

FUJITSU - Life Cycle Assessment 2018



Product specification of FUJITSU Desktop ESPRIMO P957

- Microtower housing with Power Supply Unit (PSU)
- Motherboard with Intel® Core™ processor incl. heat sink
- 2 x 4 GB DDR4 Memory modules
- 1 TB Hard Disk Drive (HDD)
- 512 GB Solid State Drive (SSD) M.2 Module
- Supermulti Optical Disk Drive (ODD)
- Graphic card incl. heat sink
- Microsoft® Windows® 10 Professional operating system

Fujitsu's Environmental Philosophy and Mission

Environmental sustainability has always formed a core part of Fujitsu's business. From the adoption of park-style design for our factory in Kawasaki in 1935 to today's ambitious Fujitsu Group Environmental Action Plan, sustainability is a key to every stage of our end to end ICT services. Significant climate change and declining biodiversity are just two of many serious environmental issues that continue to escalate on a global scale. Furthermore, with the world's population now more than 7 billion, there are rising concerns about a shortage of food, water, energy and other resources. As a global ICT company, Fujitsu can create new value and transforms business and society. The Fujitsu Group is committed to helping resolve global environmental issues through the power of ICT.

Reason for Product Life cycle Assessment (LCA)

With a product LCA Fujitsu intends to acquire scientifically proven information and insights about the environmental performance and impacts of a system from cradle to grave in all sections.



Impact categories covered by this LCA and net result

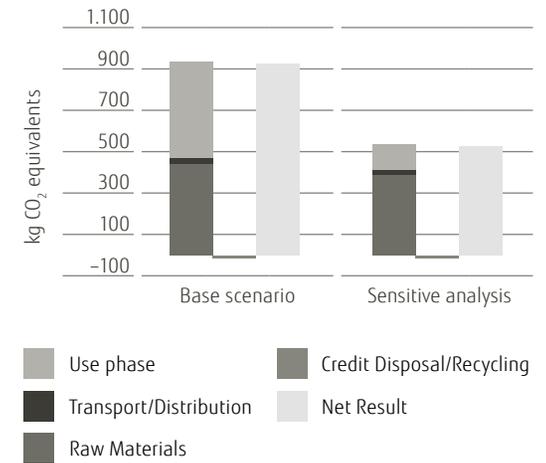
The overview shows that the net results are determined by the use phase and the raw materials.

Impact Category (net result in equivalents)	Raw Materials	Assembly	Transport/ Distribution	Use Phase
Climate change (961 kg CO ₂ equivalents)	46 %	< 1 %	2 %	52 %
Acidification (3.8 kg SO ₂ equivalents)	78 %	< 1 %	3 %	19 %
Particulate matter (744 g PM2.5 equivalents)	94 %	< 1 %	1 %	5 %
Eutrophication (2.6kg PO ₄ equivalents)	96 %	< 1 %	< 1 %	4 %
Photochemical oxidants formation (294 g ethene equivalents)	81 %	< 1 %	3 %	16 %
Ozone layer depletion (96 mg R11 equivalents)	96 %	< 1 %	4 %	< 1 %
Cumulative energy demand (15.7 GJ CED)	39 %	1 %	2 %	58 %
Depletion of abiotic resources (34.8 g Sb equivalents)	99 %	< 1 %	< 1 %	< 1 %
Water consumption (54.5 m3 H2O equivalents)	10 %	< 1 %	< 1 %	89 %

Sensitive analysis of climate change for standard configuration without graphic card

Fujitsu offers with the ESPRIMO P957 a selection of different components. The power consumption measurement for Energy Star certification has to be measured with maximum possible configuration which leads to a power consumption of 159kWh/year. These values are used for the LCA analyses to show the maximum impact. A standard configuration consumes app. 37.5kWh/year only.

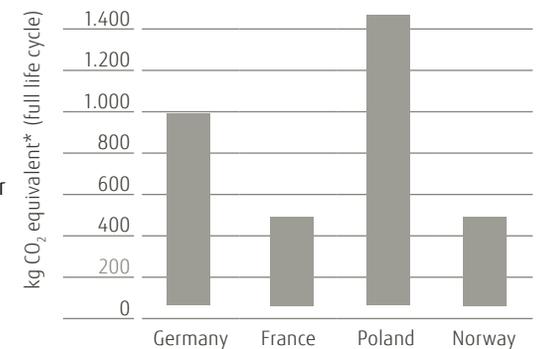
Climate change



Sensitive analysis of Climate change for Use phase with different energy mix

The use of the desktop in Germany is applied for the base scenario. For the sensitivity analysis the results were derived from using the desktop in France, Poland and Norway. This means that the German energy mix for energy supply in the use phase has been replaced by the corresponding energy mixes from the other countries.

Climate change kg CO₂ equivalent* (full life cycle)



*CO_{2e} emission is for reference of one single configuration only to show the main impact categories and will vary by variables like hardware configurations, usage scenario/ power states, electricity rates and utility provider.

CO₂e -emissions of the FUJITSU ESPRIMO P957

Fujitsu is a leading provider of ICT-based business solutions for the global marketplace. The FUJITSU ESPRIMO P957 (Microtower) is reliable, power saving microtower which is available in different power supply versions. The entire lifecycle has been considered concerning CO₂-equivalents (CO₂e) from the treatment of raw materials, manufacturing of pre-products, through transport/distribution and assembly, to the use phase, recycling and disposal.

At what point do the most emissions occur?

With 51% the use phase has the lion's share of the total footprint, which depends highly on the energy supply/energy mix of the power generation in the respective country. The extraction, treatment and transport of raw materials and the manufacturing of pre-products make up the second largest share of the total emissions. The emissions from transport and assembly play a minor role.

What opportunities for further reduction of emissions were identified?

a) Company

- Optimizing the amount of energy and raw materials used in manufacturing processes and switching to alternatives with a lower environmental burden.
- Reducing the environmental impact associated with transport through modal shift, promoting the effective utilization of railroad and sea transportation and reducing the proportion of air transport.
- Promoting reuse and recycling efforts for products.
- Focusing on developing and providing energy efficient power supplies and products like small desktops, Mini PC and thin clients.

b) Customer

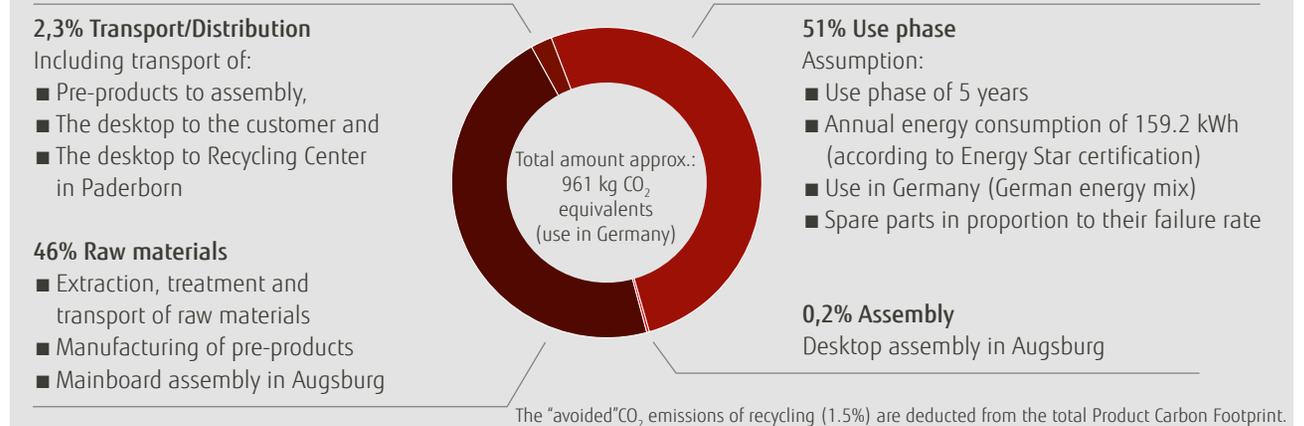
- Optimal configuration of memory and graphic (Do not oversize)
- Set optimal energy management options (monitor off after 15 min., standby after 30 min.)

Partner for project according to DIN EN ISO 14040/44:

- Analysis and assessment: bifa environmental institute

- Critical review: Fraunhofer Institute for Reliability and Microintegration.

How are the CO₂e -emissions of the FUJITSU ESPRIMO P957* distributed?



Recycling (1.5%)

By means of secondary raw materials from recycling and electricity/heat from waste incineration, CO₂e-emissions can be avoided.

- Use of energy efficient ICT-products (Energy Star®)
- Apply energy saving tips

Lessons learned?

The calculation of absolute and comparable values for all the impact categories of a life cycle analyses and especially for product carbon footprint during the entire life cycle of a product is not possible especially for the intention of a product-to-product comparison. Nevertheless, Fujitsu has attained a good transparency concerning CO₂e-emissions along the entire value chain of the product in order to identify potential for additional reduction of emissions.

*Functional unit: Microtower ESPRIMO P957 including mouse, keyboard, manuals

Are there further activities from Fujitsu regarding climate change?

Mid/long term vision and further activities are visible on the internet.
<http://www.fujitsu.com/global/about/environment/approach/vision/>

Question and answers about LCA

Are the net results of LCA from 2010 and 2018 comparable? No. The data from the used environmental data base has changed over the years and can't be compared directly. The findings are comparable.

Why are the LCA available for Microtower system only? The effort for a complete LCA with different impact categories is very high and takes long time. The principal findings can be used for other products too. The climate change impact only can be evaluated by other tools.

Additional information in document: LCA and PCF of ESPRIMO P957;

Link: <http://www.fujitsu.com/global/about/environment>

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