READY TO BOARD WITH THE SUSTAINABILITY PASSPORT

This passport provides insight into the CO_2 impact and material usage of the CTOUCH Neo touchscreen.

In co-operation with Dispersed

CTOUCH®

Share, inspire, have fun!
With CTOUCH by your side.

PREFACE

As a designer and manufacturer of touchscreen solutions for education and corporate businesses, we often receive questions about sustainability in relation to our products. Most of those questions are related to the recycling of product packaging and the usage of raw materials. Although these topics are important in the industry's mission to limit excessive usage of (scarce) resources, we believe sustainability is much more than recycling. The environmental footprint and circularity of the electronics that make our lives so much better should become a key topic on the agenda of industry.

CTOUCH has conducted a Life Cycle Assessment (LCA) in order to calculate the CO_2 impact of the manufacturing, transport, use and end-of-life stages of the CTOUCH Neo touchscreen. This research provides many insights regarding the sustainability of our products and has led to the creation of new innovative projects that benefit the environment, our partners and end-users.

This passport gives a transparent insight into CO_2 impact and material usage, which enables us to create awareness about the CO_2 impact of touchscreens. It also triggers dialogs with

CTOUCH partners about re-usage of these electronics, creating environmental and customer benefits.

CONTENT

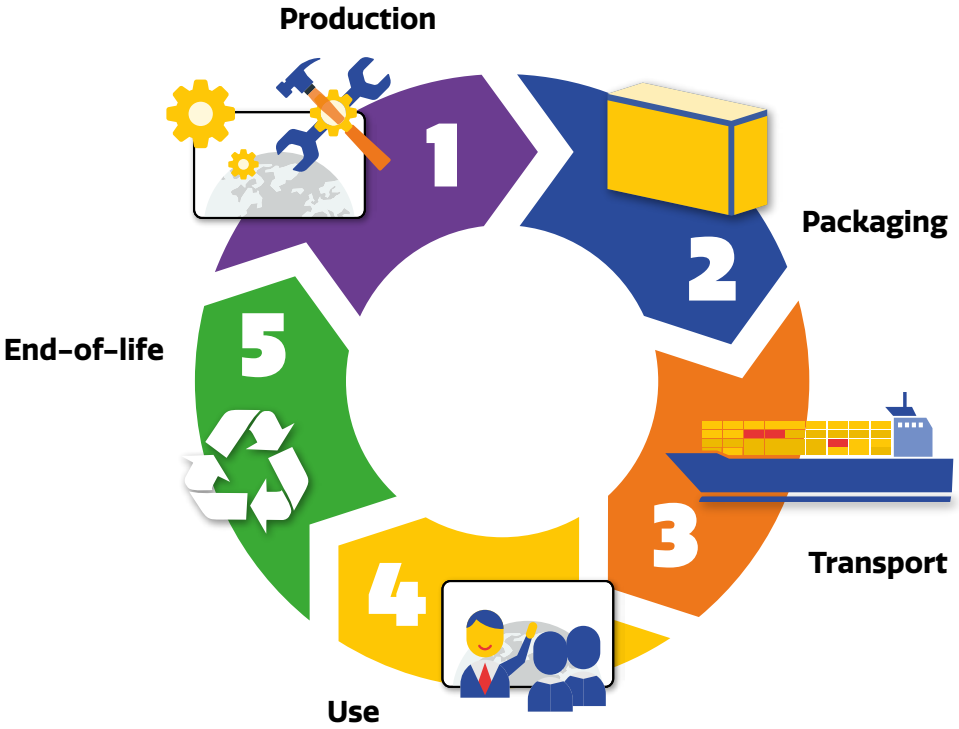
INTRODUCTION

This sustainability passport gives a transparent overview of the CO_2-eq impact of the five lifecycle stages and explores in detail the material composition and CO_2 impact related to the manufacturing of the CTOUCH Neo. In this way, CTOUCH is transparent regarding the impacts of its products, which enables us to create awareness about the CO_2-eq impact of our touchscreens. It also triggers dialogs with CTOUCH partners about re-usage of these electronics, creating environmental and commercial benefits.

The results presented in this product passport have been calculated by means of a Life Cycle Assessment (LCA), which has been performed according to the ISO 14040 and 14044 guidelines. LCA is the most widely used scientific method to map the ecological impacts of products. The ecological impact of products can consist of many indicators, but this passport focusses specifically on CO_2 emissions, in accordance with CTOUCH's sustainability strategy.

At CTOUCH, we strive to reach 60% CO_2-eq reduction. The Key Performance Indicator (KPI) we use to track our CO_2-eq reduction is "CO_2-eq impact per product per year". This is also called the emission intensity of our products.

By using this KPI, we can ensure that we encompass the positive effects that lifetime extension has on the CO_2-eq impact of our products into the equation.



$$\text{Emission Intensity} = \frac{\text{Average } CO_2 \text{ emission, weighted by sales}}{\text{Functional lifetime}}$$

LIFE CYCLE ASSESSMENT METHODOLOGY

The CO_2 footprint has been calculated using the Life Cycle Assessment (LCA) methodology in accordance with ISO 14040 and 14044. The LCA identifies key materials, processes and activities that cause environmental impacts within the life cycle of products. In accordance with the ISO 14040 and 14044 standards, the LCA consists of four phases.

Goal and Scope Definition

It is explicitly defined what is included and excluded from the analysis. Since the environmental impact KPIs of CTOUCH are based around the reduction of CO_2-eq emissions, the LCA in this study is primarily focused on the assessment of life cycle CO_2-eq emissions. This sustainability passport considers the manufacturing, packaging, distribution, and end-of-life treatment of a single CTOUCH Neo touchscreen, as well as the use of that screen for the duration of its lifetime. We as CTOUCH promise that at least 50% of our Neo products should still be in use after 10 years and be positively rated by our customers.

Inventory Analysis

The inventory analysis consists of collecting material and process (inventory) data associated with all life cycle activities within the scope. With regards to the manufacturing of the CTOUCH Neo, detailed primary data regarding the material composition was collected from the manufacturer. For the transportation phase, the average transport route and shipping methods of our products from factory to customer were calculated and modelled. Regarding the use phase of the CTOUCH Neo, the power consumption of the Neo displays has been officially measured according to the applicable EU guidelines and this data has been used as an input for the LCA. The inputs for the end-of-life and recycling phases have been based on extensive research that we have conducted in collaboration with Mirec, a recycling partner. This research has shown the exact recyclability of the materials present in our touchscreens, and is therefore a valuable input to the LCA.

Together, the collected data from all life cycle phases comprises the complete life cycle inventory. Using this inventory, a model of the CTOUCH Neo was built in OpenLCA software, in combination with the renowned EcoInvent database.

LIFE CYCLE ASSESSMENT METHODOLOGY

Impact Assessment

During the impact assessment, inventory data is translated into quantitative environmental impacts. In this process, input quantities of materials or processes are multiplied with emissions factors which relate to the impact of that material or process. The result is a figure that explains the total environmental impact of a material or process.

Interpretation

In this stage, a critical reflection on results is provided and the results are translated into actionable conclusions. First, an assessment of CO_2 outputs was conducted. Subsequently, these results are analysed and put into context. A detailed overview of impacts, life cycle hot-spots, and key materials and processes is provided. Moreover, the results are validated by analysing the most relevant academic literature and industry reports. Finally, recommendations for future improvements of environmental impacts are provided.

Life cycle stages

In this material passport, four life cycle stages are considered: production, transport, usage, and end-of-life. Environmental impact, expressed in terms of CO_2 emissions, occurs in all these stages. Impact in the production stage stems from all processes that are related to the production of our displays, such as the mining of materials, the making of components for our displays and the use of energy during product assembly. Environmental impact in the production phase naturally stems from the transport movements of our displays, from our manufacturer in China all the way to our customers in Europe. Environmental impact of product usage is calculated based on the average energy use of our displays, and their average lifetime. Lastly, the impacts of the end-of-life phase are caused by the different treatment options that our products can receive at their end-of-life, such as recycling or incineration.

LIFE CYCLE ASSESSMENT METHODOLOGY

Lifetime extension

Our progress on sustainability is measured against a baseline set in 2019. Compared to this baseline, we have extended the lifespan of our products. We promise that at least 50% of our CTOUCH Neo products will be positively rated by users after 10 years. Extending lifespan contributes to our circularity strategy, where the goal for products is to be as high as possible on the circularity ladder (R-model or R-ladder). In other words, we use our products more intensively, make them more efficient to use and give them the longest possible lifespan! The longer lifespan ensures that we need to produce fewer products and that the products are reused or recycled at a later stage. The positive impact of a longer life significantly outweighs the higher impact in the use phase. A real win-win!

Strategies			
Smarter creation and use of products	R0	Refuse	Turning a product redundant by cancelling its function, or by substituting it with a radically different product.
	R1	Rethink	Intensifying product use (e.g. via product sharing or multifunctional products).
	R2	Reduce	More efficient use and/or manufacture of products through the use of fewer natural resources and materials.
Extending the lifespan of products and parts	R3	Reuse	Reuse of discarded yet still usable product, for the same purpose, by a different user.
	R4	Repair	Repair and maintenance of broken or malfunctioning product, to enable continuation of its original function.
	R5	Refurbish	Refurbishing and/or modernising an older product, so that the improved version can be used in the product's original function.
	R6	Remanu-facture	Using parts of a discarded product in a new product of the same function.
	R7	Repurpose	Using discarded products or their parts in new products with a different function.
Usefull application of materials	R8	Recycle	Processing of materials to achieve the original high-quality or reduce to low-quality.
	R9	Recover	Incineration of materials, recovering their energy.

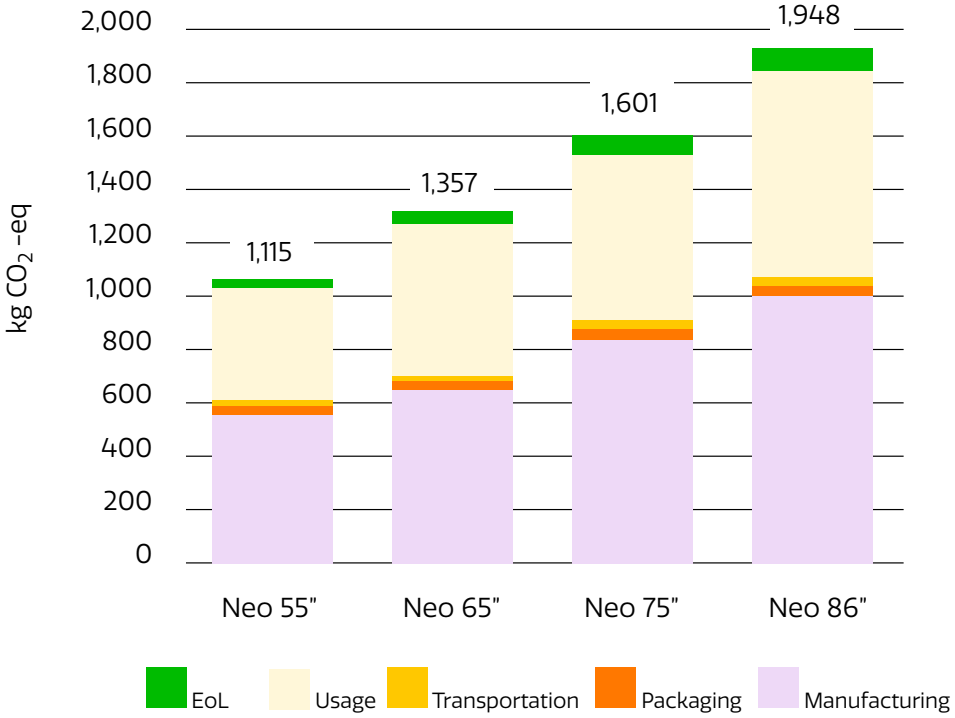
Source: the R-ladder - Delahaye et al. 2018

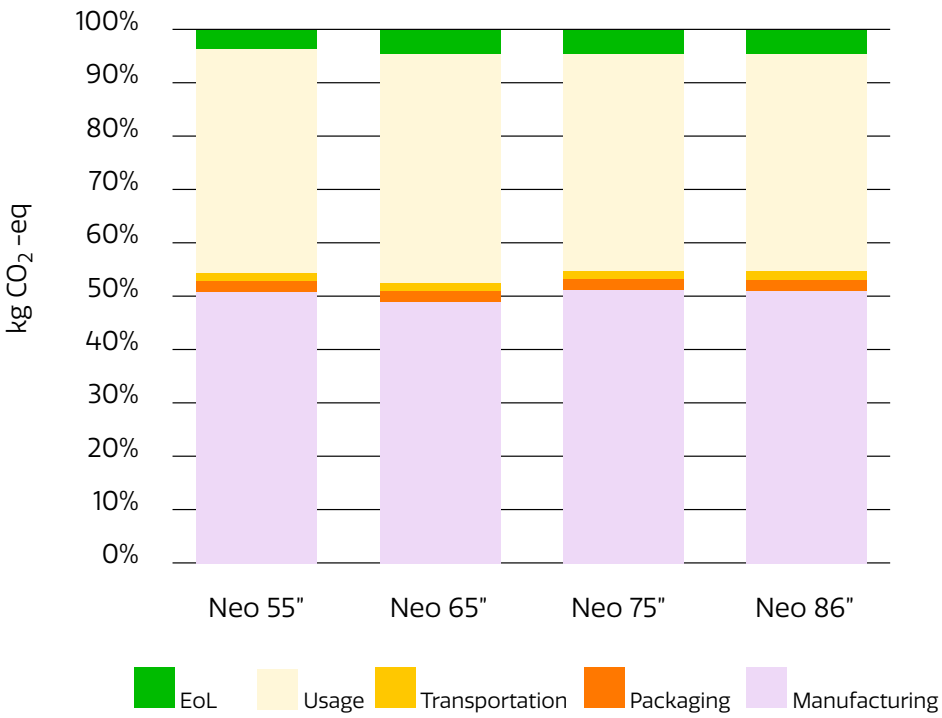
What is CO_2-equivalent?

When we talk about climate change, we often tend to focus on carbon dioxide emissions (CO_2) – the most dominant greenhouse gas. However, CO_2 is not the only greenhouse gas that is driving climate change. There are a number of other gases that significantly contribute to global warming, all of which together are quantified in one single metric called CO_2-equivalent, or CO_2-eq.

Total CO_2-eq footprint

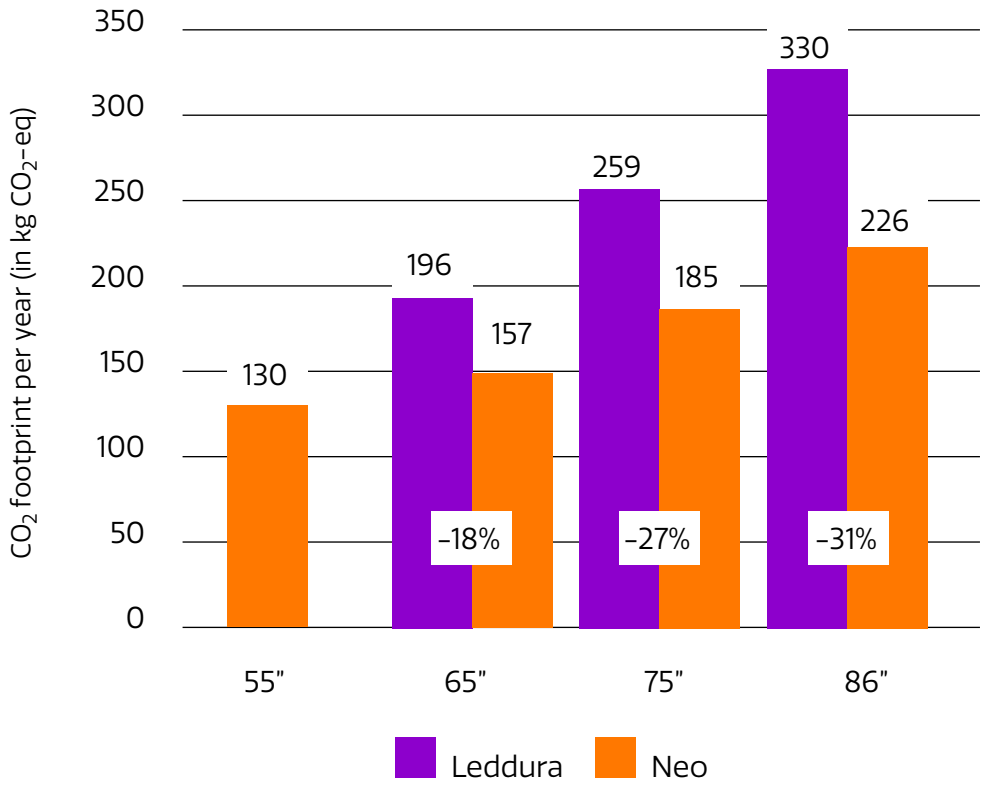
It can be observed that there is a clear trend, as with increasing product size, the CO_2 emissions increase. Furthermore, it can be noted that the manufacturing phase is the largest contributor to the total CO_2 emissions caused during the products' lifetimes. The use phase of the displays has the 2nd largest CO_2 impact. The transport and end-of-life phases have a relatively low impact compared to the other two life cycle stages.





CO_2-eq footprint per year

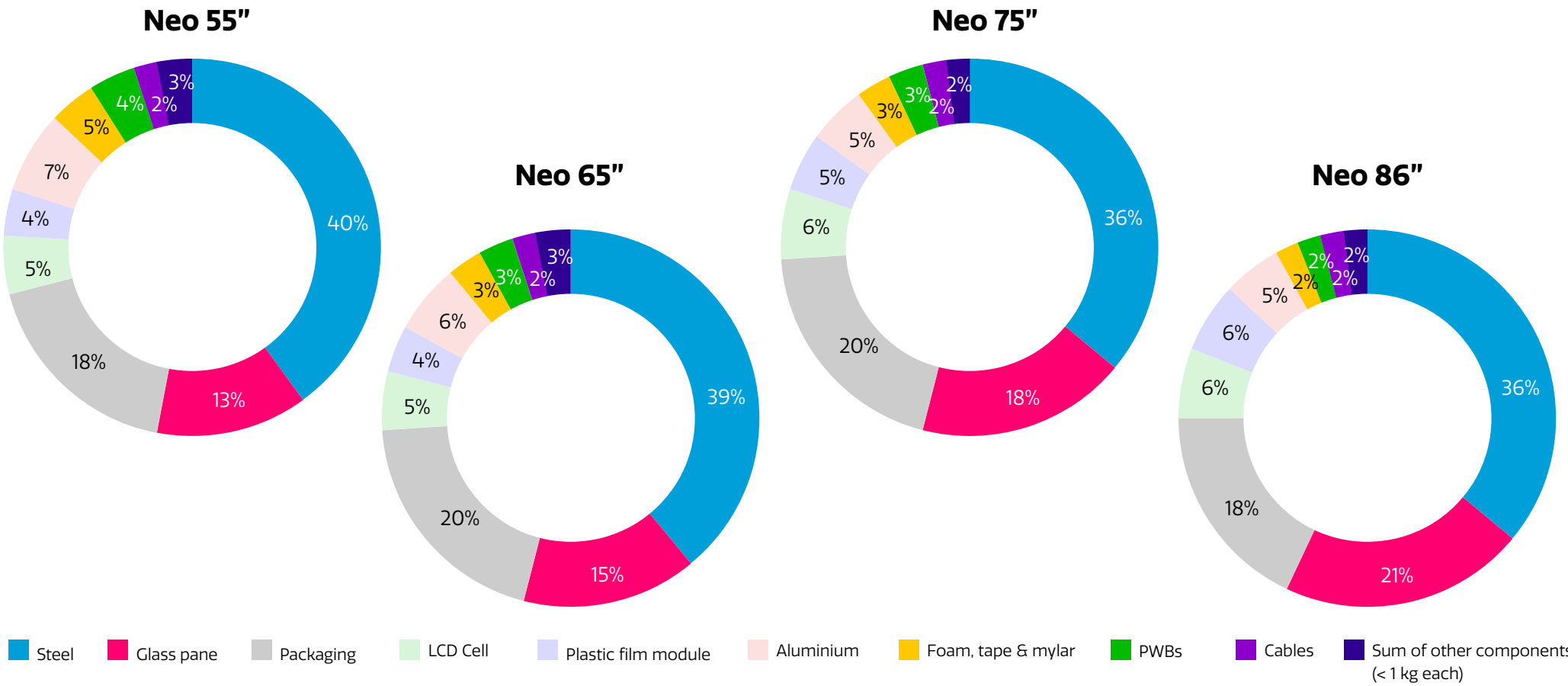
We as CTOUCH promise that at least 50% of our screens is still functioning and positively rated by customers after 10 years. This means that 50% of our products will reach at least a lifetime of 10 years, and 50% will reach at least a lifetime of 7 years. Thus, the average lifetime of our Neo products is 8.5 years. As such, if we divide the total CO_2 footprint shown on the previous page by the expected lifetime of 8.5 years, we get the CO_2 footprint per year, shown in the figure on the right. This yearly impact is between 18% and 31% lower compared to the yearly CO_2 impact of the CTOUCH Leddura.



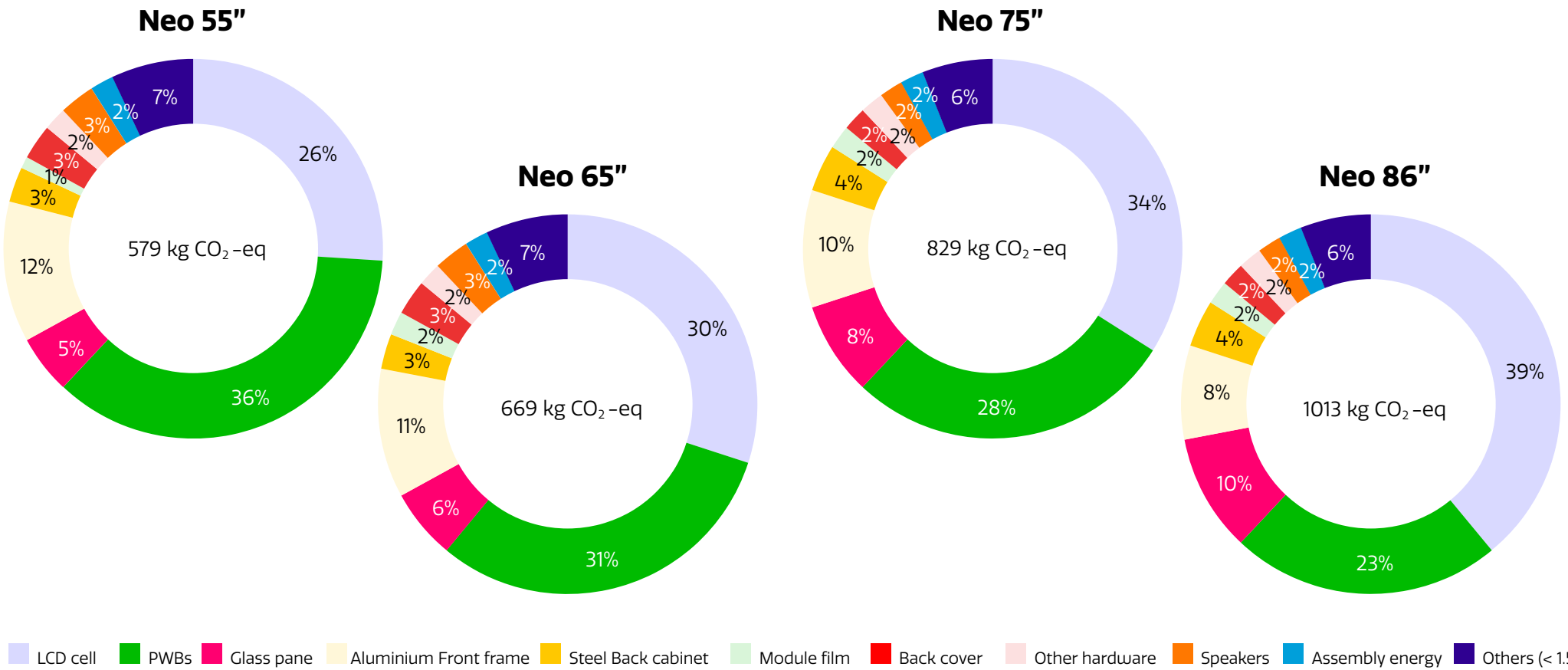
Manufacturing & Packaging

Since the largest amount of CO_2 emissions of the CTOUCH Neo is caused during the manufacturing phase, these emissions will be explored in more detail on the next pages. Emissions resulting from the packaging used for the CTOUCH Neo are also accounted for in this section.

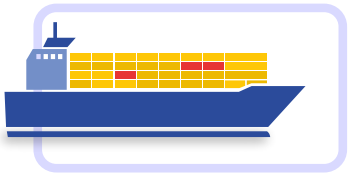
Material composition per display size (in kg)



CO_2-eq footprint during production per display size



Transport



The transport of the CTOUCH Neo, from the factory to the final customer, is responsible for almost up to 2% of the total impact on Global Warming Potential. The transport has been broken down into several stages.
First, the product travels from the factory to a port. From this port it is (usually) shipped to the Netherlands. Subsequently, it is transported to our warehouse by truck, from which it is distributed to customers by truck or van. For the different phases of transport, different emissions factors have been used to accurately represent the emissions of different modes of transport. Subsequently, the emissions that occur in all different transport phases are summed to retrieve to total transport emissions.

To minimize the impact of our products during the transportation phase, we ensure that our products are transported as efficiently as possible, with containers always fully loaded. By improving load efficiency and reducing the packaging size, we achieved a 26% reduction in CO_2-eq emissions for transporting the Neo 86".

Usage

The power consumption of the CTOUCH Neo displays is depicted in the table below.

Size	Power Consumption
55"	88 W
65"	112 W
75"	123 W
86"	151 W

Power consumption in standby mode is <0.5W. The CTOUCH Neo is very sustainable in terms of power consumption compared to its competitors. Have a look at the CTOUCH energy saving calculator for more information.

Using these values for power consumption, the average daily energy consumption was determined and translated into CO_2-eq impact data, based on average user profiles. Using this method, the CO_2-eq impact of product usage was calculated for the entire lifetime of the CTOUCH Neo. The analysis shows that the emissions in the use phase are roughly dependent on three factors: the product specifications of the touchscreens, the user profile (the way in which the screen is used), and the emissions intensity (emissions factor) of the electricity grid.

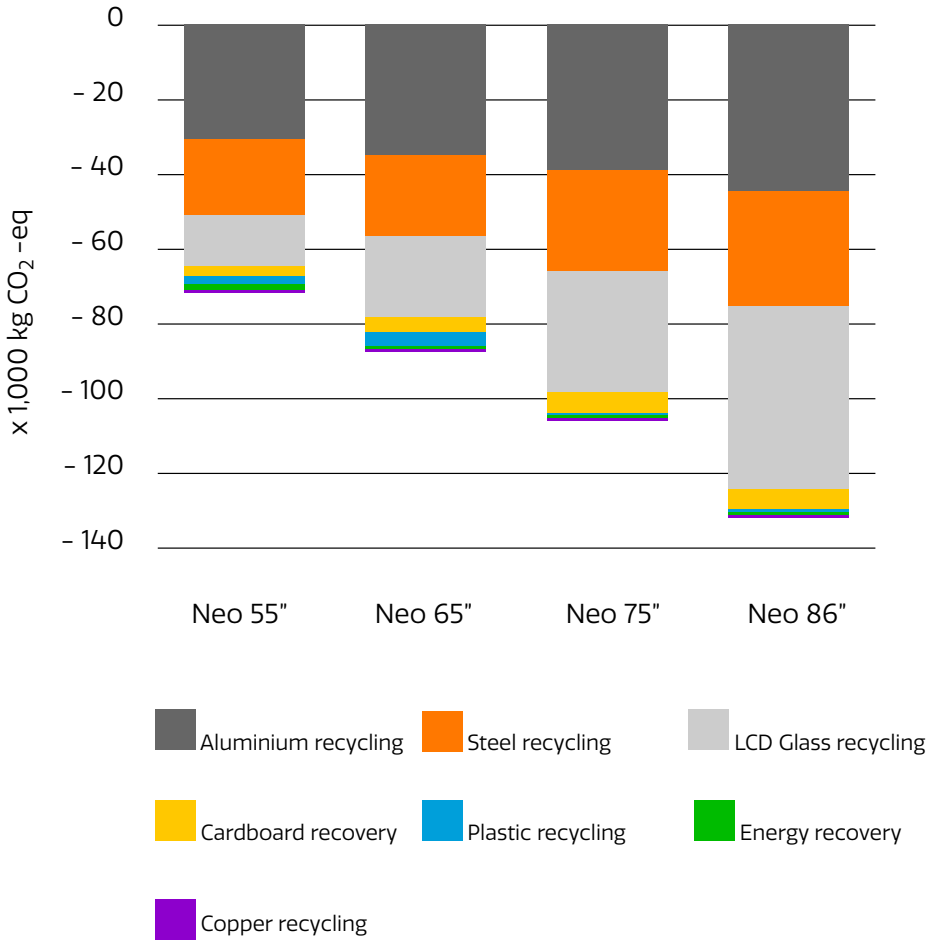
CTOUCH touchscreens always come in eco mode by default. Besides, the CTOUCH Neo includes a smart on/off function. The screen automatically turns off when nobody is in the room. This ensures that our products' energy use is lower than ever! CTOUCH is continuously developing new innovations to reduce energy consumption and spread awareness amongst our products' users.

End-of-Life

The end-of-life phase of the CTOUCH Neo accounts for up to 5% of total life-cycle GWP. The CO2-eq 2 impact of the end-of-life phase is calculated based on collaborative research with a large-scale electronic recycling company. This collaborative research shows that up to 88% of the materials in our products is recyclable! Materials that cannot be recycled are incinerated with energy recovery, to make sure that they still serve a purpose. Only a fraction of the materials in our touchscreens ends up in a landfill (0.1%).

As such, in addition to environmental impact as a result of transport and processing in the end-of-life phase, there is also potential to avoid environmental impact as a result of recycling. By recycling various materials from the CTOUCH Neo, we ensure that these materials are given a 2nd life. Recycling materials ensures that fewer virgin materials are needed somewhere else in the chain.

Therefore, we can calculate a net CO2 saving for each of the recyclable materials. The figure to the right shows the proportion of CO2 saved by recycling for each material. We may not subtract this positive impact from the total CO2 impact of our screens, but it gives insight into how recycling contributes to realizing CO2 reductions in the chain.



CONCLUSIONS

The LCA demonstrated that life-cycle emissions of the CTOUCH Neo strongly depend on the size of the touchscreen. Larger screens require more materials, process energy, and operational energy compared to smaller touchscreens of the same type. The LCA also demonstrated an overwhelming contribution of the production phase and use phase to total life-cycle emissions. Together, manufacturing, packaging and product use account for up to 95% of all life-cycle emissions. Transportation and end-of-life each account for the other 5% of life-cycle emissions. Reducing CO_2 emissions in the manufacturing and use phases is thus the most sensible and promising strategy for reducing total life-cycle emissions.

With regards to using the CTOUCH Neo, this passport shows the relatively low power consumption of the display. Nonetheless, the use phase still has one of the largest overall CO_2-eq impact due to the long product lifetime. We take pride in the long functional lifetime of our products, which we support through our modular CTOUCH BRIX solutions and Heartbeat As-A-Service programme, including CTOUCH Next life. As such, we also take full responsibility for the impacts of our products during their extended lifetime. Our efforts with regard to lifetime extension contribute to a lower replacement rate of touchscreens, and a lower CO_2-eq footprint in the industry.

Energy saving features have already been introduced in CTOUCH Neo, including a smart on/off function, which includes a timer that automatically turns off the touchscreen when nobody is in the room, as well as the default eco mode setting, which reduces the brightness and thereby significantly reduces the power consumption of the display. Ultimately, it is up to the user to use our products consciously and sustainably! Want to know more about how our products power consumption compares to its competitors? Have a look at the CTOUCH energy saving calculator for more information.

Furthermore, our collaborative research with a large-scale electronics recycler has provided us with valuable input regarding the recycling rate of the materials used in our products, and shows the positive contribution this has on preventing CO_2-eq emissions.

With respect to the manufacturing phase, we clearly see that the CTOUCH Neo is lighter than its predecessor, the Leddura, making it easier to handle and resulting in a lower CO_2-eq impact for several large components. Additionally, it is important to note that we have developed sustainability requirements for our strategic suppliers and are collaborating to investigate the use of alternative materials and to increase the use of recycled materials. Also, we are looking into expanded product recycling and re-use, as this reduces the demand for virgin materials, and consequently reduces the CO_2-eq impacts of the production phase.

Hi, we are CTOUCH

Looking for the perfect technological solutions for your meeting? CTOUCH helps organisations create a modern workplace in which people can collaborate more efficiently. We stimulate interactivity, productivity and involvement during meetings, workshops, and anywhere else too, for that matter. How? By implementing the endless possibilities of touch screens – for inspiration, for sharing knowledge, for so many things! That way, we provide you with support for any environment in which you would like to see or which requires more collaboration. We'll take care of that, and you'll be surprised at what we manage to achieve – guaranteed!

Have a look at our product range.

Or feel free to contact us via
+ 31 (0)40 261 8320 or sustainability@ctouch.eu
www.ctouch.eu

Contact

DISPERSED

Life Cycle Assessment and Sustainability Passport executed by Dispersed. Feel free to contact Dispersed via info@dispersed.nl or their website.

Literature sources

Amato, A., Rocchetti, L., & Beolchini, F. (2017). Environmental impact assessment of different end-of-life LCD management strategies. Waste Management, 59, 432–441.

Baxter, J., Lyng, K. A., Askham, C., & Hanssen, O. J. (2016). High-quality collection and disposal of WEEE: Environmental impacts and resultant issues. Waste Management, 57, 17–26.

Share, inspire, have fun!
With CTOUCH by your side.

2162V240131 EN