BuyZET

Procuring zero emission delivery of goods and services

The BuyZET Handbook

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Purpose

This guide is designed to assist city administrations to use their public procurement activities strategically to help:

- **Reduce traffic in urban areas, and**
- **Promote the use of zero emission vehicles in urban logistics.**

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Procuring zero emission delivery of goods and services - The BuyZET Handbook

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① Introduction

Impact of procurement on urban traffic flows

For many European cities today, addressing traffic congestion and reducing transport related emissions of CO_2, noise and harmful local pollutants, is a key priority. Cities are looking to:

- Reduce the number of motorised vehicle trips in the urban area
- Encourage a modal shift towards cleaner forms of transportation, such as walking, cycling and public transportation
- Foster the use of zero emission vehicles (ZEVs), such as electric or hydrogen vehicles

At the same time, it is imperative that such changes occur without reducing the overall mobility of, or placing undue financial strain on, citizens and businesses.

Municipalities and other public authorities across Europe spend huge amounts of money on the purchase of goods, services and works each year – according to European Commission estimates, public procurement accounts for 14% of EU GDP[1]. A very wide variety of items are procured, from office supplies, to canteen catering services,from street furniture to the construction of municipal buildings. In almost every case some form of transportation of people or products is required to deliver the contract.

The BuyZET project aimed to understand the impact of this spending on transportation flows in EU urban areas, to see how procurement may be used to best support the shift to sustainable mobility. Procurement activities can be divided into six categories with regards their impact on transportation patterns (see next page).

[1] https://ec.europa.eu/growth/single-market/public-procurement_en

Urban logistics and procurement

A significant proportion of motorised vehicle trips occurring in urban areas are commercial trips[2], involving professionals carrying out services or delivering products. One of the major customers for these products and services is the public sector – the municipal authority, and other public sector organisations (hospitals, schools, universities, regional/national agencies, etc.) based in the area. Almost every product or service we buy leads to vehicle trips within cities – from the delivery of office supplies to waste collection services; from bus services to road maintenance staff travelling to a work site.

The European Commission has established the target of achieving 'essentially CO_2-free city logistics in major urban centres by 2030[3]'. The public sector has a clear role to play in terms of regulations and legislation in support of this goal, however its role as a *customer* has received little focus.

Public procurement categories which impact on transportation

① 

Vehicles

Vehicles owned or leased by public to carry out their public services, such as road and green space maintenance, office car pools etc[4].

② 

Transportation services

Services contracted to private operators for the transportation of people and goods, such as bus services, disabled transport, parcel delivery, waste collection etc.

③ 

Other services with a transportation footprint

A wide variety of further services such as cleaning, catering, plumbing, or locksmith services, all of which require the movement of people and goods in their delivery.

④ 

Goods

The purchase of products, which then need to be delivered to public premises.

⑤ 

Construction

Public infrastructure and building works, typically requiring significant transportation of construction materials, equipment, waste and workers.

⑥ 

Non-transport relevant procurement

A small number of contracts which involve no, or a negligible amount, of transport in their delivery, such as desk-based consultancy services.

[2] In Rotterdam, vans (9.9% of vehicles) and trucks (1.3%), are responsible for more-than-proportional CO_2 (16% and 18%, respectively), NOx (25% and 37%) and PM10 (26% and 13%) emissions. Source: FREVUE dissemination package: https://frevue.eu/wp-content/uploads/2017/02/Dissemination-package-supporting-the-Declaration-of-Intent-for-Electric-Freight-Vehicles.pdf

[3] European Commission White Paper (2011): Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system COM(2011) 144

[4] The size of public fleets will depend on the extent to which these services are contracted out to private companies. Waste collection, for example, may be carried out by municipal staff (category 1), or be privately contracted out (category 2)

THE BUYZET HANDBOOK

Many municipalities across the EU are already making significant efforts towards promoting zero/low emission mobility solutions in their own fleets and for the transportation services they procure (categories 1 and 2 above). However, to date much less attention has been paid to the wider impact of the procurement of goods, works and services on urban traffic flows.

For this reason, the main focus of BuyZET and this Handbook is on categories 3, 4 and 5 – how public authorities can adjust their procurement of general goods and services to help promote sustainable urban transportation patterns. Links for guidance on categories 1 and 2 are provided in the box on page 7.

BuyZET brought together a group of ambitious cities, led by Copenhagen, Oslo and Rotterdam, who wished to explore how they can promote the zero emission urban delivery of goods and services through their procurement actions.

This guide presents:

- A set of preliminary procurement recommendations for services, good and construction (Sections 2, 3 and 4)
- A description of the process followed in each city to identify procurement strategies (Section 5)

One of the primary conclusions from the project, however, is that there is no single approach which fits all cases, rather that it is imperative to discuss and develop your strategies together with actors throughout supply chains, in order to devise strategies which really can deliver in practice.

Procurement of vehicles and transportation services

The European Commission has developed a set of recommended "green public procurement" (GPP) criteria, for a variety of vehicle and transportation service procurement categories:

- Purchase/lease of cars, light commercial vehicles and large category vehicles
- Mobility services (e.g. social transport, taxi services)
- Purchase/lease of buses
- Bus services
- Purchase/lease of waste collection trucks
- Waste collection services
- Post, courier and moving services

For each category a series of core (basic) and comprehensive (ambitious) criteria are proposed. These include establishing CO_2 and air pollutant emissions limits for vehicles where possible, or defining "clean" vehicle technologies where not. These are complemented by a number of further criteria in each category, for example on the provision of eco-driving training, or the use of gear shift indicators. These criteria[5] can provide a useful basis for establishing standards for vehicles used in product and service delivery as well.

The Clean Vehicles Directive (2009/33/EC), currently obliges public authorities and public transport operators to take environmental performance into account when purchasing road vehicles (see the Clean Fleets Guide for more information on this[6]). This Directive is in the final stages of being revised, with the new version due to establish a definition of a "clean vehicle", and minimum targets to be achieved in public fleets. Up-to-date information will be found on the website of DG MOVE: https://ec.europa.eu/transport/home_en.

A series of good practice examples on vehicle and transportation procurement can be found on the European Commission GPP website:
http://ec.europa.eu/environment/gpp/case_group_en.htm

[5] http://ec.europa.eu/environment/gpp/pdf/criteria/transport.pdf
[6] www.clean-fleets.eu/fileadmin/files/documents/Publications/Clean_Fleets_Guide_screen_version.pdf

② Services
Procuring zero emission delivery

The range of services purchased by public authorities is enormous – ranging from waste collection to cleaning services, from maintenance of public spaces to catering services for schools. In almost all cases, delivering such services will require transportation – of staff carrying out services in different locations around the city, and of the goods they need.

Oslo estimates that service procurement leads to nearly 4.5 million vehicle kilometres travelled within the city boundaries each year[7] - this figure excludes transportation services such as waste collection, public transport or social transportation (i.e. only category 3 on page 5).

Within BuyZET all three cities identified **facility maintenance and repair services** as having amongst the highest transportation footprint in this category – i.e. electricians, plumbers, cleaners, carpenters, locksmiths etc. required for maintenance and repair of publicly owned buildings. The information presented in this section relates to this specific set of services, but would likely be applicable to many other services procured by municipalities.

[7] www.buyzet.eu/wp-content/uploads/2017/11/Oslo-BuyZET-Transportation-Mapping-Report.pdf

Transport Decarbonisation Alliance: Call for Zero Emission Freight Vehicles[8]

The market for zero emission freight vehicles is still characterised by limited availability and high prices.

With this call, countries, cities and companies, aim to increase the size and visibility of demand for zero emission freight vehicles by:

- **Indicating the number of commercial vehicles in their organisation's fleet that they could replace with zero emission alternatives. Provided that these are cost-effective and meet the requirements of end users.**
- **Identifying like-minded organisations in their area, including their contractors and goods and services providers, potentially leading to joint procurement opportunities or other solutions for zero emission transport.**

CHARACTERISTICS

For such a wide sector it is difficult to provide a simple characterisation. In the facility maintenance and repair services sector, for example, service providers range from one person operations, to multinational businesses. However, there is a clear preponderance of small, local operators.

These services will typically be procured through framework contracts, with service providers typically visiting several sites per week, and likely having multiple customers in addition to the municipality.

Vehicles used are typically small to medium sized vans, used to transport equipment and staff from location to location.

PROCUREMENT CONSIDERATIONS

Market engagement activities carried out in the BuyZET cities with a variety of service providers, designed to identify potential zero emission delivery solutions (see Section 5), raised the following issues and considerations:

- A number of fully electric light vans are available on the market, able to cover the majority of service uses within this category, in terms of range and load capacity. However, although the market is developing, these remain typically more expensive than standard alternatives, the selection is relatively small, and for certain usages either range is too limited (particularly considering limited charging infrastructure), or power is insufficient.
- Smaller businesses find it more challenging to invest in upgrading vehicle fleets – especially without a guarantee of business.
- The municipality is normally only one of a number of customers for service providers. Private customers rarely set requirements on zero/low emission delivery (although there is a perception that this is changing).

[8] http://tda-mobility.org/zero-emission-freight-vehicles/

ZERO EMISSION PROCUREMENT STRATEGIES

Award criteria – giving preference for zero emission vehicles

Given the current limited availability of appropriate zero emission vehicles on the market, together with the significant number of smaller businesses within this procurement sector, the favoured approach from the BuyZET cities is to reward companies offering to deliver all or part of the service using zero emission vehicles with additional points at the evaluation stage – potentially also using some minimum criteria in tender specifications.

This approach has the advantages of both ensuring a minimum environmental performance is achieved, whilst also providing a strong incentive for zero emission vehicle use.

Such an approach should ideally be progressive over the course of the contract – i.e. encouraging companies to introduce an increasing number of zero emission vehicles into their fleets over the course of the contract, rather than requiring all zero emission vehicles to be available from the start. This will help to open competition whilst still having the impact desired – however, effective contract management is in this case a crucial part of the process.

Stockholm: three ways to implement environmental requirements in procurement of transportation services[9]

Stockholm's Environmental Programme 2016-2019[10] **outlines the goals for procurement processes, in which road traffic plays a major role. Environmental requirements have been applied to the procurement of transportation services for furniture and office removals, human transportation and food deliveries.**

Three different tools have been used based on the type of transportation services that were procured. In procurement of furniture and office removal, requirements for Euro 5 and max 225 g CO_2/km were set, along with the successive replacement of at least one light and one heavy truck with an environmental vehicle by six months after contract. For human transportation a ceiling of 160/190 g CO_2/km was required for the whole fleet. A sliding scale was used for food deliveries, according to which all trucks should be at least Euro 5 and a number of clean vehicles have to be introduced proportionally to the size of the fleet.

Experience in the three different procurement areas for transportation services has shown that environmental requirements do not increase the cost for the service, however they must be based on the sector's present situation. To avoid limiting competition, requirements must be flexible and need to be followed up several times per year.

The model developed by Oslo is presented below.

Oslo – Recommended environmental criteria for transport

The Oslo guidelines are designed to be used for all service and goods delivery contracts which involve an element of transportation. The requirements are formulated as a combination of award criteria, minimum requirements and contract requirements.

The requirements complement each other and are intended to be applied together.

The full guidance document, together with the full calculation models and tenderer request forms, is available in English here: http://www.buyzet.eu/core-cities/oslo/

[9] https://www.polisnetwork.eu/publicdocuments/download/2390/document/three-ways-to-implement-environmental-requirements-in-procurement-of-transportation-services-eva-sunnerstedt.pdf

[10] http://www.stockholm.se/PageFiles/130332/the-stockholm-environment-programme-2016-2019.pdf

Promoting zero emission vehicles in social transport – Capelle aan den Ijssel[11]

For the social transportation services contract tendered in 2016, Capelle aan den Ijssel award criteria were included for proposed use of zero emission vehicles, as well as an action plan for optimising efficiency and load factor. The winning bidder will use only electric vehicles in carrying out the contract.

1 Minimum requirements – specifications

All vehicles used to deliver the contract must, as a minimum, satisfy the Euro 6/VI standard.

2 Award criteria – recommended as a minimum of 30% of quality criteria

Points will be awarded according to the tenderer's ability to use zero-emission vehicles or fossil-free vehicles for the contract. The following factors are applied during the evaluation:

- The type of fuel – these are prioritised as follows:

  a) Hydrogen vehicles or 100% battery-driven electric vehicles.
  b) Biogas vehicles: compressed biogas (CBG) or liquefied biogas (LBG).
  c) Vehicles that use other sustainable fuels.
  * For both b) and c) slightly higher points will be awarded for vehicles using plug-in hybrid technology with a minimum range of 50 km on electricity.

- The date when the vehicles will be ready to use. Zero emission of fossil-free vehicles do not need to be available from the start of the contract, but can be introduced over its duration. However, the earlier they will be introduced, the higher the number of points awarded.

3 Contract requirements

A series of clauses are recommended allowing for co-ordinating deliveries across multiple contracts with a single supplier, for ensuring that the vehicles submitted in the tender (or those at least as eco-friendly), are actually used, guarantees on the nature of the fuel used, and banning engine idling on municipal premises.

4 Documentation requirements

Tenderers are requested to provide a list of the vehicles to be used during the contract, the type of fuel they use, and, if they are not available at the start of the contract, the date on which they will be introduced, together with evidence of the order or availability of the vehicle.

Monitoring low carbon, sustainable catering services City of Turin, Italy[12]

Turin introduced a number of measures and included various criteria into their current school catering contract aiming to reduce the associated carbon footprint. These included energy efficient appliances bought for schools, the utilization of mains tap water, the use of low environmental impact transport and a significant reduction in packaging and waste.

[11] www.sppregions.eu/fileadmin/user_upload/Tenders/Capelle_aan_den_Ijssel_Social_Transport_Final_clean.pdf
[12] http://ec.europa.eu/environment/gpp/pdf/news_alert/Issue47_Case_Study100_Turin.pdf

Fleet certification

In some cities, sustainable fleet management certification systems exist, which certify that fleet owners meet certain sustainability standards relating to the vehicles in the fleets, together with the way in which the fleet is managed overall. As with ecolabels helping customers to identify what is an environmentally friendly product, these fleet certification systems can help procurers identify companies which manage their fleets in a sustainable way.

One procurement approach is to require companies have a fleet certification either at the beginning, or by the end of the contract – or offer points during the evaluation stage for companies that have, or plan to get, such certification. A major precondition for such an approach, of course, is the existence of a (sufficiently ambitious) sustainable fleet management certification systems on the national market.

The procurement approach developed by Rotterdam is presented below.

ECOSTARS Fleet Recognition Scheme in Rotterdam

The city of Rotterdam has implemented the ECOSTARS recognition scheme[11], which rates vehicles and operating practices using star rating criteria, to recognise levels of environmental and energy savings performance of logistics operators. An organisation or company is awarded more stars when the vehicles in its fleet are cleaner and are used in a cleaner way. Each vehicle gets a star rating (from 1 to 5 stars), and the fleet as a whole.

Description of the procurement strategy

For the recent procurement process for the renewal of a series of facilities maintenance contracts[12], a new approach was piloted in 2018, based on the ECOSTARS scheme. The strategy involves an initial rating of the suppliers fleet at the start of the contract period, followed by an update after 3 years. The supplier will only be entitled to an extension of the contract if the result of the updated audit meets a minimum requirement.

To prevent discouraging small- and medium-sized enterprises (SMEs), a mild initial requirement was imposed: just an audit to set a baseline. An ambitious requirement was then established in order to get a contract extension: upon re-audit, the overall rating at fleet level had to be 5 stars, and the fleet should contain at least one additional zero emission vehicle.

Scope of application

All bidders have to submit proof of an appointment for an ECOSTARS audit. This simply requires an application on the ECOSTARS website[13]. An open question, currently under evaluation by the legal department, concerns subcontractors: it must be decided if they will be subjected as well to the ECOSTARS audit once they have been assigned the task. This represents a relevant issue since the market engagement phase (see Section 5, Step 3) revealed that many potential contractors do not have a fleet themselves, they only manage the contract and hire subcontractors to supply the actual services.

Evaluation of the outcome

A total of 18 individual bidders have been awarded one or more of the lots. The aim of eliciting bids from SMEs has been achieved, as both enough SMEs submitted a bid, and most of the successful bidders belong to this category.

11 of the winning suppliers have already had their fleets audited. Five have a prior audit report, which needs to be updated, and two have made an appointment for an audit intake. The audits are carried out free of charge and require only a limited amount of time from the auditee.

Development and transfer to other cities

As of 2018, the regional authority Metropolitan region Rotterdam The Hague (MRDH) has become a co-financier of the ECOSTARS scheme, which allows companies and organisations from a wider area of 23 local authorities to apply for membership. Rotterdam has also received a national subsidy to promote and upgrade the application of ECOSTARS in public procurement by municipalities throughout the nation.

[13] http://www.logistiek010.nl/nl/programma-s/Ecostars-42

[14] Covering construction, electricians, plumbing, kitchen installation, carpeting, painting, window decoration and mechanical engineering

[15] http://www.logistiek010.nl/nl/programma-s/Ecostars-42

London Fleet Operator Recognition Scheme (FORS)[16]

Born in 2006, FORS is now recognised as the main UK industry benchmark for safe and efficient fleets, and became a national accreditation scheme in 2015. FORS is a membership scheme providing operators with practical advice and guidance to help reduce fuel consumption, CO_2 emissions, vehicle collisions, and penalty charges.

Other procurement approaches

A number of further procurement approaches may be considered, potentially alongside those presented above:

- **Requiring data monitoring** – A key challenge in optimising logistics flows is the lack of reliable data available. Contract provisions can be included in service contracts requiring data to be delivered annually on distance travelled, fuel consumed, vehicle types used etc. This can help to provide a benchmark for future procurement actions.
- **Defining geographically contract lots** – To avoid service providers frequently travelling right across the city between jobs, splitting contracts into geographical areas should minimise such travel. This will not restrict the base location of the provider.

Collecting transportation data in Barcelona and Turin[17]

The Municipality of Barcelona has established micro-platforms as hubs for sustainable city logistics as a concession of public spaces (zero cost to the last mile operators). In return, the last mile operator must be neutral and work with all carriers. Moreover, they are required to provide transportation data to the municipality, to improve understanding about the system and transport flows.

In Turin, a new permission scheme encourages logistics operators to replace their vehicles with clean ones, equipped with an on-board ITS system: to obtain the incentives, all vehicles have to be equipped with a GPS system able to provide real-time vehicle data (e.g. location of the vehicle, tracking and tracing, etc) to a traffic control centre of the city.

- **Setting minimum zero emission vehicle requirements by the end of the contract** – Instead (or in addition to) setting award criteria on zero emission vehicles, municipalities can demand that all, or a certain proportion of these must be used in carrying out the services by the end of the contract. In this way, providers will only need to invest in zero emission vehicles if they have the financial certainty of a municipal contract.
- **Encouraging the use of cycling, walking and public transport** – For some services, it may be possible for providers to travel to and from sites without using private motorised transport, for example by using cargo bikes. Such travel modes can be awarded additional points during the evaluation phase.
- **Longer contract length** – As above, increasing the length of contracts offered, will allow providers to invest with more security in zero emission vehicles.
- **Setting minimum zero emission vehicle requirements** – The most certain way to ensure your services are carried out with zero emissions, is to demand this in the technical specifications of the contract. However, for the reasons given above, this is only recommended if market intelligence and engagement activities indicate that this is achievable in the local context. Otherwise the effect could be counter-productive.
- **Requesting a sustainable mobility concept** – Instead of defining the best methods of achieving zero/low emission service delivery, one approach is to allow the service providers to propose their own innovative solutions, whether through using zero emission vehicles, reducing transportation needs, using non-motorised transport, or another approach. Such an approach requires a clear concept for evaluating alternative proposals, and will require strict monitoring during the contract.

[16] https://www.fors-online.org.uk/

[17] NOVELOG Cities & Regions Factsheets: http://novelog.eu/wp-content/uploads/2018/08/05287-Polis-Novelog-Brochure-06-WEB.pdf

Incentives for buying electric cargo bikes and cargo trailers for deliveries in Baden-Württemberg[18]

Land Baden-Württemberg runs a funding scheme for electric cargo bikes and cargo trailers. This is open to companies, sharing initiatives and local authorities. The Ministry funds a third of the procurement cost, up to €3,000. The scheme has been up and running since 2017 resulting in more than 1,000 Cargo bikes by the end of February 2019. The overall funding amounts to €2.5M so far, triggering some €6M investment. The funding is used by a wide variety of companies: from flower shops to restaurants, from craftsmen (e.g. painters) to lawyers. Looking at the sort of authorities the funding goes to, there is some more demand in bigger cities, but also in more rural areas.

Complementary actions

A number of related, non-procurement activities can help to complement and facilitate the approaches presented above:

- Free/reserved parking spaces for zero emission vehicles.
- Providing electric vehicle charging infrastructure at public sites where services are delivered.
- Providing service providers with storage space for equipment, to reduce equipment transportation requirements.
- Offering guidance to companies on alternative vehicles available, together with information on any preferential funding schemes available.

Brussels raising awareness on logistics best practices for small companies[19]

In collaboration with the association Groupe One, best practices on freight are promoted among very small companies, focusing on people willing to launch their enterprise. The idea of the project is to provide support from the beginning and to help small companies to be more efficient. Being aware of the possibility to subcontract the storage for instance can avoid them important fixed charges putting a strain on their business plan. Moreover, in the framework of the new Brussels Plan for Circular Economy, Brussels Mobility promoted freight as a key element. This includes the promotion of reverse logistics.

[18] www.eletromobilitaet-bw.de
[19] https://www.groupeone.be/

Oslo integrated approach to make electric vehicles the right choice

To kick-start the adoption of electric vehicles the City of Oslo has contributed to the proliferation of an adequate charging infrastructure. Today Oslo is Norway's, and one of the world's largest owner of charging infrastructure. Easily available charging infrastructure has made driving an electric vehicle attractive and convenient, but also helped to raise public awareness and increase understanding about electric vehicles.

As for freight and logistics, the installation of public fast-charging infrastructure has proved to be effective as the uptake at all sites is near full capacity during peak hours. All stations can be easily upgraded with more chargers in case of higher demand[20].

Given the special requirements of professional operators[21], the city of Oslo is considering the conversion of semi quick chargers into fast chargers and the installation of additional 'off-street' fast chargers, especially in parking spaces that could function as micro-hubs for consolidation.

As for procurement, the municipality itself has procured low emission vehicles for its municipality fleet. The new framework tender for the City's procurement and leasing of vehicles currently only allows for zero emission electric vehicles.

[20] FREVUE Factsheet – Fast-charging infrastructure for electric freight – Oslo & Stockholm: https://frevue.eu/wp-content/uploads/2017/06/Fast-charging-infrastructure-for-electric-freight.pdf

[21] https://assured-project.eu/news-and-events/news/assured-workshop-on-on-ev-fast-charging-infrastructure-for-urban-freight

③ Goods
Procuring zero emission delivery

Municipalities purchase an enormous range of physical goods, as Table 1 below from the city of Copenhagen shows. The delivery of these goods to, typically, a large number of public sector facilities or public spaces, creates a considerable amount of freight traffic in urban areas. Copenhagen estimates that product deliveries lead to nearly 4.5 million vehicle kilometres travelled within the city limits per year.

Table 1. Categories of goods purchased by the city of Copenhagen

Goods		
Cleaning Equipment and Supplies	Furniture and Furnishings	Physical and Occupational Therapy and Rehabilitation Products, Sports and Recreational Equipment and Supplies and Accessories
Clothing	Garden Tools	Roads and Landscape, Commercial and Entertainment Structures
Commercial and Military and Private Vehicles and their Accessories and Components	Independent Living Aids for the Physically Challenged	Security Surveillance and Detection
Components for Information Technology or Broadcasting or Telecommunications	Medical Equipment and Accessories and Supplies	Structures and Building and Construction and Manufacturing Components and Supplies
Developmental and Professional Teaching Aids and Materials and Accessories and Supplies	Musical Instruments and Parts and Accessories	Surgical Products
Domestic Kitchenware	Office Equipment and Accessories and Supplies	Technical Articles
Drugs and Pharmaceutical Products	Other Purchases	Toys and Games
Food, Beverage and Tobacco Products	Personal Paper Products, Waste Containers and Accessories	Utilities

Urban consolidation centres (UCC)

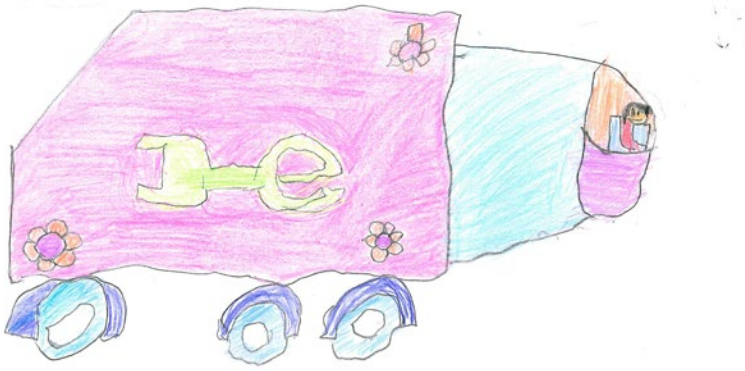
Over the last decades there have been many initiatives aimed at achieving greater consolidation and optimisation of logistics transport flows within urban areas. These have taken a variety of forms: upstream supply chain consolidation, click and collect stores, urban consolidation centres (UCCs), micro-consolidation centres, locker boxes, mobile depots etc. These experiences have illustrated that the consolidation concept can bring clear advantages in terms of reductions in urban vehicle kilometres (v-kms) driven by better bundling of urban freight. In addition, such approaches facilitate the integration of tailored zero emission vehicles (such as cargo bikes and electric freight vehicles) in logistics systems by reducing range requirements.

These experiences have also shown it is challenging to identify robust and economically viable business models for UCCs to operate self-sufficiently, without the need for public subsidies or strict regulation and enforcement. The key challenge for financial sustainability lies in achieving a sufficient volume of goods to reach scale advantages in the last mile deliveries[16].

However, to truly assess viability, external environmental and social costs (such as CO_2 emissions, air pollution and congestion) should also be considered, potentially making public subsidies for such schemes worthwhile.

CHARACTERISTICS

Public sector goods ordering and delivery patterns vary considerably from city to city, but generally this is a relatively uncoordinated process. Goods are ordered individually by different municipal departments or units/ locations, with contracted suppliers delivering directly to the site. Distributors and individual suppliers may engage in some form of delivery pooling or consolidation if they are responsible for multiple deliveries to multiple sites, but is likely on a relatively limited scale. The use of zero emission vehicles for goods deliveries, whether electric delivery vans or cargo bikes, remains the exception, although a number of logistics operators are starting to introduce zero emission schemes. Overall, there seems to be considerable scope for reducing the amount of traffic engaged in delivering to municipalities through greater rationalisation of ordering practices, consolidation of deliveries, and for increasing the use of zero emission vehicles for these deliveries.



[22] STRAIGHTSOL (2014): Final evaluation of all STRAIGHTSOL city distribution concepts

ZERO EMISSION PROCUREMENT STRATEGIES

Delivery consolidation

Obliging suppliers to deliver goods purchased by the public sector (and potentially public service providers, such as transport operators, waste collection companies, and many others) via urban consolidation centres (UCCs) has a strong potential for both reducing the number of vehicle kilometres travelled within the city for urban freight, and for increasing the proportion of such trips being made with zero emission vehicles. This could also potentially provide the necessary demand volume to make UCCs economically viable (see box).

As yet, this remains a relatively untested approach. There have been some promising pilot activities (see box on Roskilde below), and a number of cities are interested in pursuing this, but further pilots and demonstrations are necessary. Some of the key questions include:

- **Financial model** – Who should pay for the operation of the consolidation centre, and last mile delivery? The receiver, the supplier, the municipality? Are there alternative business models which might be appropriate, such as buying services rather than products?
- **Customer model** – Should consolidation focus on a specific type of goods (e.g. construction materials, food, health supplies), or cover all potential goods? Which parts of the public administration should be covered? Will other buyers from the public and private sector also be able to use the hub? Should there be multiple hubs covering different city districts, or one central hub?
- **Organisational architecture** – Who would operate the centre and how would this be contractually managed/procured? Would the service be contracted out, or covered by public staff? How can the use of zero emission vehicles be promoted, in deliveries both to and from the consolidation centre?
- **Value network** – What services should the consolidation centre provide? Cross-docking, inventory, returns? Can further functions be included to align with the changing requirements of the on demand economy?
- **Impact on facilities** – What would be the impact on ordering behaviour and storage within the public facilities served?

Consolidating deliveries through procurement

The City of Roskilde has outsourced the delivery of all goods to the city hall to City Logistik, a Danish logistics firm. The firm runs a consolidation centre at which goods for delivery to City Hall are collected and bundled. If the pilot activity is successful, this will be expanded to other public institutions in the city.

The City of Amsterdam, Amsterdam University of Applied Sciences (AUAS) and the University of Amsterdam (UvA), are all using the services of the Deudekom UCC at the edge of the city to deliver to a number of sites, with last mile delivery then carried out by electric vehicle. For the City of Amsterdam, the consolidation of printing paper alone saves a daily freight trip of 50km. As well as paper, deliveries of products such as coffee, hygiene products and office supplies are also consolidated. In these cases the city and universities pay for the last mile delivery.

In Finland, the City of Turku outsourced warehousing in co-operation with the local healthcare authority to help minimise the number of deliveries to city facilities.

Award criteria for zero emission vehicle use

As presented in the Oslo guidelines in Section 2, for goods supply contracts extra points can be awarded during the evaluation stage for the use of zero emission vehicles for delivery.

Other procurement approaches and complementary measures

Beyond the establishment and running of UCCs, a number of other approaches may be considered to promote greater consolidation and optimisation of delivery flows in urban areas:

- **Contractual conditions** - Applying contractual conditions promoting "self-consolidation" in deliveries, and/or the use of zero emission vehicles in delivery systems.
- **Virtual consolidation/demand aggregation platforms** – online platforms designed to facilitate the consolidation of demand, and therefore the optimisation of deliveries to multiple sites from multiple providers.
- **Consolidation of ordering** – Establishing more centralised ordering processes across municipal departments and sites, together with greater co-ordination of delivery schedules, and focusing on realistic delivery time requirements.

④ Construction
Procuring zero emission delivery

In any European city, the construction sector is one of the most significant in terms of economic activity – the deliveries of construction materials, machinery and workers to and from construction sites can place a significant strain on urban transportation systems. The public sector plays a key role both as a contracting and as a regulating body in this sector. The City of Rotterdam estimates that movements of sand purchased by the municipality alone account for nearly 300,000 km travelled per year – with by far the largest CO_2 emissions footprint of any product procured by the city. In the services category, construction workers also represent the group with the highest footprint.[17]

ZERO EMISSION PROCUREMENT STRATEGIES

Strategies for reducing the transportation footprint of public construction works will depend to some extent on the type of contractual arrangements and responsibilities. In Rotterdam, for example, the municipality directly purchases construction materials for maintenance, renovation and new construction of water, sanitation and road infrastructure. Elsewhere this will likely be the responsibility of the private works contractors.

CONSTRUCTION LOGISTICS PLANNING

One flexible approach is to ask contractors or material suppliers to provide their own plan for reducing the transportation impacts of construction works in their tender offer.

The City of Rotterdam is now requesting construction material suppliers to deliver a *vision and action plan towards zero emission transportation* in tendering, in line with the city's objective to have emission free city logistics by 2025.

Offers are given a rating of between 0 and 5 during the tender evaluation. Those achieving a rating of 5 are given a 5% deduction from the contract price.

[23] www.buyzet.eu/wp-content/uploads/2017/11/Rotterdam-BuyZET-Transportation-Mapping-Report.pdf

The Construction Logistics Plan (CLP) of Transport for London[24] aims at improving freight vehicle movement to and from construction sites in delivering construction materials and removing waste in a safe, efficient and environmentally friendly way. The initiative is very similar to the *Delivery and Servicing Plans*[25] which focus on improving deliveries and minimizing journeys to buildings rather than construction sites.

It envisages trip generation to identify the number of trips, routing, delivery scheduling, holding areas, permit schemes and access, impact on highway, Work Related Road Risk (WRRR), common procurement, consolidation and/or collaboration and off-site fabrication.

[24] https://tfl.gov.uk/info-for/urban-planning-and-construction/transport-assessment-guide/freight
[25] https://constructionlogistics.org.uk/construction-logistics-and-planning/

MINIMUM VEHICLE REQUIREMENTS/ AWARD CRITERIA

Zero emission heavy duty vehicles are still primarily at the piloting and demonstration phase, as the load requirements of these vehicles make them particularly challenging for electrification. Nevertheless, this situation is changing, and establishing award criteria for the use of zero emission vehicles in construction contracts may be a useful tool for further encouraging these developments.

At the other end of the scale, ensuring that old, heavily polluting heavy-duty vehicles (HDVs) are not used in contracts can be relatively straightforwardly achieved by setting minimum Euro standards for the vehicles used.

The City of Rotterdam has a Low Emission Zone, and includes contract clauses in construction material contracts, that all vehicles used in delivery must meet these standards.

CONSTRUCTION CONSOLIDATION CENTRES

As in Section 2, consolidating deliveries of construction materials at consolidation hubs is an approach of increasing interest to cities across Europe. The City of Rotterdam will be piloting the establishment of material hubs for construction works, with final deliveries to site to be made using zero emission vehicles.

The SUCCESS project[26] has explored models for the establishment of such urban construction consolidation centres in a number of European cities. The CIVIC project[27] is also exploring approaches to minimising transportation disruption and emissions caused by construction logistics in the cities of Amsterdam, Stockholm, Brussels and Vienna, and has produced guidance on Smart Construction Logistics.[28]

[26] www.success-urbanlogistics.eu
[27] www.civic-project.eu
[28] www.civic-project.eu/sites/default/files/content/bilder/civic-handbook_digital-2.pdf

⑤ The BuyZET approach

BuyZET cities followed a set of specific steps in order to identify how public authorities can adjust their procurement of general goods and services to help promote sustainable urban transportation patterns.

STEP 1. UNDERSTANDING THE TRANSPORT FOOTPRINT OF ITS OWN PROCUREMENT

Each city carried out a procurement transportation emissions mapping exercise. This allows cities to identify the CO_2 and air pollutant emissions from the transportation activities linked to their procurement of goods and services. It is primarily based on an analysis of budgetary spending data, and identifies emissions occurring within the city boundaries.

A full description of the BuyZET mapping methodology can be found in Deliverable 2.1 - BuyZET mapping methodology[29].

The results of the mapping exercise provide both:

- An overall picture on where the city stands in relation to CO_2 emissions from its own transport fleet and transport services that it procures, and
- A detailed zoom in on the most CO_2 intensive procurement clusters.

Procurement transportation CO_2 Footprint =

the total CO_2 emissions from motorised vehicle trips within the urban area directly caused by the procurement activities of the municipality.

[29] http://www.buyzet.eu/wp-content/uploads/2017/12/Deliverable-2.1-BuyZET-final-20170227.pdf

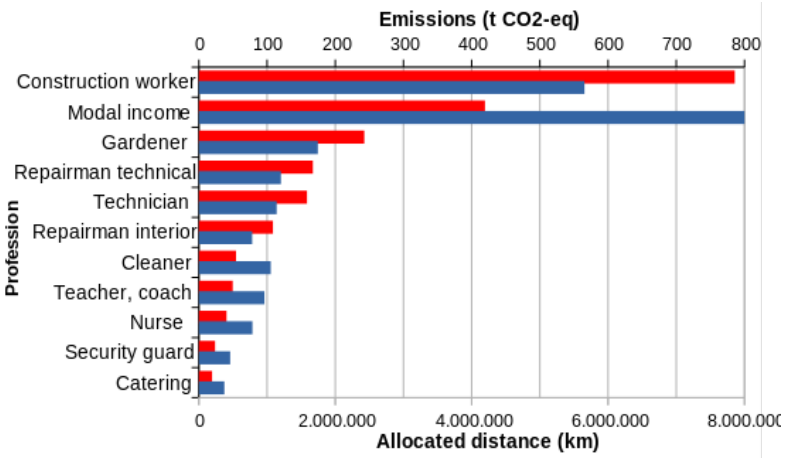
Table 2. Overview of the overall mapping results for BuyZET cities

Note: Emission numbers between the cities are not comparable due to the very different scope of services and goods falling into the transport categories in each city, mainly due to national differences in which services are the responsibility of the municipality, as well as the extent to which services are outsourced to private companies.

City and scope	Transport category	Km travelled	Tonnes CO_2	Kg NOx	Kg PM	Kg SO	Kg CO
Rotterdam	Total	-	28,685	169,494	5,672	173	-
	Own fleet	-	6,633	48,190	1,163	40	-
	Transportation services	-	19,420	112,984	3,833	115	-
	Other goods & services	23.8 mill.	2,632	8,321	676	19	-
Oslo	Total	27.4 mill.	5,838	20,910	552	-	7,600
	Own fleet	15.3 mill.	2,377	10,434	380	-	3,249
	Transportation services	6.8 mill.[30]	2,159	6,177	89	-	2,635
	Other goods & services	5.3 mill.	1,302	4,299	83	-	1,716
Copenhagen	Total	-	49,612	-	-	-	-
	Own fleet	-	2,964	-	-	-	-
	Transportation services	-	39,097	-	-	-	-
	Other goods & services	8.3 mill.	7,551	-	-	-	-

Figure 1 gives a detailed example zoom in to the most CO_2 intensive procurement clusters in Rotterdam, helping to identify procurement categories that result in the highest CO_2 and air pollution footprint.

Figure 1. Distances driven and emissions emitted from the procurement of services in Rotterdam



[30] Excluding public transport

STEP 2. PRIORITISATION OF MOST RELEVANT PROCUREMENT CATEGORIES

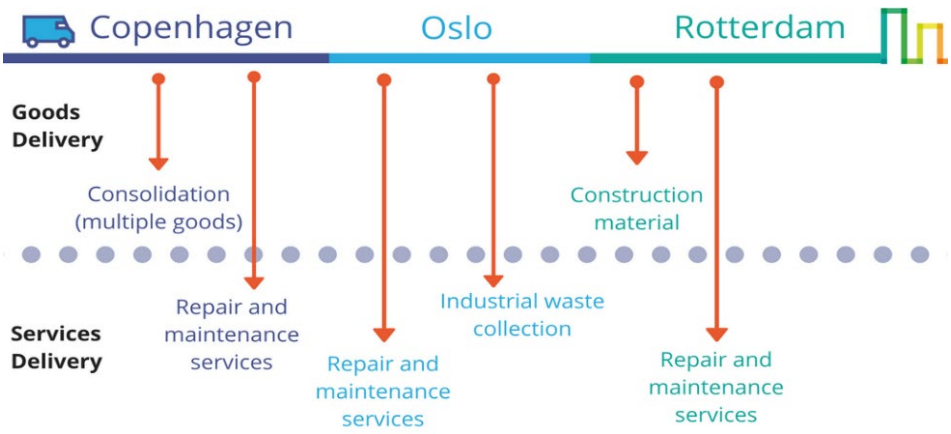
Footprint mapping provides a clear picture of the procurement clusters which have the largest transportation emissions footprint. However, while taking the decision on where to start with "decarbonisation" of its own procurement and on which clusters to focus the efforts, it is necessary to take into consideration the whole spectrum of prioritisation criteria.

Within BuyZET the cities assessed which procurement categories to focus on based on a number of prioritisation criteria:

- **Meaningfulness:** The size of the transportation emissions footprint.
- **Feasibility:** How feasible it would be to make a change in the procurement of these goods and services that will result in decreased emissions. For example, sometimes it is easier to start with product or service group that has a limited number of suppliers.
- **Visibility:** Internal and external visibility is expected to improve the effectiveness of communication about zero emission deliveries, raise awareness and initiate expected change in internal (municipal procurement) and external (suppliers) behaviour.
- **Snowball effect:** the potential of snowball effect that "decarbonisation" of this procurement cluster can have on a broader client group of the specific service providers. Municipalities are usually not the unique clients of the service providers. By facilitating zero emission delivery to the municipality, public authorities can encourage suppliers to also serve other clients with zero emission vehicles.
- **Political priorities:** Local political focus on certain environmental issues, and/ or sensitivities for example in relation to certain economic sectors, can play a role in determining where to focus efforts.
- **Planning:** contract management planning. It is necessary to look when contracts need to renewed or extended.
- **Budgetary significance:** the yearly spend (total invoice amount) on the service or goods.

Following this prioritisation exercise, each city identified a series of procurement areas to explore further – see figure 2.

Figure 2. Result of the prioritisation exercise for BuyZET cities



STEP 3. MARKET DIALOGUE WITH SUPPLIERS

The final objective of BuyZET is to identify and map out pathways to achieving zero emission delivery of procured goods and services in the urban environment. For this process to succeed it is critical that these pathways are developed in collaboration with suppliers and other market actors throughout the supply chain – in order to ensure that the procurement plans developed and any tender criteria will be feasible and effective.

The importance of such "market engagement" processes in driving sustainable innovation in the market is now widely recognised, and a substantial amount of guidance is available on this (see for example the *SPP Regions best practice report*[31]).

The BuyZET cities approached market engagement in different ways (for more details on the processes followed, and the conclusions reached, please see the *Market Engagement Reports*[32] under each individual city page):

- **Rotterdam** conducted a series of meetings with several suppliers for each procurement category. These suppliers were invited to join the market engagement by publishing a procurement prospectus[33] on the tender platform www.negometrix.com. Furthermore, known applicants for contracts were actively approached by the Rotterdam contract manager to inform them of the market engagement activities and encourage them to participate. Individual sessions with each supplier were than carried out, focusing on the aspects of:
  - Selection criteria (minimum demands) for contractors;
  - Selection criteria (minimum demands) for contracts; and
  - Tendering criteria for the quality of the contract.
- **Oslo**, for repair and maintenance services, carried out follow-up meetings with existing contracted suppliers, as well as conducting supplier surveys. For facility waste collection, a supplier conference was arranged, bringing together over 70 participants from public authorities, business associations, public funding schemes, transport companies, NGO's, biogas producers, ZEV infrastructure suppliers, waste management corporations as well the represents from the 140 municipalities from the buyers group.
- **Copenhagen**, in order to obtain knowledge and generate ideas for tender criteria on repair and maintenance services, conducted a series of in-depth interviews with suppliers. A sample of suppliers was chosen from three selected subcategories of services. Within each subcategory, one or two suppliers were chosen for interviews.

All municipalities strongly concluded that market engagement activities were absolutely essential to gaining a proper understanding of the market and potential pathways (and obstacles) to zero emission transportation. It was also noted that this is also a useful process for suppliers, to get a better insight into the policy plans and tender requirements plans for the specific cities, as well as developing their own understanding of zero emission delivery opportunities.

[31] http://sppregions.eu/fileadmin/user_upload/Resources/Market_Engagement_Best_Practice_Report.pdf
[32] www.buyzet.eu/core-cities
[33] www.buyzet.eu/wp-content/uploads/2018/03/D3.4-Procurement-Prospectus-Rotterdam.pdf

Examples of key conclusions from BuyZET market engagement activities undertaken in each city:

Rotterdam, construction materials transportation

- General: › Formulate a clear zero emission policy 2018-2025 (program, road map), preferably supported by all road authorities. › Communicate intensively.
- Vehicles: › Spread knowledge about ZEVs that are already available (retrofit and OEM). › Support (temporarily) financially the purchase or use of ZEVs.
- Logistics system: › Calculate capabilities of one or more hubs, with scenarios that they are shared by more companies and more cities. › Determine the possibilities of transport over water.
- Delivery process: › Proceed in a more planned and long-term manner when it comes to ordering products. › Inform the contractor in more detail about the planning.
- Contracting: › Where zero emission transport is possible, extend the contract duration to at least 7 years to allow vehicle investments. › Have permit applicants of a construction site add a logistics plan and introduce a policy framework with perspective on zero emission logistic plans in 2025. › Apply progressive ZEV use as award criterion, with the requirement 100% zero emission at the end of the contract term. › Enforce commitments from contractors regarding emissions. › Calculate whether it is better for zero emission to split a contract into a part transport and a part product supply.

Copenhagen, craftsmen and maintenance services

- ZEV use is possible for most craft and facility services, including electric vehicles as well as other modes such as cargo bikes, or public transportation – in some cases this is already being done.
- Don't describe the service procured too restrictively to avoid creating barriers for the service provider to optimize their solutions and minimise their driving
- Engage in market engagement for each type of service to determine to what extent it is possible to demand, or rather award preference to, zero emission transportation.
- Incentives for using ZEVs relate to a) company sustainability policies, b) avoiding congestion and scarcity of parking slots.

Oslo, facility waste and craftsmen services

- Informing suppliers of municipal zero emission delivery ambition is highly important. It shows a clear direction and gives suppliers predictability when choosing which type of vehicles and technology to invest in.
- Most suppliers are keen to invest in ZEVs, but barriers remain in terms of the technology and access to charging infrastructure.
- Suppliers need predictable conditions. It is costly for them to invest in ZEV's. The proposed solution to this is to give credit to ZEV's which are introduced during the contract, rather than before the contract starts. Longer contract length is also proposed as a way to reduce the risk that suppliers are facing when investing in vehicles.

STEP 4. BUYERS GROUPS

Municipalities are, of course, not the only customers within the city or region for the range of products and services they buy. Collaborating with other major public (e.g. universities, hospitals) and private sector buyers for the specific procurement category can be a very effective way of increasing impact and also reducing cost. The development of buyers groups can help to create sufficient demand for innovative transport solutions and facilitate the generation of sufficient purchasing power necessary to facilitate the uptake of innovative solutions by the private market (e.g. uptake of heavy duty electric vehicles, sufficient volumes for the use of urban consolidation centres, etc.).

The types of other buyer to approach will vary considerably according to the procurement category. In the area of repair and maintenance work, for example, it may be worth collaborating with housing companies, or building developers. For waste collection, major retailers may be interested in collaboration.

Buyers groups can have multiple forms of co-operation, since each priority area requires a different setting and level of integration, and different levels of governance involved – regional, national etc. It is necessary to identify all key public and private sector buyers with whom there may be potential for procurement collaboration within specific procurement categories. This may include joint procurement, or an alignment of tender requirements or simply a platform for discussion of common challenges. Within BuyZET the cities explored the following options (for more details on the processes followed, and the conclusions reached, please see the Establishment of Buyers Groups Reports[34] under each individual city page):

- In **Oslo**, the National Programme for Supplier Development (NHO), which includes regional procurement partnerships for a total of 132 municipalities, is exploring common interests and challenges in achieving zero emission from waste transportation, as well as sharing of best practice from completed tenders.

- In **Copenhagen**: the Danish Partnership for Green Public Procurement, a collaborative effort of Danish public organisations for GPP, will consider supporting the results and the recommendations of BuyZET, also in collaboration with the Danish central purchasing body SKI.

- In **Rotterdam**, Connekt, a joint agency of the Ministry of Economic Affairs and the Ministry of Infrastructure and Water Management, has agreed to share the outcome of the BuyZET footprint mapping and the experience for the development of a procurement strategy to systematically stimulate the zero emission delivery policy ambition. So far, it has been observed that high density and large population in a city positively influence the possibility to form buyers groups, since suppliers and logistics operators can more easily consolidate orders and deliveries. In this regard, the city of Rotterdam, together with other private and public local players, plans to identify common suppliers among local buyers, to align ordering patterns: to facilitate this process, Rotterdam is considering developing a tool which helps big buyers to identify their peers. This tool could then be easily transferred to other cities, that could apply a universal solution to their local-specific environment.

London public-private cooperation for procurement of green and efficient services[35]

Collective procurement in London. **This involves businesses working together to reduce the amount of freight and servicing activity in an area. For example, in partnership with New West End Company BID, TfL established preferred suppliers for waste and recycling collection services and promoted their use among businesses on New Bond Street. This reduced the number of vehicle movements from 144 to 9 a day and waste bags on the footways during shopping hours by 67%.**

Working with major estates and multi-tenanted premises. **Multi-tenanted premises are among the biggest customers of the delivery and servicing industry in London, putting them in a powerful position to influence these trips. Many estate management companies TfL has spoken to either support or have introduced initiatives that reduce the impact of deliveries and servicing activity and personal travel to and from the buildings in their estate.**

[34] www.buyzet.eu/core-cities

[35] http://content.tfl.gov.uk/freight-servicing-action-plan.pdf

STEP 5. INNOVATIVE PROCUREMENT PLANS

The final step in the BuyZET process is the development of innovative procurement plans. These are designed to take the findings of the previous steps, and turn these into a concrete plan of action – outlining the procurement approach to be taken (or piloted) for the procurement category addressed.

This final step is an ongoing process within BuyZET. First conclusions are included the recommendation sections above. The final Innovative Procurement Plans will be available when ready on the individual city pages on the BuyZET website[36].

Stakeholder cooperation in the Netherlands: Green Deal Zero Emission City Logistics

In the Netherlands, at the national level, agreements – called Green Deals[37] - are made between the national government and other partners (e.g. companies, other authorities, NGOs, etc.) in order to reduce energy consumption and improve sustainability. Rotterdam aims at zero emission urban freight system for its city centre by 2025.

In order to meet this objective, in October 2014, the municipality of Rotterdam, the Dutch research institute TNO and six transport companies in the Rotterdam region signed an agreement, called Green Deal 010 Zero Emission City Logistics (GD010ZES)[38] work together in a City Logistics Living Laboratory (CLLL) approach. The objective of this freight partnership is to develop, test and run urban logistics solutions identified in a non-binding Roadmap, defined in the framework of the GD010ZES.

[36] www.buyzet.eu/buyzet-cities
[37] https://www.greendeals.nl/english
[38] https://www.logistiek010.nl/en/programme/Green-Deal-010-Zero-Emission-Citylogistics-39

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PROCURING ZERO EMISSION
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