BACKGROUNDER

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Green NCAP 3.0: What's new?

Green NCAP is an independent initiative promoting the development of cleaner, more energy-efficient vehicles that minimize environmental impact. Its goals include improving air quality, reducing resource consumption in passenger transport, and mitigating climate change.

Green NCAP ratings (0–5 stars) are based on three key pillars:

- **Clean Air** (impact on health),
- **Energy Efficiency** (energy demand),
- **Greenhouse Gases** (contribution to global warming).

Over the years, the program has evolved significantly:

- **Green NCAP 1.0** (2020): Focused on tailpipe emissions and energy consumption during vehicle use.
- **Green NCAP 2.0** (2022): Introduced the well-to-wheel approach into the greenhouse gas assessment.
- **Green NCAP 3.0** (2025): A **major step forward** and unprecedented —now all three pillars are evaluated using full LCA.

This latest version considers emissions and energy use not only during vehicle operation, but across the **entire life cycle**: from production and transport to usage, maintenance, and end-of-life (scrapping and recycling). This cradle-to-grave approach offers new, surprising insights into the true environmental footprint of vehicles. Spoiler: the environmental footprint in the use phase often is only the tip of the iceberg!

The program combines advanced on-road and laboratory testing of the vehicle in various circumstances, supplemented by more general LCA calculations based on widely accepted, peer-reviewed methodologies and data sources. For some parameters (e.g., production), regional average weighting factors are applied to reflect the environmental status of industry in different parts of the world.

In addition to the core environmental rating, Green NCAP 3.0 also includes driver experience insights. While these do not affect the overall score, they provide valuable information on aspects such as range, winter performance, and charging—especially relevant for electric vehicles (EVs) where user aspects might be sacrificed to achieve a good environmental rating.

This document outlines the updated approach in each of the three main rating pillars, followed by a brief look at the additional driver experience features.

Rating Scheme Overview

Clean Air

Limiting harmful emissions (think of particulate matter, hydrocarbons, nitrogen oxides) is critical—especially in urban environments where cars and people share close space.

Green NCAP now also considers emissions generated during other life cycle stages, such as:

- **Vehicle production**, which can emit significantly more pollutants than the vehicle itself will during 240,000 km of driving. This is an eye-opener that narrows in many cases the gap between electric vehicles (EVs) and those equipped with a traditional internal combustion engine (ICE).
- **End-of-life processing**, where dismantling and recycling often result in a net environmental benefit, offsetting the impact of raw material extraction.

However, the **use phase emissions** still carry the most weight in the pollutant rating, particularly due to their relevance in urban health contexts.

- **Internal Combustion Engine (ICE)** vehicles produce tailpipe emissions, depending heavily on the effectiveness of their after-treatment systems.
- **EVs,** in contrast, emit no exhaust gases during use by default.

In a major innovation (and a novelty in environmental rating schemes), assessments of **non-exhaust emissions**— **particulate matter from tyre and brake wear** caused through abrasion—are now also included. These are influenced by:

- **Vehicle mass**, wheel alignment settings, and standard accelerator pedal response
- Use of **regenerative braking,** possibilities to mitigate the release of brake dust, or system design – enclosed brake drums (which collect brake dust), as opposed to disc brakes.

Energy Efficiency

Obviously, fuel consumption and/or electricity use come to mind first when assessing a vehicle on this point, as it hits the consumer's wallet.

However, energy efficiency now includes the **total energy demand** across the vehicle's life cycle:

- Energy needed to produce, transport, and dismantle the vehicle,
- Energy required to produce and transport liquid and gaseous fuel for ICE vehicles, as well as electricity for EVs.

Factors influencing energy efficiency include:

- **Vehicle mass and battery size**, which heavily affect production energy demand,
- **Rolling resistance is another influencer**, which is separately rated because of its influence on consumption.

This broader view gives consumers a clearer picture of long-term energy impacts, beyond what's seen at the fuel pump or charging station.

Greenhouse Gases

Greenhouse gases have a global impact rather than a local one and are the root cause of global warming/climate change. Therefore, all sources during a lifetime contribute equally to the rating (as opposed to pollutants).

- ICE vehicles typically emit less GHG during production but much more than EVs during use by burning (fossil) fuel during their entire life mileage.
- EVs tend to have higher production-phase GHGs (especially due to battery manufacturing), but their use-phase emissions are much lower—particularly if charged from clean energy sources.

Driving Experience (informative only)

Though not part of the sustainability rating, Green NCAP provides useful information about real-world performance—especially for EVs. These insights help consumers understand the practical trade-offs involved in owning a low-emissions vehicle.

Consumption & Range

Estimated actual consumption
Based on measured data (which are only partly representative of real-world use) and adjusted with real-world correction factors.

Driving range
For EVs only: Of special importance to consumers is the real-world driving range. Green NCAP estimates it based on measured data, modified by correction factors.

Accuracy of display
Rating the discrepancy -if any- between the measured energy consumption and what is shown on the vehicle's onboard display.

Cold Winter Performance (EVs only, -7°C)

Driving range benefits of pre-warming
A cold vehicle has increased energy consumption at the start of its trip. Pre-warming the car, when possible, can significantly benefit its driving range.

Cabin heating
Listing the time needed to reach 16°C in seconds in key areas (head, feet, front/rear).

Additional heating functions
Inventory of provisions that enhance heating comfort, like the presence of a heat pump, heated seats, a heated steering wheel, and the possibility to schedule.

Cabin thermal insulation
How quickly does the cabin lose heat when the outside temperature is -7°C?

Charging Capabilities

Battery pre-conditioning
Ability to optimize the battery temperature for fast charging.

Fast charging
Maximum fast charging performance. How quickly can the battery charge?

Home charging efficiency
How well the vehicle converts grid electricity into usable battery power.

Bidirectional charging
Whether the car can supply power to external devices or systems.