

Vehicles and transport

Framework agreement on the procurement of electric, hydrogen, and plug-in hybrid vehicles



Purchasing body:	Municipality of Copenhagen
Contract:	1 year framework agreement (with the possibility of extension for 1 + 1 year) Contract awarded: January 2017
Savings:	<ul style="list-style-type: none"> • 74 % CO₂ reduction (almost 20 tons CO₂/yr) • 27 % reduction in annual energy consumption (0.02 GWh/yr).

SUMMARY

- Framework agreement on the procurement of up to 245 electric-; hydrogen; and plug in hybrid vehicles The contract is divided into 14 subcontracts that each contain agreements with up to 5 suppliers.
- The Municipality of Copenhagen has procured 29 battery electric vehicles (BEV's), through this contract. Achieving a 74% reduction in CO₂ emissions.
- Subcontracts have been awarded to Renault, Hyundai, Nissan, BMW, IVECO. The five different companies can bid on the subcontracts as they please. Value: €5,373,080 over the course of the framework contract.

Procurement approach

The Municipality of Copenhagen has completed a framework agreement on the procurement and operational leasing of 245 electric, hydrogen, and plug-in hybrid vehicles.

The tender was completed on behalf of a *joint procurement community*, which the Municipality of Copenhagen has entered into with 19 other municipalities, regions, and state authorities for the procurement of environmentally friendly passenger cars, vans and mini buses. Every member of the joint procurement community has indicated their expected procurements under the framework contract; coming to a total of 245 vehicles.

The framework agreement runs for 1 year (with a possible extension for 1 + 1 year). The Municipality of Copenhagen is obliged to make use of the framework agreement, while the other parties may voluntarily use it. This difference is rooted in the municipalities' different political ambitions. The Municipality of Copenhagen has set more ambitious standards for themselves.

The tender has been completed to help promote greener transportation in Copenhagen, as described in Copenhagen's "Action Plan for Green Mobility". The plan was politically adopted in 2012 and together with the "CPH 2025 Climate Plan"¹ it is intended to contribute to a CO₂-neutral city by 2025.

The Municipality of Copenhagen announced the tender in December 2016 in the Official Journal of the EU. The contract was concluded approx. 1.5 months later.

PROCUREMENT INNOVATION

This is the first time that the City of Copenhagen has asked for hybrid cars.

Another new feature of the tender is that it offers the opportunity to extend the contract with new and currently unavailable technology. See section below for more detail.

The contract was divided into 14 subcontracts, each containing their own set of criteria:

- Subcontract 1: Small electric passenger car for city driving
- Subcontract 2: Small electric passenger car for longer trips
- Subcontract 3: Compact electric passenger car for longer trips
- Subcontract 4: Electric van for city driving
- Subcontract 5: Electric minibus for city driving
- Subcontract 6: Compact plug in hybrid passenger car for long trips
- Subcontract 7: Hydrogen passenger car for long trips
- Subcontract 8: Electric micro car for city driving
- Subcontract 9: Compact electric passenger car for city driving
- Subcontract 10: Compact electric passenger car for longer trips
- Subcontract 11: Electric van for city driving
- Subcontract 12: Electric large van for city driving
- Subcontract 13: Electric minibus for city driving

¹<https://international.kk.dk/artikel/liveable-green-city>

- Subcontract 14: Compact plug in hybrid passenger car for long trips.

Each subcontract was signed with the five suppliers offering the lowest price which met the technical specifications. Subsequent orders will then be completed through *mini-tenders* under each subcontract, whereby suppliers bid with prices not exceeding those they have used to enter into the framework agreement. Suppliers are not obliged to bid on a mini-tender.

The possibility of awarding *mini-tenders*, between the suppliers included in the framework agreement is another special feature. The mini-tenders run over a short period of time (1.5 week) and are included to ensure flexibility and allow ongoing procurements to be exposed to competition. This ensures the Municipality of Copenhagen will gain from the continuous price reductions on electric vehicles as well as any overstocking that might result in reduced prices.

Joint Procurement Community

In Denmark there is a tendency for municipalities to enter into so called *joint procurement communities* with surrounding municipalities, in order to reap large scale benefits.

Some of the advantages of making a joint purchase are the ability to:

- reduce administrative costs for the organizations participating.
- achieve a more favourable price on delivery (larger scale).
- push the market in a desired direction, due to the scale of demand and the number of actors involved. E.g demanding alternative products that take environment and climate into consideration.

Market engagement

Prior to the tender, there was a dialogue with the market to identify relevant vehicles. The dialogue will continue throughout the duration of the framework agreement.

In this tender market engagement has been a core element. Dialogue with the market was particularly important on issues relating to 1) leasing and 2) the specification of battery electric vehicles (BEV's) that should be included in the framework agreement at a later time (see below).

Future-proof approach

A unique feature in this tender is that subcontracts for vehicles not yet on the market are included (subcontracts 7-13). . The idea is that suppliers that with some certainty believe that the subcontract requirements can be met in the near future can enter with vehicles that they expect to offer the market in the near future. It is a prerequisite for the (future) use of the sub-contracts that the future vehicles will, as a minimum, meet the requirements of the framework agreement. In this way the municipality of Copenhagen can obtain the newest BEV's immediately after they have been introduced to the Danish market.

Tender specifications and Verification

TECHNICAL SPECIFICATIONS

A number of different technical specifications for the vehicles have been identified, divided into i.a. following topics:

- Type approval: All vehicles to be registered in Denmark upon delivery, no modified or converted vehicles, all vehicles to be left-hand driven and with a closed cabin.
- Quality - Minimum EURO NCAP Crashtest results obtained: For passenger cars = 4 stars/
For vans = 3 start / for minibuses = 3 stars.
- Battery and charging: All vehicles (except hydrogen vehicles) should as a minimum be recharged with AC 3,3 kW. If the vehicle (except hydrogen) can recharge with 3 phases AC, the vehicle should be able to recharge with a minimum 10 kW AC. If the vehicle (except hydrogen) has a recharge effect of less than 10 kW AC it should be able to recharge with a minimum of 40 kW DC.
- Guarantee, service and maintenance: All vehicles to be delivered from the factory and with a minimum of 24 months guarantee on spare parts. Additionally there should be cars for loan in replacement for those undergoing service.
- Factory guaranty: Minimum of 24 months

In addition, there are specific requirements for the different types of vehicles.

AWARD CRITERIA

- Access to each subcontract is determined on the basis of the price. Meaning that the five lowest bids for each lot are awarded the contract jointly.
- The award criterion for mini-tenders that are completed by the individual stakeholders in the joint procurement community is also lowest price.

Results

Environmental impacts

Environmental impacts are summarized in the table below. Bear in mind though, that the numbers only represent the environmental savings obtained by the Municipality of Copenhagen. Obviously the reduced emissions reach further if you take the entire framework agreement into consideration.

Furthermore, an obvious positive impact relates to improved air quality by reduction of particulate emissions.

Table 1: Environmental savings

Tender	Consumption (l/year)	CO ₂ emissions (tonnes/year)	Primary Energy consumption (GWh)
Baseline	9,280 l/year	26	0.09
Green tender	29,000 kWh/year	10	0.07
Savings		16 (63%)	0.02 (22%)

CALCULATION BASIS

- Quantity of vehicles: 29
- Average distance per vehicle/year: 8,000 km
- For conventional vehicles: 4 l diesel/100 km
- For electric vehicles: 12,5 kWh/100 km
- CO₂ emissions for conventional electricity set at 0,404652 g/kWh
- CO₂ emissions from RES sources set at 0,017 g/kWh
- For primary energy consumption a PEF (Primary Energy Factor) of 2.5 was assumed for electricity produced from fossil fuels, and 1.1 for RES²
- Calculation made using the tool developed within the GPP 2020 project (www.gpp2020.eu), and refined within the SPP Regions project. Available on the SPP Regions website.
(More detailed calculation tables are included in the Annex below).

² Source: Ecofys, Development of the Primary Energy Factor of Electricity generation in the EU-28 from 2010-2013, 2015

Financial impacts

A total cost of ownership (TCO) approach was not considered relevant in this case since electric vehicles currently are more expensive than vehicles that run on conventional fuel. The procurement of these 29 BEV's reflect a political strategy, and a price comparison has therefore been regarded as irrelevant. The Municipality of Copenhagen has noted that purchase prices of electric vehicles were 8-30 % higher.

Contract management

Random samplings will be conducted to ensure that suppliers comply with their certification. GPS trackers are installed in all passenger cars enabling the contractor to follow up on driving patterns and consumption.

Lessons learned and future challenges

An important 'lesson learned' in this tender relates to the partial agreements, that makes it possible to procure vehicles not currently on the market. It has proven quite important to define *futurity*. In Copenhagen this means that a partial agreement will run for a maximum of 6 months. This was important so that suppliers could not complain that the term futurity was too unspecific.

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About SPP Regions

SPP Regions is promoting the creation and expansion of 7 European regional networks of municipalities working together on sustainable public procurement (SPP) and public procurement of innovation (PPI).

The regional networks are collaborating directly on tendering for eco-innovative solutions, whilst building capacities and transferring skills and knowledge through their SPP and PPI activities. The 42 tenders within the project will achieve 54.3 GWh/year primary energy savings and trigger 45 GWh/year renewable energy.

SPP REGIONS PARTNERS



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Location	Denmark	CO ₂ -emissions per kWh (kg CO ₂ /kWh)	0,329																					
Input	% Green electricity for Electro engine (if any)			0%	% Green electricity for Electro engine (if any)			0%	% Green electricity for Electro engine (if any)			0%												
	Baseline												Conventional tender						Green tender					
	Quantity of vehicles	Average distance per vehicle per year (km/yr)	Kind of fuel	Amount of fuel per 100 km	Quantity of vehicles	Average distance per vehicle per year (km/yr)	Kind of fuel	Amount of fuel per 100 km	Quantity of vehicles	Average distance per vehicle per year (km/yr)	Kind of fuel	Amount of fuel per 100 km												
	Standard Engine - fuel 1		Diesel	l/100 km	29	8 000	Diesel	4,0 l/100 km						Petroleum			l/100 km							
	Standard Engine - fuel 2		Diesel	l/100 km											Diesel			l/100 km						
Electro Engine		Electricity	kWh/100km					29	8 000	Electricity	kWh/100km	12,5	kWh/100km											
Hybrid Engine																								
Electricity (combined test cycle)		Electricity	kWh/100km							Electricity	kWh/100km			Electricity			kWh/100km							
Fuel (combined test cycle)		Diesel	l/100 km							Diesel	l/100 km			Diesel			l/100 km							

Savings	Savings (Conventional tender / Green tender)			
	Energy savings (GWh/yr)	CO₂-savings (t/yr)	% of energy savings	% of CO₂-savings
Standard Engine - fuel 1	0,09	26	100%	100%
Standard Engine - fuel 2				
Electro Engine	-0,07	-10	#DIV/0!	#DIV/0!
Hybrid Engine				
Electricity (combined test cycle)	0,00	0	#DIV/0!	#DIV/0!
Fuel (combined test cycle)				
TOTAL FOR THE PROJECT	0,02	16	22%	63%