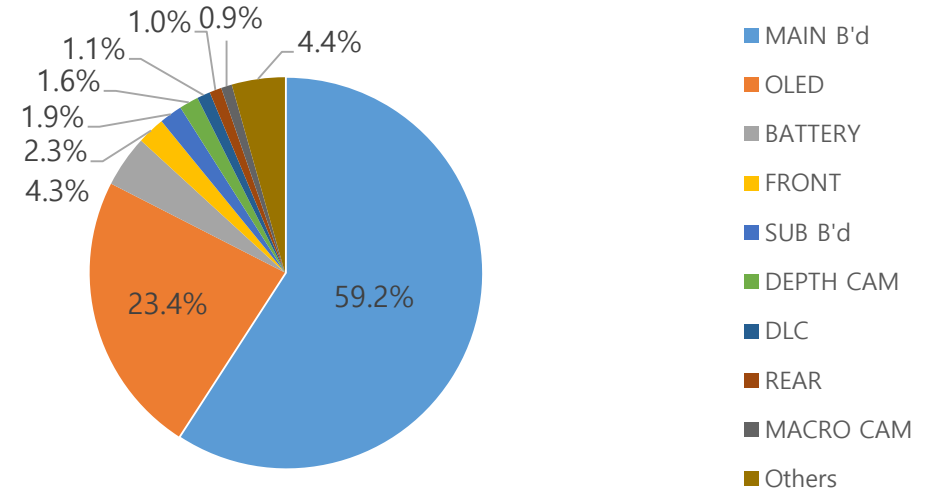


Model name	Galaxy M53
Dimension	169.5 x 77.0 x 7.4 mm
Display	6.7" OLED
Weight	Product&Acc. : 196.85 g Packages : 114.09 g

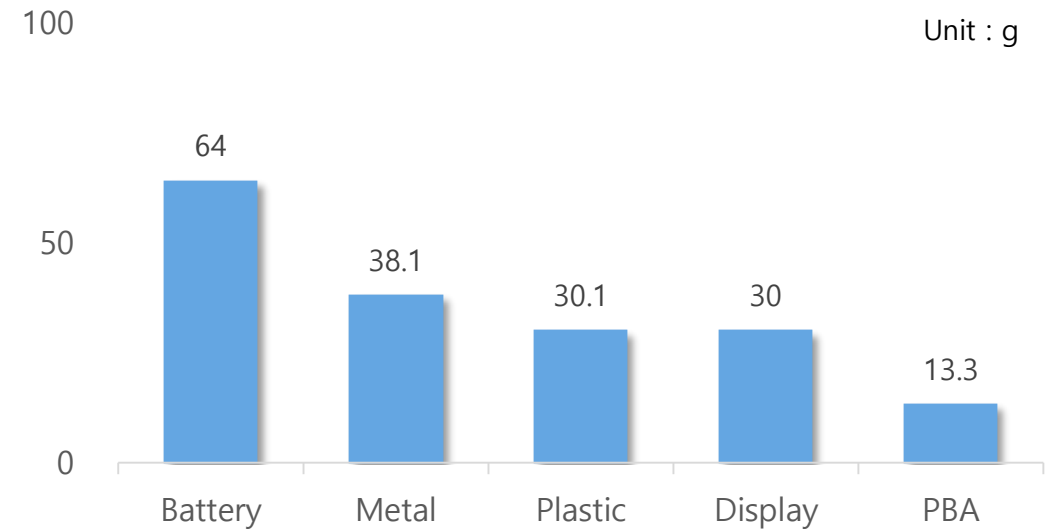
● Characterized Environment Impact



● Global Warming Impact Profile



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy M33

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

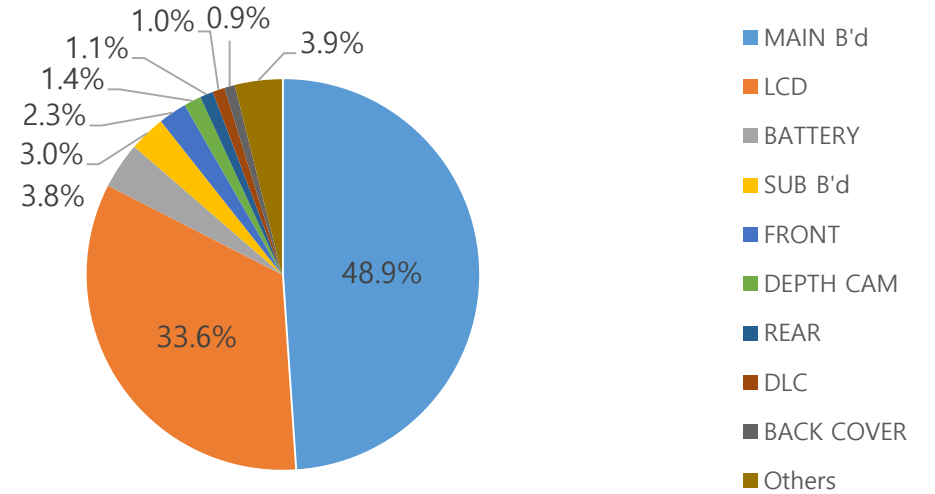
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

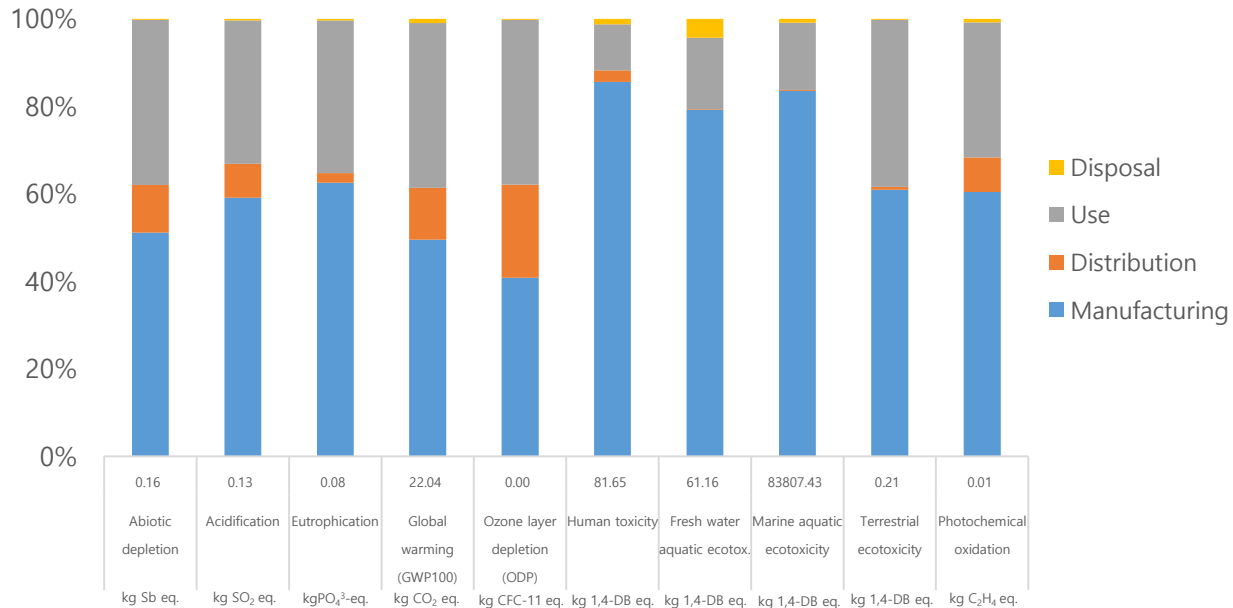


Model name	Galaxy M33
Dimension	165.4 x 76.9 x 8.4 mm
Display	6.6" LCD
Weight	Product&Acc. : 219.40 g Packages : 73.89 g

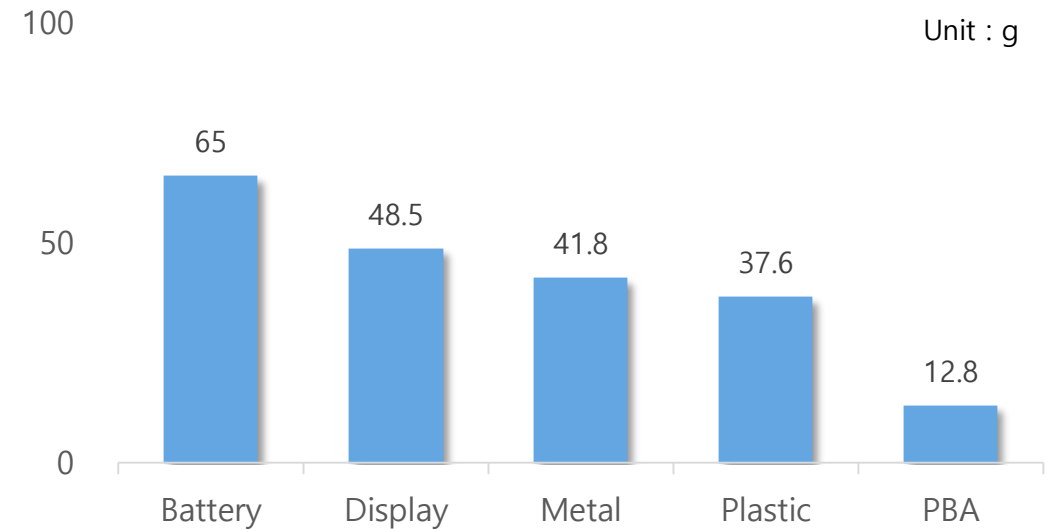
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy M23

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

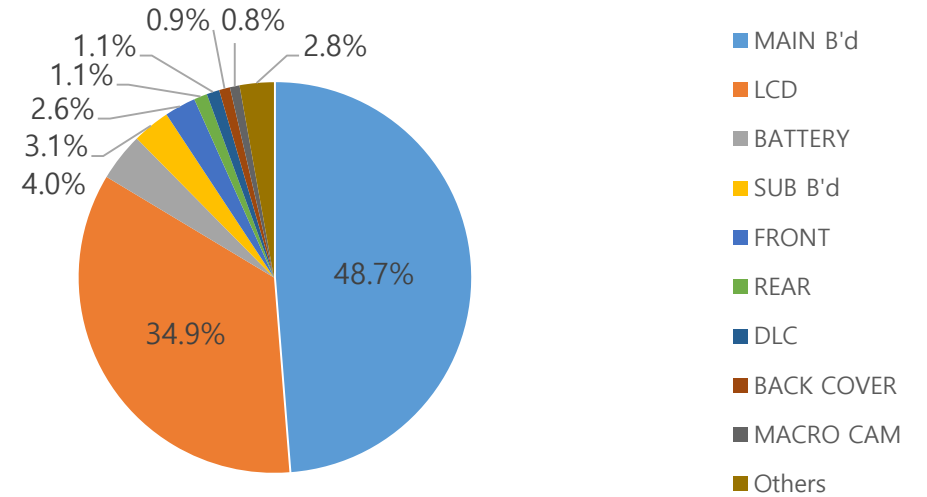
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

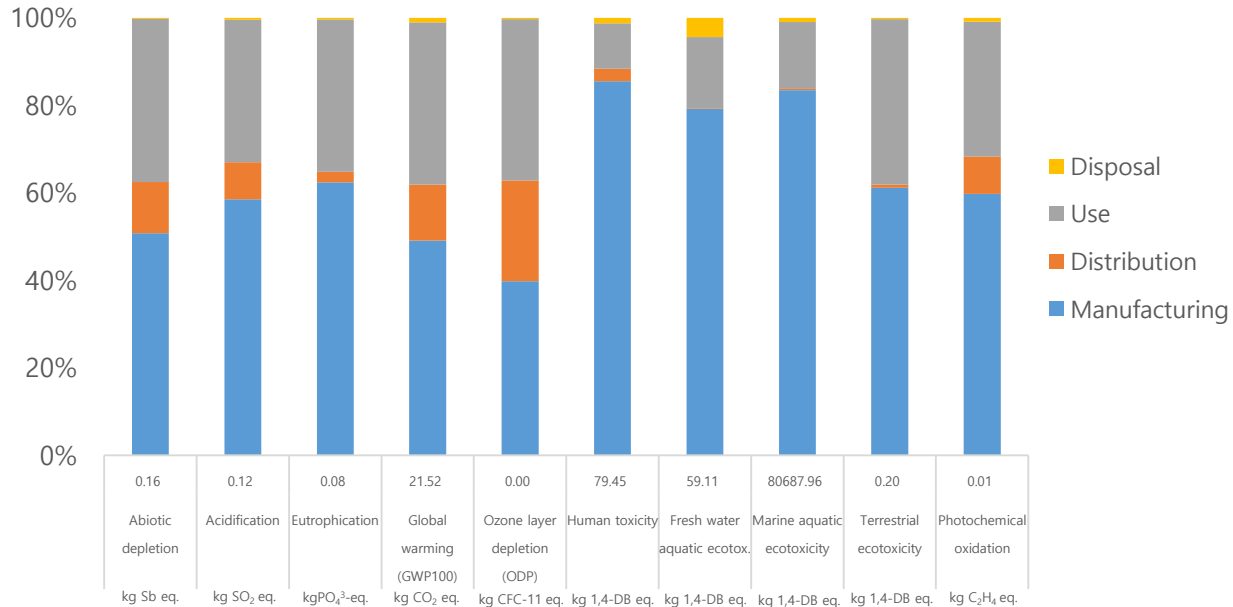


Model name	Galaxy M23
Dimension	167.2 x 77.0 x 8.4 mm
Display	6.6" LCD
Weight	Product&Acc. : 218.55 g Packages : 92.98 g

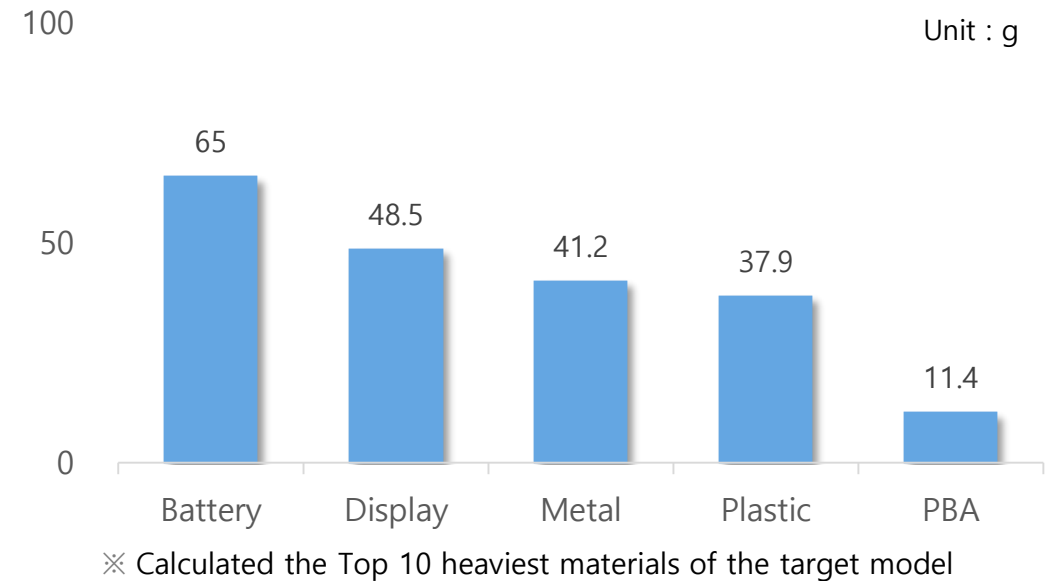
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



Life Cycle Assessment for Galaxy A13

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
Method for impact assessment	Life cycle impact assessment classification and characterization factors according to CML 2 baseline 2000 V2.05 as provided in the SimaPro 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

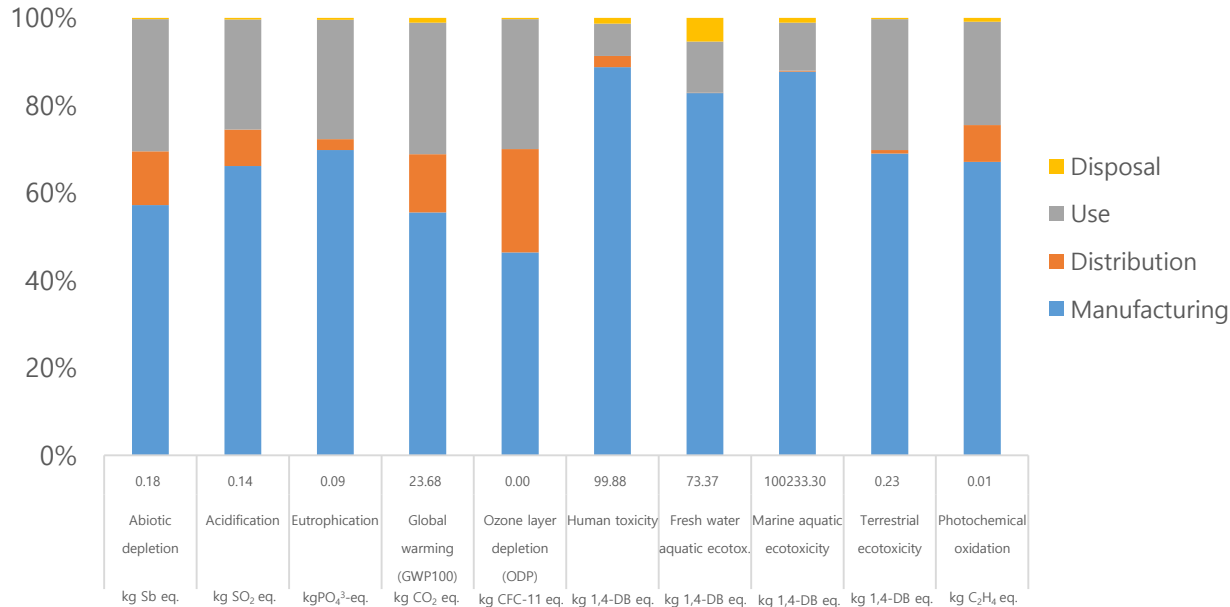
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

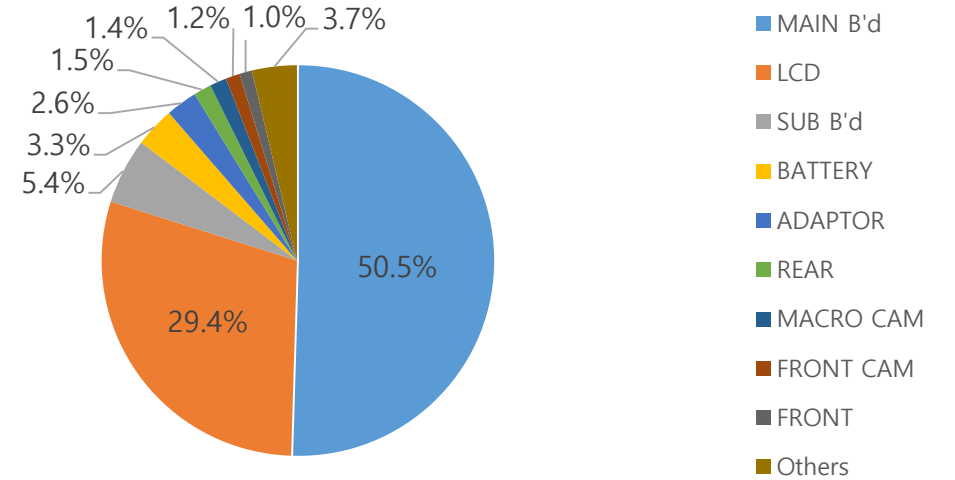


Model name	Galaxy A13
Dimension	165.1 x 76.4 x 8.8 mm
Display	6.6" LCD
Weight	Product&Acc. : 264.14 g Packages : 90.43 g

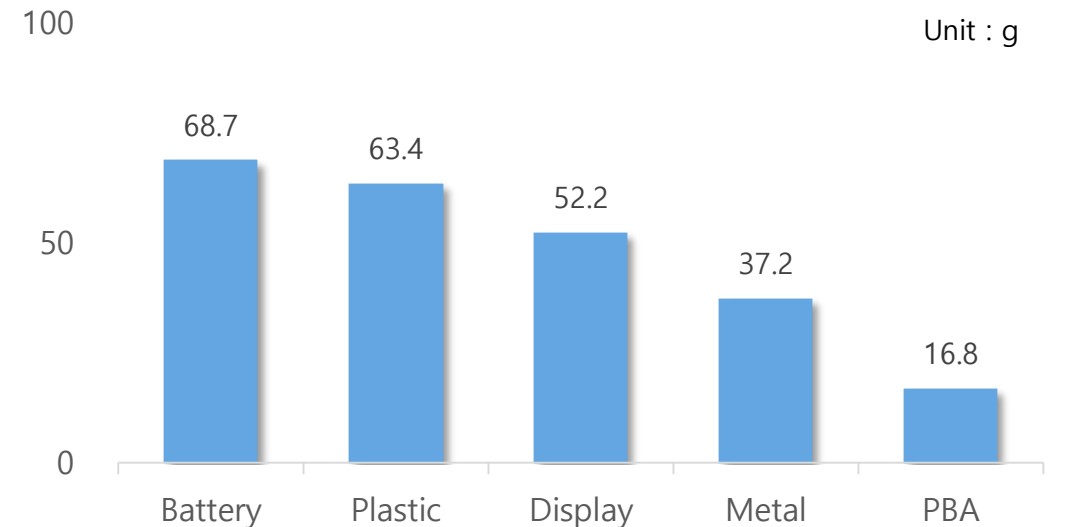
● Characterized Environment Impact



● Global Warming Impact Profile



● Top 5 Substances of Target model



※ Calculated the Top 10 heaviest materials of the target model

Life Cycle Assessment for Galaxy S22 Ultra

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

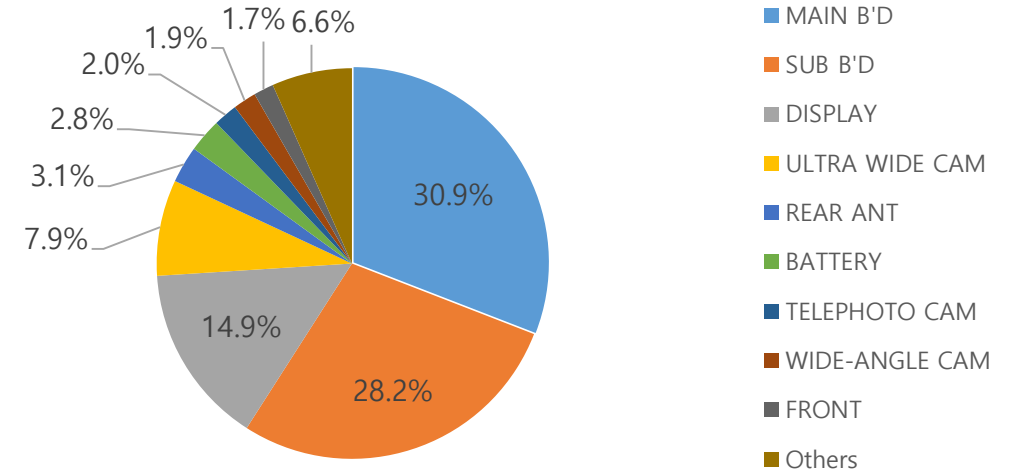
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

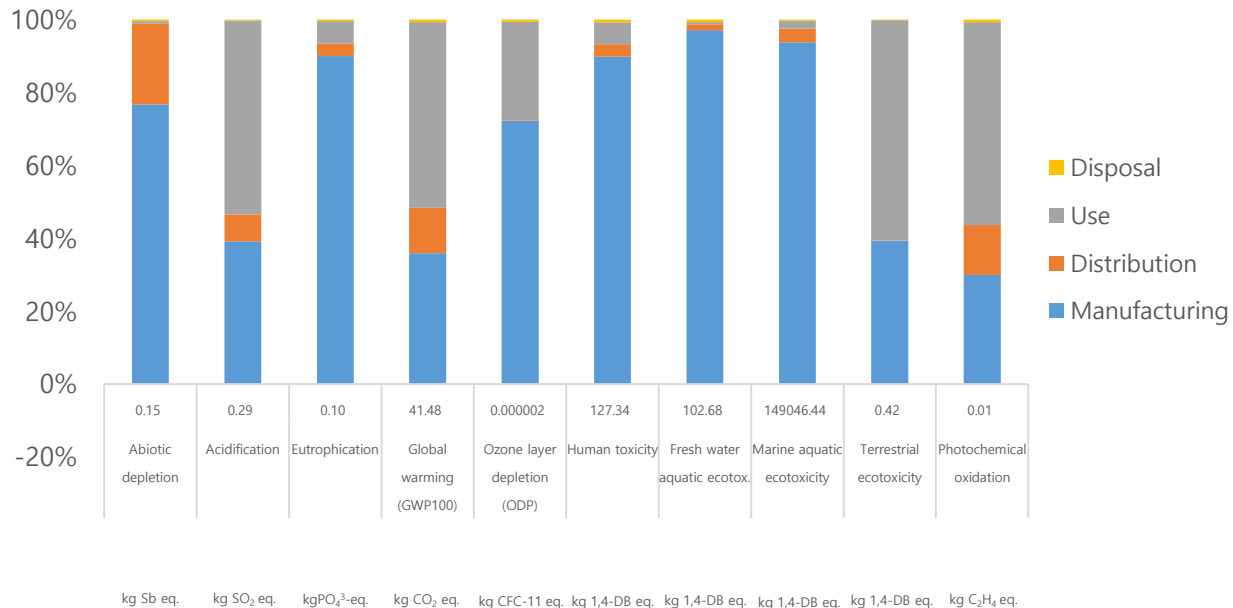


Model name	SM-S908U (Galaxy S22 Ultra)
Dimension	163.3 x 77.9 x 8.9 mm
Display	OLED 6.8"
Weight	Product & Acc. : 250.05 g Packages : 124.74 g

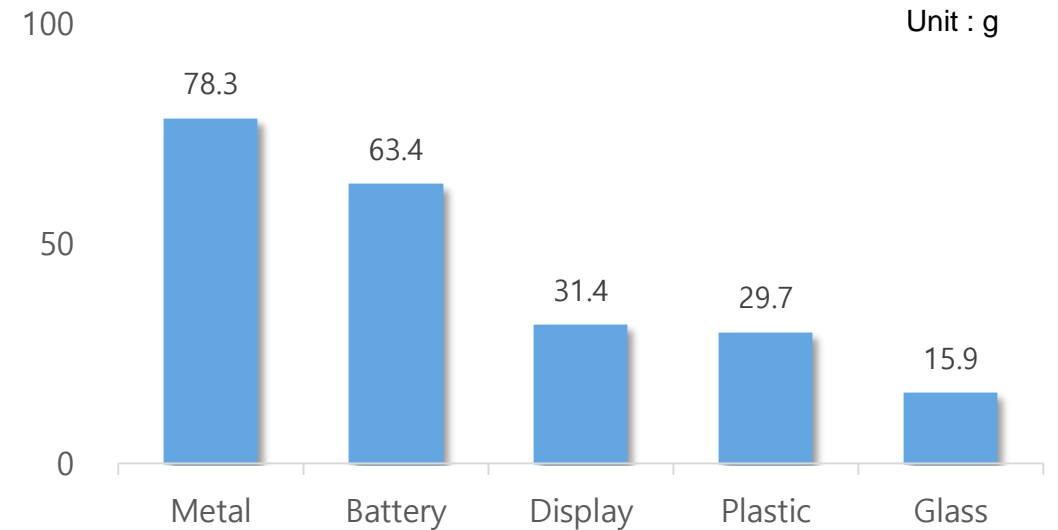
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



※ Calculated the Top 5 heaviest materials of the target model

Life Cycle Assessment for Galaxy S22+

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

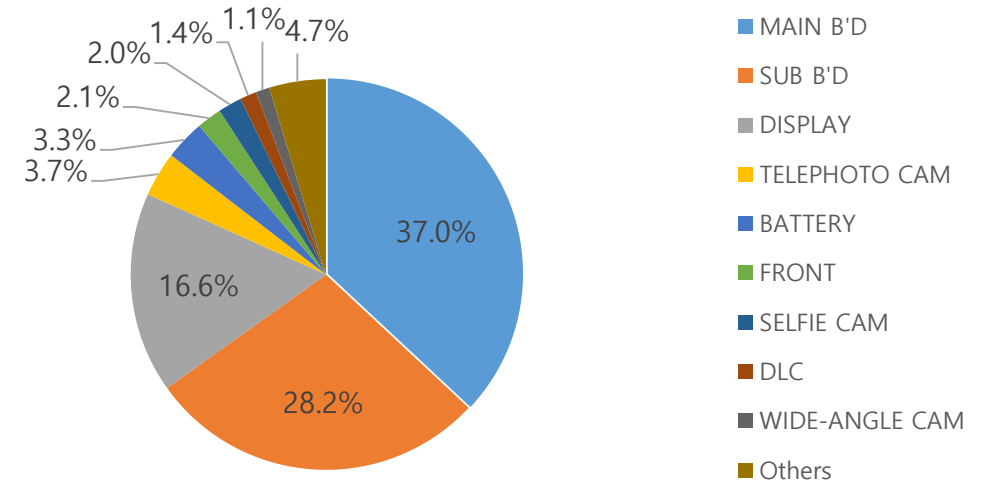
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

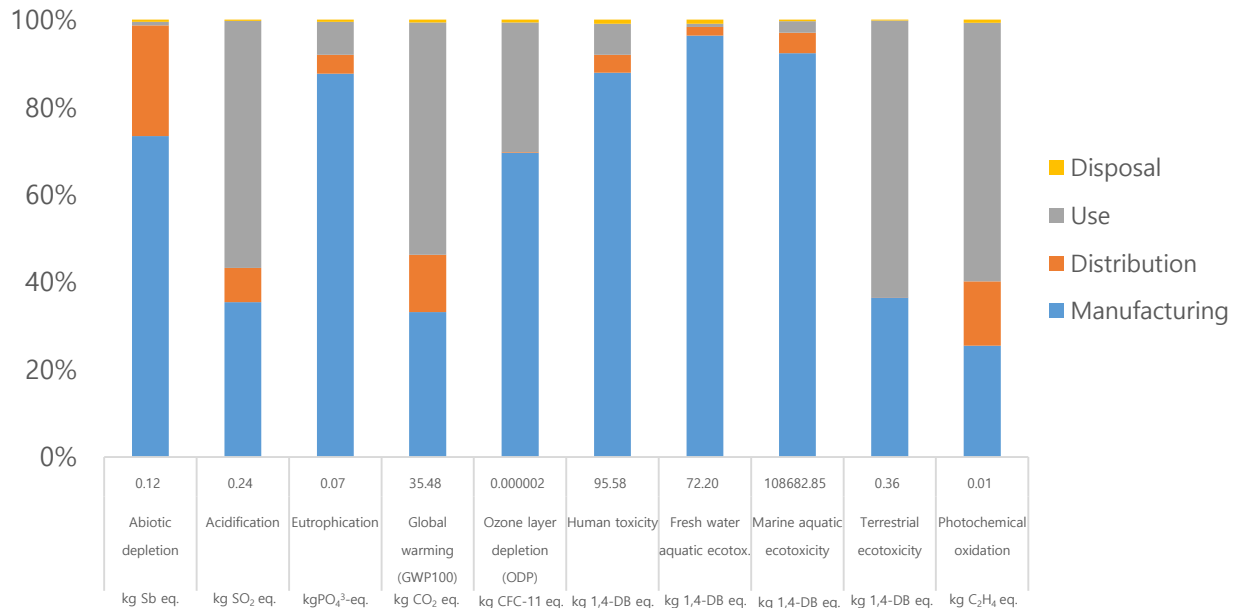


Model name	SM-S906U (Galaxy S22+)
Dimension	157.4 x 75.8 x 7.6 mm
Display	OLED 6.6"
Weight	Product & Acc. : 217.05 g Packages : 121.11 g

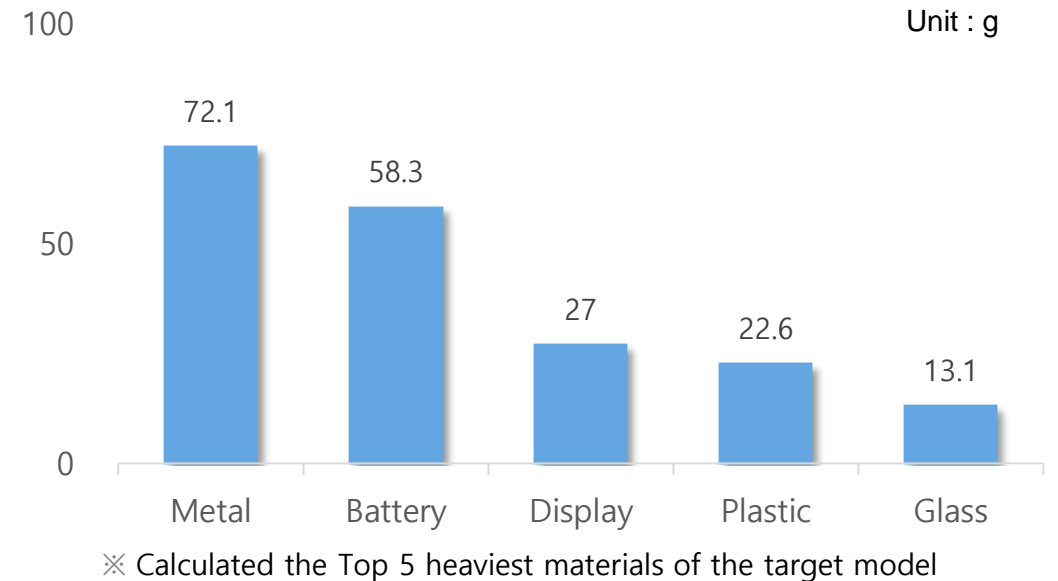
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



Life Cycle Assessment for Galaxy S22

● Background

Samsung has developed strong technical experience in assessing the life cycle environmental impacts of its products. 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 9.3.0.3 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 3.8
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 9.3.0.3 LCA tool
LCA software	SimaPro 9.3.0.3

● System boundary of LCA

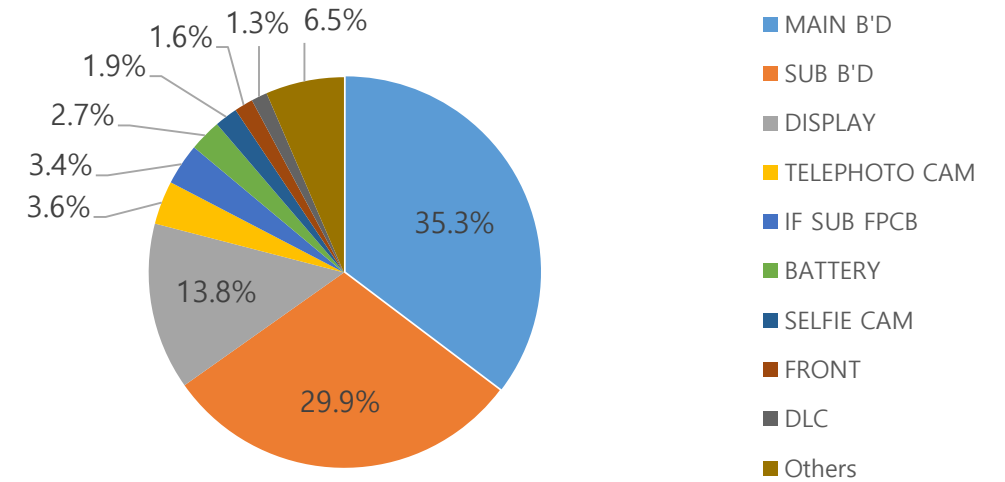
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to United States
Use	3 years use
Disposal	Waste treatment of parts and material

● Product Features

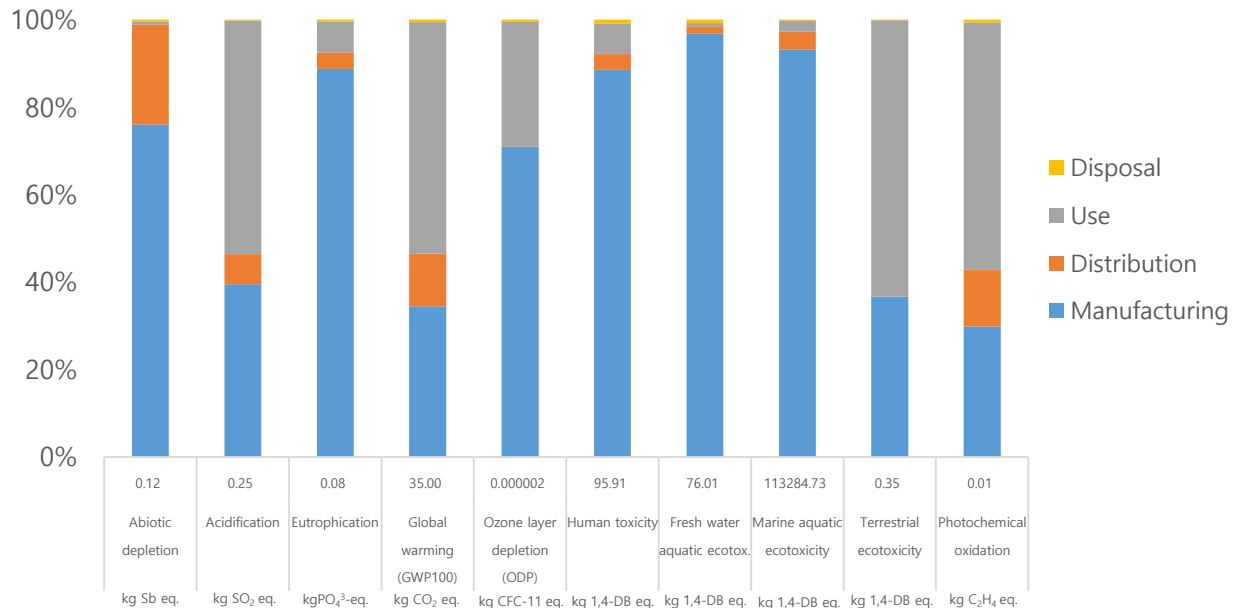


Model name	SM-S901U (Galaxy S22)
Dimension	146.0 x 70.6 x 7.6 mm
Display	OLED 6.1"
Weight	Product & Acc. : 189.17 g Packages : 116.91 g

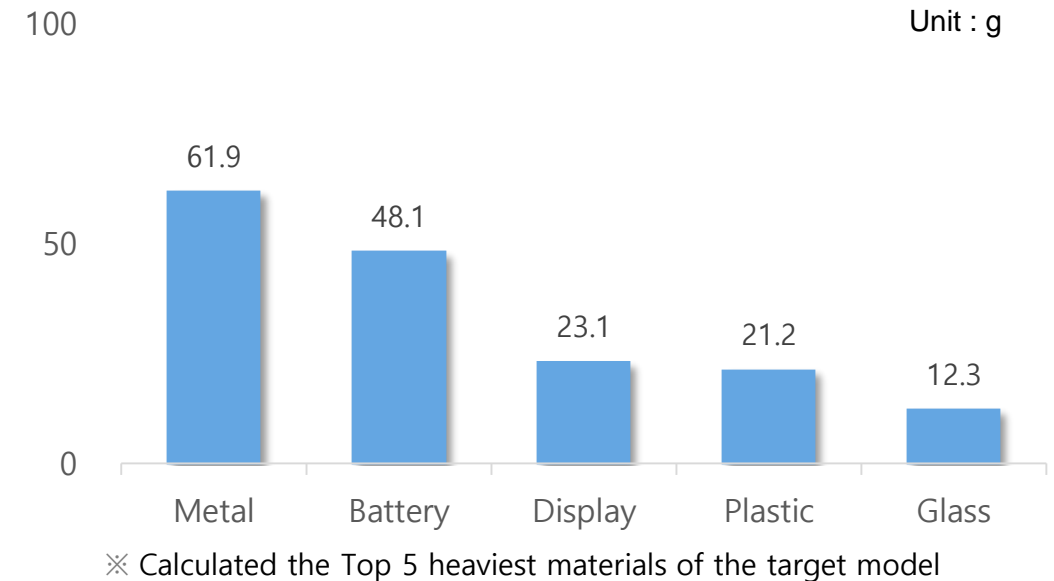
● Global Warming Impact Profile



● Characterized Environment Impact



● Top 5 Substances of Target model



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 environmental 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

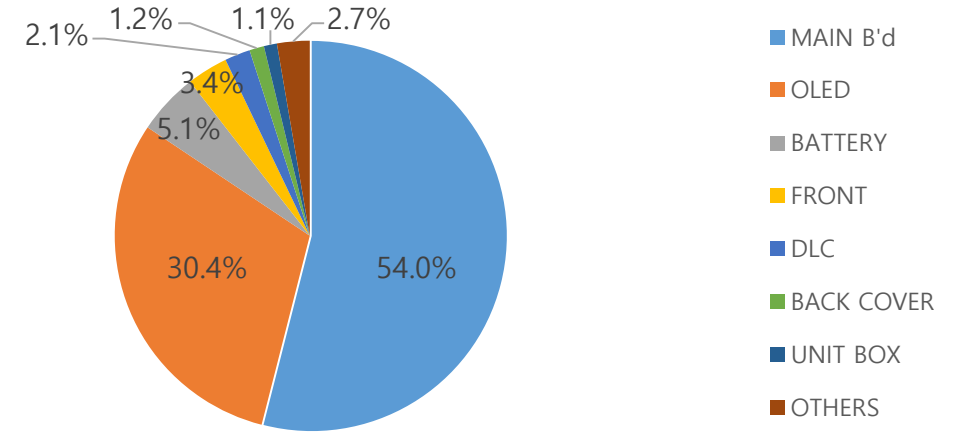
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

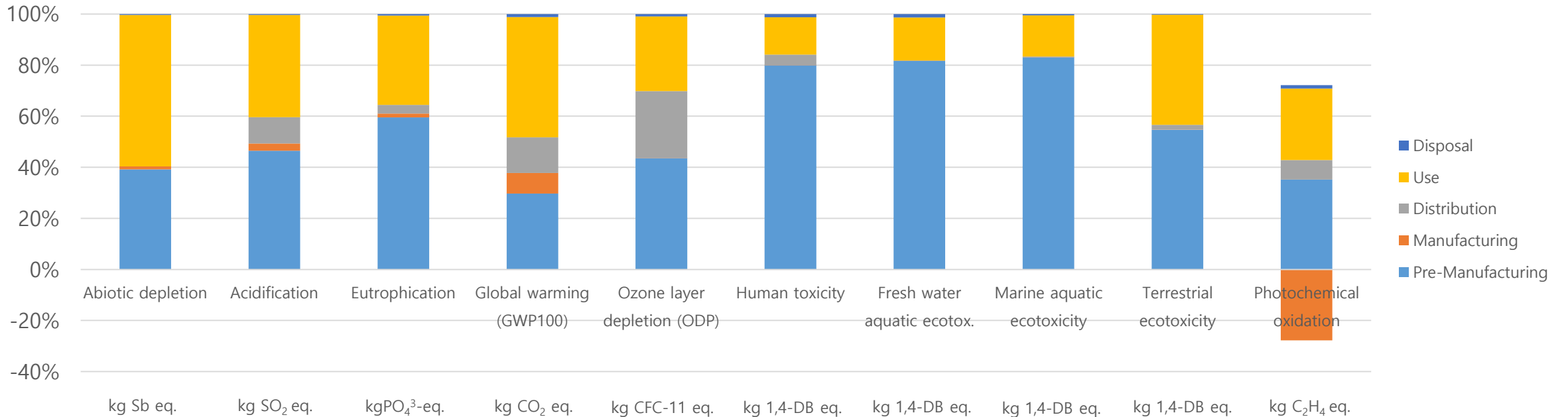


Model name	SM-G990B (Galaxy S21 FE)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	155.7 x 74.5 x 7.9 mm
Display	OLED 6.4"
Memory	ROM 128GB, RAM 6GB
Battery	4370 mAh
Camera	Main : 12.0M pixel / Sub : 32.0M pixel
Weight	Product&Acc. : 202.11g / PKG : 136.43g

● Global Warming Impact of Part



● Characterized Environment Impact



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 environmental 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

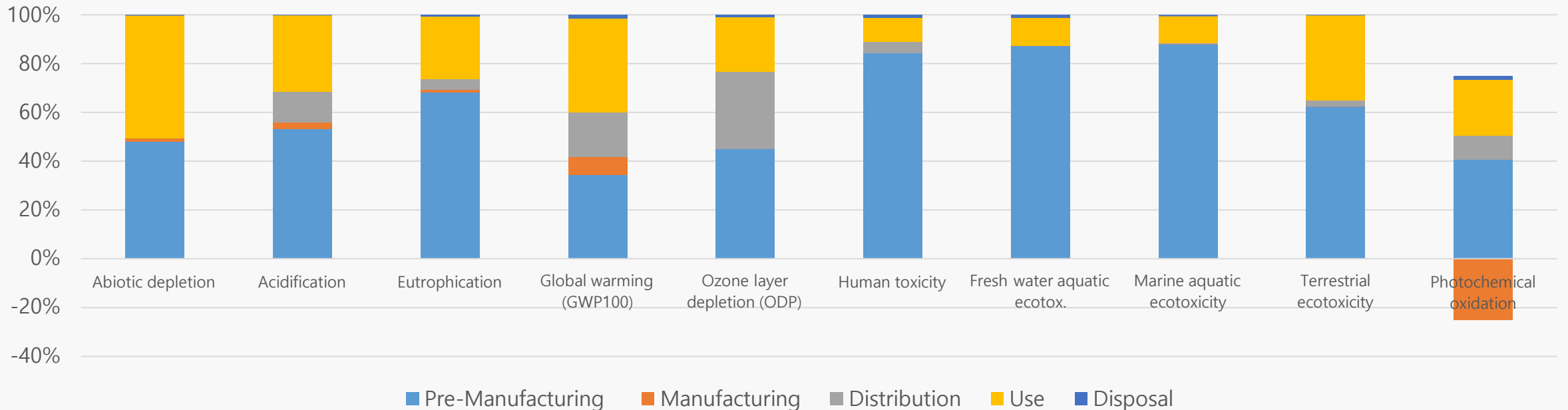


Model name	SM-G781B (Galaxy S20 FE)
Processor	Qualcomm, SM8250, 2.8GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	159.8 x 74.5 x 8.4 mm
Display	On-Cell Touch AMOLED, 6.5"
Memory	ROM 128GB, RAM 6GB
Battery	4370 mAh
Camera	Main : 12.0M pixel / Sub : 32.0M pixel
Weight	Product&Acc. : 253.74g / PKG : 229.66g

● 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 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 environmental 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

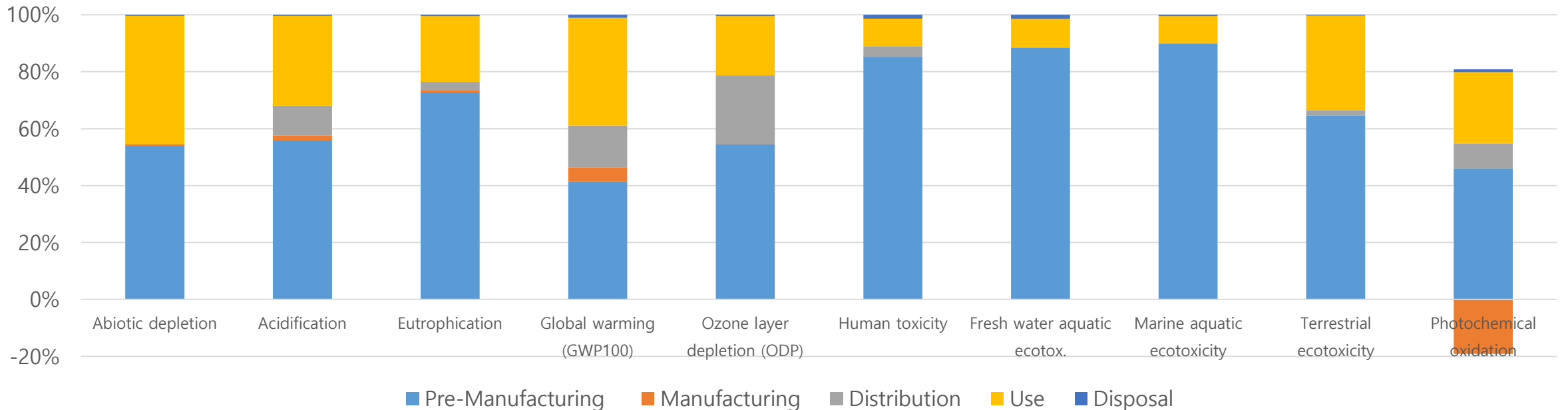


Model name	SM-F926B (Galaxy Z Fold3)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	158.2 x 128.1 x 6.4 mm
Display	Main OLED 7.6", SUB 6.2"
Memory	ROM 256GB, RAM 12GB
Battery	4275 mAh
Camera	Main : 12.0M pixel / Sub : 4.0M pixel
Weight	Product&Acc. : 290.16g / PKG : 209.87g

● 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	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 environmental 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

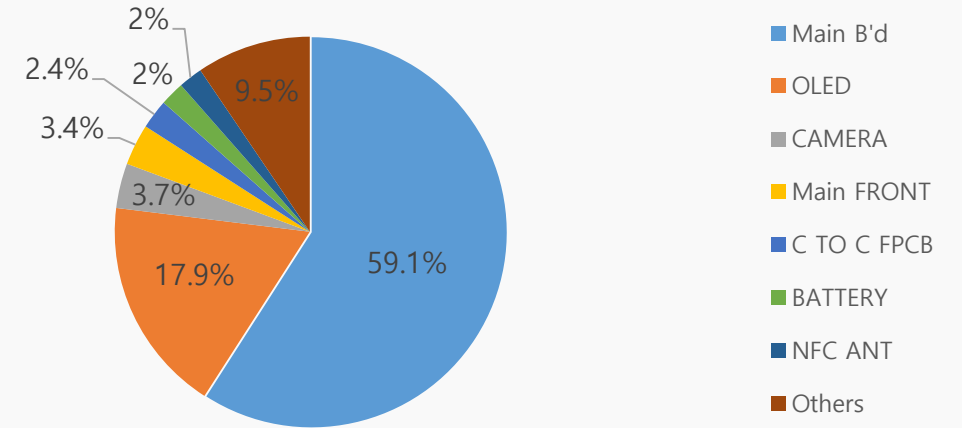
Pre-manufacturing	Parts and materials constituting the products and its transportation
Manufacturing	Product assembly by Samsung Electronics
Distribution	From Korea to EU
Use	2 years use
Disposal	Waste treatment of parts and material

● Product Features

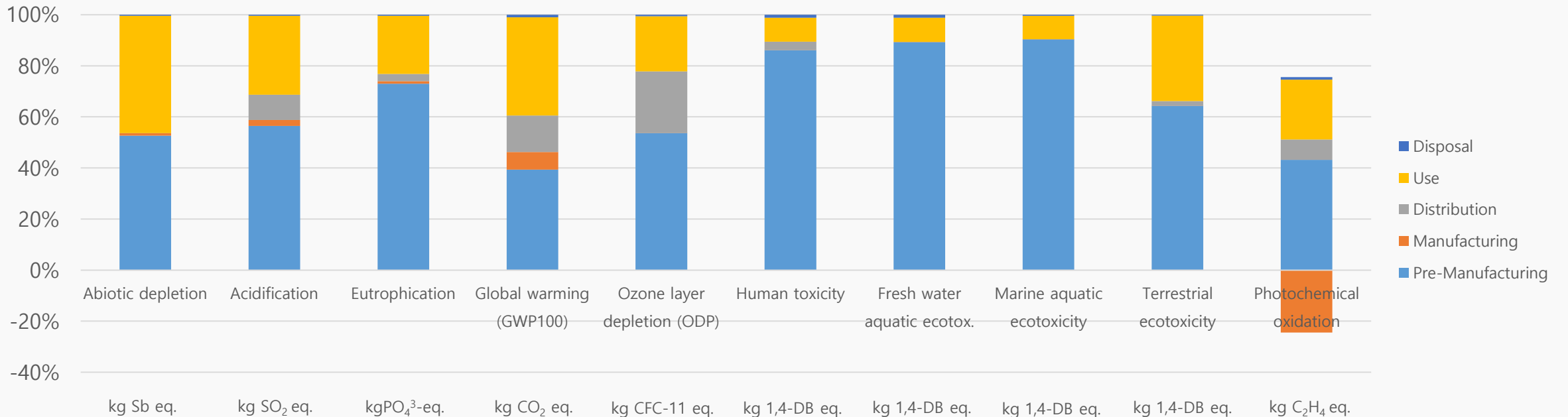


Model name	SM-F711B (Galaxy Z Flip3)
Processor	Qualcomm, SM8350, 2.84GHz, 2.4GHz, 1.8GHz Octa-Core 64bit
Dimension	166.0 x 72.2 x - mm
Display	Main OLED 6.7", SUB 1.9"
Memory	ROM 128GB, RAM 8GB
Battery	3300 mAh
Camera	Main : 12.0M pixel / Sub : 10.0M pixel
Weight	Product&Acc. : 209.49g / PKG : 142.25g

● 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 environmental 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

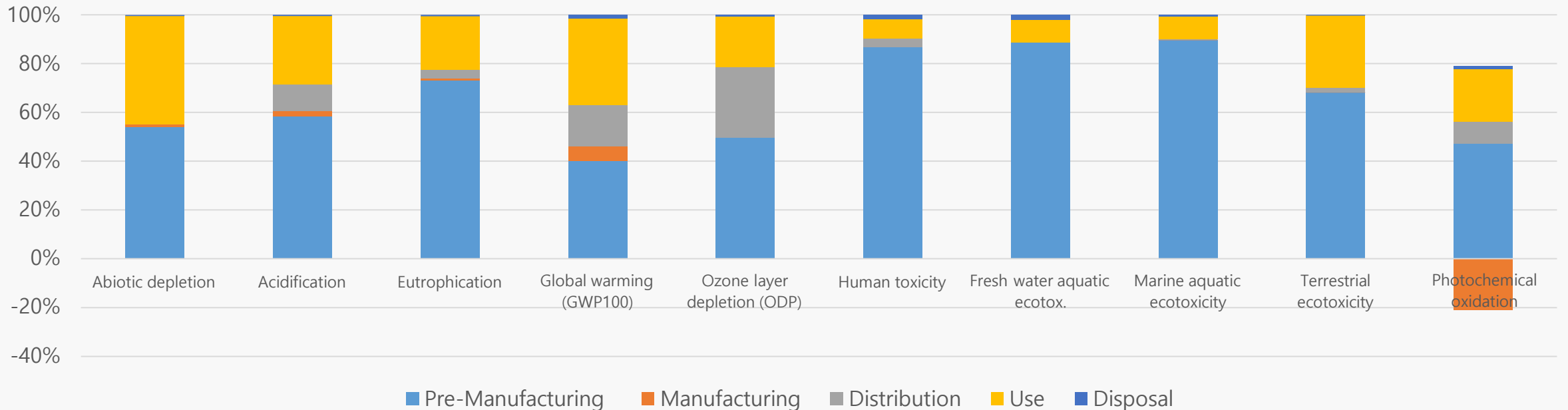


Model name	SM-A127F (Galaxy A12)
Processor	SEC, S5E3830(Exynos 850), 2GHz Octa-Core 64bit
Dimension	164 x 75.8 x 8.9 mm
Display	In-Cell Touch LCD 6.5"
Memory	ROM 32GB, RAM 3GB
Battery	4900 mAh
Camera	Main : 48.0M pixel / Sub : 8.0M pixel
Weight	Product&Acc. : 268.45g / PKG : 93.77g

● 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 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

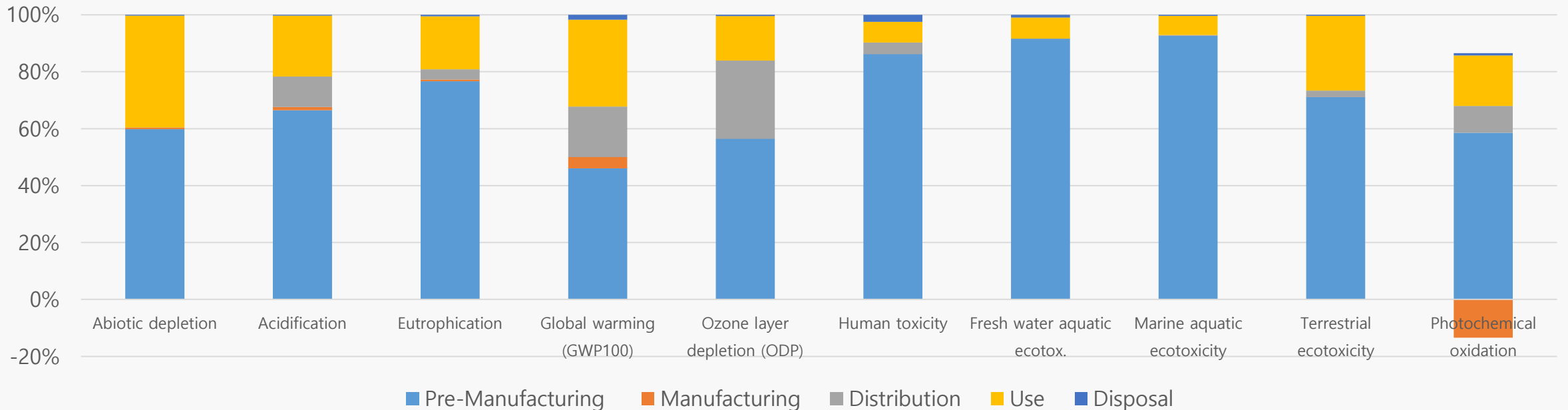


Model name	SM-N986B (Galaxy Note20 Ultra)
Processor	Octa-Core 3.09GHz,2.4GHz,1.8GHz
Dimension	164.8 x 77.2 x 8.1 mm
Display	OLED 6.9"
Memory	ROM 256GB, RAM 12GB
Battery	4500 mAh
Camera	Main : 108M pixel / Sub : 10M pixel
Weight	Product&Acc. : 303.79g / PKG 252.14g

● 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 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; J1x; On5x; Note8. 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)

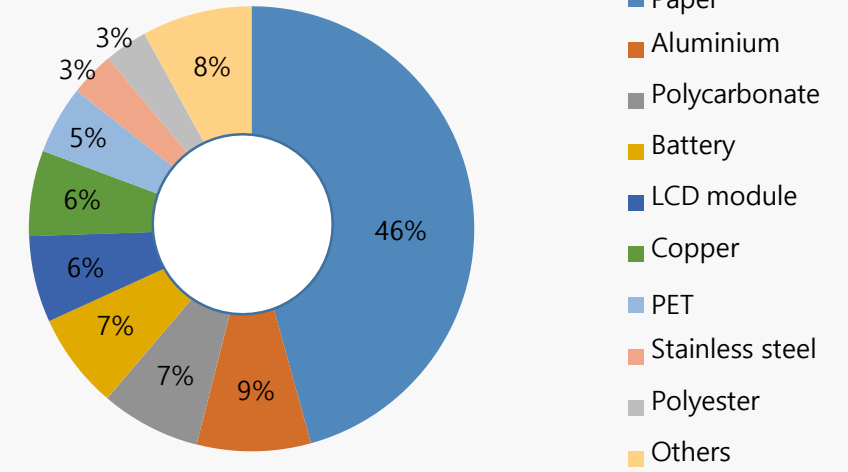
For the rest, it was done by internal expert in Global CS Center of Samsung Electronics. (ecodesign@samsung.com)

● Product Features

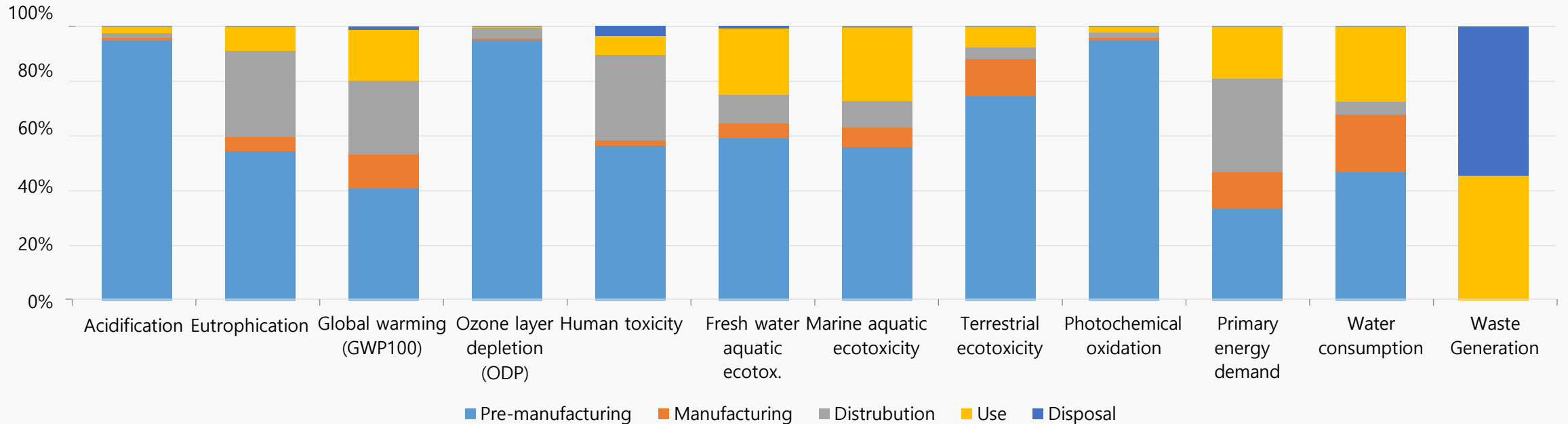


Model name	SM-N950U (Galaxy Note8)
Processor	Qualcomm 2.35GHz, 1.9GHz Octa-Core 64bit
Dimension	162.5 x 74.8 x 8.6 mm
Display	6.3" 2960 x 1440, 16M In-Cell Touch LCD
Battery	Li-Ion 3300 mAh
Camera	12 MP / 5MP
Wt.(g)	186.34g

● Material Use



● Characterized Environment Impact

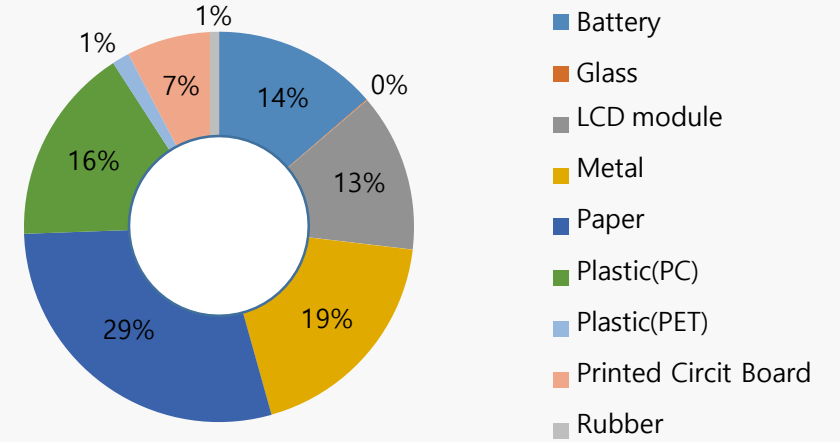


● Product Features

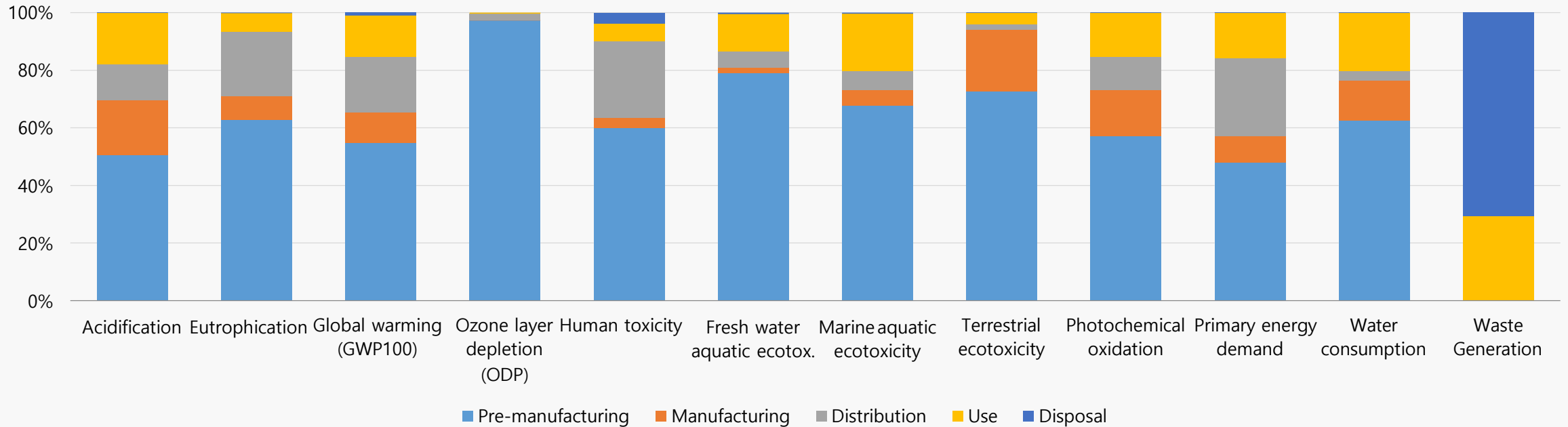


Model name	SM-G5510 (Galaxy On5x)
Processor	Quad-Core1.4GHz
Dimension	142.8 x 69.5 x 8.1 mm
Display	LCD 5"
Battery	Li-Ion 2600 mAh
Camera	12 MP / 5MP
Wt.(g)	149 g

● Material Use



● Characterized Environment Impact

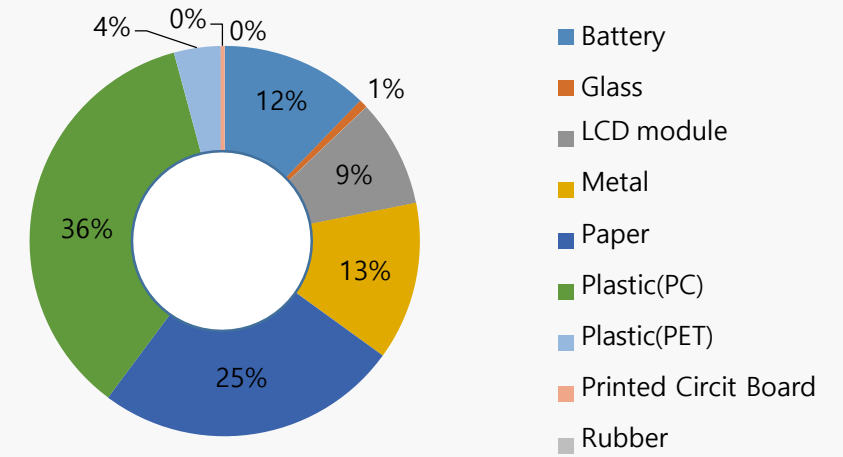


● Product Features

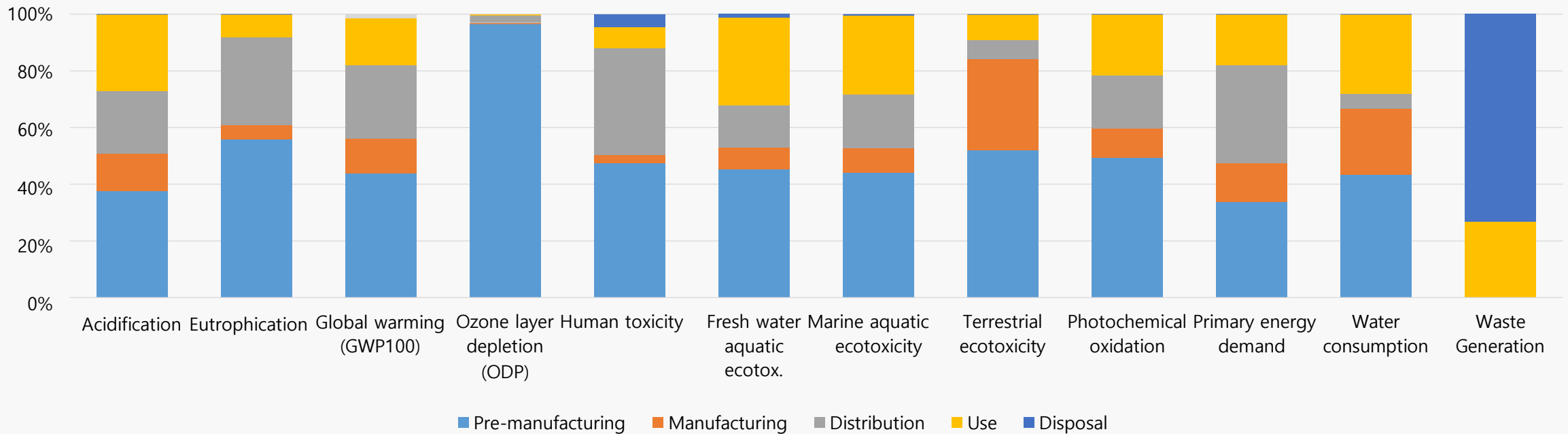


Model name	SM-J120A (Galaxy J1x)
Processor	Quad-core 1.2 GHz
Dimension	132.6 x 69.3 x 8.9 mm
Display	AMOLED 4.5"
Memory	microSD, up to 128 GB
Battery	Li-Ion 2050 mAh
Camera	5 MP
Wt.(g)	132 g

● Material Use



● Characterized Environment Impact

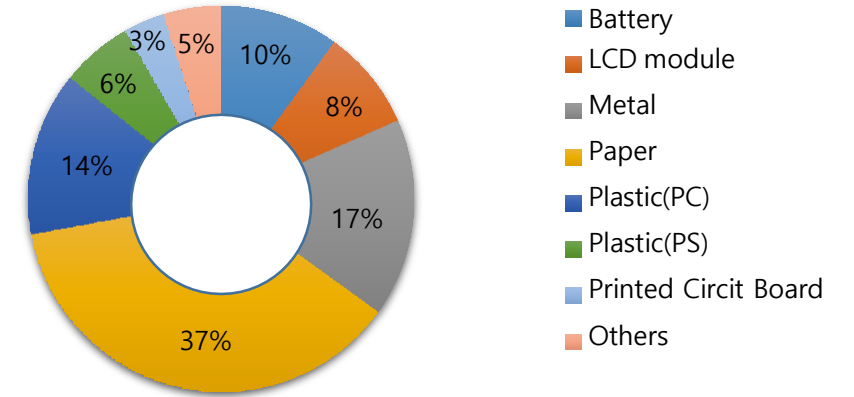


● Product Features

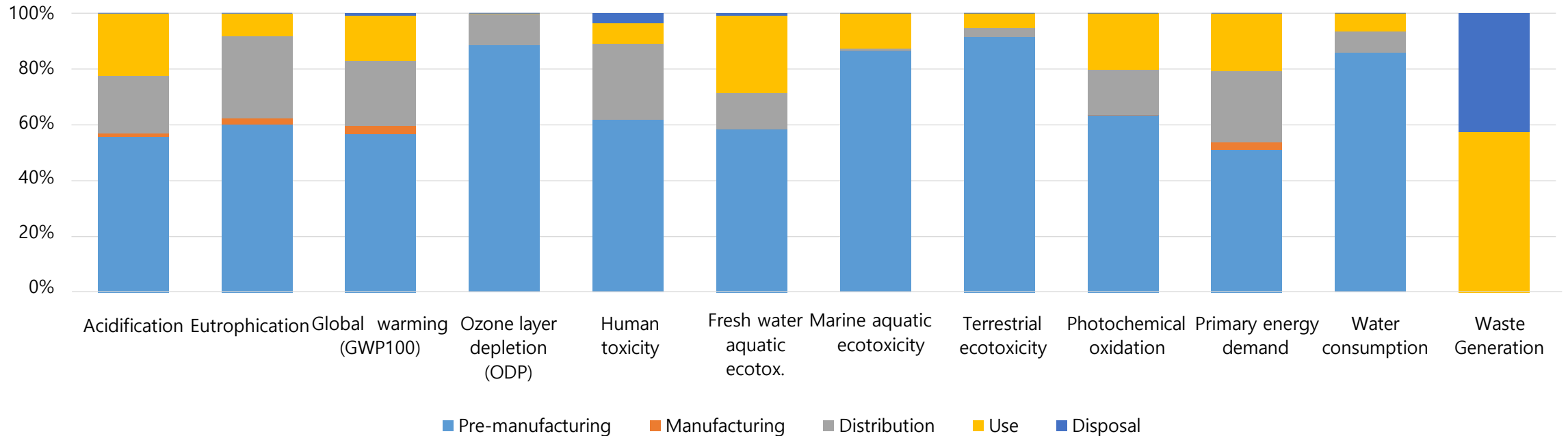


Model name	SM-N920V (Galaxy Note5)
Processor	Octa-Core 2.1GHz, 1.5GHz
Dimension	153.2 x 76.2 x 7.62 mm
Display	Super AMOLED 5.7”
Memory	32GB, 4GB RAM
Battery	3000mAh
Camera	Main : 16M pixel / Front : 5M pixel
Wt.(g)	Product : 192g / Packaging 259 g

● Material Use



● Characterized Environment Impact

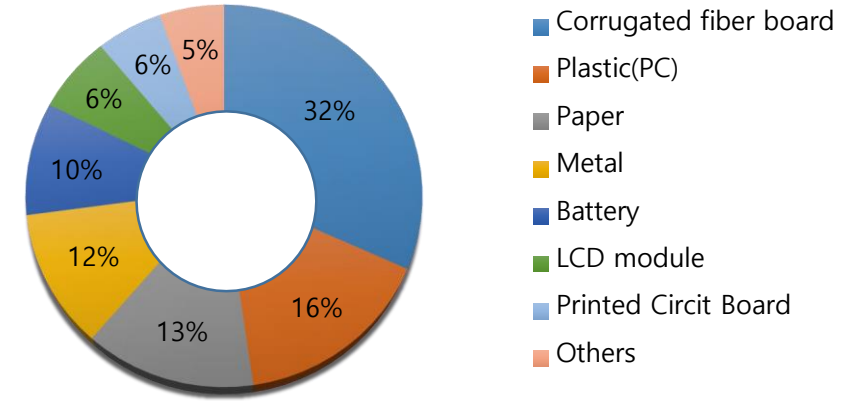


● Product Features



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

