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Polestar 4 coupé

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Carbon footprint
Summary

Introduction

This document illustrates the carbon footprint of Polestar 4 coupé and is taken from the Life Cycle Assessment report. That report, which can be considered a more in-depth analysis, can be read and downloaded at: polestar.com/sustainability.

The carbon footprint report of Polestar 4 coupé is not critically reviewed but is calculated according to ISO14044 methodology. Data is based on Start of Production (SoP) for Model Year 2027 (MY27) in the beginning of 2026.

Introduction
Transparency

Polestar is dedicated to ensuring transparency regarding the environmental impact of its vehicles. This document aims to promote openness to all audiences by disclosing the carbon footprint associated with our passenger vehicles. This is a summary of the full Life Cycle Assessment report, available at: polestar.com

Read the full report →

Introduction
Carbon footprint

A carbon footprint is the total amount of greenhouse gas emissions, expressed in CO_2 equivalents, caused throughout the entire life cycle of a vehicle.

In the cradle-to-gate calculations we include:

- Material production and refining. From raw materials to components (including battery).
- Manufacturing* and logistics. Energy used in assembly plant, transport of parts to the manufacturing plants and finished vehicles delivered directly to the dealer.

For the cradle-to-grave calculations we add on and include:

- Use phase. Electricity consumed during assumed 200,000 km of driving over 15 years.
- Maintenance. Parts replaced during the vehicle lifetime.
- End-of-life. Dismantling and disposal of the vehicle.

By assessing the full life cycle, we can identify the processes and materials with the greatest climate impact, enabling us to make better design choices and drive decarbonisation across our value chain.

*This summary includes both the Polestar 4 coupé produced in Hangzhou Bay, China and in Busan, South Korea.

Use phase calculation based on

15 years

200 000 km

Introduction
How we measure

How do we measure it?
Our assessments follow the ISO 14044 standard and use the 100-year global warming potential (GWP) factors from the IPCC (2021). The functional unit is the production and use of a Polestar 4 coupé with a lifetime distance of 200,000 km assumed over 15 years. Energy use is based on WLTP electricity consumption figures*. We apply a recycled content approach: emissions from recycled material inputs are included, but no credits are given for recycling at end-of-life.

Why does it matter?
A carbon footprint is more than a number. It gives us clarity on where emissions occur, guides material and process choices, and helps accelerate our journey to climate-neutral mobility.

*Final WLTP certification pending

The product
Technical details

Technical details	Dual motor	Rear motor
Powertrain	Electric	Electric
Drive type	All wheel drive	Rear wheel drive
Power	400 kW (544 hp)	200 kW (272 hp)
Max speed	200 km/h	200 km/h
0 - 100 km/h	3.8 s	7.1 s
WLTP range	590 km	620 km
Energy consumption, WLTP	19.0-21.7 kWh/100 km	17.8-18.4 kWh/100 km
Battery capacity (gross)	100 kWh	100 kWh
Battery pack weight, (Chemistry)	476 kg, (NMC)	476 kg, (NMC)
Curb weight	2 355 kg	2 230 kg

Carbon footprint
To car handover

The cradle-to-gate carbon footprint represents all processes occurring up until the point the vehicle arrives at the dealership for customer handover.

When the Polestar 4 coupé reaches its customer, the average carbon footprint totals 20.3 tCO_2e for the Dual motor and 19.4 tCO_2e for Rear motor cars manufactured in Hangzhou Bay. Those figures are 20.7 tCO_2e and 19.8 tCO_2e respectively for cars manufactured in Busan.

The largest share, 62% for Dual motor and 60% for the Rear motor (Hangzhou Bay), comes from various materials extraction and production such as aluminium, steel, copper, plastics, electronics, and rubber used in the vehicle, excluding the battery modules. Those figures are 61% and 59% respectively, when the car is manufactured in Busan.

Li-ion battery modules are the next biggest contributor, responsible for 27% for the Dual motor and 28% for the Rear motor (Hangzhou Bay). Those figures are 26% and 28% respectively, when the car is manufactured in Busan.

Logistics account for 11% for the Dual motor and 12% for Rear motor (Hangzhou Bay) (13% and 14% for Busan), while less than 1% comes from the manufacturing processes occurring in the assembly plants thanks to the use of renewable electricity.

The carbon footprint from logistics varies depending on which market the Polestar 4 coupé is shipped to. The total figures mentioned for all model variants in both plants include the average logistics emissions across all markets.

Cradle-to-gate carbon footprint
Hangzhou Bay, China

	Dual motor	Rear motor
Manufacturing and logistics	2.3	2.3
Li-ion battery pack	5.5	5.5
Material production	12.6	11.6

Cradle-to-gate carbon footprint
Busan plant, South Korea

	Dual motor	Rear motor
Manufacturing and logistics	2.7	2.7
Li-ion battery pack	5.5	5.5
Material production	12.6	11.6

Carbon footprint
During lifetime

The cradle-to-grave carbon footprint is calculated based on all processes occurring over the assumed 200,000 km lifetime of the Polestar 4 coupé, including end-of-life treatment.

The carbon footprint of the use phase is highly dependent on how the electricity used to charge the Polestar 4 coupé is generated.

The Global, European, and North American electricity mixes include carbon intensity reductions that are estimated to occur during the assumed 15-year lifetime of the vehicle. Data sourced from the International Energy Agency (IEA) according to their STEPS Scenario. The vehicles produced in Busan, South Korea are primarily intended for the North American market, therefore, an electricity mix representing this has been applied to these vehicles.

Hangzhou Bay, China
Using the global average electricity mix, the GHG emissions from the use of the vehicle results in 13.0 tCO_2e (Dual motor) and 12.2 tCO_2e (Rear motor) while using the European average electricity mix results in 3.8 tCO_2e (Dual motor) and 3.5 tCO_2e (Rear motor) respectively.

Busan plant, South Korea
Using the global average electricity mix, the GHG emissions from the use of the vehicle results in 13.0 tCO_2e (Dual motor) and 12.2 tCO_2e (Rear motor). Using the North American average electricity mix results in 8.2 tCO_2e (Dual motor) and 7.7 tCO_2e (Rear motor) respectively.

Renewable electricity
Customers can make significant reductions to their climate impact by charging with renewable electricity, charging exclusively with wind power electricity results in 0.5 tCO_2e.

Cradle-to-grave carbon footprint – Hangzhou Bay, China

Dual motor

End-of-Life	1.2
Use phase, Global electricity mix	13.0
Use phase, European electricity	3.8
Use phase, Wind electricity mix	0.5
Maintenance	1.9
Manufacturing and logistics	2.3
Li-ion battery pack	5.5
Material production and refining	12.6

Cradle-to-grave carbon footprint – Hangzhou Bay, China

Rear motor

End-of-Life	1.2
Use phase, Global electricity mix	12.2
Use phase, European electricity	3.5
Use phase, Wind electricity mix	0.5
Maintenance	1.9
Manufacturing and logistics	2.3
Li-ion battery pack	5.5
Material production and refining	11.6

Cradle-to-grave carbon footprint – Busan plant, South Korea

Dual motor

End-of-Life	1.2
Use phase, Global electricity mix	13.0
Use phase, North America electricity	8.2
Use phase, Wind electricity mix	0.5
Maintenance	1.9
Manufacturing and logistics	2.7
Li-ion battery pack	5.5
Material production and refining	12.6

Cradle-to-grave carbon footprint – Busan plant, South Korea

Rear motor

End-of-Life	1.2
Use phase, Global electricity mix	12.2
Use phase, North America electricity	7.7
Use phase, Wind electricity mix	0.5
Maintenance	1.9
Manufacturing and logistics	2.7
Li-ion battery pack	5.5
Material production and refining	11.6

Carbon footprint
Measures to reduce

During the course of the Polestar 4 coupé program, Polestar (together with its partner Geely) has decreased the vehicle carbon footprint by 1.1 tCO_2e for the Dual motor variant.

The decrease in carbon footprint from the battery pack is attributed to increased recycled content of aluminium in the battery pack and battery module structure. Aluminium from smelters utilizing renewable electricity in the battery pack structure is also used.

The Li-ion battery pack improvements are incorporated from model year 2026. The increased recycled steel and aluminium content came into the vehicle from the present model year 2027.

Polestar 4 coupé Dual motor, comparison – Hangzhou Bay

Cradle-to-gate carbon footprint – MY24/MY25 vs MY27