

Taking account of glazing's role in reducing CO₂ emissions from the car fleet

Regulation EC 333/2014

Under regulation EC 333/2014¹, the fleet average to be achieved by all new cars in the EU is 95 grams of CO₂ per kilometre as of 2021. This target will have to be met through technical improvements, as measured by the future WLTP test cycle replacing the existing NEDC one. To achieve the target, credits obtained via the eco-innovation scheme can be used as well. In addition to these tools, 10g CO₂/km are meant to be saved by way of complementary measures.

High-performance glazing technologies, in particular solar control glazing, can contribute to reducing CO₂ emissions generated by light duty vehicles, which are equipped with mobile air-conditioning systems (MAC). Nevertheless, despite the complex policy architecture described above, to date no regulatory incentive exists to encourage car manufacturers to embrace this fuel and CO₂-saving technology.

Glass for Europe calls on policy makers to re-think the existing policy architecture on CO₂ emissions of vehicles, as existing instruments create too many loopholes.

Glass for Europe takes the view that European decision makers should:

1. **Support the inclusion within the WLTP test cycle of emissions generated by the use of Mobile Air-Conditioning**
2. **Call for a rapid review of the eco-innovation scheme** to ensure that, until the benefits of CO₂ saving automotive glazing technologies are adequately reflected in official CO₂ emissions data, these technologies can qualify as eco-innovations.

Executive summary

- ▶ To date, there are **high-performance glass technologies available on the markets that help reduce the fuel consumption and CO₂ emissions of vehicles.**
- ▶ Since **emissions from air-conditioning systems are not accounted for neither in the NEDC or future WLTP test cycles**, car manufacturers are not ready to invest in these products as they prefer to focus investment on technologies that allow them to meet their CO₂ binding targets.
- ▶ **Due to regulatory loopholes, to date no regulatory instrument can be activated** to support the market uptake of these CO₂-saving glass technologies
- ▶ **Glass for Europe calls for the eco-innovation scheme to be opened up** to provide immediate support for the uptake of these glass technologies, until concrete complementary measures are put in place or until comprehensive-driving emission test cycles become applicable.

¹ Regulation EC 333/2014 to define the modalities for reaching the 2020 target to reduce CO₂ emissions from new passenger cars.



1. The role of solar control glazing in reducing CO₂ emissions from vehicles

Solar control glazing is a range of advanced glass products that provide not only good visibility and durability but also attenuate solar heat gain. Glazing with advanced solar control properties substantially reduces heat build-up inside vehicles² and therefore either reduces the need to air condition the vehicle or helps considerably lower the load on the air-conditioning unit.

Studies have shown that reducing a standard vehicle's thermal load by 5% reduces energy consumption of the MAC unit by 10%. Given that solar control glass can contribute to reducing inside cabin temperatures by more than 10%, it has the potential to improve overall fuel consumption efficiency by 2% and up to 4% in some cases³.

Although solar control technologies are readily available to automotive manufacturers, most new cars are not yet equipped with these glass products. The main reason for this is simple: today, air-conditioning use and the related fuel consumption, and CO₂ output are not taken into account in official vehicle data. Consequently, there is no incentive in Europe for manufacturers to use this glass technology. In the US however, CO₂ credits from the Environmental Protection Agency can be obtained for the use of advanced solar-control glazing.

2. Which regulatory loopholes exist in the EU and how can they be tackled?

The test cycles: NEDC and WLTP

The fuel consumption and subsequent CO₂ emissions generated by vehicles are calculated using the NEDC test-cycle. Like any standard the NEDC test cycle establishes a certain number of conditions and parameters; however, these do not reflect the exact conditions of vehicle use. For instance, it does not include any assessment of the car when the air-conditioning system is on. The CO₂ savings potential of solar control glass technologies is therefore not reflected in the data generated by this test cycle.

In the future, a new test method will apply, i.e. WLTP. Although this test procedure is meant to better reflect real driving conditions, under the current state of discussion, the inclusion of extra fuel consumption and CO₂ emissions generated by the use of air-conditioning systems is not yet contemplated.

- ▶ **Within the development of the future WLTP test cycle**, it is essential that the use of air conditioning systems is included to help reduce the gap between the test cycle data and real-life measurements.
- ▶ **Until a new adequate test-cycle is agreed, alternative policy instruments must be made available to promote the uptake of CO₂ saving glass.**

2 The reduction in temperatures tested in a sedan car exposed to sun reached an average 7°C in the cabin, nearly 9°C at the driver seat and 14,6°C on the instrument panel surface. Source: National Renewable Energy Laboratory, Dr. Robert Farrington – An Overview of Vehicle Test and L's A/C Fuel Use Reduction Research – 2007.

3 Sources : B. Taxis-Reischl & Fa. Behr - Energieverbrauch Klimaanlagen und Wege zur Verbrauchsreduzierung - 1997.





Complementary measures

Under regulation EC 443/2009 as amended by regulation EC 333/2014, savings of 10 g CO₂/km must be met through complementary measures, as part of the EU's integrated approach. In this context, the European Commission is developing a test procedure to assess the fuel consumption generated by the use of MAC. This test procedure should incorporate the benefits of most advanced solar control glazing technologies and reflect their benefits in terms of fuel and CO₂ savings⁴. Upon adoption and after a final round-robin-test, this test procedure should become mandatory for car manufacturers, which would have to run the test and incorporate the fuel consumption data in their type approval registration dossiers.

- ▶ Glass for Europe welcomes this development, but stresses that **setting a MAC test method cannot be considered as a complementary measure in itself, as it will not provide any regulatory or market incentive for energy-efficient systems**. Including the test data in the registration dossier will have no impact on consumer choices, as car buyers will not look for this data or choose their preferred car on this basis. For their part, car manufacturers will not invest more in these efficient technologies as they do not help them achieve their CO₂ binding targets.
- ▶ In order to provide real incentives, specific complementary measures are needed to deliver the identified CO₂ savings potential linked to MAC. In the opinion of Glass for Europe, **until the data from the MAC test procedure are added to the NEDC (or future WLTP) values, innovative technologies allowing a reduction of CO₂ emissions from air-conditioning should/must qualify for eco-innovations**.

The eco-innovation scheme

Upon application by a supplier or a manufacturer, CO₂ savings achieved through the use of innovative technologies can be taken into account, i.e. discounted from the value obtained by way of the NEDC test cycle. This instrument therefore provides a powerful incentive to car manufacturers to use these technologies. The eco-innovation scheme is only applicable to technologies which are not covered by the test cycle or by a complementary measure (see above). Detailed criteria exist and a lengthy application procedure is in place. In fact, due to the complexity of the scheme, only three applications have been submitted, and only one granted so far⁵.

To date, solar control glass technologies cannot apply for eco-innovation status, mainly/primarily because these glass technologies have an impact on the consumption of the MAC system, which is supposedly covered by a complementary measure. As explained above however, no complementary measure is yet in place and the ones envisaged so far would not provide a genuine incentive. Additionally, overly restrictive assessment criteria prevent the glass industry from applying for eco-innovation status.

- ▶ The eco-innovation criteria and procedure are too restrictive and complex. **Glass for Europe is of the opinion that this scheme needs to be re-visited** to allow a greater number of applications to support the market uptake of innovative technologies. *See paper on eco-innovations*.
- ▶ So long as energy-efficient mobile air conditioning and solar-control glass are not covered by a regulatory measure that adequately reflects their CO₂-saving benefits, be it by way of a new test cycle or a concrete complementary measure, **these technologies should be eligible under the eco-innovation scheme**.

⁴ This assumption is based on the latest proposals from the consultants and the EC. It remains to be approved.

⁵ Of the three applications received by the EC, only one from Audi was granted so far. The other two applications are still being considered.





To date, no regulatory instrument supports the market uptake of a proven and recognised CO₂-savings technology in automotive, i.e. solar control glazing. This is all the more regrettable as this technology is readily available in the market and can easily be integrated by car manufacturers.

This situation has arisen because of regulatory loopholes that could be fixed by way of a short-term measure that would be withdrawn as medium and long-term solutions are put forward⁶.

- ▶ In the short term, **the eco-innovation scheme needs to be re-visited** to allow promising technologies not otherwise regulated to be eligible.
- ▶ Once the MAC test procedure is finalised, a concrete complementary measure should be developed, such as integrating the MAC data into the overall fuel consumption of vehicles.

Glass for Europe is the trade association for Europe's flat glass sector. Flat glass is the material that goes into a variety of end products, primarily in windows and facades for buildings, windscreens and windows for automotive and transport as well as solar energy equipment, furniture and appliances. Glass for Europe brings together multinational firms and thousands of SMEs across Europe, to represent the entire flat glass value chain. It is composed of flat glass manufacturers, AGC Glass Europe, Guardian, NSG-Group, Saint-Gobain Glass Industry and Siseçam-Trakya Cam, and works in association with the automotive glass partner Carlex as well as national partners gathering thousands of building glass processors and transformers all over Europe.

⁶ The eco-innovation status would cease when other measures are in place so as to avoid double counting of the CO₂ saving benefits.

