



ACQUISITION OF AN ELECTRIC MINIBUS

GENERAL CONSIDERATIONS

Regarding electric vehicles, the major benefits that are normally pointed out when compared to conventional vehicles (gasoline and diesel) are: reducing dependence on fossil fuels, reducing CO₂ emissions, the absence of direct exhaust emissions (CO₂, NO_x, SO_x, etc.) and reduced noise levels. On the other hand, the main adverse effects are: emissions of CO₂ and other pollutants associated with electricity production (depending on the mix of electricity used), low energy density and high cost of batteries, the need of replacing batteries during the lifetime of the vehicle, as well as depletion of natural resources used in electric/electronic systems (eg lithium); it is therefore important to ensure the reuse/recycling of batteries and other components.

The criteria presented here refer mainly to the use phase of the vehicle, aiming in particular to reduce power consumption and emissions of greenhouse gases and other pollutants. It also presents criteria relating vehicle maintenance and use of toxic substances in its manufacture. Unfortunately, there is a lack of information from the Life-Cycle Assessment (LCA) point of view which turns more difficult the comparison between electric vehicles and conventional ones in terms of impact on environmental and socio-economic media during other phases in their life-cycle. Nevertheless, the LCC-CO₂ tool developed within the framework of the SMART-SPP project can give a partial look over these matters, but only in terms of CO₂ emissions and not over impacts generated during the whole supply chain; in fact, the deepening on such subjects might represent a switch of mentality involving electric vehicles and its advantages in front of gasoline-fuel vehicles. Anyway, the close collaboration of electric vehicles manufacturers is needed in this process in order to have the basic information that could make possible systematic LCA studies to proof their suitability in relation to others; and this quite unlikely to happen by now.

LEGAL CRITERIA

In this document they were not considered as environmental criteria what is required in the laws that compete in each territory since they are of compulsory accomplishment. These are:

LEGISLATION	FIELD
Commission Directive 2007/34/EC of 14 June 2007 amending, for the purposes of its adaptation to technical progress, Council Directive 70/157/EEC	It establishes the permissible sound level and the exhaust system of motor vehicles.
Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000	End-of-life of vehicles – It defines orientations for the design of cars which facilitates the prevention and valorisation of residues of vehicles or vehicles at the end-of-life phase.

Note: The legislation referred in this document may not be exhaustive so we suggest to proceed to deeper searches for the elaboration of a tendering process.

ECONOMICAL CRITERIA

The method for evaluating the economical aspects during the tendering process is SMART-SPP's LCC-CO₂ tool. It allows the calculation of the ownership costs, among which are considered not only the purchase price but also the costs of operation, maintenance and end-of-life. The tool along with its user's guide can be downloaded at the SMART-SPP's website: <http://www.smart-spp.eu/>.

TECHNICAL/ENVIRONMENTAL CRITERIA

The technical and environmental criteria below can be used as technical specifications as well as evaluation criteria. The most important ones are the shaded.

ASPECTS	CRITERIA	VERIFICATION
TECHNICAL CRITERIA		
CHARGING TIME	Charging time should not be superior to 6 hours for total charge.	Vehicle/batteries data sheet.
RANGE	Range should not be inferior to 120 km.	Vehicle/batteries data sheet.
ENVIRONMENTAL CRITERIA		
EMISSIONS OF GREENHOUSE GASES	<p>If the vehicle is fitted with an air-conditioning system designed to contain fluorinated greenhouse gases, the specific gas must have a global warming potential (GWP) ≤ 150 (related to CO₂ and a time horizon of 100 years).¹</p> <p>If the GWP is higher, the leakage rate from the system must not exceed 40g of fluorinated greenhouse gases per year for a single evaporator system, or 60g of fluorinated greenhouse gases per year for a dual evaporator system.¹</p> <p>An extra punctuation can be given to those vehicles whose air conditioning systems use a refrigerant with GWP $<15$² (as mentioned in the Preliminary remarks of the criteria document of the Blue Angel ecolabel for low-pollutant municipal vehicles and buses RAL-UZ 59; studies have been leaded for development of alternative fluids, whose GWP will satisfy this criterion).</p>	<p>The bidder must provide the name, formula and GWP of the refrigerating gas used in the air conditioning system. If a mixture of gases is used, the GWP will be calculated through the weighted mean of each gas considering its weight and GWP.</p> <p>The results of the harmonized leakage detection tests should be lead following Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air conditioning systems in motor vehicles and amending Council Directive 70/156/EEC.</p>
	<p>CO₂ emissions</p> <p>Indirect emissions during use phase: from electricity consumption in kg CO₂/year (it depends on the electrical mix).</p> <p>Embedded CO₂ emissions: emissions during production, transportation and disposal in kg CO₂.</p>	SMART-SPP LCC-CO ₂ tool
POWER	Vehicles must be equipped with tyre pressure monitoring systems (TPMS).	Vehicle data sheet.

¹ Transport - GPP Product Sheet

² Blue Angel ecolabel Low-Noise and Low-Pollutant Municipal Vehicles and Busses RAL-UZ 59

ASPECTS	CRITERIA	VERIFICATION
CONSUMPTION	Renewable energy production systems for the operation of peripheric equipments in order to preserve the electricity from the batteries exclusively for the engine. Ex: some prototypes have integrated PV systems on the roof.	Vehicle data sheet.
	Regenerative brake.	Vehicle data sheet.
	Low-rolling resistance tires. ³	Blue Angel Ecolabel or equivalent specifications.
WASTE	The bidder should ensure the collection and recovery in duly licensed units of the following vehicle components during maintenance operations: waste oils, tires and batteries.	Copies of the Monitoring Guides of Waste duly completed and licenses of their recipients, according to the legislation.
TOXIC SUBSTANCES	Except for impurities, priming and painting of the vehicles shall be done with coating materials free from paint raw materials (fillers, pigments, drying agents) which contain lead, chromium VI and cadmium compounds. During the coating process the solvent emissions must not exceed 150 g/m ² . ⁴	Blue Angel Ecolabel or equivalent specifications.
	Test records must show that the total PCA content of the tread oil measured according to IP 346 does not exceed 3%. The quantity of PCAs in oils in the tread rubber (PCA/kg tread rubber) shall be determined according to IP 391 along with ISO 1407 and ISO 4645 or ISO TC45 /SC3N or equivalent. The level must not exceed 15 % by weight. ISO 21461:200x may also be used, in which case the limit is 0.35% HBay. Other equivalent tests will also be accepted. ³	Blue Angel Ecolabel or equivalent specifications declaring compliance with the EU Directive 2005/69/EC.

³ Blue Angel ecolabel Low-Noise and Fuel-Efficient Automobile Tires RAL-UZ 89

⁴ Blue Angel ecolabel Low-Noise and Low-Pollutant Municipal Vehicles and Busses RAL-UZ 59

MORE INFORMATIONS

SOURCE	LINKS
<i>Blue Angel Ecolabel</i>	http://www.blauer-engel.de/en/index.php
<i>GPP toolkit</i>	http://ec.europa.eu/environment/gpp
<i>LCC-CO2 SMART-SPP tool</i>	http://www.smart-spp.eu/

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