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FOR A SUSTAINABLE AND COST-EFFICIENT CLEAN BUS DEPLOYMENT : UITP POSITION ON THE REVISION OF DIRECTIVE 2009/33/EC

***UITP** (International Association of Public Transport) is a passionate champion of sustainable urban mobility and is the only worldwide network to bring together all public transport stakeholders and all sustainable transport modes. We have 1,400 member companies giving access to over 18,000 contacts from 96 countries. Our members are public transport authorities and operators, policy decision-makers, research institutes and the public transport supply and service industry. Visit our website: www.uitp.org/eu-policy*

Key facts for public transport in the EU 28

***Passenger journeys:** 57 billion/year, more or less equally shared between road modes (mainly bus) and rail modes (urban, suburban and regional rail).*

***Economic value of public transport services:** € 130 - 150 billion/year or 1 – 1.2% of GDP.*

***Employment:** direct employment 1.2 million and indirect employment 2 - 2.5 indirect jobs for each direct job on average.*

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ADVANCING PUBLIC TRANSPORT

Summary

UITP welcomes the Commission's intention to reduce emissions stemming from the transport sector. Our association has signed the voluntary Commission "Declaration on promoting large-scale deployment of clean buses in Europe"[1], is engaged in research projects testing the newest bus technologies, and is supporting our members to introduce new **bus systems** step by step in a (socially, operationally and environmentally) sustainable and cost-efficient way.

To our surprise, the proposal for a revised Clean Vehicles Directive, which would make the purchase of the cleanest types of vehicles obligatory, places the highest burden on public transport, which is already a clean, energy-efficient and climate-friendly mode of transport. While UITP recognizes the benefits public procurement may have for the manufacturers of certain technologies, it wants to remind decision-makers that public transport companies are at the same time required to provide a cost-efficient service, especially since the demand for public transport is raising while cities' budgets are limited.

The Clean Vehicles Directive requires a balance to be struck between offering cost-effective public transport services and setting ambitious public procurement goals.

We recommend the political decision-takers to consider the following points:

- The Clean Vehicles Directive should leave flexibility to local authorities and operators to choose the technology best fit to their needs; it should be technology-neutral and allow for innovation.
- The list of "clean" technologies needs to be discussed, in particular considering that EURO VI buses are just as clean for pollutant emissions as natural gas/biomethane buses but are not included in the list; biofuels and diesel hybrids are not mentioned neither. It is important to provide regulatory stability and not to change the level of stringency in this definition in just a few years.
- The Directive is oblivious to the real reasons why the uptake of buses defined as "clean" has so far been slow, and does not address these barriers.
- In public transport, it is too limited to look at the vehicle alone; the infrastructure is part of the system and needs to be procured together with the vehicle. Its costs need to be considered, too.
- If the authorities' budget for public transport remains the same while "clean" buses and their related infrastructure are more expensive, there is a risk that the number of buses or the overall public transport service must be reduced; similarly, if transport companies need to propose the same service now with "clean" buses without additional revenues, they might no longer be able to bid. Therefore, if Member States agree to this Directive, they have to put sufficient financial schemes in place which cover the additional costs.
- There is a missing coherence with the Directive on the deployment of alternative fuels infrastructure (2014/94/EU), in which the set-up of charging/refueling infrastructure for public transport was voluntary; now the purchase of "clean" buses becomes an obligation, but the infrastructure is not there.
- The text has a strong social dimension: public transport staff needs to be trained for electro-mobility.
- The proposal needs to be simplified with respect to the way vehicles count towards the quota. Counting certain vehicles only with factor 0.5 is not transparent; all should count with factor 1.
- It is important to distinguish between greenhouse gas emissions and pollutant emissions of vehicles. The tail-pipe emission approach is problematic too; it leads to only electric and hydrogen vehicles qualifying as "zero-emission", whereas the production of energy (especially if based on coal or natural gas) produces CO2 emissions elsewhere.

[1] http://www.uitp.org/sites/default/files/Press%20release%20-%20UITP%20signs%20Commission%27s%20declaration%20on%20alternatively%20fuelled%20buses_modified%20after%20EUC.pdf

UITP Position

The current proposal of the European Commission for a revised Clean Vehicles Directive (CVD) 2009/33/EC obliges public transport authorities and operators with a PSO contract to choose certain "clean" technologies when procuring, renting, leasing or hire-purchasing buses. Through this initiative, the Commission wants to support the manufacturing industry and help reduce GHG emissions from the transport sector.

The public transport sector is already providing a clean and sustainable way of travelling for citizens today. In European cities, only 3-6 percent of transport emissions stem from public transport.[2] [3] Hence, every Euro spent on public transport already today contributes to clean air.

Our sector is committed to improving its service and carbon footprint. In this context public transport companies are continuously renewing the oldest parts of their bus fleets and use ever cleaner technologies, such as Euro VI diesel or gas buses, biodiesel or biogas, hydrogen and electric buses as well as hybrids. UITP supports its members to implement new technologies successfully, through projects like ZeEUS[4], ASSURED[5] and JIVE[6], but underlines that in most cases **the introduction of new technologies (such as electric buses systems) means important changes to the company's infrastructure (depots, workshops, charging stations, access to the electric grid, etc.), workforce, and to the operation (new time-tables, number of vehicles in service, etc.),** which can so far only be managed on a project basis and with additional public funding. All the while, the main objective of a public transport company and authority remains to provide a reliable and affordable mobility service to the citizens.

While UITP recognizes the benefits public procurement has for the manufacturers of certain technologies, it reminds decision-makers that public transport companies are at the same time required to provide a cost-efficient service, especially since most cities do not have the financial means to cover additional costs.

The Clean Vehicles Directive requires a balance to be struck between offering cost-effective public transport and setting ambitious public procurement goals. This is especially important as public transport is supposed to grow and cater for a higher demand, as trends across Europe show.

This paper outlines UITP's position and suggestions on the Commission proposal.

Clean technologies: more flexibility for public transport

In its present proposal for a directive, the Commission defines the term "clean vehicle" for the first time and sets mandatory minimum procurement targets for such vehicles at Member State level: up to 50 per cent of the buses purchased, leased or rented in the years until 2025 and up to 75 per cent until 2030 (or more!) have to be "clean".

Unless light duty vehicles, buses are not defined based on CO2 limits, but through a list of technologies, according to which only electric, hydrogen and natural gas buses qualify as "clean bus". A footnote in the annex to the Directive states that, in the case of electric buses, a "relevant part" of the energy has to be used for the operation of the vehicle. UITP interprets this in a way that plug-in hybrid buses are included in the definition of "clean" vehicle, which would however exclude other hybrids despite their ability to save up to 30 percent of energy, too.

By choosing certain fuels and technologies and setting mandatory procurement targets at EU level, the Commission is limiting the autonomy of cities, regions and local authorities to self-govern themselves. This puts into question the principle of subsidiarity.

[2] In French cities, less than 4% of the emissions stem from public transport (Deloitte study)
[3] In Vienna (Austria), despite a very high modal split of 39%, public transport emits only 6% of the transport CO2 emissions.
[4] www.zeeus.eu
[5] www.assured-project.eu
[6] www.uitp.org/jive

UITP considers that by selecting certain fuels and technologies for buses, the Commission is being overly prescriptive and does not consider

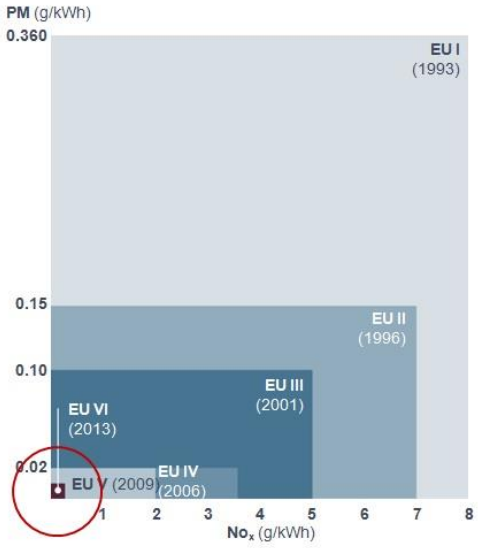
a) **the fact that other technologies currently have a much better effect on air quality and/or CO2 emissions than those defined as "clean" in the Directive;**

b) **the right of local authorities to choose solutions to the problems at their own level;**

c) **the potential evolution of technologies;**

d) **nor is this list in line with other EU legislation, such as the so-called DAFI directive 2014/94/EC on the deployment of alternative infrastructure**.

This leads to a situation where a number of suitable alternatives are no-longer in scope but could play a significant role in reducing emissions from the sector. For example, **diesel hybrids, biofuels and advanced biofuels** are not in scope but in fact help to reduce transport emissions.



Development of PM and NOx emissions for diesel buses (from EURO I to EURO VI)

Euro VI diesel buses have extremely low pollutant emissions (see graphic) and a comparable level of CO2 and pollutant emissions to natural gas buses; but only natural gas buses are included as "clean". Studies have shown that diesel and CNG buses emit very similar levels of CO2 tailpipe emissions around 5g/mi. While natural gas has a lower carbon content this advantage is eroded by general higher fuel economy for diesels. It is therefore difficult to understand why gas buses are considered "clean" whereas modern diesel buses are not.

Unlike cars, buses are not tested on test benches, but on the street in so-called "SORT" cycles (SORT = Standardised On-Road Testing). Real driving tests by bus operators have demonstrated that, unlike many diesel cars, **diesel buses actually meet the emission limits** set in the EURO standards; many vehicles even show lower emission in real driving than what is declared by the manufacturers, and **any Euro VI diesel bus emits far less NOx in real driving than a Euro 6 car, despite its larger size**![7]

UITP therefore considers Euro VI buses as a "clean" technology. Many cities and operators – and more importantly rural areas! – will rely on this cost-effective technology for years to come, simply because the alternatives are not reliable yet and too expensive (especially in rural areas, where an increase of costs can easily mean the end of public transport altogether).

By looking only at tailpipe emissions, the Commission actually fails to improve the emissions levels. A striking example is the hydrogen production: the Netherlands is one of the biggest hydrogen producers in Europe, but research shows that out of the 8 billion m3 of H2 produced, about 7 billion m3 is currently made of natural gas.[8] When H2 is produced from natural gas, the CO2 emissions from this production are very high.

UITP view is that the Clean Vehicles Directive should leave enough flexibility to public transport operators to choose the technologies that best fit their local circumstances.

This could be done either by having a technology-neutral definition of a "clean bus" based on CO2 and pollutant emission limits at a reasonable level; or for instance by referring to the list of technologies in article 2 of the DAFI Directive 2014/94/EU on the deployment of alternative fuels infrastructure[9], which includes

[7] https://www.theicct.org/publications/nox-emissions-heavy-duty-and-light-duty-diesel-vehicles-eu-comparison-real-world
[8] www.fluxenergie.nl/nederland-is-al-grote-producent-waterstof
[9] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0094&from=EN

biofuels for instance.

It needs to be ensured that **trolleybuses**, but also all types of **hybrid buses** fall under the definition, as the latter represent an important transition technology towards full-electric vehicles and should therefore be promoted. Furthermore, it is important not to stop the development of new propulsion systems or energy sources, such as HVO-biodiesel or "xTL" through a definition that is too narrow and impedes innovation.

Regulatory stability for long-term investments

Investments into infrastructure are always made to last for several decades. It is therefore crucial to ensure regulatory stability and avoid that the definition of "clean vehicle" (in particular "clean bus") changes in the near future – otherwise, companies would invest into bus infrastructure today linked to a technology they may no longer purchase tomorrow.

UITP therefore thinks that **the definition of "clean bus" should be established now and not be modified through a delegated act in the near future**. We suggest to link the definition to the DAFI Directive 2014/94/EU, which would make the delegated act unnecessary. Should the definition nevertheless be replaced by a definition based on CO2 thresholds (through a delegated or implementing act), then **the legislative text should clearly specify that the level of stringency should not change at that moment**, but that the future CO2 threshold has to be set at a level that includes all those technologies that originally fell under the definition of "clean bus".

The directive fails to address the real barriers to introducing new bus technologies

UITP members are very interested in technological development and eager to improve their fleet. The purchase of various forms of electric buses is picking up pace across Europe in recent years. However, compared to the overall fleet their numbers remain relatively low so far due to a number of reasons which are unfortunately *not* addressed by the Clean Vehicles Directive, such as:

- **the lack of mature products** that meet the needs of the operator/authority to provide a reliable service: this concerns the range (how far a vehicle can go with its battery), the load (the number of passengers that fit into an e-bus is lower than for a diesel bus), the reliability in service; etc.
- **lack of available charging/refueling infrastructure**, both in the depots, maintenance workshops, and in the public space. As outlined before, the DAFI Directive 2014/94/EU focused on light duty vehicles and trucks. This was a missed opportunity to prepare the public transport sector for the shift to alternative fuels. The set-up of infrastructure is a long-term planning process and takes several years;
- **long procedures and large sets of permissions** and clearances required to first gain approval for the design and, in a second step, for the construction of charging/refueling infrastructure: for electric bus charging, the grid connections must be established, contractual arrangements agreed with a wider variety of players, permissions granted by a number of different players and so on;
- **costs** are an important factor, as those buses defined by the Commission as "clean" cost more than conventional Euro VI diesel buses, and other costs need to be added (such as costs for setting up the infrastructure, changes to the depots and maintenance workshops, additional batteries to replace the first set in the bus, training of drivers and maintenance staff, etc.). Furthermore, in order to run the same service with electric buses instead of diesel buses, roughly 15-20 percent more buses are needed (each having nearly double the price of a diesel bus);

The impact assessment of the European Commission calculated costs of roughly 2.2 billion €; own calculations from UITP members arrive at additional costs of more than 40 billion €.

- **for electric buses, the life-time of the batteries is unknown**, and as they would charge and discharge several times daily, one can be sure that they will need to be replaced once or multiple times throughout the duration of a PSO contract;
- **the skills development of the staff:** bus drivers, but more importantly the maintenance staff at the workshops need to be trained to repair and maintain electric buses; while they are currently familiar with simple vehicle mechanics, in the future they need to upskill and become electric engineers. This requires time and careful planning in conjunction with the unions.
- **the need to diversify**: many operators want to diversify their bus fleet in order to prevent a complete interruption of service if the supply of one of the fuels/electricity is interrupted (for example in cases of long-lasting power cuts);
- **European rules on the level of indebtedness** limit the companies' ability to take on further loans in order to buy more expensive vehicles and their infrastructure – even if they wanted to do so and if the total cost of ownership (TOC) of an electric bus was favourable, this would restrict the purchasing possibilities;
- **the need to procure vehicles and their infrastructure together** since both products need to fit together in order to allow smooth operations;
- **the lack of standardized e-bus charging systems** in the EU. The standardization of various forms of electric charging systems for buses is just starting (early 2018); all the while, the systems continue to differ from one another, which leads to several operators waiting until it is clear which system will be shared between all manufacturers.

In practice, a range of factors needs to be taken into account when choosing to purchase a particular type of low emissions bus. The most important parameters include infrastructure requirements, local and regional policies (e.g. low emissions zones), government incentives, total cost of ownership as well as route characteristics, new or additional maintenance, operational maturity and environmental considerations (both CO2 and air emissions). It is because of this, that electric buses might not be suitable for some lines. The sector also considers it important not just to rely on one technology alone. By diversifying fuels and technologies, it help builds resilience in the public transport offer to customers.

As the real barriers are not addressed, practical problems remain unsolved. In UITP's opinion, the targets in the proposed Directive are currently too ambitious for some cities and certainly for many rural areas.

The risk of rising costs

The prices of hybrid buses are one third higher than their diesel counterparts, and a full-electric bus costs more than twice the price of a diesel bus – not including the infrastructure investments. This means that, if the budget of authorities remains the same, fewer buses can be bought for the same amount of money, leading either to a reduction in procurement (and in consequence to the oldest diesel buses in the fleet being used for more years than originally planned) or – eventually – to a reduction of public transport services, as you cannot offer the same service with fewer (more expensive) vehicles. As mass transit means low-emission mobility, a reduction of public transport would be at the detriment of the Commission's own emission reduction ambitions. In fact, more and more cities stress the wish to increase the modal share of public transport as a means to reduce transport emissions in their territory.

Very ambitious procurement requirements without an increase in revenues for the transport companies, as currently witnessed in the Netherlands, can also make concessions less attractive for operators; this could result in less competitive offering.

If the authorities do not have a larger budget for public transport, placing additional costs on the sector could make public transport more expensive for the users and hence less attractive, which could result in people shifting away from public transport. Again, this would ultimately go against the objectives of the

EU's low emission mobility strategy, which the Clean Vehicles Directive aims to contribute to. Rather, the ultimate goal of the Directive should be to support the public transport sector to enlarge their offer and encourage cities to come up with holistic solutions that will help to reduce emissions in the transport sector in line with the EU low emission mobility strategies.

There is a very pronounced risk in **rural areas**, which today provide a low-density public transport service, that higher costs will mean an immediate end of this public transport offer altogether because in many cases it is already at the brink of non-profitability. Cost-efficient Euro VI diesel buses will continue to play an important role especially in those areas for several years to come.

When considering the costs to our sector the legislators need to adopt a 'whole systems' approach in which issues such as the infrastructure needs, skills, etc are factored in. UITP is quite surprised, considering the huge investments necessary to meet the Clean Vehicles directive's targets, that the Commission's impact assessment claims that the proposal leads to a positive balance sheet with costs of approximately 2.2 billion €; in fact we challenge those numbers based on calculations from our own members that indicate a much higher cost (over 40 billion €).

Last but not least, the Directive also requires sub-contractors to meet its requirements in terms of providing services with a "clean" fleet (above certain thresholds), which places an additional costs on **small and medium enterprises (SMEs)** which often work as sub-contractor for larger the public transport companies. It remains to be seen if they can still be considered for public transport services if they cannot provide enough "clean" vehicles.

There is a significant risk that the Commission's proposals will delay the deployment of cleaner buses in the sector or, worse still, reduce the levels of public transport services. Public transport needs to be not only clean, but also affordable.

In order to mitigate these risks, **Member States and the EU should establish adequate financial incentives** systems to support public transport undertakings in the transition towards the cleanest technologies. Such financial incentives systems have proven to be very effective in various Member States. Since the additional costs for the public transport sector are very high, especially in the short and medium term, **new sources of financial support need to be found at EU and Member States level**. The revision of the Eurovignette Directive on future road tolling systems[10] and its provisions on earmarking part of the income for sustainable public transport could be an opportunity to channel additional funding towards low-emission bus systems. Furthermore, in the multi-annual financial framework, the Commission needs to earmark sufficient budgets to the deployment of low-emission bus systems.

The EU and Member States should also **shape the enabling policy environment** to support the scaling up of low-emission bus systems in small, medium and large cities. This could include financial or administrative support to set up the infrastructure (including at the private properties of the operators) but also advantageous energy tax schemes for public transport, or other similar incentives.

Implementation and application to contracts

It is important to note that some PSO contracts run beyond 2025 and may be calculated based on diesel buses. Existing PSO contracts must be respected and the upcoming **new rules or obligations can only apply to new contracts**.

The experience from our sector shows how important it is to **procure vehicles and the infrastructure together** to ensure that they match – especially while the charging systems are not yet standardized at EU level. This may be new to the procurement staff, hence requiring more time for the preparation of new tenders.

[10] https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-275_en

For new technologies, **longer term contracts** could potentially help in terms of delivering against the objectives of the clean vehicles directive, as there is a longer time to capitalize on the initial investment.

Time to set up the infrastructure in public transport

It will be essential to ensure that the Directive is supported by complementary policies, however this is currently not the case. While the Clean Vehicles Directive proposal now includes ambitious *mandatory* targets for the uptake of "clean" public transport vehicles, the 2014 DAFI Directive on the deployment of alternative fuels recharging and refuelling infrastructure has been *voluntary* for public transport. In fact, Member States are not required to include targets for public transport infrastructure in their national implementation plans, unlike the infrastructure needed for private vehicles. **Without the necessary infrastructure being in place, however, the Clean Vehicles Directive cannot deliver.** Vehicles could not be charged and hence not be used in service. Therefore, the infrastructure comes first and the vehicles come second. Both need to fit together.

It is therefore essential that Member States update their national implementation plans from the alternative fuels infrastructure Directive (DAFI) and engage their cities and public transport undertakings so that the necessary infrastructure for low-emission bus systems can be planned for. This process of setting up the infrastructure for public transport requires some time; UITP is of the view that the Clean Vehicles directive should foresee a first period of roughly five years during which the focus is on setting up the infrastructure needed, and only then should any procurement targets for public transport vehicles apply. At the same time, the Clean Vehicles directive offers the opportunity to make the set-up of infrastructure happen; hence UITP encourages the Commission to take this forward.

The legislators should give the public transport sector sufficient time – at least five years – to set up the necessary infrastructure before introducing any mandatory vehicle procurement targets for this sector. Furthermore, national funding instruments are necessary to help overcome the initial financial burden on the side of operators and cities.

Simplify the text: count all buses with factor 1 towards the quota

Table 5 in the Annex of the Commission proposal contains a footnote stating that only zero-emission vehicles count towards the procurement targets with factor 1, while others (natural gas vehicles, hybrids) count only with factor 0.5 towards the quota. In UITP's opinion, this **makes the system unnecessarily complex and non-transparent**. It leads to a situation where the quotas stated in the proposal will de facto be irrelevant, because **the real quota that need to be achieved in terms of number of vehicles purchased will actually need to be much higher than what is stated in the table**. This is against the principles of clarity and better regulation.

UITP therefore suggests that all vehicles that fall under the definition of a "clean vehicle" should count with factor 1 towards the quota.

Should there be the political will to further incentivize the purchase of zero-emission vehicles, these could then count with a factor higher than 1, which would at least establish a "clean vehicle" as a baseline and facilitate the achievement of the procurement targets by large numbers of zero-emission vehicles.

The same footnote is furthermore not clearly drafted and needs careful editing to improve clarity.

Accounting emissions

By accounting emissions based on tailpipe emissions the Commission completely ignores how energy or electricity is generated and **risks a shift of CO2 emissions from the transport sector to the energy sector**. **It is essential that the nexus between transport and energy is not lost** and that target setting follows carbon

accounting standards that help with valuating low carbon vehicle options.

As long as "clean buses" are defined based on a list of technologies, all of these technologies would (in principle) be treated equally. However, if the definition was replaced by one based on CO2 thresholds, then one needs to carefully consider the various carbon accounting rules that apply to different fuels. For instance, biofuels would need to include CO2 emissions from raw materials, processing, transport and distribution, as regulated in Annex V point C of the Renewable Energy Directive 2009/28/EC.[11]

Proportionality

The proposal for a directive is mainly affecting public transport, since buses are the major part of vehicles procured by public authorities and transport operators under a PSO contract.

It appears that the proposed directive does not respect the polluter-pays principle, as it puts the highest burden in terms of procurement targets on the sector that is the least polluting.

Considering the fact that public transport is already a clean mode of transport – only up to 6 percent of the cities' transport emissions stem from public transport! (see introduction) – combined with the relatively low modal split of public transport in most cities, UITP wonders what the *real* contribution to emission reduction from the public transport sector can be, and whether this is worth the huge costs associated with the Commission's proposal.

UITP recommends that the proposal be revisited with this perspective in mind and that the burden on the public transport sector be proportionate to the improvements that can actually be achieved for the overall emissions in cities and regions.

As stated above, the worst consequence of this proposal – a reduced or more expensive public transport – needs to be prevented.

What could be done instead?

UITP sees the need to highlight many of the difficulties that lay in the Commission proposal, but also suggests solutions. In order to support emission reduction and a higher modal shift for clean public transport, policy-makers could instead:

- set **targets for an earlier replacement of the oldest diesel buses** that are still in operation (e.g. Euro II, Euro III) and replace them by modern Euro VI diesel, hybrids or alternatively fuelled / electric buses. This would immediately reduce the emissions of the public transport fleet, as older diesel buses still emit significantly more than modern ones (see graphic on p. 4)
- help **improve the modal shift towards public transport**, for instance by
    - encouraging cities to set up low-emission zones and/or banning individual cars from city centres;
    - improving the commercial speed and fuel efficiency of buses within the city by creating separate bus lanes;
    - giving energy tax or other tax incentives to public transport operations to reduce the operational costs of low-emission vehicles;
    - incentivizing companies to provide job tickets / abonnements instead of company cars;
    - etc.

[11] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016PC0767R%2801%29

- **accelerate the set-up of alternative fuels infrastructure in public transport** by including public transport in the Member States' national policy plans for the DAFI Directive 2014/94/EU;
- **set up sufficient funding schemes for low-emission bus systems** at Member State and EU level; this will reduce the initial high investment for the infrastructural changes and help the sector move much faster into the direction promoted by the European Commission.