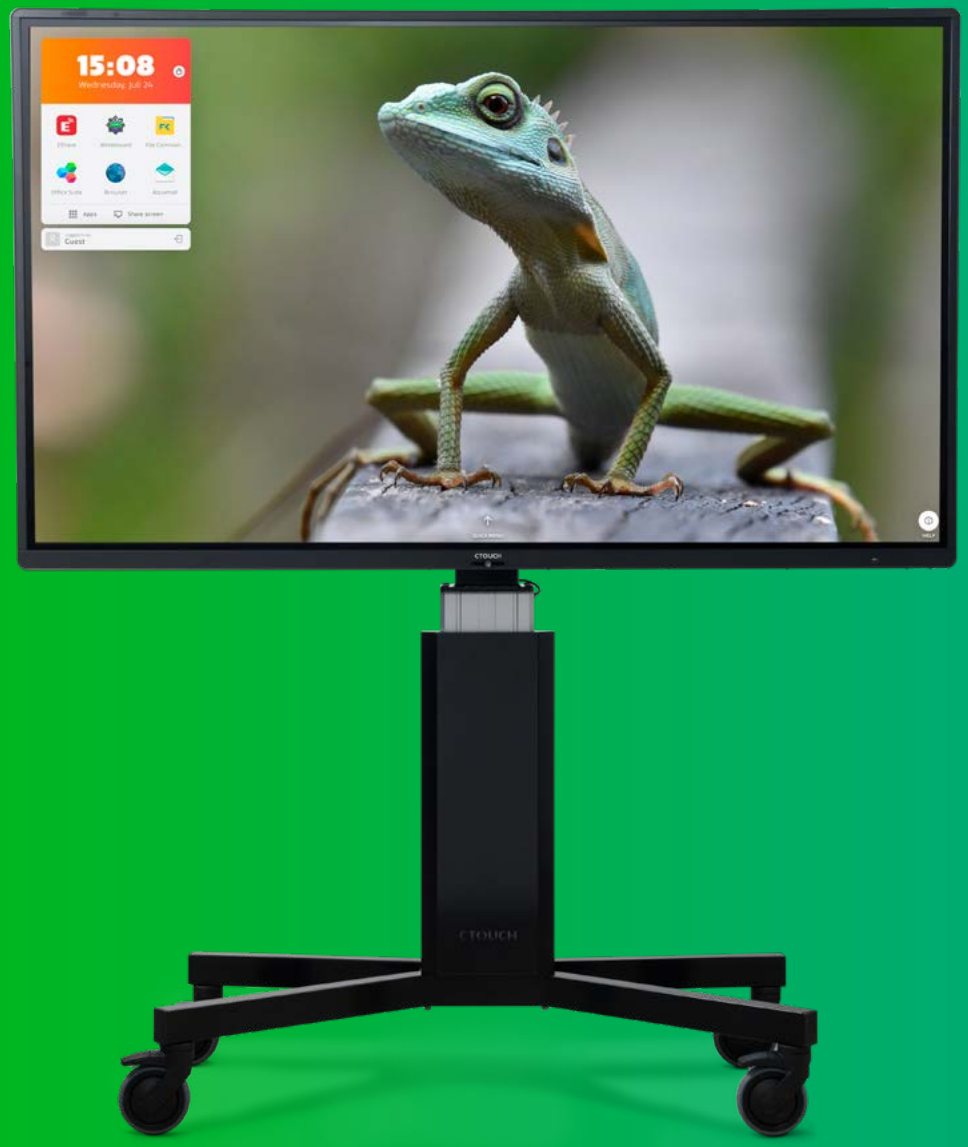

READY TO BOARD WITH THE SUSTAINABILITY PASSPORT

This passport provides insight into the CO_2 impact and material usage of the CTOUCH RIVA D2 touchscreen.

In co-operation with Dispersed

CTOUCH®

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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 AV industry pioneers.

As the world's most sustainable touchscreen manufacturer, we are committed to making a positive impact on the future through transparency. We perform Life Cycle Assessments (LCAs) to identify the environmental impacts and ethical risks of our supply chain and our products throughout their entire life cycle. The results of the LCA combined with insight on our CO_2 impact are at the base of this sustainability passport.

We are the first (and currently only) touchscreen manufacturer with a sustainability passport for our touchscreens. The details of this passport comes to life in the online Sustainability Dashboard.

It's not just our products' CO_2 impact that we measure. We also take responsibility for the impact of our suppliers on people and the environment. Therefore, we have mapped all important and impactful materials and their suppliers (Tier 2 and 3). Our key suppliers have signed the Social Responsibility Employment Statement to ensure that slavery and child labour do not occur in any part of our supply chain, and that a safe and healthy working environment is guaranteed.

CONTENT

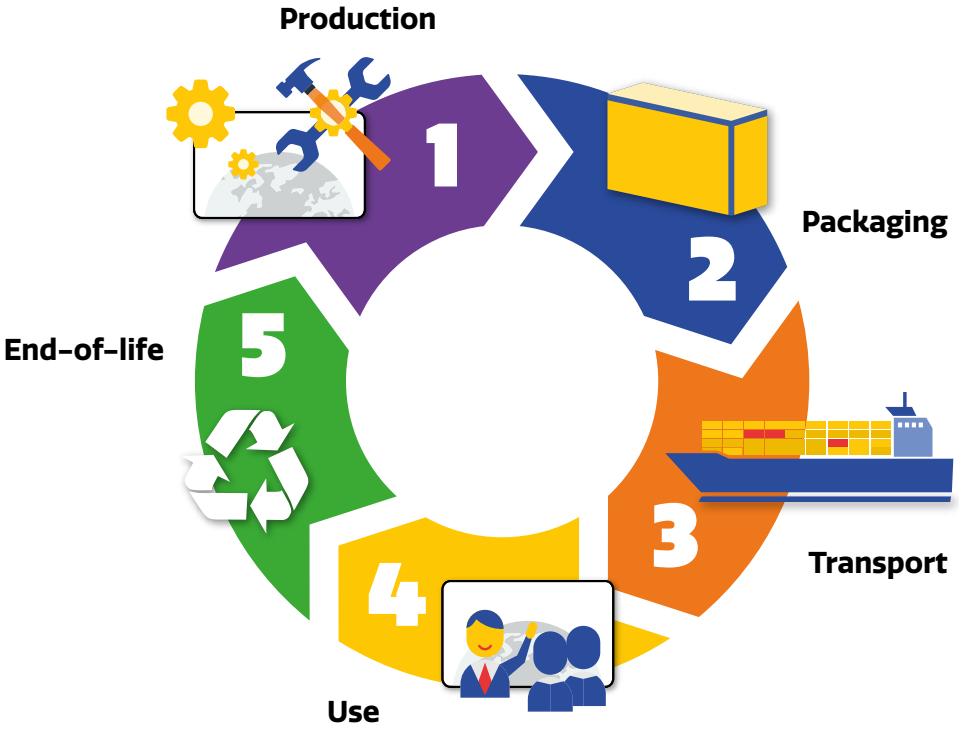
INTRODUCTION

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 Riva D2. 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-eq 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 five phases: manufacturing, packaging, transport, use and end-of-life.

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 Riva D2 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 Riva D2 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 regard to the manufacturing of the CTOUCH Riva D2, 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 Riva D2, the power consumption of the Riva D2 displays have 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 Riva D2 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-eq 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 sustainability passport, five life cycle stages are considered: manufacturing, packaging, transportation, usage, and end-of-Life. Environmental impact, expressed in terms of CO_2-eq emissions, occurs in all these stages. Impact in the manufacturing 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 transportation 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 generic 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 Riva D2 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.

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

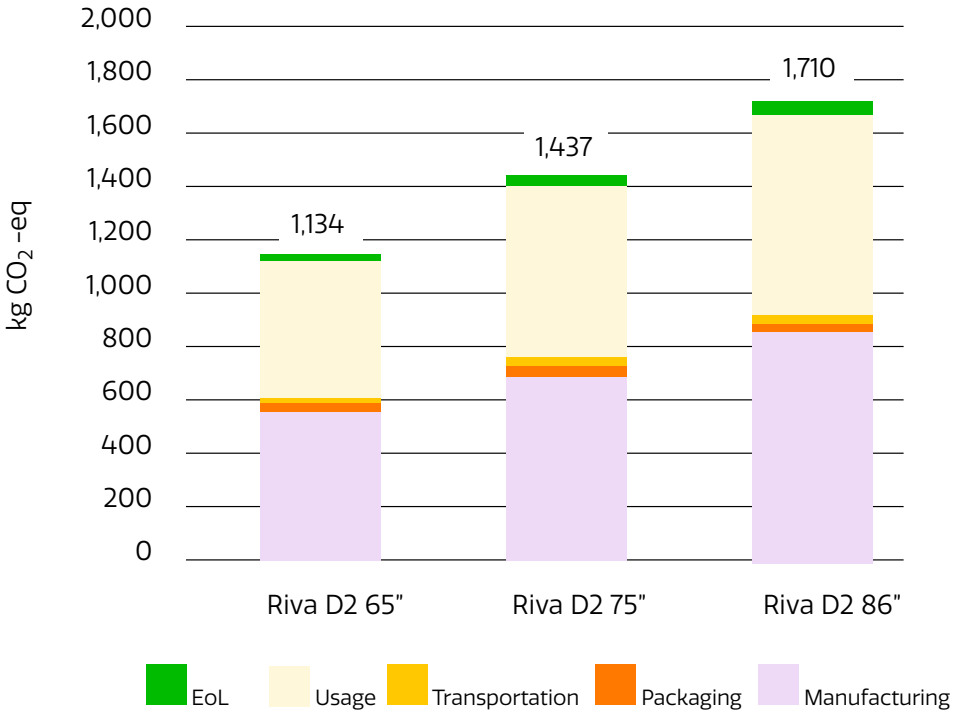
RESULTS

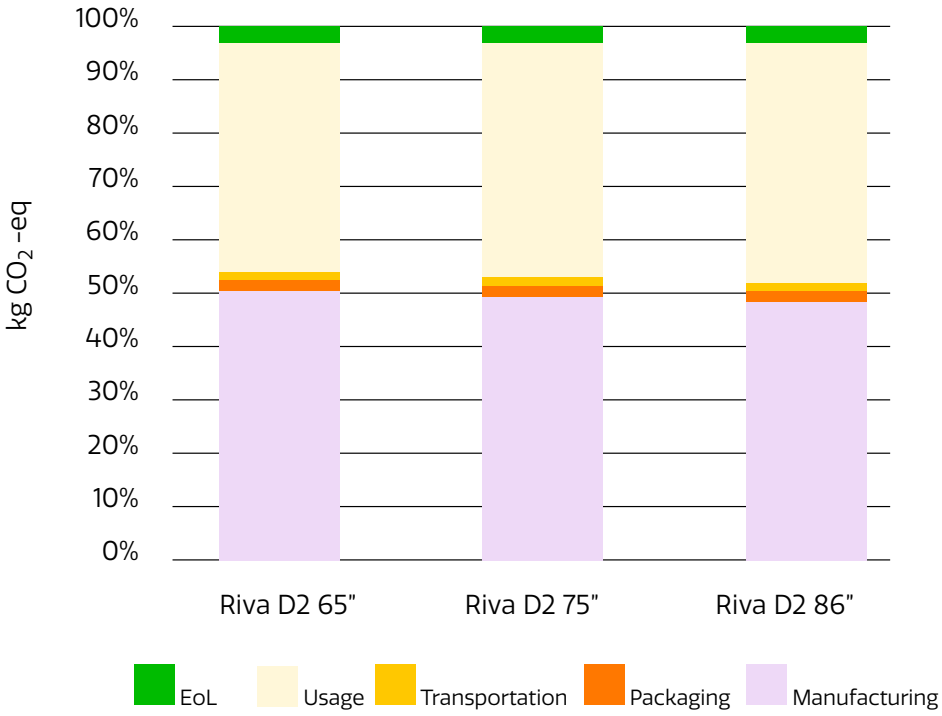
What is CO_2-equivalent?

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

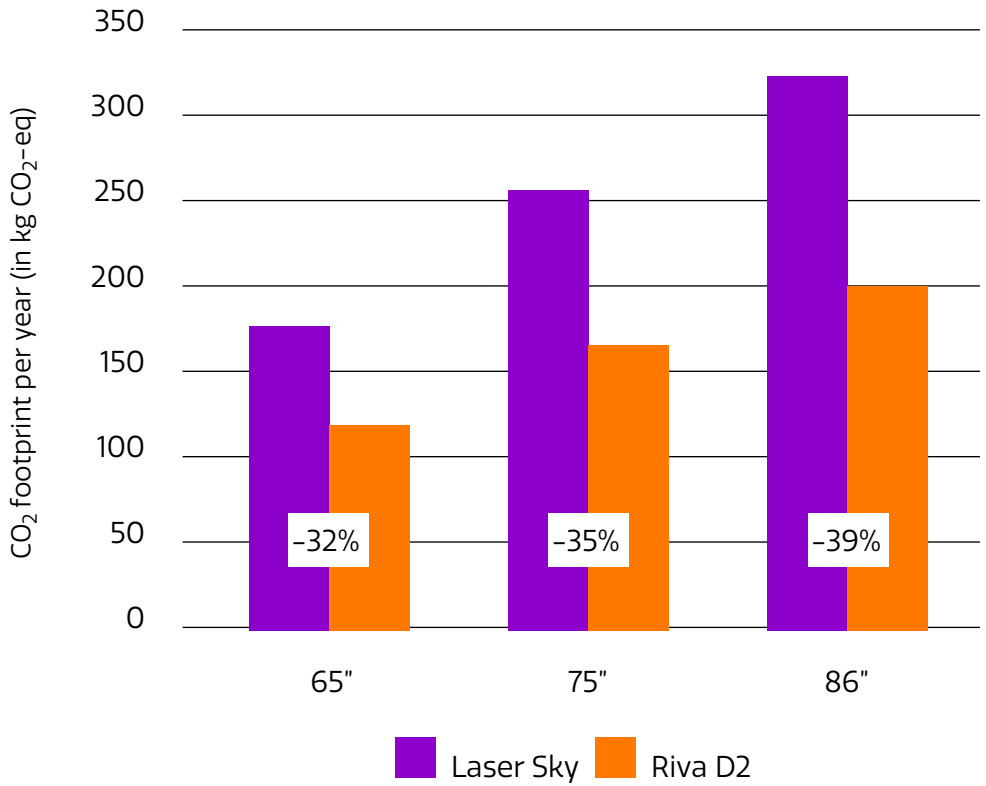




RESULTS

CO_2-eq footprint per year

We, as CTOUCH promise that at least 50% of our screens is still functioning and positively rated by our customers after 10 years. This means that more than 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 Riva D2 products is 8.5 years. This is a significant increase compared to the 7-year lifetime of the predecessors of the Riva D2, namely the CTOUCH Laser Sky/Nova, and Riva 1. As such, if we divide the total CO_2-eq 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 CO_2-eq impact is between 32% and 39% lower compared to the yearly CO_2-eq impact of the CTOUCH Laser Sky. This is a great result considering the fact that we also take into account 1.5 more years of usage as a result of longer product lifetime!

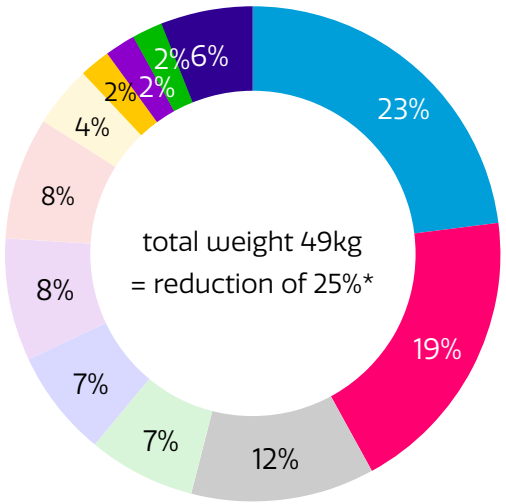


Manufacturing & Packaging

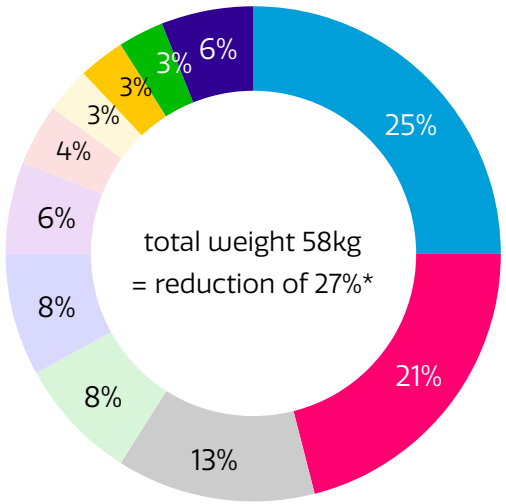
The CO_2-eq emissions of the CTOUCH Riva D2 during the manufacturing phase will be explained in more detail on the next pages. Emissions resulting from the packaging used for the Riva D2 are also accounted for in this section.

Material composition per display size (in kg)

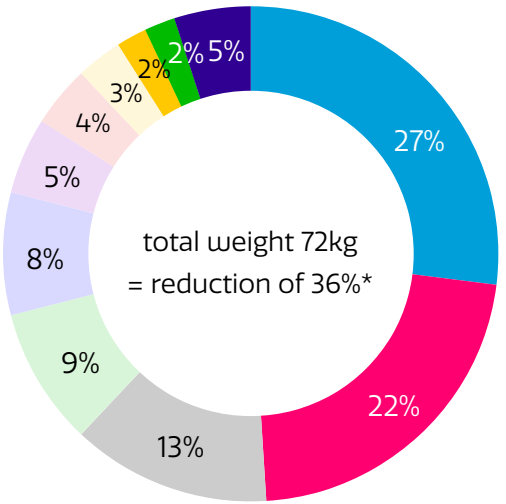
Riva D2 65”



Riva D2 75”



Riva D2 86”



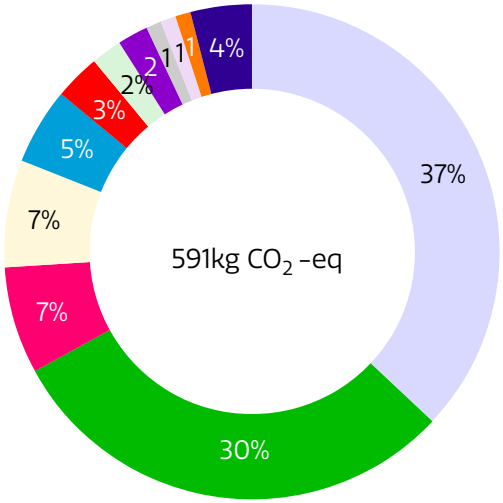
Back cover | AG glass | Carton box | Module film | Cell | Back cabinet | Other hardware | Front frame | EPE packaging | Cables | PWBs | Sum of other components (< 1 kg each)

* weight reduction compared to predecessor of Riva D2 (Laser Sky)

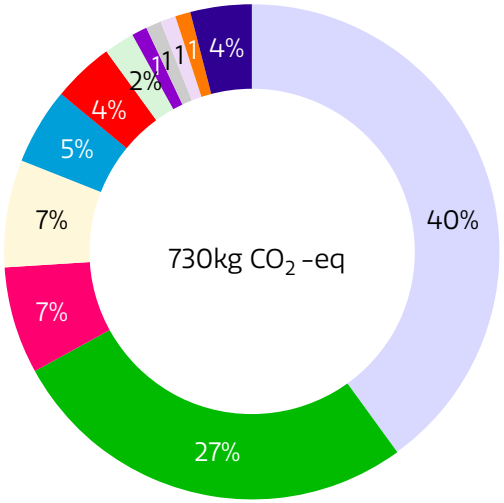
RESULTS

CO_2-eq footprint during production per display size

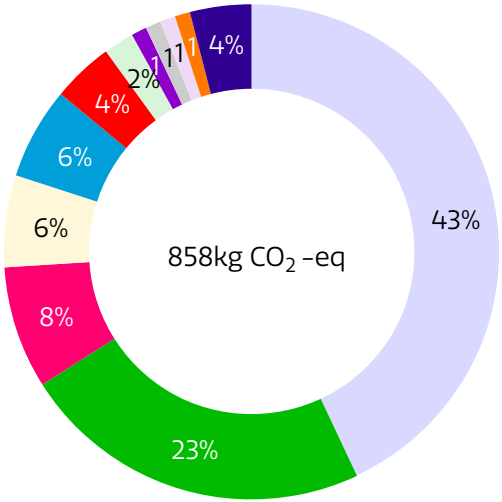
Riva D2 65"



Riva D2 75"

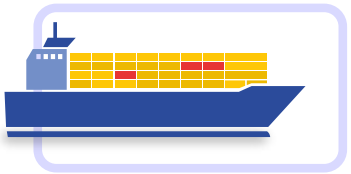


Riva D2 86"



LCD cell | PWBs | Glass pane | Front frame | Back cover | Backlight | Module film | Cables | Cardboard packaging | Back cabinet | Speakers | Other components (< 1kg each)

Transport



The transport of the CTOUCH Riva D2, from the factory to the customer, accounts for about 2% of the total CO_2-eq footprint. The transport has been broken down into several stages. First, the product is transported from the factory to the port in China. From this port it is (usually) shipped to the Netherlands. Subsequently, it is transported from the port in the Netherlands to our warehouse by truck, from which it is distributed to our 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 transportation. 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 28% reduction in CO_2-eq emissions for transporting the Riva D2 86" and a 12% reduction in CO_2-eq emissions for the Riva D2 75".

Usage

With regards to product usage, the power consumption of the Riva D2 displays have been officially measured according to the applicable EU guidelines (ErP): COMMISSION REGULATION (EU) 2019/2021 Ecodesign requirements for electronic displays; COMMISSION DELEGATED REGULATION (EU) 2019/2013. The Riva D2 thereby meets the Ecodesign requirements as stated in Annex II(A,B,C,D,E) of the (EU) 2019/2021. EN 50564:2011EN62087-1:2016; EN62087-2:2016; EN62087-3:2016; EN 62087-7:2019.

Size	Power Consumption
65"	95.6 W
75"	123.7 W
86"	149.8 W

Power consumption in standby mode is <0.5W. The CTOUCH Riva D2 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 Riva D2. 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.

The CO_2 impact during the use phase is directly related to the touchscreen's energy consumption. That's why CTOUCH displays always come in eco mode by default, helping users save energy and reduce emissions. CTOUCH is continuously developing new innovations to reduce energy consumption and spread awareness amongst our products' users.

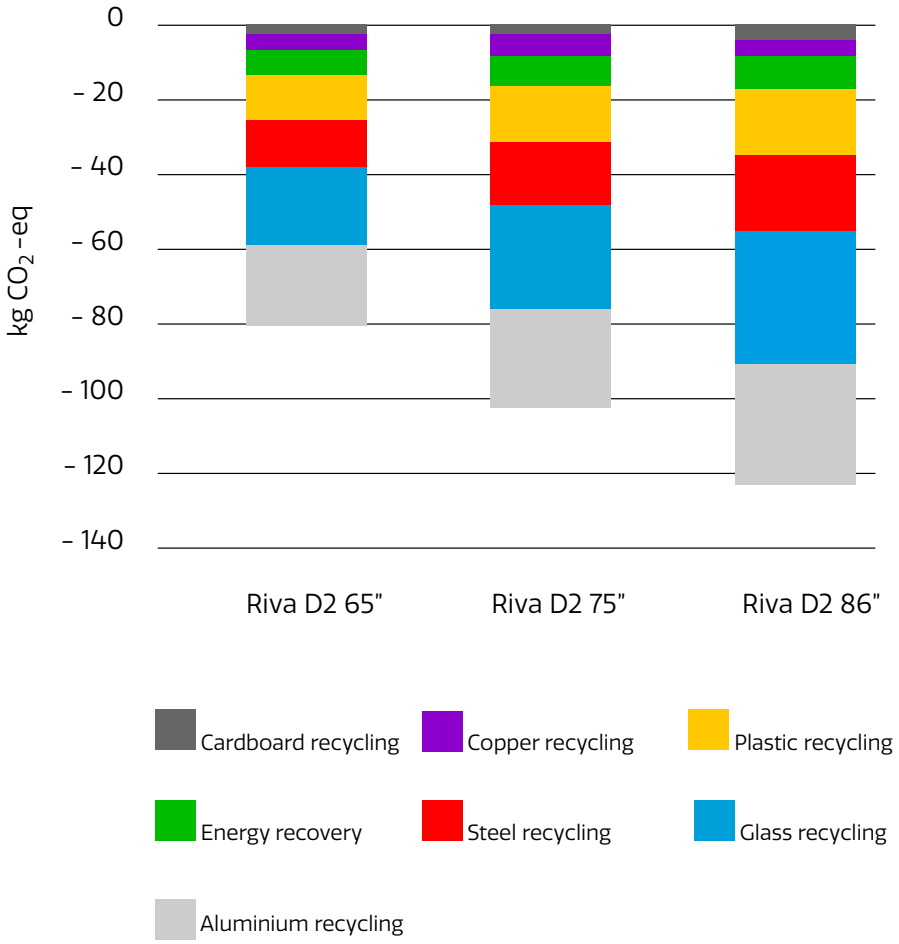
End-of-Life

The CO_2-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%).

By recycling various materials from the Riva D2, 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 CO_2 saving for each of the recyclable materials. The figure to the right shows the proportion of CO_2 saved by recycling for each material.

We may not subtract this positive impact from the total CO_2 impact of our screens, but it gives insight into how recycling contributes to realizing CO_2 reductions in the chain.



CONCLUSIONS

The LCA demonstrated that life cycle emissions of the CTOUCH Riva D2 strongly depends 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 usage account for a total of 96% of all life cycle emissions. Transportation and end-of-life each account for only 2% of life cycle emissions.

With regards to using the CTOUCH Riva D2, 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 extended 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.

CTOUCH touchscreens are the most sustainable touchscreens in the market. CTOUCH displays always come in eco mode by default, which reduces the brightness and thereby significantly reduces the power consumption of the display, helping users save energy and reduce emissions. 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 Riva D2 is lighter than its predecessor, the Laser Sky, 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? As the world's most sustainable touchscreen manufacturer, CTOUCH helps organisations create a modern and sustainable 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 touchscreens – 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. Our commitment to sustainability makes us an excellent choice when you are looking to reduce your environmental footprint while benefiting from high-quality, eco-friendly interactive displays.

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

Contact

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

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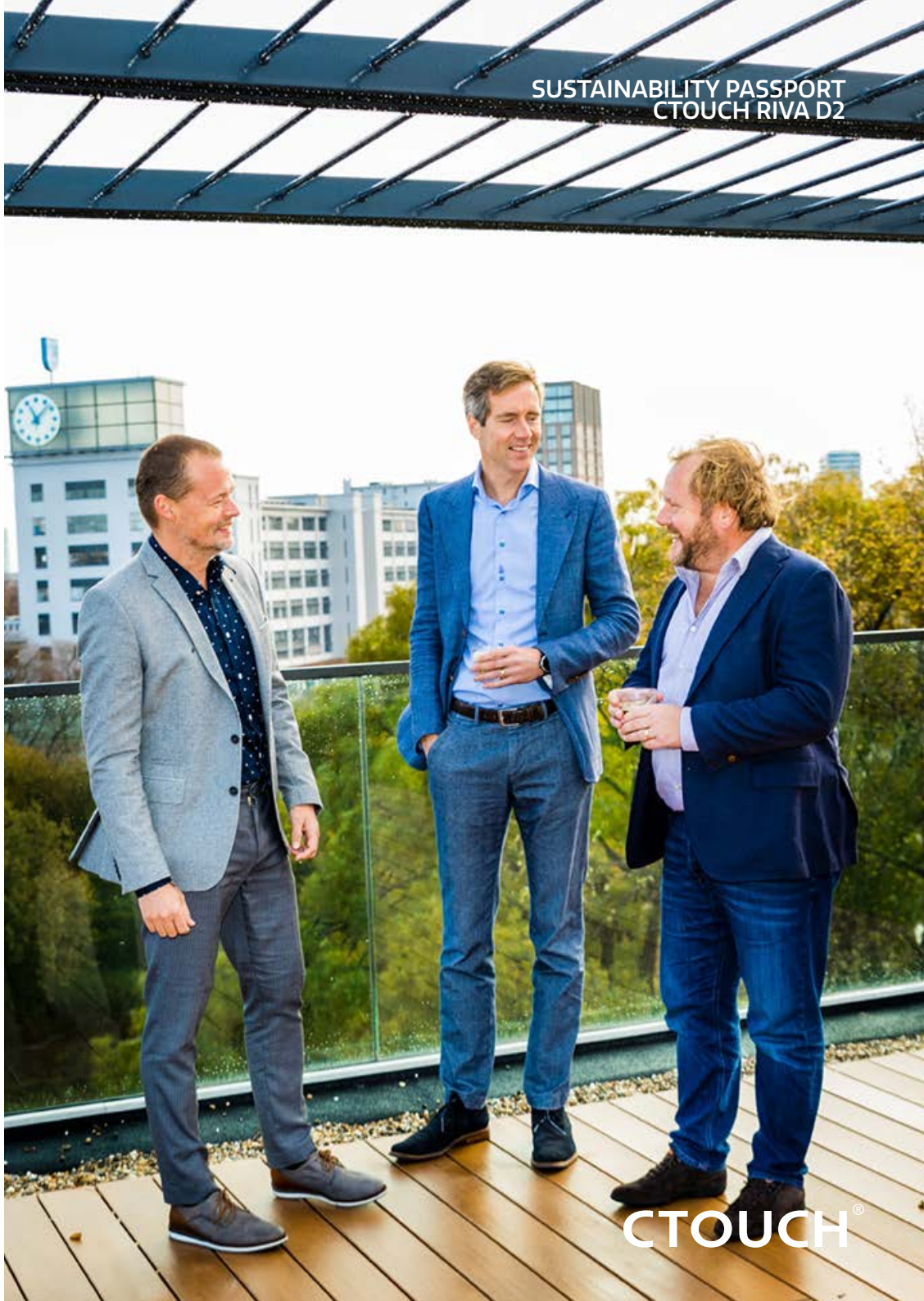
SUSTAINABILITY PASSPORT
CTOUCH RIVA D2



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