Introducing clean vehicles into public fleets

Recommendations for European and national policy makers

July 2015

Background

The need for the rapid and widescale introduction of alternative fuel vehicles (AFVs) within Europe's cities is not in question – as a central pillar of strategies to both reduce CO_2 emissions and to reduce the harmful levels of urban air pollution.

The public sector in Europe has long been recognised as a powerful demand-side actor in a range of market sectors. The sizeable vehicle fleets owned/leased by public authorities and transport service providers offer a potentially significant market opportunity for AFVs – particularly for buses and certain specialist vehicles, such as waste disposal vehicles. Public authorities can also play an important, exemplary role in showcasing such vehicles and demonstrating their feasibility. The Clean Vehicles Directive (CVD) (2009/33/EC) was introduced in order to stimulate demand from the public sector, and exploit this market opportunity.

The uptake of AFVs and full application of the CVD by European public authorities remains relatively slow, despite significant advances made by certain individual cities. The current legislative framework provided by the CVD and other Directives and Regulations is unlikely to achieve the aims set.

Furthermore, the CVD does not address another area of potential public procurement influence: companies contracted by public authorities to provide various services, which involve a significant element of transport – e.g. road maintenance, waste disposal, elderly/disabled transport services etc. By putting requirements on the vehicles used in carrying out these services, the potential influence of public procurement is significantly extended.

The recommendations

These recommendations for European and national policy makers have been developed based on the findings and expertise of the partners in the Clean Fleets project, and in co-operation with Polis. They are aimed at facilitating the greater uptake of AFVs within Europe's publicly owned or controlled vehicle fleets. As they cover both the European and the national level, each recommendation states for which level it is likely most relevant.

Whilst the focus of the Clean Fleets project has been on the vehicle procurement process and the CVD, it is crucial to recognise that this is only one area of policy and legislation which impacts on the introduction of AFVs into public fleets. Most of the recommendations below focus on procurement related areas, however this will not be sufficient to ensure the ultimate aim of the greater market uptake of AFVs is achieved without measures also aimed

at addressing the financial attractiveness of AFVs in relation to conventional vehicles, and the credibility of emissions data from current test cycles. As such, both these issues are touched on at the end of the document.

Procurement and the CVD

1. Clean Vehicle standard

The current CVD obliges public authorities and public transport operators to take environmental impacts into account but, importantly, doesn't set any minimum standard which must be achieved.

For new vehicles, such a standard would need only to relate to CO_2 emissions. Whilst emissions of local pollutants such as PM and NOx are highly significant in urban air quality the Euro standards already provide a strong regulatory framework for addressing these. The major problem is rather the significant variation between local pollutant emissions measured during current type approval test cycles, and those measured in reality (particularly in relation to NOx). Any quantified minimum local pollutant emissions requirement within a clean vehicle standard would require realistic emissions data. However, if the testing framework is improved to provide this, then the Euro standards is already in place to deal with the issue, making additional requirements in a clean vehicle standard unnecessary. The only alternative means of addressing local pollutants currently within a clean vehicle standard would be to prescribe certain technical measures for specific engine technologies (particularly diesel).

The requirement in the current CVD to address CO_2 and energy efficiency separately does not make sense given that a reduction of CO_2 emissions is the ultimate goal, and energy efficiency simply a means to achieve this goal – indeed this condition is rarely applied in practice (with conditions set for one or the other but rarely both).The introduction of a clean vehicle standard, with a defined minimum environmental performance level would have a number of significant benefits:

- Ensures meaningful improvement – it would ensure that a defined minimum standard is achieved across Europe by all new publicly owned/operated vehicles
- Ease of use – a clear standard would make any Directive easy to apply by public authorities
- Market focus – for most vehicle categories, the market share of the public sector is too small to have a significant impact on the market. The establishment of an agreed standard for a clean vehicle provides a tool that can easily be adopted by major private sector fleet operators
- Communicability – one of the problems with the current CVD is its complexity, which makes it challenging to communicate about. Providing a clean vehicle standard would provide a very simple focus which would help promotion significantly.

Given the globalised nature of the vehicle market, establishing a common standard at the European level would be considerably more effective than the establishment of individual standards at the Member State level. National standards do, however, offer an alternative option.

There is a danger that minimum standards act as a brake on further improvement, by not incentivising developments beyond this point. Any minimum standard must therefore be:

a) ambitious enough to lead to immediate improvement,

b) progressively tightened over time, with future limits clearly announced.

It is likely that such a standard would only be currently practical for standard light duty vehicle types, and can directly build on CO_2 emission labelling schemes. For larger and/or more specialist vehicles it would be highly challenging to agree a standard given the enormous variation in usage patterns and vehicle configuration. For such vehicles, access to specialist knowledge (see section 2 below) is likely a more effective approach at the moment for encouraging AFV usage. Current efforts undertaken by the European Commission (in particular the VECTO tool under development for the measuring of HDV fuel consumption and CO_2 emissions) may hopefully allow minimum standards to be developed in the near future.

Whilst a standard would ensure that minimum environmental performance requirements are met, it may not immediately lead to a major increase in the number of AFVs purchased, but (depending on the ambition level) rather encourage the purchase of very efficient diesel vehicles. Therefore two additional measures are proposed:

- To provide a focus for authorities that wish to be more ambitious and go further an additional advanced clear vehicle standard could be developed, which could only be met by AFVs.
- To set a minimum percentage of vehicles owned or leased by public authorities should meet this advanced clean vehicle standard by a set date following introduction of the legislation

Recommendation 1*: (EU) Introduce a Europe wide clean vehicle standard for all public vehicle purchases, with a maximum CO_2 emission value per vehicle category. This maximum value should be progressively tightened, with future values clearly mapped out for the coming years.*

Recommendation 2*: (EU) Introduce a Europe wide **advanced** clean vehicle standard that may optionally be used by public authorities in procurement. This standard should be progressively tightened, with future values clearly mapped out for the coming years.*

Recommendation 3*: (National level) Set minimum percentage of vehicles owned or leased by public authorities to meet the **advanced** clean vehicle standard by a certain date following the introduction of legislation, and progressively tightened over time.*

2. Knowledge/capacity gap

With an ever growing number of alternative fuels and technologies to choose from - and rapid technological developments related to each option - public authorities and major fleet operators are faced with a highly complex decision making process to determine the most appropriate option.

Determining the most appropriate technology is heavily dependent on usage pattern (including daily usage, route distance, topography, climate etc.). This is particularly relevant for larger and/or specialist vehicles, where both usage patterns and the set up of the vehicles can vary enormously from place to place. Assessing these factors will typically require a significant degree of specialist expertise and up-to-date technical and market knowledge which is unlikely to be available to all but the biggest public authorities. This need is particularly marked in countries with less experience in the operation of AFVs.

The reduction of overall environmental impact of public fleets requires a comprehensive approach to fleet management, beyond the simple purchase of new vehicles – driver training, reducing wasted mileage, appropriate maintenance, retrofitting. This should also be seen as one element of a wider mobility management approach – with public authorities encouraged to rethink their mobility needs, including an assessment of whether the purchase/lease of a vehicle is necessary at all, and the consideration of car sharing, and employee incentive schemes etc. Such approaches could offer substantial benefits, but again would require an upscaling of existing skills for many public authorities.

Despite the clear economic arguments in favour of a life cycle costing/total cost of ownership (LCC/TCO) approach, public authorities still typically base procurement decisions on purchase price alone, and do not take other costs related to vehicle ownership into account, particularly fuel and maintenance costs. One of the primary reasons for this is a lack of expertise in the implementation of LCC within vehicle procurement.

Any strategy designed to encourage the uptake of AFVs within the public sector would benefit substantially from measures aimed at improving skills within public authority administrations and providing access to expertise.

Recommendation 4*: (National level) Establish capacity building programmes for fleet managers and vehicle procurers within public authorities.*

Recommendation 5*: (National level) Establish national/regional centres of excellence on AFVs and fleet management, to promote and provide free direct advice to public authorities and other large fleet operators on sustainable mobility choices in general, on potential AFV options, on leasing and financing models available, and act as a focal point for the collection of usage data and AFV market/technical knowledge.*

Recommendation 6*: (EU) Funding support for European wide initiatives aimed at the establishment of centres of excellence on AFVs and fleet management, capacity building and information sharing.*

3. Applicability

In most European cities, the biggest problems with regard to air pollution are caused by a small number of relatively old vehicles – particularly those manufactured before the introduction of the Euro IV standard. As the current CVD is focused solely on the purchase of new vehicles, and all vehicles must now comply with the Euro 6/VI standards, its impact on the issue of local pollution is negligible. Some form of obligation on public authorities to replace or retrofit older, highly polluting vehicles could have a substantial impact – and a far higher cost effectiveness in terms of € per gNOx/PM saved. This would likely need to be accompanied by a subsidy scheme, or guidance on alternative financing/contractual models.

The number of vehicles purchased directly by public authorities is decreasing, as an increasing number of services are contracted out to private companies. Although the CVD currently applies to operators of public transport services as well as direct vehicle purchases, it does not apply to private operators of other public services which involve the use of vehicles to a significant degree – examples of such services include road maintenance, waste disposal, delivery services, and transportation for the elderly and disabled.

Furthermore the obligation on public transport operators within the current CVD is restricted to their purchases of new vehicles (i.e. only those vehicles purchased during the contract period), and does not affect the overall make up of the fleet of vehicles delivering the service. Many public authorities are introducing conditions on the environmental performance of the vehicles employed by private service providers as a powerful tool in influencing the market. This approach should be encouraged.

The development of labelling and certification schemes for environmental fleet management, such as Ecostars, can be a highly supportive tool for public authorities to use when procuring services. Requiring service operators' fleets to comply with the criteria underlying such a scheme, and allowing the certification/label as proof of compliance can provide a straightforward and reliable mechanism.

Recommendation 7*: (EU) Extend the applicability of the CVD to all operators of public services which involve the use of vehicles as a major component of the contract. This should also extend to cover companies who are subcontracted to the main contractor*

Recommendation 8*: (National level) Set a timetable for the gradual replacement/retrofitting of old, heavily polluting vehicles public authorities and public service operators to at least achieve the Euro 4/IV standard, accompanied by a subsidy scheme.*

An additional option for a certain percentage of vehicles in a service operator's fleet to meet the basic or advanced clean vehicle standard, or to comply with environmental fleet management certification scheme criteria, by the end of the contract could be included.

Recommendation 9*: (EU) Funding support for projects aimed at the phasing out of older, heavily polluting vehicles from cities.*

4. Well-to-wheel CO_2 emissions

CO_2 emissions data, which manufacturers are required by legislation to provide, is assessed at the tailpipe – i.e. emissions deriving from the burning of the fuel in the vehicle. However, this tank-to-wheel (TTW) assessment fails to recognise the significant impact of fuel production during the entire well-to-wheel (WTW) cycle. Emissions related to the generation of electricity for example (and to an even larger extent, hydrogen) for use in vehicles are not taken into account. Nor are the life cycle benefits of regenerative biofuels.

Accurate WTW calculations can be very elaborate and complicated. For the purpose of a clean vehicle standard, the simplified model applied successfully in Sweden may be considered, based on existing information, without unfairly discriminating against any vehicles:

All member states are required by the Renewable Energy Directive to report on the percentage CO_2 benefit achieved by biofuels over their fossil fuel equivalent. For vehicles to be run on biofuels by the purchasing authority this same percentage reduction could be applied to the reported tailpipe CO_2 emissions for the vehicle. To allow for variations, an average for several years could be used.

For electric and Plug-in hybrid electric vehicles data on CO_2 emissions from electricity production is available for both national and often also regional level and may be used. Alternatively, the purchasing entity may choose to purchase green electricity, which may then be taken into account in emissions calculations.

By comparing tailpipe emissions from fossil fuelled cars with a reduced tail-pipe figure for renewable fuelled vehicles and emissions from the electricity used in EVs, the WTW aspect is included in the procurement or – preferrably – in a Clean vehicle standard (see recommendation 1).

Recommendation 10*: (EU) For CO_2 emission limits and/or a clean vehicle standard, allow these emissions to be assessed at the WTW level.*

5. Monetising external environmental impacts

The CVD sets a methodology for monetising the environmental impacts of vehicles for use in a direct cost assessment within procurement decision making. Where a public authority wishes to monetise such emissions the CVD methodology must be used. However, this operational lifetime costing methodology has a significant number of weaknesses:

- It is overly complex

- It sets values for NOx, PM, and CO_2 emissions that are so low they effectively have no impact on purchasing decisions.
- By far the most important factor (although still dwarfed by purchase price) is energy efficiency – an abstract measure, that has no direct correlation to CO_2 emissions, as it is related to the energy content of the fuel together with a reference energy cost (the cheapest of either petrol or diesel before tax) that is the same no matter which fuel the vehicle uses in reality

The application of this methodology in its current format is unlikely to lead to an increase in the purchase of AFVs. If this approach is to be maintained in any future revision of the CVD it should be modified considerably. As in the case of any clean vehicle standard (see recommendation 1), CO_2 emissions are the only relevant parameter, and in order to have an impact on purchasing decisions , the value given to such emissions should either be much higher, or public authorities should be entitled to set their own values.

Recommendation 11*: (**EU)*** *(If the OLC methodology is maintained) Only CO_2 emissions should be included in the OLC methodology. The minimum value given to CO_2 emissions as a default should be considerably increased, and, ideally, flexible.*

Other policy frameworks

The recommendations above all specifically relate to vehicle procurement. However, it is impossible to consider this element in isolation from others if the aim is to increase the uptake of AFVs within public fleets.

1. Cost

Despite the pressing need to address environmental issues, voluntary take up of AFVs on a widescale within the public sector is unlikely if it is perceived that these options will cost substantially more - particularly given the current pressure on public budgets.

National fuel and vehicle taxation regimes, as well as subsidy schemes for AFVs, are clearly the most influential modifier of base production costs, and therefore central to any strategy for improving the financial attractiveness of AFVs in comparison to conventionally fuelled vehicles. Other factors, such as low emission zones, preferential parking schemes or reduced motorway charges, can help make AFVs more cost-competitive. On the other hand, refuelling infrastructure, as well as training for drivers and maintenance staff, will typically entail additional one-off costs when shifting to new fuels and technologies.

Recommendation 12*:* *(EU & National level) Vehicle and fuel taxation schemes should be modified to encourage the use of AFVs and be more consistent across the EU.*

Recommendation 13*: (EU & National level) Multiple measures aimed at increasing the financial attractiveness of AFVs should be applied in all levels of government.*

2. Test cycles and emissions data

Good decision making requires having accurate and reliable information at your disposal. European data reporting requirements and emissions restrictions on vehicles ostensibly provide an excellent source of information for procurers to use when assessing the environmental performance alternative vehicle options. However, numerous studies indicate that the emissions data (both on CO_2 and local pollutants, including NO_x and PM) collected using the current test cycles for type approval are far removed from the real emissions observed during testing under real driving conditions. The assessment of vehicles according to their CO_2 emissions rating or the Euro standard will not therefore ensure the correct decision is made.

This means that the current European vehicle testing and emissions reporting framework is not therefore conducive to good decision making.

Recommendation 14*: Ensure the rapid introduction of realistic test cycles for both light and heavy duty vehicles as a matter of the highest priority, and that the CVD (or any replacement legislation) be reviewed in detail once this is in place.*

Clean Fleets

The Clean Fleets project (www.clean-fleets.eu) assists public authorities and fleet operators with the implementation of the Clean Vehicles Directive and the procurement or leasing of clean and energy-efficient vehicles.

Clean Fleets project partners

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