

Position Paper

CO₂ emissions targets on buses must *not* result in greater car use and accelerate climate change

Introduction

The decarbonisation of public transport services is a goal that public transport authorities (PTAs) expressed in the 2018 EMTA declaration of intentⁱ for the promotion of a scaled transition to zero emission buses.

To stimulate a transition towards low- and zero-emission buses, the European Commission already imposed targets on the demand-side, applicable on PTAs through the Clean Vehicle Directive. In 2021 however, an EMTA white paperⁱⁱ reported a wide gap between the actual needs of public transport operators and the zero-emission vehicle specifications available from EU manufacturers. This is one of the rationales in favour of creating supply-side targets, with the view to accelerate innovation, scale-up production and lower its cost. On 14 February 2023, the European Commission proposedⁱⁱⁱ such supply-side targets imposing on manufacturers the sale of exclusively zero-emission buses from 2030.

This position paper outlines several concerns with the proposed regulation, including the lack of support for PTAs to perform a costly transition at the expense of the sector's primary objective – mode shift – whose climate impact is far greater than any gain on the side of bus powertrains. It calls for financial support channelled directly towards the public transport sector. It flags the need to acknowledge the role of biogas as a climate neutral fuel that is locally produced from organic waste, that offers a mature solution, and in which the sector has already made long term investments supported by European funding.

Which solution for longer metropolitan bus routes?

Metropolitan bus routes help connect remote communities with urban hubs. They are indispensable to address car dependency and the current cost-of-living crisis. Vehicles on such routes operate much greater distances each day than those on central urban routes. They are least appropriate for battery-electric conversion due to range limits. Their conversion to hydrogen would address range concerns but is neither cost-neutral, nor an operational success.

EMTA members report operating much of their metropolitan routes with low-floor buses, and would thus be unable to renew their biogas/CNG/diesel fleets after 2030, under the current proposal. The lack of reliable zero-emission technology for these routes poses a substantial barrier to meeting the proposed targets. The industry needs time and resources to develop, test, and implement viable solutions for this critical segment of the public transport network. The charging infrastructure is particularly complex and expensive to deploy.

[1]

The proposed regulation risks having negative rebound effects:

- it may encourage the purchase of *high-floor* buses after 2030 to continue operating such long routes, albeit with degraded conditions of access and comfort.
- it may encourage the *splitting* of metropolitan routes into shorter routes, easier to decarbonise with battery-electric vehicles but imposing an interchange that would make journey time longer and hence less attractive and less economically viable.

Such rebound effects would clearly take urban mobility off track from the path that the European Commission sets out in its New Urban Mobility Framework. It would weaken public transport and certainly not make it the backbone of urban and metropolitan mobility. It would reinforce the social exclusion of suburban and remote communities, already affected by fuel poverty.

The Commission must therefore address those concerns, working more closely with metropolitan transport authorities, understanding the actual needs of the sector.

Zero emission bus operations remain costly

EMTA members report that the total cost of ownership (TCO) for battery-electric buses by European manufacturers remains higher than that of diesel-buses. In addition, switching a route to battery-electric vehicles typically requires more vehicles, and hence a larger depot, due to the battery capacity limits and to charging time when buses cannot operate.

The only cases where the electric transition was cost-neutral were observed where national governments have deployed targeted subsidies or where routes could be shortened to match the limited range of battery-powered vehicles.

Raw materials required in battery production may become the bottleneck that derails the Commission's targets for electric cars, trucks, and buses. In this unfortunate scenario, the proposed targets will only make buses more expensive for the public transport industry, perhaps leading to service cuts: a counter-productive outcome since public transport services reduce car use and hence carbon emissions, regardless of the bus powertrain.

The cost of hydrogen fuel cell buses remains prohibitive for most PTAs, and this technology remains known for reliability issues and challenging depot operations. Electric buses on the other side are typically taller and heavier than buses with a combustion engine: their use on routes with height or weight restrictions is thus prohibited, leading to lower service level and greater car use. This goes to illustrate the breadth of challenges, and hence costs, associated with a technology transition.

The transformation of depots, or the construction of new ones, is necessary when switching to zero-emission buses. It is a considerable challenge for authorities and operators. Electric bus depots that must be relocated closer to the urban core, due to range limitations, are blocked by the lack of available land or building permissions.

The question of bus depots illustrates that a transition towards zero-emission buses requires much hidden workload and much capacity building on the side of authorities and operators. This is to match the broad range of stakeholders involved: from grid operators to energy providers and municipalities. This hidden workload is hardly considered in funding or financial support programmes and thus represents a financial burden on PTAs.

The proposed regulation would hence come with substantial extra costs, direct and indirect, for most PTAs.

The public transport sector is in crisis

The adoption of remote-working practices, online meetings and online shopping is one of the most visible consequences of the Covid-19 pandemic on behaviours. This is thus with lower fare income on the revenue side that PTAs must face a dramatic change on the cost side: higher energy costs, higher wages in the context of staff shortages, higher construction costs, etc. Unable to balance the books, PTAs are already seeking additional subsidy to keep services running.

In the few places in Europe where ridership has recovered beyond 2019 levels, this is due to shock-therapy either through aggressively subsidised fare discounts, or through a costly increase in service level. Those exceptions hence confirm that the financial balance of public transport has deteriorated in a systemic manner.

Until the pandemic, public transport ridership was growing across Europe^{iv}. A virtuous circle was stimulated by increased service coverage and frequency, leading to higher ridership, in turn supporting greater coverage and frequency. In PTAs now confronted with a funding gap, there is a real risk that a vicious circle occurs. Service frequency cuts and frozen investments would deteriorate ridership and, in turn, further reduce service frequency. In such places, there is a risk of losing decades of ridership growth, resulting in greater car use, congestion, and hence greater CO2 emissions.

EMTA members thus consider it wrong to assimilate buses and trucks and invite the Commission not to overlook key differences. Passenger transport by bus, unlike commercial goods transport, is a public service running under challenging conditions and obligations, delivering tremendous positive externalities by offering access to jobs and service whilst reducing car use. The provisions in the proposal should thus be nuanced to acknowledge the non-commercial, fragile, and indispensable nature of bus operations.

The public transport sector is simply incapable of adopting – all at once throughout Europe – technologies that incur higher costs. The Commission must therefore examine and compensate for the cost of its proposal.

Modal shift is the most efficient and scalable climate change mitigation policy

Do buses contribute to local air pollution and global warming? Considering their high occupancy rate, buses are cleaner than private cars. Over its life cycle, compared to an electric car, a bus produces fewer greenhouse gas emissions per passenger-kilometre^v regardless of whether it is powered by diesel or electric batteries.

A shift of passenger traffic from public transport to private cars, even electric cars, would incur a tremendous cost to society. Research in Norway, where the carbon-intensity of the electricity is already low, shows that externalities of a private e-cars in cities at peak time amount to NOK 3.4 per passenger-kilometre, versus NOK 0.4 for diesel busses.

[3]

Reducing car use is thus the main goal of most PTAs, thereby reducing pollution, congestion, and giving affordable and inclusive mobility solutions to all. This main goal is – and should remain – a focus point for funding, skills, and innovation.

Diverting resources away from this primary goal would come at a great cost, socially, economically, and environmentally. There should be no competition between a mode shift objective and a technology transition objective. Hence why additional resources must be created for the latter.

Structural funding is needed

In the transition towards zero-emission buses, European financial support programmes exist. Yet many remain project-oriented and case-dependent, leading to financial uncertainty in the planning of zero-emission bus services. PTAs rarely have the possibility to raise new taxes, which increases the importance of structural financial support mechanisms at the EU and national level.

To address these concerns and facilitate a successful energy transition, we urge the European institutions to allocate direct funding to the public transport sector, as recommended in EMTA's 2021 white paper. This financial support will enable PTAs to invest in the necessary infrastructure, vehicle procurement, and workforce development needed to achieve the proposed emissions targets. Without this funding, the public transport sector is unable to deliver the technology transition called for by the Commission.

Let the contracting authorities procure reliable services, rather than micro-manage

The legislative proposal introduces the *security of supply* as a major criterion in the award of contracts for the purchase or the use of urban buses, with a score that must be weighted between 15 to 40%. Those EMTA members contracting *services* (i.e. the passenger transport operations by bus) rather than *vehicles* consider the proposal inappropriate and disproportionate.

When procuring bus services, PTAs may not set out specific requirements for spare part availability, interoperability with charging stations, etc. but set out service level targets instead – such as the operator must complete 99,9% of all scheduled trips. How operators meet the targets is not relevant for the PTA (number of spare buses, availability of spare parts, etc.).

In the Commission's proposal, such PTAs would have to evaluate the tender based upon the operator's plan for spare part stock. This is neither the role nor the competence of a PTA to examine and control how many screen wipers, tires, and electronics an operator can stock.

The Commission must therefore exclude the security of supply criterion or reduce its weight in cases where the tendering body purchase bus *services* rather than rolling stock.

The regulation must be technology-neutral

Battery electric and hydrogen vehicles currently are the only zero-emission technologies available to power buses. A lifecycle analysis^{vi} however shows that battery-electric buses emit about 70g CO₂ per passenger-km. The gradual greening of the electricity mix will certainly improve this figure over time, but the manufacturing of vehicles and their batteries remains carbon intensive.

[4]

Many PTAs have already invested substantial resources in transitioning to biogas. These investments were made in good faith considering that biogas, where it is produced from organic waste, often locally, helps reduce greenhouse gas emissions. The proposed emissions targets may render these investments obsolete, in particular the biogas refuelling depots, straining the already limited financial resources of PTAs and potentially hindering the broader decarbonisation efforts. The same remark applies in regions where buses run on biodiesel (HVO100) that is certified made from waste products.

Due to exemptions from the 2030 target, biogas production and distribution systems would remain in place for construction vehicles and bin lorries. Buses running on biogas hence benefit from and reinforce local synergies that exist in regions where biogas production has developed. The local production is an important way to cut the environmental impact of transporting the fuel itself.

Those PTAs running long metropolitan routes with coaches are reporting the lack of zero-emission alternatives. European manufacturers of coaches have invested in biogas and biogas depots were built accordingly, often with EU funding. This seems to be a legitimate choice considering the weaknesses of hydrogen-powered alternatives: the cost and low reliability mentioned before, the circa 30% energy efficiency, and the water consumption required in fuel production.

Overall, operating buses and coaches with biogas produced from organic waste has a lower carbon footprint than operating battery-electric buses. A regulation that claims to be technologically neutral would acknowledge the true greenhouse effects of each technology and accept that biofuels certified made from waste can outperform battery-electric and hydrogen-based solutions in terms of life-cycle carbon footprint.

Conclusion

The proposal made by the European Commission appears to be an industrial policy seeking to establish a European leadership in zero *tailpipe* emission vehicles. However, it is not for the public transport sector, nor for passengers, to pay for a European industrial policy. The sector is fragile and must not be the collateral casualty resulting from the proposed new regulation.

The proposed CO₂ targets on buses could increase greenhouse gas emissions due to the financial collapse of local public transport in places, and due to the targets ignoring true greenhouse gas emissions with a life-cycle perspective.

To make its proposal workable, the European Commission should:

- make it technologically neutral, by accounting for life-cycle emissions rather than mere tailpipe emissions, hence making allowances for the continued use of biogas infrastructure.
- make funding available, directly to public transport authorities and operators, to cover the additional cost of new targets on both infrastructure and rolling stock.

ⁱ EMTA, 2018, *Declaration of Intent for the promotion of a scaled transition to zero emission buses*, https://www.emta.com/IMG/pdf/emta-declaration_of_intent-2018_full_signed.pdf

ⁱⁱ EMTA, 2021, *Towards Zero Emission Public Transport*, https://www.emta.com/IMG/pdf/emta_towards_zero_emission_public_transport-3.pdf

ⁱⁱⁱ European Commission, *European Green Deal: Commission proposes 2030 zero-emissions target for new city buses and 90% emissions reductions for new trucks by 2040*, Press release, 14 February 2023, Strasbourg, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_762

^{iv} EMTA, 2022, *EMTA Barometer 2022*, https://www.emta.com/IMG/pdf/barometer_2022-2.pdf?4298/bcdfdf4388d626b01345007e4ad46596fd218096

^v ITF, 2020, *Good to Go? Assessing the Environmental Performance of New Mobility*, International Transport Forum, <https://www.itf-oecd.org/sites/default/files/docs/environmental-performance-new-mobility.pdf>

^{vi} Ibid