Public Procurement of Heavy-Duty Electric Vehicles

Key takeaways from the Big Buyers Initiative working group

The Big Buyers Initiative is a European Commission Initiative for promoting collaboration between big public buyers in implementing strategic public procurement. Public procurement can be a key tool in driving the development of innovative goods and services on the European market. By working together and pooling their purchasing power, cities, central purchasing bodies, and other major public procurers can maximise their market impact.

The Big Buyers Initiative is currently managed by ICLEI - Local Governments for Sustainability and Eurocities.

The Big Buyers Initiative is funded by the European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. The sole responsibility for any error or omissions lies with the editor. The content does not necessarily reflect the opinion of the European Commission. The European Commission is also not responsible for any use that may be made of the information contained herein.

1. Introduction

The big buyers heavy-duty electric vehicles group

Public procurement is a key tool for cities and public entities in reaching their strategic goals related to, for example, climate neutrality, better governance and social inclusion. The pilot phase of the Big Buyers Initiative (BBI), running from April 2019 to October 2020, has demonstrated that many public entities already have the ambition to collaborate with the market and support their efforts towards the production of more innovative and climate-friendly products. However, acting individually, there is only so much influence a single city administration or public body can wield as a procurer.

The concept of the Big Buyers Initiative is based on an understanding of the need to align and combine the purchasing power of individual public entities, bringing them together in strategic partnerships to maximise their market impact, lower costs, help introduce innovations into the market, and help scaleup good solutions, while at the same time improving skills and capacities in professional procurement practice. During the pilot phase of the BBI, three joint collaborations have been established by collecting interest from public entities across Europe: zero emission construction sites, circular construction and one working on procurement of heavy-duty electric vehicles.

The last group is looking at different types of heavy-duty electric vehicles, including waste trucks and street cleaning equipment, but also heavier city distribution and potentially snow cleaning, in line with the procurement needs of the participating entities for the next three years. The focus is related to the electrification of the chassis component of vehicles, which can then be adapted for different uses.

Group members are from the cities of *Amsterdam, Budapest, Helsinki, Lisbon, Malmo, Oslo, Porto, Rotterdam, Stavanger and the public entities Belgian Post and SKL Kommentus* (Swedish central purchasing body).

Why move towards alternatively fuelled vehicles?

The use of electromobility in waste collection, transport of heavy material and street cleaning promises a significant reduction in noise and pollutant emissions in line with the European entities' climate ambition and air quality targets. Electric vehicles can also be used in low emissions zones, which are becoming increasingly common in European cities.

In the BBI group on heavy-duty electric vehicles, most of the group entities have the aim to make their city fleet emissions free by 2030, while for a few others, similar ambitions are to be reached for a later year.

While a variety of market options are currently available for the electrification of passenger cars and other smaller types of light commercial vehicles, there is currently little available on the market for heavy-duty vehicles, not only in terms of manufacturing of new electric vehicles, but also related to available options for the retrofitting of existing vehicles.

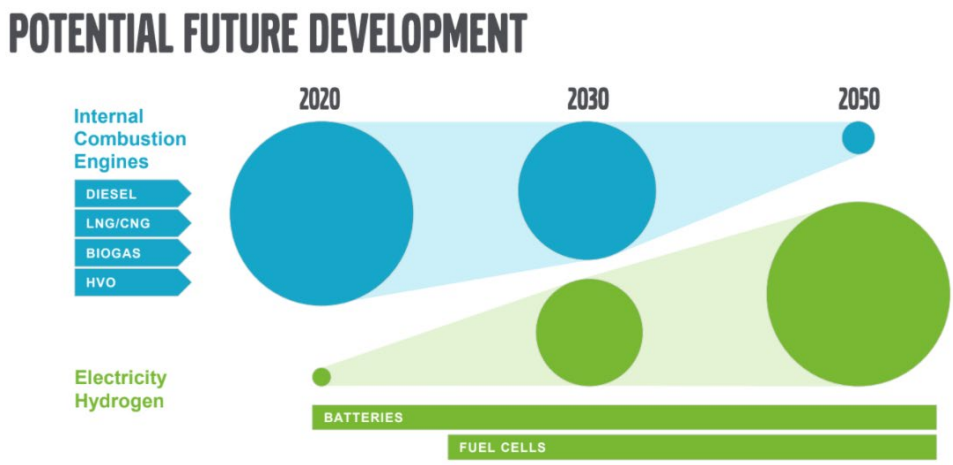
The procurement and use of fully electric vehicles for waste collection and street cleaning is not widely developed across Europe. A few pilot projects have been launched in the preceding years, mainly as

results of European funded projects (i.e. for example the ElektroAes project[1]). These have supported and financed the procurement of around one or two vehicles, mainly to run pilot testing.

There is therefore a real need to push the market further in developing new solutions, to scale up pilot projects, and test the potential and actual use of these vehicles in real-life conditions.

Clean heavy-duty vehicle: any truck or bus using one of the following alternative fuels: hydrogen, battery electric (including plug-in hybrids), natural gas (both CNG and LNG, including biomethane), liquid biofuels, synthetic and paraffinic fuels, LPG.

Additionally, the new EU 'Clean Vehicles Directive'[2] promotes the procurement of clean vehicle solutions in public procurement tenders, identifying minimum targets for aggregated procurement of vehicles at national level and for contracts after 2021.



Expected vehicles development according to suppliers

Activities and outcomes of the collaboration

At the beginning of the BBI collaboration, the entities active in the group identified a series of activities which are necessary to enhance the purchasing of heavy-duty electric vehicles across Europe. The main aim for all the interested entities was to *create a dialogue with the market to collect information and to mobilise companies (from large companies to SMEs) towards investment and research on heavy-duty electric vehicles.*

- **Sharing knowledge on products:**

The group agreed that there is currently little information available among buyers aboutEuropean vendors and their products, including expected performance and price of vehicles.

[1] https://trimis.ec.europa.eu/project/use-three-electric-waste-disposal-vehicles
[2] https://ec.europa.eu/transport/themes/urban/clean-vehicles-directive_en

- **Sharing information on tenders criteria**

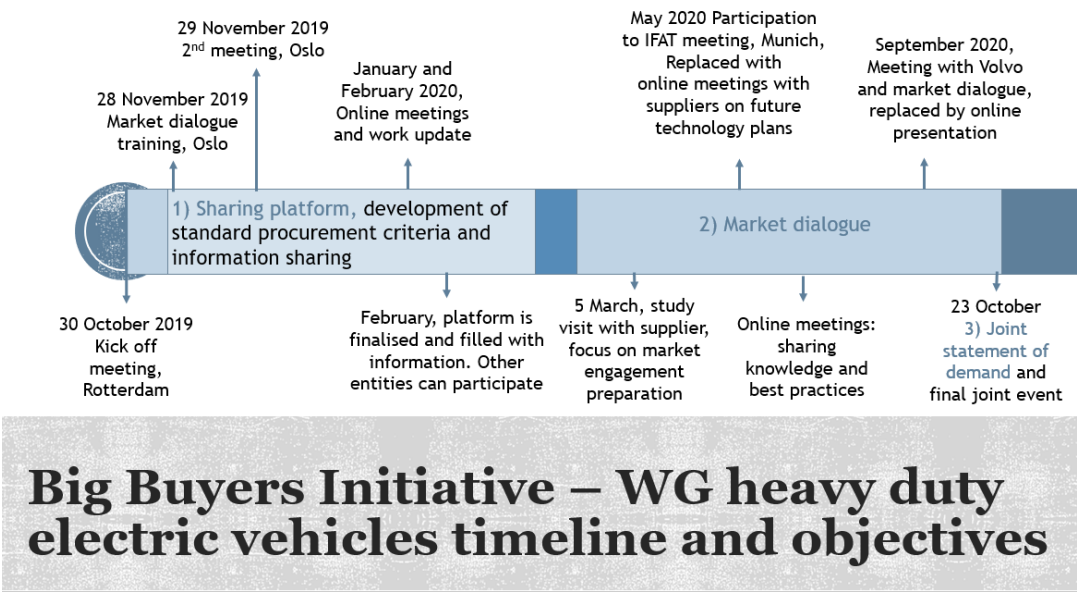
The group identified a need to develop and share tender documents and procurement criteria for heavy duty vehicles.

- **Sharing market information:**

While many of the BBI entities had already approached some of the companies currently producing heavy-duty electric vehicles, the collaboration allowed for a more systematic approach and sharing of information and comparison of prices. Above all, technological development is taking place at a relatively fast speed, and it is necessary to know which technologies might be available soon.

After identifying the needs, the group focused on working on the following concrete actions, which were developed during the one-year long collaboration:

1. Creation of a platform for collaboration and sharing of technical specifications for currently available and future vehicles;
2. Joint market dialogue and engagement on companies' products and future technology plans;
3. Joint statement of demand and lessons learned on procuring heavy-duty vehicles.



Timeline and list of activities of the group

2. Challenges in procuring heavy duty electric vehicles

The uptake of heavy-duty electric vehicles in Europe is still relatively low compared to smaller electric vehicles and vans.

Throughout the collaboration, the BBI group participants identified a series of challenges:

- Challenges related to procurement: the acquisition of vehicles, the charging infrastructure and the maintenance, become all linked elements in the tender criteria development. We therefore need to work on a new tender criteria definition, evaluation of the technological and

environmental component of tenders, and life cycle evaluation of the products, for example in relation to battery life and components.

- Technical challenges of the products: a limited number of models available on the market, which are, however, still very expensive and have many technological shortcomings.

All of these challenges have been summarised in the table below:

	Technological	**Financial**	**Institutional**
Vehicles and batteries	- Ranges and power limitations of heavy electric vehicles - The difficulty in estimating the range of a vehicle due to the dependence of how the vehicle is used, topographical factors, environmental factors etc. - Few available models - Retrofitting of diesel vehicles is not provided as an option - The relatively short warranty of the batteries and the high cost of replacing non-functioning batteries - Battery safety (in case of accidents, fire departments required)	- High investment costs - Lack of innovative investments solutions	- The reluctance amongst suppliers to share information about future development plans - Lack of political commitment and resources for the fleet renovation (especially after Covid-19), which might lead to the adoption of intermediary solutions related to retrofitting current or moving instead towards biodiesel - Not the same availability of products in some of Europe's peripheral regions (i.e. Norway and Portugal, ...)
Agencies and operators	- Lack of knowledge for vehicle maintenance (need to be provided by the supplier)	- Lack of necessary capital to carry outinvestments	- Insufficient information on cost of ownership for new vehicles - Uncertainties regarding future political priorities - Management of waste collections that requiresa change in the shifts system to allow for recharging time (limited range and power of e-vehicles)
Energy supply, grid and infra-structure	- Selecting which charging solutions to implement and potential changes to be made to the power grid to accommodate these solutions	- Large capital required for the grid infrastructure development - Availability of sustainable energy for	- Lack of green energy production in certain countries

	- Lack of stable technologies related to the energy grid:this is an evolving technology that does not allow for a one-size-fits-all solution across Europe and across types of vehicles (light vs heavy duty)	certain European countries.	

Issues in joint cross-border procurement

While the participating entities of the group all agreed on advantages of working jointly on procurement, there was some uncertainty whether joint cross-border procurement could be attempted.

The group therefore discussed the challenges and possibilities for the collaboration to eventually lead to cross-border procurement. Discussions were mainly based on two very practical examples: the city of Paris (initially active in the group) attempted to carry outjoint procurement with 10 other cities for electric buses on the occasion of the 2015 Paris COP negotiation, which did not succeed. The cities of Oslo and Copenhagen are currently working on a joint dynamic purchasing system[3] for non-road mobile machineries. Such collaboration initially was supposed to involve additional cities, which, in the end, could not be involved.

Among the issues they faced:

- Difficult to agree upon which machine type to focus: the special needs of every city might not be taken sufficiently into account with joint procurement.
- The costs of vehicles, optimal equipment and the conditions of registration were not the same in each country/city.
- Numerous internal validations were necessary at each city level, which made the process cumbersome.
- Using a Dynamic Purchasing System is more time consuming compared to a framework agreement.
- Different legislation among European countries for procurement.

Such issues and discussion, the different level of ambitions and difference in the type of vehicles each entity is looking to procure in the short term were among the reasons the group decided not to focus on joint cross-border procurement, but rather limit the collaboration to joint market dialogue.

3. Ambitions and procurement plans of the participating entities

Amsterdam

Ambition: The City of Amsterdam aims to decrease the city's CO2 emissions by 55% in 2030 and by 95% in 2050, compared to 1990, which is used as the reference year. The entire city fleet is to be zero emissions by 2030, with progressive targets defined by the type of vehicle.

[3] https://www.kk.dk/indhold/dynamic-purchasing-system-non-road-mobile-machinery

In particular, the currently operational 149 waste collection vehicles aim to be zero emission by 2030, the sweep/dirt trucks (currently 240), zero emission by 2025, the street cleaning machine (29 vehicles) zero emission by 2023, and street sweepers (94 vehicles) by 2028. Amsterdam is also facing a challenge related to waste collection and street cleaning in the historical city centre, due to the presence of the fragile old bridges and is looking for alternative zero emission solutions, especially for the low emissions zone of the city.

Procurement plans: The city of Amsterdam is in the process of designing the procurement of its new contract related to waste collection and the street cleaning service. The contract is expected to be launched by the end of 2020, following some delays related to Covid-19.

Belgian Post

Ambition: Belgian Post (Bpost) has the intention to cut 50% of its emissions by 2030. To achieve this objective, Bpost will shift gradually away from a fleet that depends on traditional fossil fuels to alternative and more environmentally friendly fuels (electricity, hydrogen, biomethane and sustainable advanced biofuels).

Bpost's fleet contains around 18.000 vehicles, including 3,500 bicycles, 3,500 vans for last-mile delivery, but also company cars and heavy trucks for transportation between mail and sorting centres.

Procurement plans: In the next three years, Bpost is looking to purchase more than a thousand company cars and similar numbers for vans. Later, the purchase of heavy-duty electric vehicles is also planned. More information on Bpost's green vehicles policy is available here.

Budapest

Ambition: Budapest runs its public services via its utility companies. The city would like to significantly reduce its greenhouse gas emissions, therefore novel technologies and approaches play a significant role for the upcoming 5-10 years. One of the largest heavy-duty vehicle fleets belongs to the utility company responsible for waste management in Budapest, which is also owned by the Municipality of the City of Budapest.

Procurement plans: An amount of HUF 200 million (app. 572,000 €) has been planned in the 2021 Capital Budget, which will be used to implement various pilot projects next year. As part of this, an e-zemcon pilot project is planned to be tested, in which electric machines would be used. In addition, in connection with the performance of the public cleaning tasks of Budapest Public Area Maintainer Utility Company, electric street sweeper machines would be tested.

Upcoming vehicle procurement actions: passenger cars: 5 pcs (2021), 7 pcs (2022) 10 pcs (2023) max. 3.5 tons transportation vehicles: 5 pcs (2021), 7 pcs (2022) 10 pcs (2023) heavy-duty waste collection vehicles: 3 pcs (2023).

Helsinki

Ambition: The Helsinki City Construction Services, Stara, is an expert in the fields of construction, environmental management and logistics with approximately 1,500 professionals. Stara has an annual procurement volume of €125 million (2018) and an invested fleet value of €44 million. Stara owns 125 heavy trucks, all of which are currently powered by diesel engines. The annual procurement volume is 2-6 vehicles. Stara's goal is to become carbon neutral by 2030 and they are currently investing in retrofitting solutions for all their vehicles.

Procurement plans: According to the plan to become carbon neutral by 2030, there is an immediate need to purchase low or zero emission vehicles. However, Stara could not find any corresponding market offers so far. Stara would like to talk to suppliers which offer an integrated system including the machines, charging stations, training and after-sales services. Until now, most of their heavy vehicles have been procured separately based on the price.

The new Finnish national procurement legislation allows innovative procurement and Stara has gained experience with innovative procurement when they launched an open call to buy a snow piling machine.

Lisbon

Ambition: The City of Lisbon is determined to lead by example on the path to electric mobility and green procurement. With this purpose, from 2011, the city council committed to the introduction of at least 20% of all newly purchased vehicles as EVs and has been progressively replacing conventional cars.

Their goal is for all all light commercial (duty) vehicles to be electric by 2025 while gradually testing the procurement of all other types of heavier vehicles.

However, they face a variety of challenges when, in the past, they have attempted to procure cleaner vehicles (without specifying electric in the tender criteria):

- Having light and heavy vehicles able to work all day in 3 shifts;

- Ensure heavy vehicles supporting the city cleaning and waste collection with autonomy over 150 km and shorter battery charging time;
- Guaranteed technical assistance and car parts in less than 48h.

They have therefore mainly received offers for diesel vehicles, one offer for gas and still no offers for electric vehicles.

Procurement plans: Lisbon launched in 2020 three new procurement tenders for heavy duty vehicles. Many environmental criteria were added, but the offer encompassed only diesel products. Iveco was the only company that responded, offering gas or CNG vehicles. The provision of maintenance support for electric vehicles in Portugal remains a challenge. Due to the pandemic, the city predicts that the change towards electrification might be slower.

Oslo

Ambition: The city of Oslo uses procurements as a strategic tool to reach sustainability goals. The city has an ambitious target of reducing CO2 emissions by 95% by 2030, and awards suppliers which introduce zero emission vehicles and machineries in contracts. From 2025, all suppliers must use zero emission or biogas technology in the municipality's own contracts for construction works or the transport of goods and service. Stipulating such requirements also builds up under the municipality's procurement strategy and the objective "Oslo Municipality's procurements are to make Oslo a greener city". In 2019, the first zero emissions construction site in the world was piloted in the centre of Oslo. The purpose of the project was to renewi and upgradeg streets and pavements. The project was successfully completed by using only zero emission excavators and wheel loaders.

The public transport company Ruter has a target of only using zero emission vehicles from 2028. So far, several battery electric and hydrogen busses have been introduced. Ruter is also piloting zero emission automated buses. In addition, an electric ferry is introduced and is commuting between Oslo and the neighbouring municipality Nesodden. The City of Oslo has many goods and service contracts where deliveries are already made solely with zero emission vehicles. The number of "zero emission contracts" is expected to expand rapidly, as more and more suppliers invest in new vehicles.

The city agency for waste management has also ambitious targets:

- Produces biogas from own waste
- Large number of refuse trucks that run on biogas
- Some trucks with electric refuse compactor
- Goal to increase number of zero emission trucks
- New tender winter 2019/2020
- Plans to renew approx. 1/7 of fleet each year

Procurement plans:

For waste collection, Oslo currently operates 81 refuse vehicles of which none are fully electric, but 14 have an electric compactor. 56 of the other vehicles use biogas.

Oslo is planning to purchase 20-25 refuse vehicles within the next two years. Of those, the ambition is to get at least two fully electric vehicles as a pilot project.

Porto

Ambition: In 2019, the city of Porto signed the European Commission-sponsored Covenant of Mayors for Climate and Energy. In doing so, the city voluntarily raised its target for cutting carbon dioxide emissions to 50% by 2030 (compared to 2004 levels).

The municipal light vehicle fleet (passenger and goods) is around 70% electric. The city's main problems are its heavy-duty vehicles, but Porto is committed to having a 100% zero emission fleet by 2030.

Procurement plans: The fleet of municipal solid waste collection vehicles (from the Porto Municipal Environment Company) is being upgraded. In the short term, around 70% of these vehicles will be running on natural gas. By the end of 2020, 26 natural gas vehicles will already be on Porto's roads. Since 2018, the Municipality has been replacing its municipal fleet with electric vehicles, contributing to a reduction in emissions and savings in operating costs of around €600,000 per year. Along with this investment, charging points have been placed at strategic locations in the city.Since 2020, all the electricity purchased by Porto Municipality for its municipal buildings has been fully produced from renewable sources (certified), which means that all the charging energy is from 100% renewable sources.

Rotterdam

Ambition: According to the policy "Clean Air", City Maintenance Rotterdam set the objective of obtaining a completely emission free vehicle fleet by 2030. The current fleet includes different types of vehicles such as light commercial vehicles, vans, garbage trucks (top loader), rear loader, equipment carriers and sweeping machines which use different fuels. A first step for City Maintenance Rotterdam will be to achieve 100 % emission free passenger vehicles by 2023.

For the full electrification of its fleet, the charging infrastructure remains a major challenge. Although batteries are becoming more effective, with the current charging system only ten electric trucks can be charged at the same time.

Rotterdam has the ambition to have their entire city fleet zero emission by 2030, with intermediary targets by type of vehicles:

- Passenger cars by2023,
- Light commercial vehicles by 2025,
- Heavy commercial vehicles by 2030..

Procurement plans: Rotterdam currently has 527 electric scooters and bicycles, 213 electric and 204 hybrid passenger cars, 37 electric delivery vans, 2 hybrid and 2 fully electric garbage trucks, 3 smaller electric sweepers and a larger electric sweeper.

After the evaluation of these pilot products, new tenders will be launched in the next few years.

SKL Kommentus (Central Purchasing Body in Sweden)

Ambition: a general ambition to help our municipalities and county councils with products that support Agenda 2030. However, no ambition to procure heavy electric vehicles at the moment.

Procurement plans: small electric vehicles. Awaiting results from our public procurement on small electric vehicles.

Stavanger

Ambition: According to the "Climate and Environmental Plan 2018-2030" for Stavanger, the municipality aims to "cut direct greenhouse gas (GHG) emissions in Stavanger by 80 per cent by 2030 and to be fossil-free by 2040, i.e. not use any fossil energy sources for transport or building heating. Reducing greenhouse gas emissions is a challenge that will require comprehensive measures within transport, energy, waste management, agriculture and other areas."

Stavanger currently has 75 waste collection vehicles with a compactor, of which one is fully electrical and three small electric waste collection vehicles which operate in the centre of Stavanger.

Procurement plans: Stavanger plans to buy a few electric garbage trucks in the next few years for which several meetings with the market took place in the last year.

However, the outcome of the dialogues was that the local market is not yet ready for providing heavy electric vehicles, but that competitive products will soon be available in Norway.

4. Lessons learned from the collaboration

After a needs assessment that led to the creation of the group, the entities started to work together in October 2019 for a total of one year of collaboration, with much disruption in the activities caused by circumstances related to Covid-19. There was new pressure on public entities to deliver on other priorities and many of the planned procurement contracts had to be delayed.

Furthermore, producers faced severe disruption and many offices and production factories had to close for a few months, bringing activities back to normal only in September 2020. This clearly was a challenge for the planning of the market dialogues which had to be hosted online.

Despite the short time frame and the challenging circumstances, the group positively evaluated the collaboration and drew some key takeaways from the joint collaboration:

1- A joint collaboration and a *joint statement of demand* creates much positive attention towards the suppliers and sends an important signal to the market. It is however necessary to bring together entities that have a similar level of ambition and want to focus on buying very similar products.

2- For this reason, a thorough *needs assessment* of each entity is necessary to be able to aggregate demand. Such assessment needs to include a deep understanding of the needs, procurement rules, waste management system status of the fleet and geographical condition in

each city, as for example batteries will not have the same use in different conditions (extreme heat or cold temperatures, presence of hills, etc).

3- *Knowledge sharing* between cooperating cities is valuable, particularly for the evaluation of the machines' real-life condition, operation, and maintenance cost.

4- Suppliers want to *compete on green solutions*: those that were involved in the dialogues all agreed that future market development for them will be on heavy-duty and long-haul electric solutions (also with hydrogen) and are all investing on solutions which will benefit cities.

5- The *market dialogue must be systematic*: the group developed a standard set of questions which guided the interaction with the suppliers. Such a document provided for an easy comparison of the products and made sure that presentations of the products were targeted and to-the-point and included many technical specifications.

6- *Using environmental criteria in tenders is an effective method*, but these need to be checked prior to tendering with the suppliers if they can be satisfied. For example, some producers are moving towards obtaining certification for the mineral elements in electric vehicles, as part of the responsible minerals initiative, but might not be able to comply with such a criterion just yet.

7- From an organisational perspective, it is necessary to *create a safe file sharing system,*(e-mails are not optimal) especially when it comes to sharing upcoming procurement plans.

Factory visit and dialogue with Aebi-Schmidt, March 2020

Product availability

Even if the number and type of available products for new heavy-duty waste collection vehicles are still somewhat limited on the market if compared to electric passenger vehicles, companies are heavily investing in research and innovation.

The group has been carrying out joint market research on which products are currently available on the market and their technical specifications. However, much information on real-life use of those vehicles and possible additional management cost is still missing.

Above all, availability of products for European peripheral regions (i.e. Portugal, Finland or Norway) is not always the same compared to European central regions. Similarly, the price difference is still high between European countries and the maintenance support might not be always available.

From the dialogue with the markets, it emerged that new products and solutions, particularly for the batteries, its compact ability and the recharging process, are expected by suppliers for delivery in the next few years, even if Covid-19 might challenge suppliers' possibility to deliver on tender.

The group has developed the following products overview that they are willing to share further and to keep updated. It is freely available on the BBI website.

Market dialogue

By working jointly, the entities involved in the BBI heavy-duty electric vehicles group have shared the information they have acquired on product availability and market readiness across Europe. Additionally, the collaboration was also aimed at organising a number of market dialogues.

While initially two physical dialogues with suppliers were forecasted, in particular during the IFAT[4] conference in Munich of May 2020 and in September 2020, finally only dialogues with five companies could take place: a meeting and factory visit was held with *Aebi-Schmidt*, producers of street cleaning vehicles. Online market dialogue took place with *Volvo, Renault, Daimler and Eneco e-mobility*.

Other suppliers were approached, but the Covid-19 situation has forced many of these on temporary office or production closures, which delayed some of the planned meetings and collaborations.

Meeting digitally also had the disadvantage that information on future technology plans were more difficult to share, since meetings were attended by a high number of people. Despite the circumstances, meetings were deemed fruitful and interesting, particularly for product presentations with technical specifications, discussion of the challenges faced by the buyers and further understanding on extended technology development and market availability in Europe.

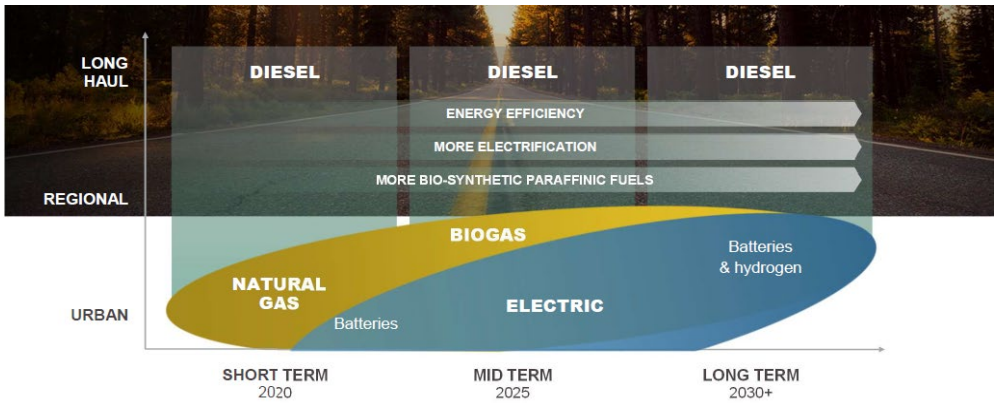
4 https://www.ifat.de/en World's Leading Trade Fair for Water, Sewage, Waste and Raw Materials Management

However, there was clear interest from suppliers to meet and discuss the needs of public entities and their upcoming procurement plans, particularly for the time frame 2021-2026. However, such dialogues are easier when taking place bilaterally rather than in a larger group.

Suppliers are also keen to receive feedback on the products and, for example, in relation to issues related to safety concerns, for example the use of electric sweepers, which do not make noise, in pedestrian areas and in relation to batteries safeties, which might require new fire department procedures.

- **The future is electric**

All suppliers see the future market for trucks and heavy vehicles going towards electric, even if the role that hydrogen might play in the next years for future technology development is unclear and which type of recharging type will be the preferred solutions by suppliers in Europe.



In addition to the market potential related to cities and other public companies moving towards zero emission fleets, companies see the following reasons to move towards electric vehicles production:

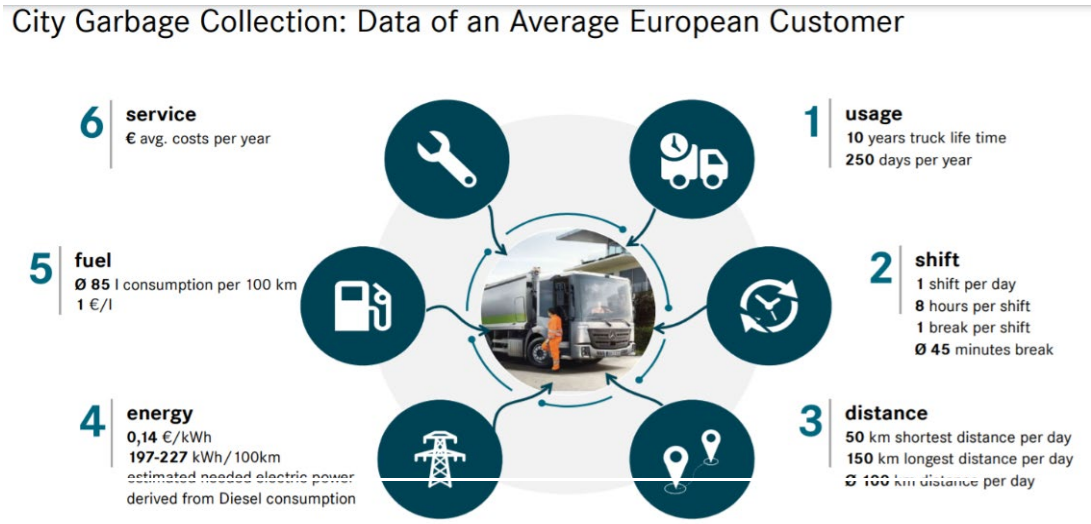
- Urbanisation: in 2050, 2/3 of Europe's population is expected to live in urban areas and in 2030 number of megacities (>10m inhabitants) is expected to almost double;
- Reduction of noise emissions;
- Reduction of CO2 emissions and the political push in Europe towards climate neutrality, which also provide funds for experimentation on zero emissions vehicles;
- Improving cities' air quality standards;
- Company greening ambitions: for example, Daimler has the ambition for all of their new vehicles in Europe to be CO2-neutral by 2039

Additionally, electrification of vehicles might simplify the development of the next expected technological developments: the use of Artificial Intelligence, digitalisation, and autonomous driving.

- **The need for accurate data**

Most of the suppliers have developed simulator programmes to identify real-life conditions and allow the buyers to estimate costs and plan for battery charging time and duration. This will allow city waste companies, for example, to calculate the need for modifying waste collection shifts, routes and breaks to accommodate possible recharging time.

For this reason, entities interested in acquiring electric heavy-duty vehicles for waste collection need accurate data on their geographical conditions, expected use and need.



Average vehicle use according to Volvo company

- **Differences in charging solutions**

When buying electric vehicles, the charging infrastructure and charging type needs to be taken into consideration: on one side, the charging needs of the public entities have to be clear, whether it will be necessary to have a high number of fast recharging points or if night recharging will also be possible. Here, the possibilities provided by the energy grid will need to be taken into consideration.

In this regard, it seems that different suppliers have different priorities regarding AC-charging vs. DC-charging. While some might offer options for both, some suppliers will give priority to one or the other.

Currently, charging infrastructure is not future proof and different types of vehicles might require different charging infrastructure. This might also lead to issues related to lock-in solutions from suppliers which should be avoided. Finally, in future city planning, the city might require using the same charging column for different types of vehicles, from waste collection to electric buses.

- **Maintenance and battery guarantee**

Most suppliers provide a guarantee on the battery, which includes replacement and disposal in case of malfunctioning. Such a guarantee can range from 3 to 5 years or number of battery charges.
The vehicle maintenance service is not always included. Its availability is related to the country in which the product is sold.

While technology here is still under development, it is expected that there will be differences in battery quality between new electric vehicles and retrofitted vehicles. When asked, suppliers still did not see an advantage economically or in terms of quality in providing retrofitted vehicles.

In the future, many technological advances are expected in battery development, but mainly in terms of quality. Suppliers, however, do not expect battery cost to significantly drop in the next 10 years.

Finally, many suppliers are taking into consideration the need to supply environmentally friendly battery disposal certification and certification on battery production, for example by providing due diligence documents on the origins of minerals used in batteries.

- **Role of SMEs for e-mobility**

As of today, it seems that only larger companies can deliver products of good enough quality for heavy duty electric vehicles. However, public entities see a role for local, smaller suppliers and highly innovative SMEs.

While most of the market dialogue of the BBI took place with large companies, a dedicated European Innovation Council ePitching event was organised with Belgian post on 14 September to address their needs in the field of e-mobility and charging infrastructure. The event gave Bpost the opportunity to meet with some of Europe's most innovative SMEs: 12 companies from 8 different countries were invited to present their solutions in a short pitch.

Bpost representatives were impressed by the number of interesting companies, both on loading infrastructure, but also on other challenges that Bpost is currently facing. After having seen all the pitches and meeting one on one with the start-ups, Bpost will follow up with the most interesting companies in the coming months.

Questions developed by the group to initiate the dialogue with suppliers.

Subject	Question
General	What important developments can be expected in the area of BEH and FCEV waste collectors within the next 5 years?
	Will it be possible to get all the waste collectors of the BBI cities emission free by the beginning of 2030? What is the expected production capacity in the next years of emission free chassis?
	In some European cities, the weight of BEH is an issue. For example, in Amsterdam the quays are weak and more heavy waste collectors do damage the quays. And in Porto for example, larger trucks don't fit in the smaller streets.
	Is the electric drivetrain fully integrated with waste compactors or other utilities requiring hydraulic oil pressure to function?
	How do you expect the vehicle performance to change in various temperatures?
	How long do you expect your vehicle to be able to operate before it needs to charge?
	How much longer can the vehicle operate if you fast charge it for approximately half an hour during the workday?
	Does the vehicle have regenerative braking? Is it possible to adjust the level of regeneration?

	What is the optimal size of the waste compactor for this vehicle if the goal is to maximise payload within the limits posed by maximum legal weight of the vehicle and the legal axle weights?
Maintenance	Please can you point out the major difference in maintenance compared to regular (diesel) vehicles? This could include finance, maintenance, and location.
	What is a minimum contract duration for you as a client for which an assignment is interesting for you and you can achieve the desired goal of emission-free trucks by 2030? Can you explain why you choose this duration?
	How many trucks must be purchased within a contract in order for the contract to be of interest to you? Please explain.
	Can you advise the BBI on what kind of tender should be requested to get a contract which indicates maximum space to achieve the determined goals?
Charging Network	Can you indicate what the purchase of waste collectors on a large scale (+ 100 per city) means for the capacity of the charging network within the cities? What is the required capacity per truck?
	What is the highest charging output that it is possible to be able to charge this vehicle? How fast is it possible to charge this vehicle from 20-100%?
	What is the optimal charging output for the battery?
Conditions	What kind of other information, circumstances or preconditions are needed to be able to achieve the emission free goal by 2030 within a contract?
Batteries	How are they produced, and are there any risks? Environmental (minerals) /social (supply chain)/In case of fire? etc.
	Do you have control of your supply chain regarding the raw materials for the batteries? Is it possible to guarantee that you comply with social and ethical standards?
	Any recent, or foreseeable, progress regarding battery production?
	Does the vehicle come with several battery options? What are the different options?
	How will the weight of the battery pack affect the net payload?
	What is the expected lifetime of the battery pack?
	Does the battery come with a guarantee?

5. Next steps of the group

Even if Covid-19 related circumstances prevented some of the activities taking place, in particular further dialogues with the market and factory visits, most of the entities have positively evaluated the collaboration and are interested in continuing the work, possibly under the Big Buyers for Climate and Environment Initiative.

Further actions that might take place:

1) *Further work on the technical specifications of vehicles:*

- Evaluation of pilot projects and the performance of heavy-duty vehicles in real-life conditions.
- Evaluation of additional costs for the provision of waste collection services and street cleaning.
- Inviting other entities which are already piloting these vehicles to share their experience.
- Supporting the development of a universal range test for electric heavy-duty vehicles similar to the Worldwide Harmonised Light Vehicles Test Procedure (WLTP) for personal vehicles.

2) *Continuing the joint market dialogue:*

- Focusing dialogue on new technologies for retrofitting of vehicles.
- Discussing the role of local SMEs in providing vehicles maintenance.
- Follow up market developments, but also keep track of what is developed on other alternative fuels (CNG, H2).
- Support standardisation of the charging infrastructure, for different brands of vehicles, but also for different types of vehicles (i.e. a unique charging infrastructure for electric buses and waste collection vehicles).

3) Discuss the role of the EU in supporting the further uptake of heavy-duty electric vehicles:

- Create a standardised set of tendering criteria for heavy duty vehicles that can be used as a basis for public entities across Europe to define their future tenders.
- Monitoring of EU financial incentives for low emission vehicles, in particular under the 'next generation EU'.
- Monitoring of EU research and innovation funds for battery development.
- Development of innovative financing solutions for the procurement of electric heavy duty vehicles.

Above all, there are currently uncertainties related to the Covid-19 situation in Europe and the possibility of an economic crisis. In addition to affecting factory production during the months of the lockdown across Europe, it also affected the procurement plans of the participating entities which had to postpone the purchasing of new vehicles.

It remains to be seen whether public entities will retain the same level of ambition towards the purchasing of highly innovative products for which real-life performance is still unknown with shrinking public budgets.

Get in touch!

For more information on the **Big Buyers Initiative**, visit
https://sustainable-procurement.org/big-buyers-initiative

For further inquiries, contact Anja De Cunto, anja.decunto@eurocities.eu