



READY TO BOARD WITH THE SUSTAINABILITY PASSPORT

This passport provides insight into the CO₂ impact and material usage of the CTOUCH RIVA D2 touchscreen.

In co-operation with Dispersed

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CTOUCH®



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.

CTOUCH has conducted a Life Cycle Assessment (LCA) in order to calculate the CO₂-eq impact of the manufacturing, packaging, transport, use and end-of-life stages of the CTOUCH Riva D2 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 up and downstream partners in the supply chain and end-users.

This passport gives a transparent insight into CO₂-eq impact and material usage, which enables us to create awareness about the CO₂-eq impact of touchscreens. It also triggers dialogs with CTOUCH partners about a more responsible manufacturing and use, and thus creating environmental benefits.

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INTRODUCTION

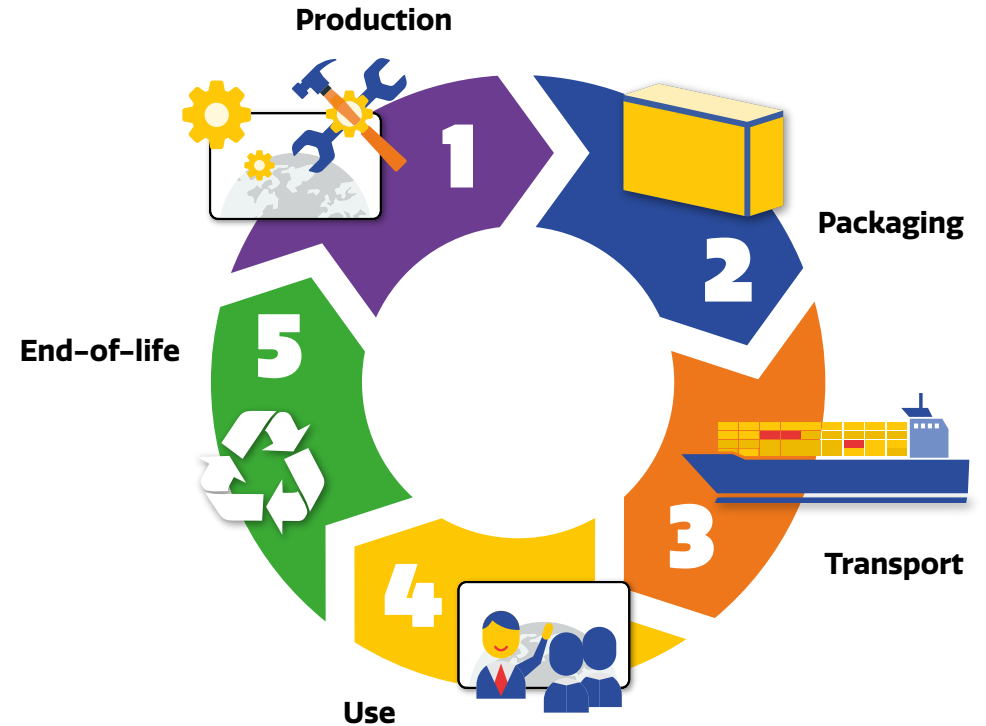


This sustainability passport gives a transparent overview of the CO₂-eq impact of the five lifecycle stages and explores in detail the material composition and CO₂ impact related to the manufacturing of the CTOUCH Riva D2. In this way, CTOUCH is transparent regarding the impacts of its products, which enables us to create awareness about the CO₂-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 CO₂ emissions, in accordance with CTOUCH's sustainability strategy.

At CTOUCH, we strive to reach 60% CO₂-eq reduction. The Key Performance Indicator (KPI) we use to track our CO₂-eq reduction is "CO₂-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 CO₂-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 CO₂-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 CO₂-eq emissions, the LCA in this study is primarily focused on the assessment of life cycle CO₂-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 EcolInvent 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 CO₂-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

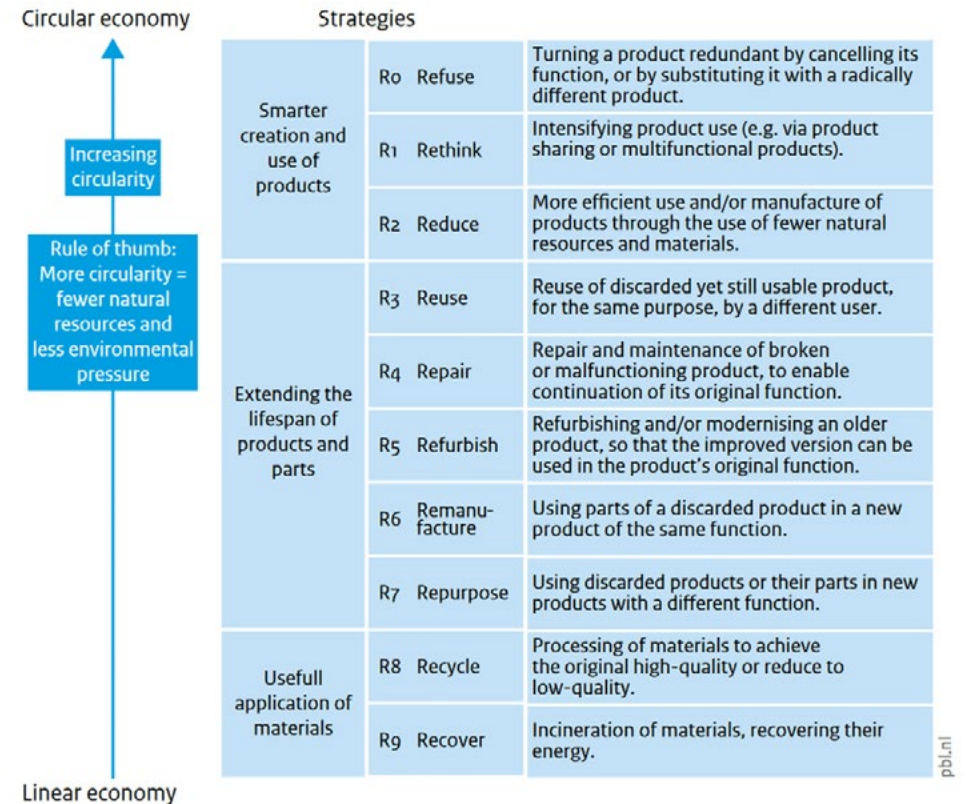
In this sustainability passport, five life cycle stages are considered: manufacturing, packaging, transportation, usage, and end-of-Life. Environmental impact, expressed in terms of CO₂-eq emissions, occurs in all these stages. Impact in the manufacturing stage stems from all processes that are related 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!



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

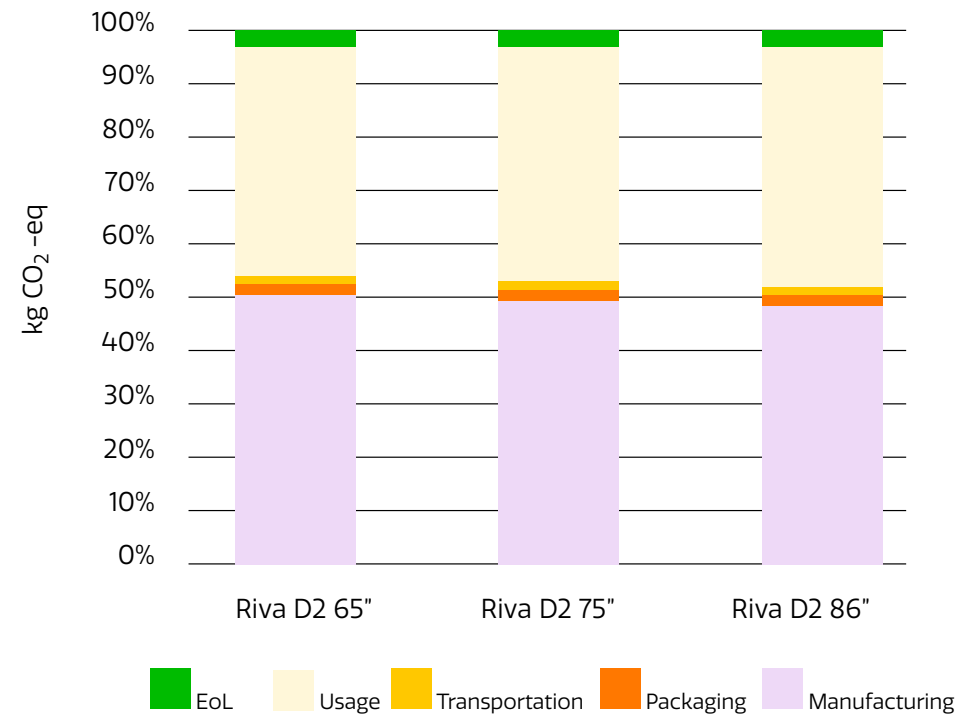
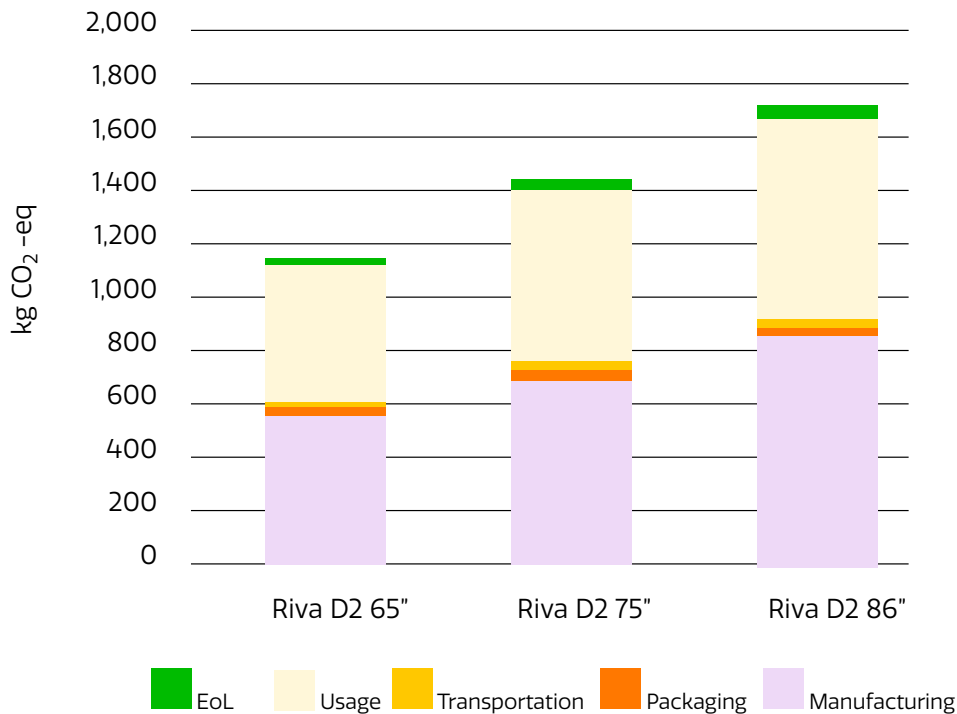


What is CO₂-equivalent?

When we talk about climate change, we often tend to focus on carbon dioxide emissions (CO₂) – the most dominant greenhouse gas. However, CO₂ 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 CO₂-equivalent, or CO₂-eq.

Total CO₂-eq footprint

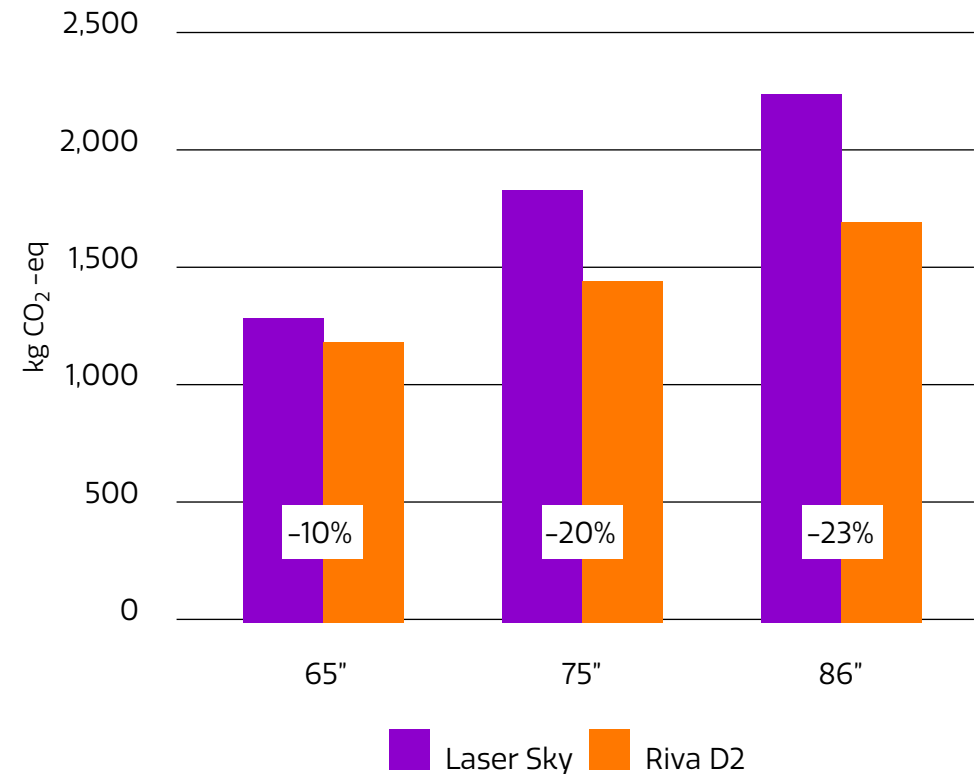
It can be observed that there is a clear trend, as with increasing product size, the CO₂-eq emissions increase. Furthermore, it can be noted that the manufacturing phase is the largest contributor to the total CO₂-eq emissions caused during the products' lifetimes. The use phase of the displays has the 2nd largest CO₂-eq impact. The transport and end-of-life phases have a relatively low impact compared to the other two life cycle stages.





CO₂-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 CO₂-eq footprint shown on the previous page by the expected lifetime of 8.5 years, we get the CO₂ footprint per year, shown in the figure on the right. This yearly CO₂-eq impact is between 23% and 10% lower compared to the yearly CO₂-eq impact of the CTOUCH Laser Sky, especially awesome considering we take into account 1.5 more years of usage as a result of longer product lifetime!



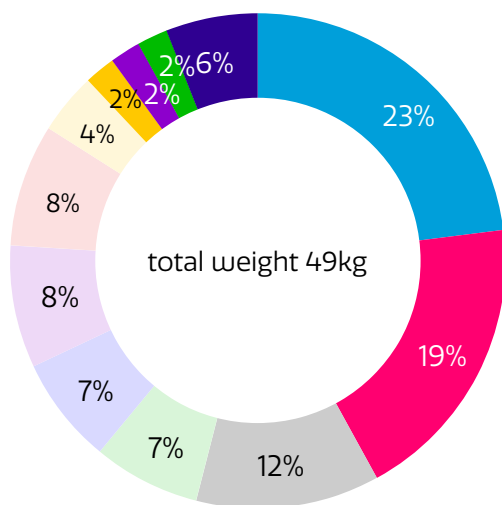
Manufacturing & Packaging

The CO₂-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.

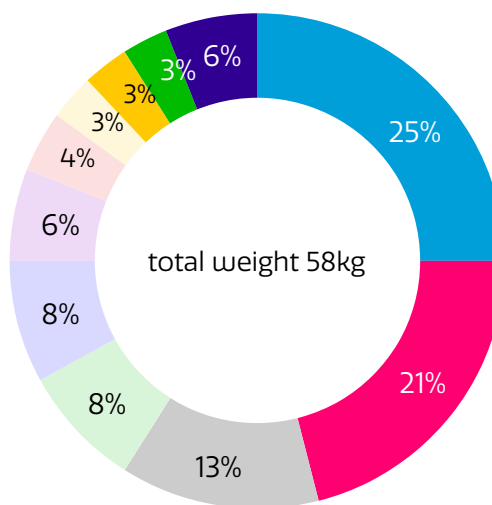


Material composition per display size

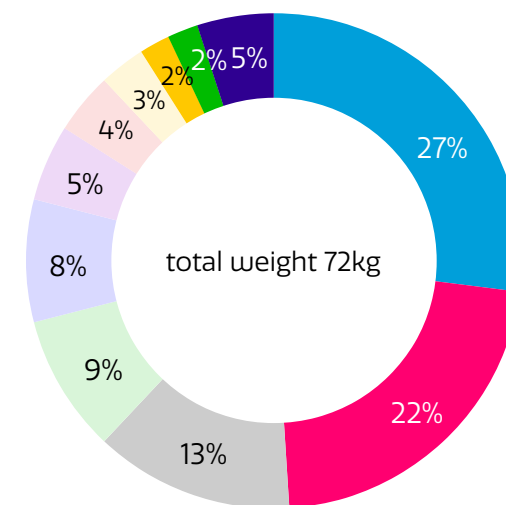
Riva D2 65"



Riva D2 75"



Riva D2 86"



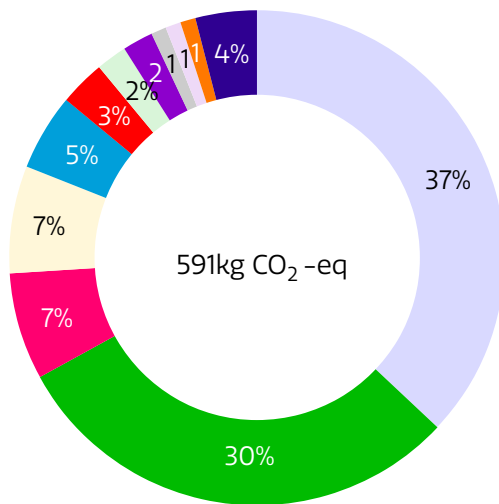
■ Back cover
 ■ AG glass
 ■ Carton box
 ■ Module film
 ■ Cell
 ■ Back cabinet
 ■ Other hardware
 ■ Front frame
 ■ EPE packaging
 ■ Cables
 ■ PWBs
 ■ Sum of other components (< 1 kg each)

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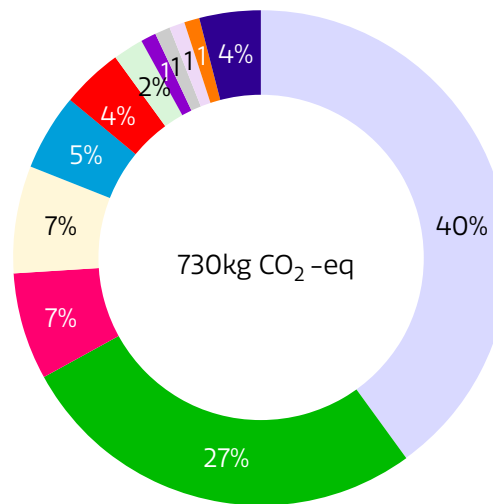


CO₂-eq footprint during production per display size

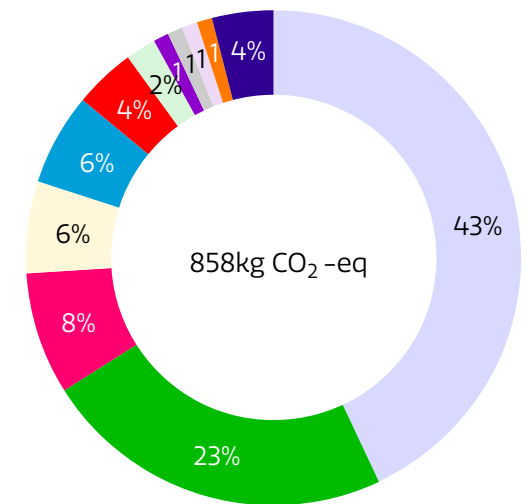
Riva D2 65"



Riva D2 75"



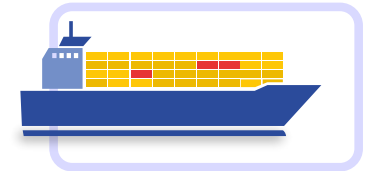
Riva D2 86"



- 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 end customer, accounts for about 2% of the total CO₂-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.



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.



Power consumption in standby mode is <math><0.5\text{W}</math>. 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 CO₂-eq impact data, based on average user profiles. Using this method, the CO₂-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 CO₂ 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.

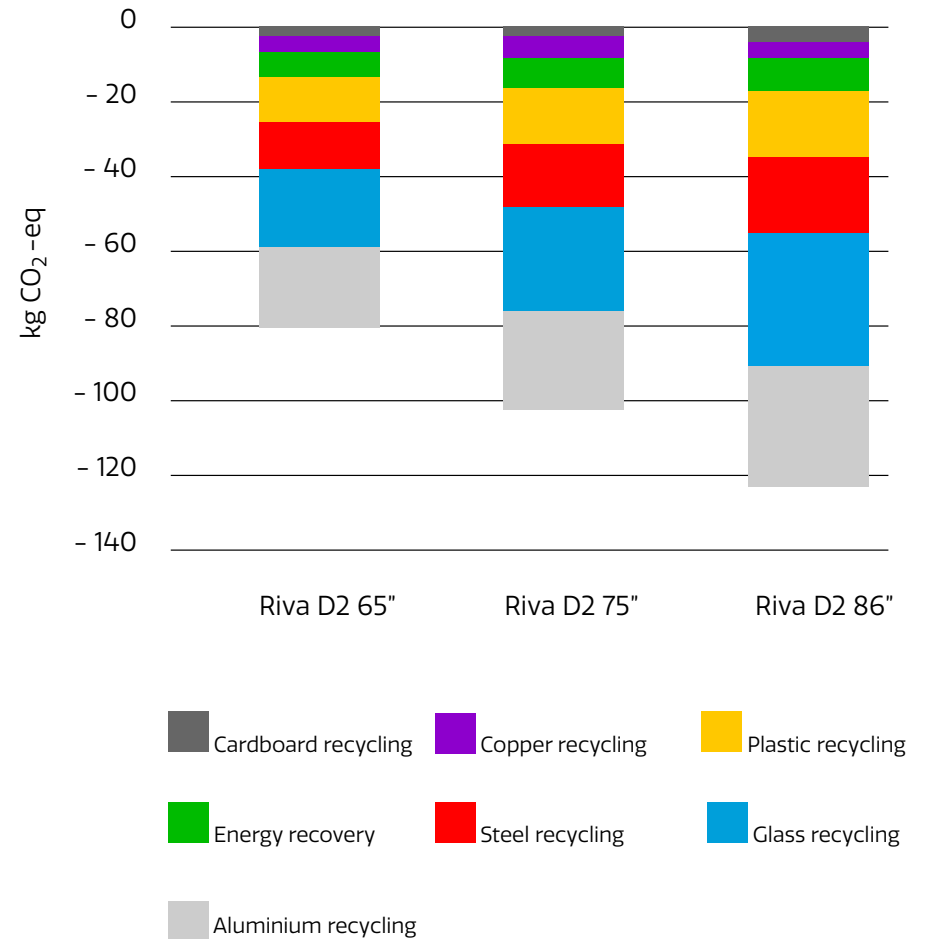
Size	Power Consumption
65"	95.6 W
75"	123.7 W
86"	149.8 W

End-of-Life

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%).



The recycling of different materials in the Riva D2 results in a positive contribution in terms of CO₂-eq -impact, because these materials are used for a 2nd purpose after recycling. This ensures that less virgin material has to be used, providing a positive contribution in terms of CO₂-eq emissions. The graph below shows the positive contribution of each recycled material of the CTOUCH Riva D2.





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 CO₂-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 CO₂-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 CO₂-eq emissions.

With respect to the manufacturing phase, we clearly see that the Riva D2 is lighter than its predecessor, making it easier to handle and resulting in a lower CO₂-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 CO₂-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 info@ctouch.eu
www.ctouch.eu



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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CTOUCH RIVA D2



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