

JRC TECHNICAL REPORTS

Revision of the EU Green Public Procurement Criteria for Transport

*Technical report and criteria proposal
(3rd draft)*

*Annex: Table of comments from the
stakeholders on the 2nd draft of
Technical report and criteria proposal*

Rocío Rodríguez Quintero, Candela Vidal-Abarca
Garrido, Hans Moons, Miguel Gama Caldas (JRC)
Ian Skinner (TEPR)
Anouk van Grinsven, Maarten 't Hoen, Huib van
Essen (CE Delft)

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TABLE OF COMMENTS FROM THE STAKEHOLDERS

Category 1 Purchase, lease or rental of cars, LCVs and L-category vehicles

Annex table 1: CO₂ emissions

Selected information to the subject comment	Comment description	Assessment by JRC
Periodic revision of thresholds	We encourage the periodic revision of the type-approval CO ₂ emissions thresholds, as they should be adapted to technical progress	Comment acknowledged: the proposed criteria aim to account for technical progress as the CO ₂ values have a downward trend until 2020/2021.
Implementation of tiers in framework agreements	<p>Frameworks agreements are usually approved for from 2 to 4 years. This means that the Co₂ limit would be set in the beginning year, for example 2018, and would not be updated until the next bid.</p> <p>From the framework agreement call for tenders to bid, to the start of the agreement, when public procurers can actually buy, there are 8 months, so, it is not feasible to update criteria yearly.</p>	Comment acknowledged: in the case of a framework agreement, if it is not possible to set annual tiers along the timeframe of the agreement, then public procurers would need to decide what criteria would be appropriate to set in year 1 for a 2 or 4 year contract.

Selected information subject to the comment	Comment description	Assessment by JRC
<p>Thresholds to be stricter, no mass-based</p>	<ul style="list-style-type: none"> • We welcome the JRC's decision to measure CO2 emissions at the tailpipe. The GPP should avoid being overly complex to encourage use by public authorities • We recommend sticking to the initial approach for N1 Class III vehicles (criteria TS1). The threshold should be based on one single value, and not be a function of the vehicle mass. • The targets mentioned in the TS1 for different vehicle categories should be adapted to technical progress. They should therefore be revised downward from 2021 on, following a 7% yearly reduction, in line with the range expressed for cars and vans by the European Parliament in two legislative acts in 2013.[1] <p>[1] Report 30 April on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new passenger cars;</p> <p>Report 13 May 2013 on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 510/2011 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new light commercial vehicles;</p>	<p>Comment not accepted:</p> <p>N1 Class III: At the second AHWG, Option 2 (a mass-based approach) was generally considered to be most appropriate for N1 class III vehicles, due to the wide range of loads and types of vehicles within this segment.</p> <p>Post 2021 values: Agree that the values should follow a downward trend post 2021, but the criteria have been developed until 2021, so setting post 2021 values are out of the scope of the current revision</p>

Selected information subject to the comment	Comment description	Assessment by JRC
WLTP translation	As indicated in the webinars slides the NEDC needs to be updated when WLTP have been released. Why not now as from 1st of September 2017 WLTP will be available.	Comment accepted: As explained in the section on the NEDC in the TR, comprehensive data on the WLTP is not yet available; the Commission has recommended that NEDC values continue to be used for the purpose of consumer information until the end of 2018. For 2019 onwards the NEDC CO2 figures presented in the GPP criteria have been translated into WLTP figures according to the JRC estimations
WLTP translation	<p>WLTP is in effect of September 2017. Please use these values</p> <p>These values can only be reached by BEV, FCE and PHEV if WTW or LCA approach aren't considered. WLTP should be used when available. As new studies regarding BEV and PHEV its quite clear these powertrains carry a CO2 burden in manufacturing or through favorable NEDC homologation.</p> <p>http://www.ivl.se/download/18.5922281715bdaebede9559/1496046218976/C243%20The%20life%20cycle%20energy%20consumption%20and%20CO2%20emissions%20from%20lithium%20ion%20batteries%20.pdf</p> <p>http://www.theicct.org/sites/default/files/publications/Integrating-EVs-US-EU_ICCT_Working-Paper_22062017_vF.pdf</p> <p>http://www.cleanercarcontracts.eu/media/articles/3/download/icct_laboratorytoroad_2016.pdf</p>	Comment partially accepted: 2019 and onwards NEDC values have been translated into WLTP. NEDC values will still be available in 2018

Selected information subject to the comment	Comment description	Assessment by JRC
TTW vs WTW	This is already done since several years through WtW study from JEC.	Comment not accepted: TTW metrics are preferred by public procurers since it is much easier to implement in a call for tender: it is based on common metrics and test methods used by manufacturers and known by consumers. This is also in line with overall CO2 legislation in the EU for vehicles. The choice of WTW factors might entail some issues, since in most situations it is not possible to know the pathway of the fuels consumed.
TTW vs WTW	The criteria should include also consideration on air quality improvement. The CO2 reduction is achieved via tailpipe is not enough, a Well-to-wheel approach should be considered.	Comment not accepted: with regards to CO2 emissions, see above. The criteria set on air pollutant emissions deal with air quality issues
TTW vs WTW and alternative fuels	<p>The criteria so far are not (!) in place in terms of gaining the way towards rewarding drivelines that can facilitate the best vehicle procurement which can actually reduce both CO2, NOX and PMs. Especially when using only a very limited part of the whole CO2 value chain for alternative fuels to diesel/gasoline (up-stream - Well to Tank) for alternatives like ED95, E85, M100/M85, HVO, biogas and other low-carbon fuels in a vehicle lifetime perspective).</p> <p>The market for alternative drivelines are limited at</p>	Comment not accepted: see above.

Selected information subject to the comment	Comment description	Assessment by JRC
	<p>the moment, but the OEMs (at least some of them) are going to or already offers alternatives to "only diesel drivelines", to lower CO2, NOX and PMs (especially the truck and bus OEMs). Still "only diesel drivelines" are mostly being sold, but this will change. High blends with second generation bio-fuels is a good alternative (money vs. CO2 and NOX reduction efficiency), if you can't afford an electric/fuel cell based driveline or if this doesn't exist in a specific sub category (this picture is even more relevant when looking at machines).</p> <p>Each country has their own taxation for fuels/vehicles that either enhances or abort the possibilities of investing in alternative drivelines (bio-fuel drive lines (ED95, E85, M100/M85, HVO, biogas) or fuel cell based drivelines on H2 or M40). Therefore it is crucial to facilitate a diverse criteria setting when procuring the best alternatives to diesel.</p>	

Selected information to the subject comment	Comment description	Assessment by JRC
TTW vs WTW and alternative fuels	<p>These Comprehensive criteria only target PHEV or RREV or FCEV vehicles.</p> <p>Does it make sense without considering WTW effect of such a powertrains ?</p> <p>Please check attached graph from CLEANER CAR CONTRACTS BENCHMARK 2017 https://www.natuurenmilieu.nl/wp-content/uploads/2017/05/CCC_benchmark_overview_2017_170501v2-003.pdf</p>	Comment not accepted: see above
TTW vs WTW and alternative fuels	<p>According to VW presentation at the 2017 Vienna Symposium WTW and TTW CO2 emissions are very different depending on the powertrain. Please see attached extraction from VW presentation Vienna Symposium.</p> <p>"CNG as ideal supplement to e-traction aiming at CO2-neutral mobility?" https://link.springer.com/chapter/10.1007/978-3-658-17109-4_4</p>	Comment acknowledged: the comment is acknowledged but no relation with the paragraph is apparent. For ICEVs, WTW emissions are proportional (not equal) to TTW, though the slope will be different for each fuel and pathway

Selected information subject to the comment	Comment description	Assessment by JRC
TTW vs WTW and alternative fuels	<p>This is done by existing Green gas certificates. According to the revision of the Renewable Energy Directive Guarantee of Origin needs to be monitorized. For renewable methane trading ERGAR has been established to monitorize.</p> <p>www.ergar.org</p>	Comment not accepted see above. The purchase of the fuel is usually not part of the vehicle purchase.
Natural gas vehicles Biomethane credits	<p>Solutions could come with the proposal for the CO2 regulation for post 2021:</p> <p>Maintaining CO2 tailpipe emissions from type approval procedure</p> <p>Including CO2 credits in the monitoring phase according to the rate of renewable gas certified</p> <p>Solutions could come with the proposal for the CO2 regulation for post 2021:</p> <p>Maintaining CO2 tailpipe emissions from type approval procedure</p> <p>Including CO2 credits in the monitoring phase according to the rate of renewable gas certified</p>	Comment not accepted: no credits have been approved for post 2021 targets

Selected information subject to the comment	Comment description	Assessment by JRC
Natural gas vehicles cost-efficiency	TCO calculated from Thinkstep WTW study for VW golf is for BEV €0.0475 and for CNG €0.0142. As can be read in attached file GHG emission reductions is determined to be €1.11 /kg CO2-eq for the BEV vs diesel and €0.44 /kg CO2-eq for the NGV.	Comment acknowledged: TCO calculations strongly depend on the assumptions made and also change rapidly due to the technological developments. Due to these developments an assessment should not be solely based on the current TCO, but also on future expectations.
Natural gas vehicles running on biomethane	<p>The following study suggest otherwise even if the EV's would run on 100% renewable electricity. Total GHG emissions from different CNG pathways are always lower than Petrol and Diesel and can be lower than EVs. Please attached IVL study and graph.</p> <p>http://www.ivl.se/download/18.5922281715bdaebede9559/1496046218976/C243%20The%20life%20cycle%20energy%20consumption%20and%20CO2%20emissions%20from%20lithium%20ion%20batteries%20.pdf</p>	Comment not accepted: CNG is not mentioned in this report. The conclusions of the report are: 'Based on the assessment of the posed questions, our conclusions are that the currently available data are usually not transparent enough to draw detailed conclusions about the battery's production emissions.' and 'This report also concludes that there is no fixed answer to the question of the battery's environmental impact.'
Vehicle-fuel system as subject matter	ICE running with renewable energy sources (as renewable gas) should be awarded as well.	Comment not accepted: The purchase of the fuel is usually not part of the vehicle purchase.

Selected information subject to the comment	Comment description	Assessment by JRC
<p>Armour-plated vehicles to be out of the scope</p>	<p>Armor-plated cars are usually placed in the segment M1 cars large.</p> <p>This cars have an extra weight up to 1000 Kg, so, in order to achieve a nimble driving experience, they need large engines, and, therefore with higher CO2 thresholds.</p> <p>Maybe armour-plated cars should just be relieved from this GPP, or CO2 threshold needs to be raised, at least, in for Large M1 Cars.</p>	<p>Comment acknowledged: Armoured vehicles are classified as special purpose vehicles according to Directive 2007/46 and are thus not classified as M1 vehicles. This means armoured vehicles are out of scope.</p>

Annex table 2: Air pollutant emissions

Selected subject comment	information to the comment	Comment description	Assessment by JRC
AC awarding points formula	Some countries, like Spain, already have a formula for all numeric criteria. In our case, formula is similar, but not the same. In the formula proposed in GPP, no offer can achieve the maximum points. This unsuitable for our Framework Agreements, as we are strongly advised to always give 0 points to the worst offer and 100% points to the best offer. We would suggest leaving just the text, instead of a certain formula.	Comment partially accepted: the formula has been modified to enable 100% points to the best offer.	
AC awarding points formula	Refer to EURO-6 values	Comment not accepted: the formula ensures that the offer with the highest emissions does not get points, and enables a better comparison between offers of vehicles of the same technology.	
AC warding points formula and diesel	<ul style="list-style-type: none"> • The TS2 comprehensive criterion is a good incentive for the use of zero emission vehicles in cities that can significantly improve air quality. • We recommend aligning the NOx max value for vehicles to the limit value set for gasoline fueled vehicles, in order to remove any bias in favour of diesel powered vehicles from the GPP criteria set. 	Comment not accepted: the formula ensures that the offer with the highest emissions does not get points, and enables a better comparison between offers of vehicles of the same technology.	

Selected information subject to the comment	Comment description	Assessment by JRC
Close to zero emissions vehicles instead of zero emissions	If going towards a zero emissions "capability" also Close to Zero emissions should be included. It is necessary to consider cost-efficiency from solutions, looking also to their capability to replace current old fleets.	Comment not accepted: low emissions vehicles are awarded with additional points by means of the AC. Improved air pollutant emissions performance, and the zero emissions capability ensures that the vehicle does not emit pollutants along the distance driven within urban areas. Besides, Close to zero emission vehicle is not clear enough as a definition for public procurement.
Diesel vehicles and ambition level	As mobility services like taxi, car sharing etc. are mainly used in dense urban areas, which is most likely highly polluted area, the criterion has to be way more ambitious. Diesel-cars should not be added to the existing fleets. All new cars should cover Class "A" of the EQUA-Index.	Comment not accepted: the criterion is based on environmental performance of the vehicles, technology-neutral. The measurements shall be based on European harmonised standards.
PHEV and EV performance and air conditioning	<p>Market studies right now show that some of the Zero tailpipe emission capability vehicles fuel engine, has a way worse CO2 emission performance than the just-fuel equivalent. We attach the spreadsheets Consumptions-CO2-hybrids, with our data of car in production in 2017, length, consumptions and CO2 emissions.</p> <p>What we also see of these phev vehicles is that its autonomy range is radically reduced, when air conditioning system is on. This means that real CO2 emissions in hot countries, is actually better with light cars fuel based, than phev.</p> <p>We attach the document Air-Conditioning-Electric-Batteries, which is the only source we have found that links air conditioning with battery autonomy</p>	Comment partially accepted: the data provided mix hybrid vehicles and plug-in hybrid electric vehicles (PHEV). PHEV are equipped with a battery that can be externally charged and that allows them to run on electricity a certain distance (electric range or zero emissions capability). The data provided show that PHEV perform 70% lower TTW CO2 emissions than a diesel, and according to the literature review the WTW emissions (including indirect emissions from electricity consumption) would be more than 15% lower than diesel. In the case of hybrids, the data show that some hybrid vehicles performs similar or even a little worse to its diesel counterpart, but many other ones perform between 10 - 20% better than their diesel counterparts. However, <u>hybrid vehicles are not zero tailpipe emissions capable</u> . In any case, the criteria on air pollutant emissions address the capacity of the vehicle to reduce these pollutants,

Selected information subject to the comment	Comment description	Assessment by JRC
	<p>range. We would rather set a criterion that did not favor to higher Co2 emissions, ignoring whether the vehicle has or not any range of Zero Tailpipe emission capability. We agree on having, at least, a default range threshold, because, otherwise, it is better for the environment the simple petrol engine.</p>	<p>while there is another criterion dealing with CO2 emissions. Regarding air conditioning, the type approval test procedures do not take them into account to measure the range of EVs, and it seems this will be unchanged in the short term. However, this does not affect the capacity of the criteria set to compare different vehicles and select the best option in the market.</p>
PM emissions instead PN	<p>Right now, the only information about Particles available for cars, at least in Spain, is measured in gr/KWh and not in (#/km) but as EU6d and RDE is implemented we hope that this data will be available for vehicles in technical sheets. Meanwhile, maybe particles measured in gr/kwh could be used as an award criteria</p>	<p>Comment not accepted: the emissions of concern are related to the number of particles emitted from gasoline direct injection engines, not the mass of the particles. PM is measured in mg/kWh only in HDVs.</p>
PN emissions	<p>Right now, the only information about Particles available for cars, at least in Spain, is measured in gr/KWh and not in (#/km) but as EU6d and RDE is implemented we hope that this data will be available for vehicles in technical sheets. Meanwhile, maybe particles measured in gr/kwh could be used as an award criterion</p>	<p>Comment not accepted: there seems to be a mistake in this comment, since Euro 6 limit values are expressed in mg/km for cars and vans, it is not a unit to be introduced by Euro 6d stage. Limits are expressed in mg/kWh for heavy duty vehicles. Euro 6 also sets a limit value for particle number (PN) which is a different parameter than particulate matter (PM), and as its name indicates is measured as number of particles per km (#/km), not as mg/km, which is the unit for PM.</p>

Annex table 3: Technical options to reduce GHG emissions

Selected subject information to the comment	Comment description	Assessment by JRC
Traffic information and route optimisation	The criteria "Traffic information and route optimisation" should not be withdrawn in order to make public authorities aware of the benefits of enhanced traffic information. Further, we recommend promoting the use of tools such as JRC's "Green Driving Tool", which could help procurers to select the best suitable type of car for their needs. However, we understand that it might be difficult to incorporate this aspect to the GPP criteria	Comment accepted
Traffic information and route optimisation	The criteria on traffic information systems should not just simply be dropped but mentioned as an indication to public authorities, in order to make them aware of the benefits of enhanced traffic information.	Comment accepted

Annex table 4: Battery warranty

Selected subject comment	information to the comment	Comment description	Assessment by JRC
Minimum warranty according to technological development	warranty	Criterion TS6 on minimum battery warranty should be moved to the core set of criteria, and include a note to the procurers inciting them to check the state of the art in term of battery warranty, because of the sector's rapid technological developments.	Comment accepted

Category 2 Mobility services

Annex table 5: CO2 emissions

Selected subject comment	information to the comment	Comment description	Assessment by JRC
Update to technical progress		We encourage the periodic revision of the type-approval CO2 emissions thresholds, as they should be adapted to technical progress	Comment acknowledged
Update to technical progress		<p>We consider that a comprehensive criterion with lower CO2 emissions average should be taken into account to incentivize procurers to go beyond the core criteria AC1.”</p> <p>We could add a further point: “We consider that the values proposed in the AC1 criteria should be set in different tiers from 2018 to 2021, as is the case of the TS1 thresholds</p>	Comment partially accepted: the mobility services should be promoted over the purchase of cars, therefore the criteria should be as simple as possible, and less stringent than for the purchase of cars. Zero emissions capable vehicles are addressed in the air pollutant criteria. Further reductions will be attained by means of the emissions reduction plan. The tiers of the category 1 have been introduced.

Selected information subject to the comment	Comment description	Assessment by JRC
Update to technical progress and stricter comprehensive level	<ul style="list-style-type: none"> The targets mentioned in the AC1 should be adapted to technical progress. They should therefore be revised downward from 2021 on, following a 7% yearly reduction, in line with the range expressed for cars and vans by the European Parliament in two legislative acts in 2013.[1] A comprehensive criterion with lower CO2 average should also be introduced, in order to allow procurers to go beyond the core criteria mentioned in AC1. <p>[1] Report 30 April on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new passenger cars;</p> <p>Report 13 May 2013 on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 510/2011 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new light commercial vehicles;</p>	Comment partially accepted: see above
WTW vs TTW and alternative fuels	The criteria so far are not (!) in place in terms of gaining the way towards rewarding drivelines that can facilitate the best vehicle procurement which	Comment not accepted: the promotion of sustainable biofuels is the subject of other EU policies, whose definition and GHG emissions reductions are being

Selected information subject to the comment	Comment description	Assessment by JRC
	<p>can actually reduce both CO₂, NO_x and PMs. Especially when using only a very limited part of the whole CO₂ value chain for alternative fuels to diesel/gasoline (up-stream - Well to Tank) for alternatives like ED95, E85, M100/M85, HVO, biogas and other low-carbon fuels in a vehicle lifetime perspective).</p> <p>The market for alternative drivelines are limited at the moment, but the OEMs (at least some of them) are going to or already offers alternatives to "only diesel drivelines", to lower CO₂, NO_x and PMs (especially the truck and bus OEMs). Still "only diesel drivelines" are mostly being sold, but this will change. High blends with second generation bio-fuels is a good alternative (money vs. CO₂ and NO_x reduction efficiency), if you can't afford an electric/fuel cell based driveline or if this doesn't exist in a specific sub category (this picture is even more relevant when looking at machines).</p> <p>Each country has their own taxation for fuels/vehicles that either enhances or abort the possibilities of investing in alternative drivelines (bio-fuel drive lines (ED95, E85, M100/M85, HVO, biogas) or fuel cell based drivelines on H₂ or M40). Therefore it is crucial to facilitate a diverse criteria setting when procuring the best alternatives to diesel.</p>	<p>revised in the view of the indirect land use change impacts. Second generation biofuels represent below 5% of production of biofuels, and apart from biomethane, they do not reduce NO_x emissions.</p>

Annex table 6: Air pollutant emissions

Selected subject information to the comment	Comment description	Assessment by JRC
Diesel vehicles and ambition level	As mobility services like taxi, car sharing etc. are mainly used in dense urban areas, which is most likely highly polluted area, the criterion has to be way more ambitious. According to our comments in 3.3.2 diesel-cars should not be added to the existing fleets. All new cars should cover Class "A" of the EQUA-Index	Comment not accepted: the criterion is based on environmental performance of the vehicles, technology-neutral. The measurements shall be based on European harmonised standards.
Update to technical progress towards Euro 6d	<ul style="list-style-type: none"> • In the TS1 comprehensive criterion, make sure 60% of cars and LCVs are covered. • The euro class targets mentioned for different vehicle categories should be adapted to technical progress. By 2021, all cars used in the service should be euro 6. 40% of car and LCV shall meet at least euro 6d. 	Comment partially accepted: yearly tiers for Euro 6 fleet composition have been introduced, though not as ambitious as the comment suggested
Zero tailpipe emissions capability	<p>Need an extension of the criteria for near zero emission category.</p> <p>Because as it is well known, the PHEV vehicles are also not zero, the near zero capable NGVs are also not zero. The zero criteria is far not technology neutral assumption, however does not support the low emission mobility targets of the EU, just prefer only one option of the available clean alternatives</p>	Comment partially accepted: low emissions vehicles are awarded with additional points by means of the AC Improved air pollutant emissions performance. The zero emissions capability ensures that the vehicle does not emit pollutants along the distance driven within urban areas. Besides, near zero emission or close to zero emission vehicle is not clear enough as a definition for public procurement.

Annex table 7: Combined mobility services

Selected subject comment	information to the comment	Comment description	Assessment by JRC
General comment	We welcome the formulation of the AC4 criterion as an award criterion because it could draw procurers' attention to the benefits of Mobility as a Service.	Comment acknowledged, though it has been changed to an explanatory note due to the lack of information to define a criterion workable for public procurement.	

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Category 3 Purchase or lease of buses

Annex table 8: GHG emissions

Selected subject information to the comment	Comment description	Assessment by JRC
Eligible technologies: natural gas vehicles	Technology Class Natural Gas vehicles: B Natural Gas vehicles: A (at least 10% renewable gas)	Comment partially accepted: OEM dual-fuel NG vehicles are included as C and high pressure direct injection natural gas vehicles as B
Eligible technologies: natural gas vehicles	This means not automatically, that contracting authority is accepting the NGV as applicable. Makes high disadvantage for the NGV vehicle penetration development. Qualify NGV (top of that with 10%RES) into category C as equally to the diesel with smart alternator/smart clutch for compressor/even start-stop system is ridiculous!	Comment partially accepted: see above
Eligible technologies: natural gas vehicles	Add Natural Gas buses to the list of alternative fuels available technology with WTW savings calculated from JRC 2014 version 4.a	Comment partially accepted: see above
Eligible technologies: natural gas vehicles	WTW CO2 emissions savings for heavy-duty NGVs are between 6-16% see attached graph	Comment partially accepted: see above

Selected information subject to the comment	Comment description	Assessment by JRC
Eligible technologies: natural gas vehicles	<p>Can not agreed, since KTI made PEMS measure comparison on articulated city bus EuroIV DPF diesel and NGV shows a tailpipe reduction on CO2 of 19%. But not only this; NO2 -99%, NOx: -96%, PM -75% (despite of DPF on diesel)! http://www.panlng.eu/wp-content/uploads/2016/06/1_2_PAN-LNG_elterjedes.pdf Report from pg. 105.</p>	Comment partially accepted: see above
Natural gas vehicles: figures from literature review	<p>These are far not acceptable figures</p> <p>Also not to make different between the CNG and the at least half tons lighter LNG is not acceptable. Having hybrid as 5-6 times bigger CO2 saving than NG is ridiculous approach. For example Volvo hybrids in real have no consumption reduction</p> <p>From the other hand, to declare the benefit of the NG engines before they technology improvement would take place (ie. some of the existing NG engines are based on a 50y old technology, but still ensure the massive emission benefit) and far not based on the possible and targeted level of the technology</p>	Comment not accepted: the comment refers to values coming from the literature, and therefore can only be revised by their authors. Suggest to contact with the sources (see list of references)

Selected information subject to the comment	Comment description	Assessment by JRC
Better definition and description of technologies	We would need further explanation about the Smart /Clutched Compressor. Is this related to the air conditioning system or is it another bus component?	Comment accepted: definitions of technologies have been included, though smart/clutched compressor has been removed from the list of eligible technologies due to an increase of the ambition level. As a reply of the question, the compressor is the equipment providing the pressure to the pneumatic system of some vehicles, used mainly for braking, suspension, gear shift, but also to open/close doors, and other auxiliaries. The compressor of the air conditioning is part of the refrigerant circuit.
Better definition and description of technologies	As long as Engine Software Management Optimization is not defined, all tenderers will state some kind of software optimization and, therefore, the criteria will not be useful to make a distinction between ecofriendly engines and polluting engines..	Comment accepted: the technology has been removed
Renewable methane	The list is missing the alternative fuel route of NG, Renewable NG technologies!	Comment not accepted: the renewable methane is considered within the criterion proposed

Selected information subject to the comment	Comment description	Assessment by JRC
Renewable methane	<p>15% or 25% of renewable methane are requirements which are too far from reality. 10% can be considered a realistic value for the next years.</p> <p>The contracting authorities may qualify dedicated natural gas vehicles as class C, B or A (see Table 4 and Table 7), if they have a supply of renewable methane meeting at least 10% demand).</p>	Comment not accepted: other stakeholders indicated that it was appropriate or even too low.
Biomethane costs	<p>available data on biomethane costs can be found in the IRENA BIOGAS FOR ROAD VEHICLES TECHNOLOGY BRIEF from March 2017</p> <p>http://www.irena.org/DocumentDownloads/Publications/IRENA_Biogas_for_Road_Vehicles_2017.pdf</p>	Comment not accepted: the data provided is biomethane production per m ³ , data in cost per km for buses is needed. The table only shows values from literature, not JRC's estimations

Selected information subject to the comment	Comment description	Assessment by JRC
Alternative fuels	<p>Definetly insufficient movements from the diesel secured by the proposal. For those contracting bodies, where the own self motivation does not exist to go greener, this does not support to promote the NG or other alternative fuelling solutions.</p> <p>To be clear, for a transport company each new passway is out of any wishes. The only thing what can encourage them, the lower CAPEX, the lower cost, if it is proved. From that, the lower CAPEX is only what able to prove in at the stage of purchase.</p>	Comment partially accepted: OEM dual-fuel NG vehicles are included as C and high pressure direct injection natural gas vehicles as B
Renewable electricity supply	<p>Why the same criteria is not proposed for natural gas in general ?</p> <p>Why renewable criteria are not asked for electricity ?</p>	Comment not accepted: literature shows that electric vehicles running on EU mix electricity achieve 20% reduction, while this is not the case for natural gas.
Renewable methane supply for public procurers	For the public procurer the information about the renewable supply of methane is impossible to gather and, therefore, can't check what the tenderer's technical sheet states. They cannot qualify accurately dedicated natural gas vehicles as C, B or A.	Comment not accepted: there are some contracting authorities that have dedicated supply systems, so they control the suppliers and the source of methane. If that is not the case, dedicated NG vehicles cannot be qualified, but other NG vehicles have been incorporated in the lists

Selected information subject to the comment	Comment description	Assessment by JRC
General comment	<ul style="list-style-type: none"> • The technology based approach is a good solution to indicate to public authorities in a simple manner what clean solutions for buses exist. This solution should be used until the VECTO tool enters into force. VECTO is a simulation tool developed by the commission to support the certification, monitoring, and reporting of CO2 emissions from Heavy Duty Vehicles. • Public authorities should be given the opportunity to classify fuel cell hydrogen buses, which have a great potential to reduce emissions, as category A or B, depending on the carbon intensity of the electricity used to produce hydrogen. The maturity of the technology should not impact its classification within the TS1 criterion. 	Comment acknowledged
Market availability of some technologies (active flow control)	We have only found one producer that has some active flow control in the coach bodywork. We would ask to check whether there is more than one bus body builders that have these enhancements, otherwise using this criterion, is beneficial for just one producer.	Comment not accepted: the criterion includes other technologies that are equally eligible and hence can compete with the active flow control equipped buses

Annex table 9: Air pollutant emissions

Selected information to the subject comment	Comment description	Assessment by JRC
Near zero emissions vehicles	<p>From one side have to declare a Near Zero Emission category which one in most of the countries in the EU assure a better airquality than BEV and far better than PHEV, as considering the fact, that must take observation on the energy production, from where NOx, SOx, PM and even Mercury comes out in a serious quantity, polluting the air even the urban areas. If nothing else, let's take the evidence of the airquality of the Chinese megacities.</p> <p>Zero tailpipe emission should take place as a requirement only in case, if the grid or direct vechicle fleet charging can ensure a better performance as the NGV itself. Without having it we can instead of decrease, we can even definetelly increase the pollution, and in many cases the GHG.</p>	<p>Comment not accepted: According to EEA (https://www.eea.europa.eu/themes/transport/electric-vehicles/electric-vehicles-and-energy), an increase in electric vehicle use will result in an overall net benefit in terms of lower emissions of carbon dioxide (CO2) and the air pollutants nitrogen oxides (NOx) and particulate matter (PM); and an overall increase in sulphur dioxide (SO2) due to emissions from the electricity-generating sector. However, these results did not take into account the new BATs for large thermal power plants, which set stricter EU standards by mid-2021.</p>
Better definition of pollutants covered, to be focused on NOx and PM	<p>This criterion should state explicitly the pollutants that should be measured within AC 3. We recommend focusing on NOx and PM, as those are the main pollutants responsible for poor air quality in cities.</p>	<p>Comment accepted</p>
On-road performance	<p>It has to be made clear that the emission performance is measured in normal road-use (better than EURO 6)</p>	<p>Comment not accepted: HDVs show a good on-road performance, and Euro VI already requests in-service conformity testing using Portable Emission Measurement Systems, the first one to be carried out</p>

Selected subject comment	information to the comment	Comment description	Assessment by JRC
		within 18 months of the approval and then every 2 years	

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Annex table 10: Exhaust pipes

Selected information subject to the comment	Comment description	Assessment by JRC
General comment	This criterion should be kept as it is.	Comment accepted

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Category 4 Bus services

Annex table 11: GHG emissions

Selected information subject to the comment	Comment description	Assessment by JRC
Fleet composition data	Pretty old data, have been changed since that	Comment acknowledged
Adjust points according to technology classes	<ul style="list-style-type: none"> In AC1 criterion, double points compared to class C should be awarded to class B vehicles. 	Comment accepted
Increase % renewable methane.	<ul style="list-style-type: none"> Since the use of renewable methane is a crucial precondition for the environmental performance of natural gas powered vehicles, we recommend in TS1 the following thresholds: at least 50% renewable methane to classify a vehicle as A, 30% for class B, and 20% for class C. 	Comment not accepted: the shares of renewable methane are in line with the thresholds for the classification of technologies. Other values would be arbitrary and according to other stakeholders very difficult to achieve

Selected information subject to the comment	Comment description	Assessment by JRC
Request renewable to hydrogen and electricity	<p>In the case of introducing WTW CO2 saving, all fuels should be considered. Hydrogen and electricity have different WTT pathways with very different CO2 emissions.</p> <p>http://iet.jrc.ec.europa.eu/about-jec/sites/iet.jrc.ec.europa.eu/about-jec/files/documents/report_2014/wtt_appendix_2_v4a.pdf</p> <p>Remove text:</p> <p>At least 25% for class A, 15% for class B or 10% for class C of the methane supply shall be renewable methane.</p>	Comment partially accepted: the share of renewable methane is needed to ensure the GHG reduction of dedicated natural gas vehicles. However, OEM dual-fuel and HPDI have been included without the renewable methane precondition

Annex table 12: Air pollutant emissions

Selected subject comment	information to the comment	Comment description	Assessment by JRC
Fleet composition 100% Euro VI		To request the Euro V is not securing a low level of NO _x , since the fact, the SCR system effective, when the AdBlue system works, but if it gets wrong (or manipulated!) the vehicle pollutes magnitudes higher NO _x . The transport companies are never to repair it, but becoming happy, because the AdBlue consumption and running costs cuts!	Comment partially accepted: there is consensus among the stakeholders about these percentages, given the lifetime and current state of the European fleet. However, yearly tiers have been introduced for the Euro VI fleet composition
Fleet composition 100% Euro VI		All vehicles used in carrying out the service shall meet Euro 6. Buses not meeting the Euro 6 - standard should be refitted, which is both possible and cheap.	Comment partially accepted: see above
General comment		This criterion should be kept as it is.	Comment partially accepted: yearly tiers have been introduced for the Euro VI fleet composition

Annex table 13: Noise

Selected subject comment	information to the comment	Comment description	Assessment by JRC
General comment		This criterion should be kept as it is.	Comment acknowledged
Request certification verification	private for	Or have Piek-certification for low noise while loading and off-loading of goods. http://www.piek-international.com/english/	Comment not accepted: public procurement criteria cannot request specific private certificates, unless they comply with several requirements on stakeholders participation, transparency, etc. Besides, according to its website, Piek certification is aimed at reducing noise emission during loading and unloading in retail trade and craft businesses, which does not cover buses or waste collection trucks.

Annex table 14: New vehicles

Selected information to the subject comment	Comment description	Assessment by JRC
Improve the fleet (not only keep)	We recommend that CPC1 requires new vehicles in service fleets to lead to an improvement of the overall environmental performance of the fleet (both in term of GHG and air pollutant emissions).	Comment not accepted: the continuous improvement of the service is addressed by the TS and CPC on environmental management measures, aligned with the management systems principles

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Category 5 Purchase or lease of waste collection vehicles

Annex table 15: GHG emissions

Selected information subject to the comment	Comment description	Assessment by JRC
NG vehicles within eligible technologies	Not taking into consideration of the bio- or the synthetic methane usage in any share, which could reduce further the WTW calculation. To note as well, the graph is reflecting to an early Dual-fuel technology, not for the dual-fuels of today, which could further decrease the CO2 level, compare to SI engine.	Comment accepted: OEM dual-fuel NG vehicles and high pressure direct injection natural gas are included
NG vehicles within eligible technologies	As previous notice, the old technology does not reflect to the real emission capability	Comment accepted
NG vehicles within eligible technologies	<p>This is a worst possible basis for making evaluation on NGV truck performance!</p> <p>Take a look to the list of the vehicles.</p> <ol style="list-style-type: none"> 1. There is only 6 vehicle which is dedicated SI by OEM, was at that time only available with Alison automatic gearbox, which is good not because of its energy efficiency 2. There are trucks from Volvo, their dual-fuel Euro V engines was the first, in small quantity produced technology trial, with low conversation factor from the diesel basis, also high methane slip, because of the insufficient conversation. The new Euro VI version has no methane slip and far better efficiency, that should be the basis of any comparison. 	Comment accepted

Selected information subject to the comment	Comment description	Assessment by JRC
	<p>3. Other conversations of diesel engines, like Hardstaff, Prins, Clean Air Power, and Co., could demonstrate, that the diesel engine can run on gas, today a conversation is possible, they can keep the EuroV level and it is their good form. They can not come in line of OEM mass producer diesel engine technology and simple not comparable in it's fine tune! At least take a notice on, the methane slip comes because of valve-timing, the in.-ex. valve overlapping is not to be modified at a conversation, this is ok for diesel, but a gas, which is injected to the intake manifold, can not good.</p> <p>Let's measure, compare advanced technology equipped gas engines to those diesel ones, which are continuesly developped in the last forty years with extreme cost!</p> <p>Let's see our PEMS comparison from page 105, however MAN engine technology is also from the past: http://www.panlng.eu/wp-content/uploads/2016/06/1_2_PAN-LNG_elterjedes.pdf</p>	
NG vehicles within eligible technologies	The reports highlights the importance of technologies; market is abandoning retrofit dual fuel solutions in favour of OEMs dedicated products with methane emissions from the exhaust contributing to less than 1% to the overall CO2 equivalent emissions.	Comment acknowledged

Selected information subject to the comment	Comment description	Assessment by JRC
Payback periods of NGV	<p>According to the LOWCVP trial report, OEM dedicated NGVs have a payback period of 2.9-3.5 years, instead the suggested 6-18 years. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/581858/low-carbon-truck-trial-final-report.pdf</p> <p>Change Payback period to 2.9-3.5 years</p>	Comment accepted

Annex table 16: Air pollutant emissions and auxiliary units

Selected information subject to the comment	Comment description	Assessment by JRC
Euro VI and N2 vehicles	<p>Scope of Euro VI states that it applies to part of N2 vehicles and no N3. This criterion won't apply to all waste collection vehicles. We would rather propose a criterion that awarded points indirectly proportional to NOx and CO2 emissions.</p> <p>From REGULATION (EC) No 715/2007 Scope</p> <p>1. This Regulation shall apply to vehicles of categories M1, M2, N1 and N2 as defined in Annex II to Directive 70/156/EEC with a reference mass not exceeding 2 610 kg.</p>	Comment partially accepted: N2 and M2 vehicles are within the scope of Euro 6, and the criterion has been modified accordingly
Near zero emissions vehicles	Need to add the near zero vehicles. PHEV is also not a zero emission vehicle! An MSW truck has a fuel consumption on a shift roughly 100 liter diesel, fully inside of city mission; PHEV can not serve it without starting the ICE.	Comment not accepted: near zero vehicles are awarded points by means of another AC. The criterion does not define PHEV as zero emissions, but zero tailpipe emission capable.
Better definition of pollutants and focus on NOx and PM	This criterion should state explicitly the pollutants that should be measured within AC 3. We recommend focusing on NOx and PM, as those are the main pollutants responsible for poor air quality in cities.	Comment accepted
Auxiliary units – general comment	Criterion should be kept as it is.	Comment accepted

Category 6 Waste collection services

Annex table 17: Waste collection services

Selected information subject to the comment	Comment description	Assessment by JRC
Air pollutant emissions - GA	This criterion should be kept as it is.	Comment accepted
Air pollutant emissions - PHEV is no zero emissions	PHEV is NOT zero tailpipe emission	Comment acknowledged: the criterion says "capable to run with zero tailpipe emissions"
GHG emissions	<p>In the case of introducing WTW CO2 saving, all fuels should be considered. Hydrogen and electricity have different WTT pathways with very different CO2 emissions. http://iet.jrc.ec.europa.eu/about-jec/sites/iet.jrc.ec.europa.eu/about-jec/files/documents/report_2014/wtt_appendix_2_v4a.pdf</p>	<p>Comment partially accepted: the share of renewable methane ensures the GHG reduction of dedicated natural gas vehicles. However, OEM dual-fuel and HPDI have been included without the renewable methane precondition. The literature review shows that electric vehicles running on the EU electricity mix achieve WTW GHG emissions reductions of 20%</p>
GHG emissions	<ul style="list-style-type: none"> • Since the use of renewable methane is a crucial precondition for the environmental performance of natural gas powered vehicles, we recommend in TS1 the following thresholds: at least 50% renewable methane to classify a vehicle as A, 30% for class B, and 20% for class C. • In AC1 criterion, double points compared to class C should be awarded to class B vehicles. 	<p>Comment partially accepted: the shares of renewable methane are in line with the thresholds for the classification of technologies. Other values would be arbitrary and according to other stakeholders very difficult to achieve</p>

Selected information subject to the comment	Comment description	Assessment by JRC
New vehicles	We recommend that CPC1 requires new vehicles in service fleets to lead to an improvement of the overall environmental performance of the fleet (both in term of GHG and air pollutant emissions).	Comment not accepted: the continuous improvement of the service is addressed by the TS and CPC on environmental management measures, aligned with the management systems principles
Noise emissions	This criterion should be kept as it is.	Comment accepted
Route optimisation	Given the potential for emission reduction route optimisation has we recommend extending the AC6 criterion to the core set of criteria.	Comment accepted

Category 7 Post, courier and moving services

Annex table 18: Post, courier and moving services

Selected information subject to the comment	Comment description	Assessment by JRC
Air pollutant emissions - general comment	This criterion should be kept as it is.	Comment accepted
CO2 emissions technology neutrality -	<i>For L-category vehicles: all the L-category vehicles used in the service shall be electric.</i> This is not technology neutral approach	Comment acknowledged: it is not possible to set a technology-neutral criterion for L-category vehicles.
CO2 emissions - topography not relevant due to e-bikes. TS to be also core	As electric bikes become mainstream, topography loses relevance. The TS1 on cyclelogistics can therefore apply to both the comprehensive and the core sets of criteria.	Comment accepted

Common criteria for vehicle categories

Annex table 19: Common criteria for vehicle categories

Selected information subject to the comment	Comment description	Assessment by JRC
<p>Noise emissions - examples of HDV phase 3 compliant</p>	<p>Further to the TNO report, Volvo can provide city buses and inter-city buses compliant with the phase 3 range of 76-79 dBA according to below table:</p> <p>Vehicle type; dBA; Test protocol:</p> <p>B8R EU6 Inter-city; Certified at 73dBA; EC/ECE R51.02 (CNR)</p> <p>B5LH EU6 City (hybrid); Certified at 75dBA; EC/ECE R51.02 (CNR)</p> <p>Full Electric City; Certified at 68dBA; EC/ECE R51.03 (NNR)</p> <p>Our internal test show that the two CNR certified buses will be certified according to NNR well within the phase 3 range of 76-79 dBA.</p> <p>Important to keep the suggested noise criteria in GPP since it will promote full electric buses!</p>	<p>Comment acknowledged</p>

Selected information subject to the comment	Comment description	Assessment by JRC
Noise emissions – General comment	<p>The award criteria on tyre noise and vehicle emission should be maintained as comprehensive criteria, because of the market availability of phase 3 compliant tyres for HDVs, that have a noise limit range between 76-79dB.[1]</p> <p>[1] A TNO report indicates that the market penetration of phase 3 compliant tyres is still very limited.</p>	Comment acknowledged
Alternative fuels	<p>Regularly, homologation test results confirm that Autogas vehicles, in average, emit 96% less NOx than diesel vehicles. LPG cars generate almost no particulate matters and black carbon (soot). More recently, a research on real driving emissions measured through a portable system showed that Autogas cars emit up to 19% less CO2, and 90% less small particles than their gasoline equivalents. LPG also bring a 98% reduction in NOx compared to diesel in real driving conditions. (happy to provide sources)</p>	Comment acknowledged: LPG vehicles will benefit from the AC on improved air pollutant emissions performance

Selected information subject to the comment	Comment description	Assessment by JRC
Alternative fuels	The communication "public procurement for a better environment" clearly states that "criteria will be based on a life-cycle approach". Current report is in breach with this principle, and this implies that: a) negative externalities such as upstream emissions to the environment are ignored; b) proposed criteria is discriminatory as certain technology are favoured due to this choice of methodology. WTW emissions are nonetheless well documented (e.g. Fuel Quality directive).	Comment not accepted: the thresholds of the criteria, though based on TTW, stem from the scientific and technical literature available which is based on LCA and WTW. TTW emissions are preferred by public procurers since it is much easier to implement in a call for tender: it is based on based on common metrics and test methods used by manufacturers and known by consumers. This is also in line with overall CO2 legislation in the EU for vehicles.
Alternative fuels	Under specific circumstances, CNG/LNG vehicles can be eligible. In the interest of technology neutrality, it is important to allow LPG vehicles as well, as both are alternative fuels, both offer similar levels of emission savings and both can be substituted by renewable fuels. Bio-LPG is a promising fuel which should be encouraged through GPP. (happy to provide more info)	Comment not accepted: the supply of bioLPG is very limited and its use in transport competes with other final uses as space and water heating.

Common criteria for service categories

Annex table 20: Common criteria for service categories

Selected information subject to the comment	Comment description	Assessment by JRC
Drivers training - update training	In the CPC1 criterion of the section on competence of tenderer and staff training, drivers should be given 8 hours of training per year and be monitored in addition to these training in order to get feedback on the way they drive.	Comment not accepted: LCC estimations show that increasing the duration of the update training would not entail a higher efficiency of the measure, but just an increment of costs. Monitoring of the drivers performance is already part of the contract performance clause
Environmental management measures – general comment	We welcome the technical specification TS1 for environmental management measures, especially the proposal for implementing an emissions reduction plan with measures aimed at reducing the GHG emissions and air pollutants emissions.	Comment acknowledged

Other comments

Annex table 21: Other comments

Selected information to the subject comment	Comment description	Assessment by JRC
General	The second draft of the technical report simplifies the criteria set and makes it more easily applicable for public authorities. The creation of categories defining common criteria for vehicles and services categories further clarifies the whole criteria set.	Comment acknowledged
Summary of the comments	<p>Both T&E and EEB have consulted the draft criteria set for Transport together with its member organisations and other environmental NGOs. We recommend that the proposal should be improved with regard to the following points of concerns which are outlined in further detail in the attached PDF file and in the respective chapters of HTML version of the 2nd draft of the JRC's technical report:</p> <ul style="list-style-type: none"> • Air quality criteria should explicitly focus on NO_x and PM, as these pollutants have the most detrimental effects on air quality. • Criteria related to air pollutant and GHG emissions should be designed in a future-proofed way, taking into account technological developments and future improvements. • Where appropriate, the criteria should include some guidance for public authorities, for instance regarding technological development in specific vehicle categories (e.g. battery electric vehicles) and 	Comment partially accepted: see specific comments replies

Selected information to the subject of the comment	Comment description	Assessment by JRC
	legal obligations (e.g. drivers' training).	
Air pollutant emissions – general comment	Air quality criteria should explicitly focus on NOx and PM and PN as these pollutants have the most detrimental effects on air quality.	Comment accepted: the criteria are focused on those pollutants
LCC of some case studies	TCO analysis for the other alternative fuels is missing. Can be misleading to the procurer	Comment accepted: LCC analysis includes other alternative fuels

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