Product Life Cycle Assessment for Mobile Product

Background

Samsung Galaxy series, cutting edge smart devices was analysed based on life cycle assessment (LCA) methodology according to international standard ISO 14040 series in order to determine potential environmental impact across the whole life cycle including pre-manufacturing, product manufacturing, distribution, product use and disposal phase. Product bill of material (BOM), parts and components logistics, energy consumption in product use and end-of-life scenario data were utilized to model the environmental impact using a dedicated LCA S/W and its database. Potential environment impact was quantified in total 12 environmental impact categories including Global warming, Abiotic depletion, Acidification, Eutrophication, Ozone layer depletion etc.

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

<table>
<thead>
<tr>
<th>Pre-manufacturing</th>
<th>Parts and materials constituting the products and its transportation (from supplier to Samsung factory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Product assembly by Samsung Electronics (Data collection period: April ~ May, 2015)</td>
</tr>
<tr>
<td>Distribution</td>
<td>From China or Vietnam to United States</td>
</tr>
<tr>
<td>Usage</td>
<td>2 years use</td>
</tr>
<tr>
<td>Disposal</td>
<td>Waste treatment of parts and material</td>
</tr>
</tbody>
</table>
### 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

- **Corrugated fiber board**: 32%
- **Plastic(PC)**: 16%
- **Paper**: 10%
- **Metal**: 13%
- **Battery**: 12%
- **LCD module**: 10%
- **Printed Circuit Board**: 6%
- **Others**: 5%

### Characterised Environment Impact

- **Acidification**
- **Eutrophication**
- **Global Warming**
- **Ozone Depletion**
- **Human health toxicity**
- **Freshwater aquatic ecotoxicity**
- **Marine aquatic ecotoxicity**
- **Terrestrial ecotoxicity**
- **Photochemical formation**
- **Primary Energy Demand**
- **Water consumption**
- **Waste generation**

- Materials:änn
- Manufacture: één
- Distribution: één
- Use: één
- Disposal: één
**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.**: Product : 192g / Packaging 259 g

**Characterised Environment Impact**

[Diagram showing environmental impacts]

**Material Use**

- Battery: 37%
- LCD module: 6%
- Metal: 10%
- Paper: 8%
- Plastic(PC): 17%
- Plastic(PS): 5%
- Printed Circuit Board: 6%
- Others: 3%

[Bar chart showing material usage by stage]
### Product Features

<table>
<thead>
<tr>
<th>Model name</th>
<th>SM-T377P (Galaxy TAB E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Quad-Core 1.2GHz</td>
</tr>
<tr>
<td>Dimension</td>
<td>212.1 x 126.0 x 8.9 mm</td>
</tr>
<tr>
<td>Display</td>
<td>TFT 8.0&quot;</td>
</tr>
<tr>
<td>Memory</td>
<td>1.5GB RAM</td>
</tr>
<tr>
<td>Battery</td>
<td>5000mAh</td>
</tr>
<tr>
<td>Camera</td>
<td>Main : 5M pixel / Front : 2M pixel</td>
</tr>
<tr>
<td>Wt.(g)</td>
<td>Product : 192g / Packaging 259g</td>
</tr>
</tbody>
</table>

### Material Use

- Battery: 5%
- Glass: 3%
- LCD module: 15%
- Paper: 27%
- Plastic(PC): 18%
- Printed Circuit Board: 25%
- Others: 7%

### Characterised Environment Impact

- Acidification
- Eutrophication
- Global warming (GWP100)
- Ozone layer depletion (ODP)
- Human toxicity
- Fresh water aquatic ecotox.
- Marine aquatic ecotoxicity
- Terrestrial ecotoxicity
- Photochemical oxidation
- Primary energy demand
- Water consumption
- Waste Generation

- Pre-manufacturing
- Manufacturing
- Distribution
- Use
- Disposal