The 01's Life Cycle Assessment

Executive summary

LYNK&CO

Key Life Cycle Assessment (LCA) findings at a glance

Charging behaviors play a significant role for the Lynk & Co 01's climate impact.
The frequency of charging and the electricity mix used have a significant impact on the vehicle's climate impact during its lifetime.

Roughly **59 tons of CO_2e** when no charging or charging solely with electricity from coal power.

24 - 35 tons of CO_2e when charging with wind power or the average European grid mix.

The future reduction of the European electricity grid mix's carbon intensity will reduce the Lynk & Co 01's carbon footprint. **However, a significantly lower carbon footprint is achieved when charging the car with renewable electricity.**

Car sharing has the potential to **decrease** the need for additional **car production.**

Materials such as aluminum, steel and Li-ion batteries contribute the most to climate impact from producing the car. **Switching to low carbon alternatives can help lower the car's climate impact.**

The outcomes of the study can be used to educate users on the variability of the 01's climate impact. In turn, this can **nudge customers to use the cars efficiently, charge frequently, and use fossil-free electricity whenever possible.**

Lynk & Co's first-ever Life Cycle Assessment of its plug-in hybrid car, the 01, is now available!

With this study, Lynk & Co reiterates its commitment to transparency and to improving its sustainability performance, from production to end of life and everything in between. This assessment is an important step on the path to reaching the company's sustainability objectives, including offering only fully electric vehicles and reducing the car's footprint by 50% by 2030, as well as reaching carbon neutrality by 2040.

Lynk & Co commissioned **IVL Swedish Environmental Research Institute** to perform this **Life Cycle Assessment (LCA) of the Lynk & Co 01 PHEV.** The full LCA report can be found **here.**

READ THE FULL LCA REPORT

This study assesses the 01's climate impact, comparing different user behaviors and different electricity mixes used to charge the vehicle. The methodology used in this study is based on existing LCA standards and the methodology published by other brands in the Geely group. The functional unit used is defined as **"driving a Lynk & Co 01 PHEV for 200,000 km": this corresponds to the entire lifetime of the car in operation.**

The LCA yielded a few key findings. First of all, user behavior matters! The result of the study indicates that the Lynk & Co 01's climate change impact varies significantly depending on how frequently the user charges the car – and what source of electricity they use. Not charging at all, or charging solely with electricity from coal power, means emitting emissions of roughly 59 tons of CO_2 equivalents during the lifetime of the car. On the other hand, the impact on climate change when charging with wind power or the average European grid mix ranges from 24 to 35 tons of CO_2e.

The Lynk & Co 01 is a plug-in hybrid. This means that two different drive cycles are used in the evaluation: the combined cycle and the weighted combined cycle (see full report for more information).

What do these mean? Simply that, in the combined drive cycle, the car is not charged from any external electricity sources: only electricity from regeneration is considered, so it runs mostly on petrol. And in the weighted combined cycle, external electricity and the combustion engine are powering the car. The use phase data comes from the WLTP drive cycles – the Worldwide Harmonized Light Vehicle Test Procedure used for vehicle certification in the European Union.

Combined drive cycle (runs mostly on petrol)

Weighted combined drive cycle (runs mostly on external electricity)

Focusing on what matters

LCA highlights use-phase emissions as main hotspot for climate impact, followed by material production.

These are theoretical test cycles and the results should be interpreted with care. Most car users do not follow either the behavior of the combined or weighted combined scenario, but rather a mix of the two. The weighted combined cycle also assumes a high degree of charging that might not reflect the average PHEV user's usage.

In Figure 1 below, both the combined and the weighted combined cycle, when charged exclusively with electricity from coal power, show similar results. In those cases, the use phase contributes to a substantial portion of the whole life cycle's impact on climate change: roughly 70%! When the car is charged with either the average European grid mix or wind power, the use phase impact is reduced to about 51% and 27%, respectively.

While the use phase of the car contributes to the majority of the climate impact, material production is the second largest hotspot, with aluminum, steel and the Li-ion battery at the forefront. Using recycled aluminum would save a significant amount of energy and therefore reduce the environmental impact. Hypothetically, if 30% to 50 % of the aluminum used in the car came from recycled content, the total climate impact during the car's life cycle could be decreased by 1.2 to 2 tons of CO_2e, respectively.

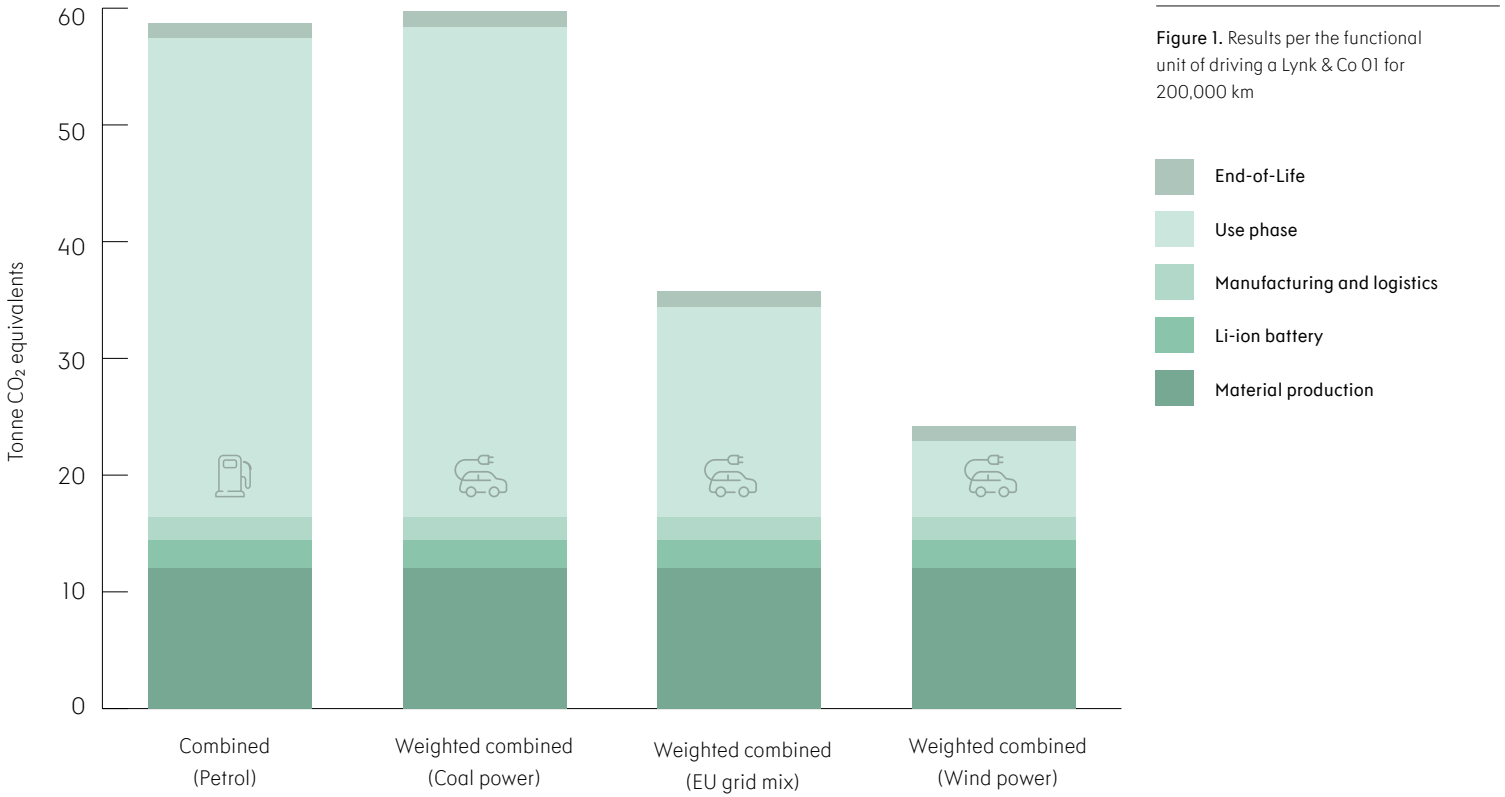


Figure 1. Results per the functional unit of driving a Lynk & Co 01 for 200,000 km

Car sharing for a lower footprint

Since car sharing is one of the building blocks of Lynk & Co's business model, a sensitivity analysis has been done to explore its potential environmental benefit.

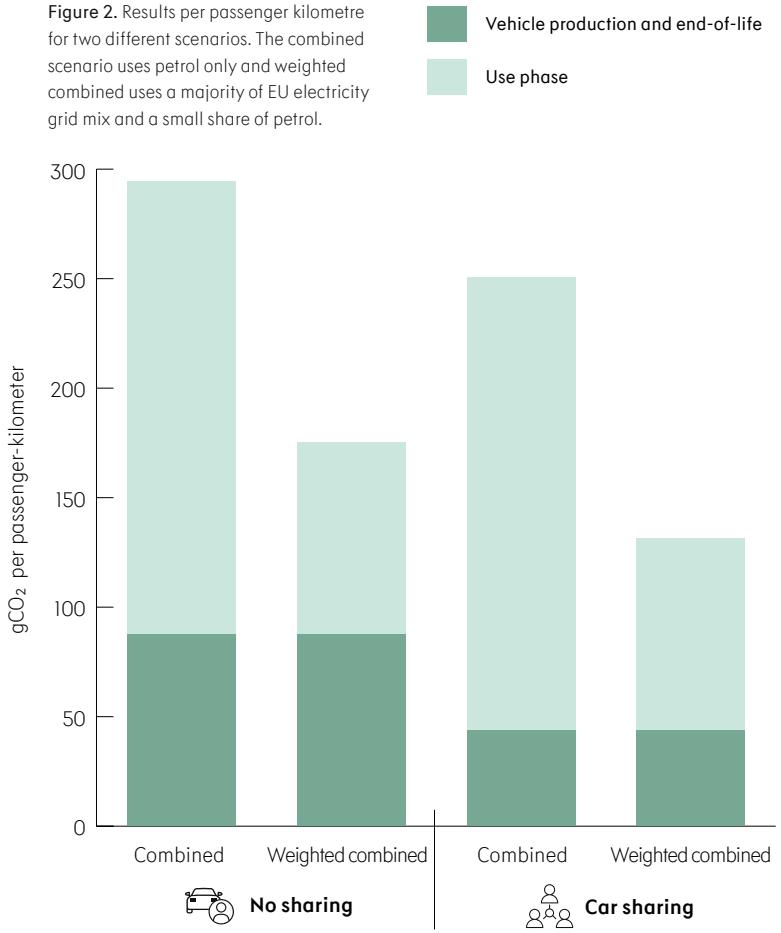
As the effects of car sharing could not be evaluated using the current functional unit, another unit, which can take into account the number of passengers using the vehicle, was used instead. The new functional unit for this analysis is "passenger kilometers". With this unit, the previous results have been divided by the lifetime distance and number of passengers. The same lifetime of the vehicle is assumed (200,000 km) and Table 1 below describes the theoretical scenarios of no-sharing and car sharing.

Table 1. Information about theoretical scenarios that have been analyzed.

Scenario	How is the environmental burden distributed?
NO SHARING	The environmental burden from the whole life cycle is divided by one person (owner)
CAR SHARING	The environmental burden of production is divided by 2 persons, and the use phase by 1 person

The results for each scenario are illustrated in Figure 2 below. If users embraced a car sharing concept and shared one car instead of having two cars, the environmental burden would be lower for both combined and weighted combined drive cycles. It would also be a more efficient use of resources, since only one car needs to be produced to perform the same mobility services as two cars.

Figure 2. Results per passenger kilometre for two different scenarios. The combined scenario uses petrol only and weighted combined uses a majority of EU electricity grid mix and a small share of petrol.



Read the full LCA for more information, as well as additional sensitivity analysis regarding future improvements on the European electricity grid mix and increased use of recycled aluminum.

READ THE FULL LCA REPORT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