



# Checklist – Procurement of vehicles and machinery on biogas and electricity (BEV)

## Introduction and scope:

This checklist is intended for public procurement advisors and climate advisors of vehicles and machinery, including personnel specifically assigned to assess vehicle needs in municipalities and counties. The checklist has a particular focus on sections and considerations specifically designed for vehicles and machinery for technical maintenance departments. It is designed to cover main aspects of procurement of service and operational vehicles and machinery employed by public authorities (municipalities, counties, national level). Writing in **red** shows words or parts that must be adapted to suit the individual needs of the tender or the contracting authority.

*Public authorities are advised to combine the use of this checklist with the routine on the ordering of vehicles and machinery (see [routines and strategies section](#)), as these two guidance materials are meant to complement each other.*

The guidance material covers themes like:

- How to ensure procurement of vehicles and machinery does not result in procuring more vehicles than you need
- Criteria and requirements you can use to award circularity in procurement of biogas and electric vehicles and machinery
- Adaptations you can make to ensure operational requirements are met when using biogas or electric vehicles

## Guidance on the structure and use of the checklist

The checklist starts with a *pre-analysis section* where you consider the operational and transportation needs of the vehicle and whether the need can be met by other means than an ordinary procurement. If you find that a procurement needs to be done, you progressively go from step to step to assess and evaluate the different needs. The rest of the checklist consists of these steps:

- 2. Assess and decide the functional and operational requirements of the vehicle
- 3. Market inquiry: check if your need can be met by procuring a biogas or battery-electric vehicle
- 3 b) Technical maintenance sections: make considerations on market readiness of biogas and electric vehicles/machines and consider adaptations to maintain operational security.
- 4. Consider and assess how your service needs and contractual guarantees can be met



- 5. Make requirements and award criteria for circular aspects to award the supplier that offers the models with the best durability, payload, and other circular features.

## 1. Pre-analysis: Rethinking the need for the vehicle/procurement

First you should consider if there is really a need to make a procurement to fill the operational and transportation needs of the vehicle or machinery? Can you fulfil the needs by utilizing existing vehicles in your section or other parts of the organization?

Question	Follow-up action	Comments/ adaptation measures
Describe the transportation/ operational need for the vehicle Is it necessary to procure the vehicle? Can the demand for the vehicle be met by utilizing similar existing vehicles/ machinery more efficiently? Can the demand for the vehicle be met by utilizing vehicles/machinery from other parts of the organization?	If you can provide the need for the vehicle by utilizing similar existing vehicles that are available from either your own organization/ section or other sections/ organizations, consider aborting the procurement process and contacting the other sections of your organization who has the operational responsibility for the vehicle. .	Check the log of the vehicle, when and how often it is used, and logs of other similar vehicles to consider if the operational needs can be met by utilizing an existing vehicle/ machine.

## 2. Consider the main functional requirements of the vehicle/ machine

The first part you should consider after the pre-analysis are the most important functional requirements for the vehicle. Which functional requirements are important to meet the transportation or operational needs? What are the most central performance criteria the vehicle or machine must offer to cover the operational need? What information do you have to provide basis on requirements like range of the vehicle and equipment needed?



Question	Follow-up action	Comments and considerations
<p>Consider first the everyday operational use of the vehicle/machine: What is the need of continuous operations in hours or in kms of range? <b>For machinery:</b> specify need for continuous operations with moderate intensity and hard intensity</p>	<p>If the everyday operational use of the vehicle/machine can be met by a vehicle on electricity (fully BEV) and biogas, choose a vehicle/machine on biogas or electricity (BEV).</p>	<p>If there are selected days where you will need more range or hours of operations, consider if the need can be met by either renting or leasing another vehicle/machine.</p>
<p>What kind of terrain and road conditions must the vehicle handle? Are all-wheel drive functions needed to secure operations? If yes, why?</p>	<p>If the operational need can be met by a biogas or battery-electric alternative without all-wheel drive, procure a vehicle/machine powered by electricity (BEV) and biogas.</p>	<p>While all-wheel drive functions now are available on many electric vehicles and most biogas vehicles; these versions might be more expensive</p>
<p>Do you need to transport equipment or gear? How much payload do you need?</p>	<p>If yes, consider first how much payload you need for everyday operational needs and then consider if battery-electric or biogas vehicle models comply with the requirements. If there are days where you might need more payload than for everyday needs, consider if these needs might be met either by renting a vehicle or if an existing vehicle in your section/dept. which comply with these needs might be used instead</p>	



### 3.Consider if the needs can be met by a biogas or battery-electric (BEV) vehicle model

When you have investigated the need the machine/vehicle should cover, you should now start market dialogue with operators. Below you will find some questions for market dialogue and competition with tenderers with suggested follow-up actions. Other relevant questions can be found in the routine for procuring fossil free equipment.

*Note: If your transportation needs are connected to technical maintenance tasks and not provision of services to individual persons or service vehicles purely for transportation, go to section 3 b)*

Question	Follow-up action	Comments
Can you offer vehicles/machinery for the specified needs and purposes on biogas, electricity (BEV), or hydrogen?	If the answer is yes and they can provide models with comparable LCC costs, procure a vehicle on biogas, electricity (BEV), or hydrogen	
What is the range in km according to WLTP measures?	If the supplier can offer 2-3 models on biogas or BEV with the operational range needed, procure the model on biogas or electricity that best suits your needs and provides good qualities for circular concerns (see section 5)	Most vehicles on biogas and electricity now offer WLTP ranges of 350 – 550 kms.  Consider buying maintenance chargers for the 12V battery for electric vans  Buy cars with slightly larger batteries than needed if you are worried about reach in winter seasons
What is the payload of the vehicle?	If you are planning to procure a van and there is need for transporting some equipment, but the payload needed is less than a ton: consider if the need can be covered just as well with an electric SUV.	Using a passenger car with fitted compartments instead of a van, can offer more selection and better comfort for drivers and still meet operational needs.



Do you provide vehicles on biogas and electricity for the specified need with all-wheel drive?	If you get several responses of yes, make it a minimum requirement  If you get fewer than three models offered on biogas or electricity, consider if all-wheel drive can be a part of an award criterion	Many models of electric vans now also come with all-wheel drive functions.
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### 3 b) Considerations for technical maintenance sections

**Target groups:**

Road maintenance and sewage/water maintenance sections, public procurers, leaders of technical maintenance sections

**General**

Biogas vehicles machinery and electric machinery complement each other. Fully electric vehicles and machinery can cover functions for wheel-loaders and excavators, while biogas models are common for trucks and road maintenance and also exist for sweepers and tractors.

**considerations:**

Electric trucks will generally be used for most purposes, except plowing (because of vibrations). Transportation of masses for repair of roads, water tanks for ice/skating rinks, road/street marking, maintenance of road signs. Electric trucks however have a clearly higher investment cost compared to biogas.

**Trucks and sweepers - biogas**

Question	Comments and considerations
<p><b>Availability</b> Which kind of trucks are available on biogas?</p>	<p>Trucks on biogas are standard editions for all kinds of trucks and sport the same functions as diesel-powered trucks, except operation on the front axle and sub-fitted shears.</p> <p>Crane trucks, plowing trucks, trucks for road maintenance are examples of functions covered by biogas trucks</p>
<p><b>Range</b> What is the average range of biogas trucks?</p>	<p>Biogas trucks either use compressed biogas (CBG) or liquid biogas (LBG).</p>



	CBG trucks range: 250-400 kms, LGB trucks range: 900 – 1500 km.
<b>Investment cost</b> What is the investment cost of a biogas truck compared to a diesel truck?	Extra investment cost for biogas trucks compared to vehicles on diesel: on average 10-15%.
When do you use LGB trucks instead of CBG trucks?	LGB trucks are used when you need to drive longer distances, for instance to collect deposited masses.
<b>Functional requirements - space</b> How do you assess needs for space for distinct functions?	Compressed biogas needs more space than diesel. The more gas needed, the longer the wheelbase. Liquid biogas needs less space for storage than CBG. You can fit 300 kg LBG (equivalent to 450 litres of diesel) with 4,35 m wheelbase
<b>Need for extensions</b> Do you need extra fuel containers to provide extra reach?	Placing of gas fuel containers (for instance placing of extra fuel containers behind the cabin) can provide solutions that will make biogas models a viable option for your need. Use market inquiries to investigate if suppliers can deliver these solutions.
<b>Operational security</b> How can you maintain operational security and preparedness?	<ul style="list-style-type: none"><li>• Keep a diesel version as back-up for a few years</li><li>• For winter maintenance/plowing: Keep an agreement with external contractors on providing back-up vehicles if problems should arise with the fossil free trucks</li></ul>
<b>Operational security – LGB trucks</b> Are there operational security concerns you should address when introducing trucks on liquid biogas (LGB)?	LGB trucks and vehicles/machinery need to be used quite continuously to avoid gas leaks and should not be out of operations for more than a week.  Installing gas meters and doors that automatically open in case of a leak are examples of measures that can be taken to safeguard operations. Collaborate with a



	safe operations agency to find the right measures.
Which other vehicle types are available on biogas?	Sweepers on biogas are also an option from several suppliers, versions from 2 – 5 tons.

## 4. Service and guarantees

For technical maintenance sections: When you have found that models on biogas or electricity can cover the need, the next step will be to consider how you can award and require necessary service and guarantee solutions to ensure operational preparedness.

Question	Follow-up action	Comments
Do you have local service operators for maintaining the vehicle/machinery?	<p>If it is an electric or biogas vehicle or machinery for more technical functions - always require local or regional service solutions.</p> <p>Consider using aspects related to service as part of award criteria (response time, distance to service station, numbers of available service technicians and their competency)</p>	<p>Local service functions for the vehicle are important in case something goes wrong.</p> <p>Shorter distance to the service station reduces both transportation needs and time needed for service of the vehicle.</p>
What operational or contracting guarantees can you provide as a standard?	<p>If the response is positive: Make clear contractual obligations and requirements on consequences of service breach or require that the contractor must provide a back-up solution.</p>	<p>Consider increasing the size of the procurement to lower the sense of risk and increasing the incentive for the contractor.</p>



## 5. Make requirements and circular award criteria for the vehicles/machines

If the need can be met by using a biogas or fully electric vehicle, you should now award the models that can offer the most circular rewards in terms of reducing transportation, durability of the vehicle or machine and lower climate footprint for the vehicle. Below you will find some examples of circular award criteria for biogas vehicles and machinery.

### Award criterion - Environmental quality – circular concerns 35%

Wording of criterion	Verification requirements
<p>The bidder will be awarded for the vehicle's functional environmental qualities in terms of the vehicle's capacity to provide more efficient &amp; reduced driving as well as the vehicle's general durability and repairability.</p> <p>The scoring of this criterion is based on the payload and fuel capacity of the vehicle as well as the description of choices made to give the components of the vehicle longer lifetime and durability.</p>	
<p><b>Payload</b></p> <p>The bidder will be awarded for payload of the offered vehicle/machine exceeding the minimum requirements. The bidder can score between 0 and 10 points. The bidder offering the highest payload will be awarded 10 points. This criterion accounts for x % of the criteria environmental quality.</p>	<p>Specification of payload in tons &amp; kgs, product sheet of the offered vehicle.</p>
<p><b>Fuel capacity</b></p> <p>The bidder will be awarded for fuel capacity of the offered vehicle/machine exceeding the minimum requirement. The bidder can score between 0 and 10 points. The bidder offering the highest fuel capacity will be awarded 10 points. This criterion accounts for x % of the criterion environmental quality.</p>	<p>Specification of fuel capacity in m3s of biogas, attachment of product sheet of the offered vehicles.</p>



<p><b>Durability and long-life cycle of the vehicle</b></p> <p>The bidder shall give a description of 1-2 A4-pages, where the following parts are included, but not limited to: Description of chassis, extensions and spare parts.</p> <p>The bidder will be awarded for the choice of stronger and more durable components, which are easier to repair and less frequently needs to be replaced with new components. We will base the evaluation on a description of choices made to ensure the vehicle/machine will have greater longevity/lifespan.</p> <p>Eventual factory guarantees attached to the description will be weighted proportionally more than other factors. This criterion accounts for x % of the criterion environmental quality.</p>	<p>Completion of attachment x</p>
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## 6. Make award criteria for electric vehicles and machinery:

If the need can best be met by procuring a fully electric vehicle, you should now award the models that can offer the most circular rewards in terms of reducing transportation, durability of the vehicle or machine and durability of the battery. Consider using parts of the award criterion environmental quality and circular concerns from section 5. For award criterions related to the battery, see below

### Life-cycle costs and service life of battery for electric vehicles and machinery

Question	Suggested follow-up action
Can you provide life-cycle cost estimations for the vehicle/machinery?	If several responses of yes, consider making low life-cycle cost estimations part of a cost award criterion
Can you provide information on the expected service life of the battery of the vehicle?	If the response varies, consider if the expected service life of the battery can be part of an award criterion. For suggestions see example below this table



**Award criterion – environmental quality EV-battery durability**

Wording of criterion	Verification requirements
<p>The bidder will be awarded for longevity and durability of the batteries of the offered vehicle/ machine.</p> <p>Charging cycles &amp; durability of battery: It is preferable that the batteries of the vehicle have the longest possible service life, i.e. the least possible deterioration over as many charging cycles as possible. State the expected service life of the batteries in terms of the expected number of charging cycles.</p>	<p>The bidder shall state the estimated number of charging cycles of the battery of the offered vehicle/machine.</p> <p>Product sheet or link to product specifications must be attached.</p>