

Procurement of electric vehicles to test the economic efficiency Provincial government offices of Upper Austria and Carinthia

About this Best Practice Case

This Best Practice Case is interesting for other Public Procurers because the objective of Upper Austria and Carinthia (two federal states of Austria) was not just to procure Electric Vehicles for its fleet, but to learn more about the economic efficiency of such vehicles in relation to their fleet management system. The aim was to solve questions like: how can it be ensured in the software that the tested electric vehicles have a minimum usage per year; how can the e-vehicle be prioritized in the fleet management system especially for longer routes that employees want to book and how is their conduct and energy consumption in real daily usage (wintertime/summertime) compared to the manufacturers specifications. The main goal was to determine if and how the vehicles in the existing fleet could be changed to electric vehicles with the same amount of vehicles, the same budget and being more environmental friendly.

<p>Title: Procurement of electric vehicles to test the economic efficiency Cluster Topic: Vehicles Procedure: Direct Award Contract (DAC) Country: Austria Procuring Authority: Upper Austrian Government</p>
--

Upper Austria & Carinthia: Direct awarding of three electric vehicles to test their economic efficiency within the existing fleet and fleet management system

Key Points

- An investigation to determine if a change of the allocation of vehicles in the fleet management system software can lead to at least a usage 15 000 km/year of the e-cars to guarantee its economic efficiency
- Tests of three electric vehicles in practice
- Integrating a charging concept in the fleet management system that relates to the calendar and to meeting durations of the employees that use the vehicles
- The project was awarded with the Austrian Innovative Procurement Price

The Procurement Objectives

Brief description

Electric Vehicles (e-cars) are on the front run these days as cities and regions want to fulfil their environmental goals and lower the CO₂ emission. Governments created several instruments, like state subsidies for a private buyer of an e-vehicle or changes of taxation, that start to have an impact. But how can a public procurer guarantee the economic efficiency of e-cars in its own public fleets, without higher costs due to the sustainability goals that the government wants to meet? Are there re-useable practical tests and guaranteed performances? Can one integrate a new charging concept, such as the time schedules of employees and their meeting duration in the fleet management software, in a way to foster the economic efficiency of the e-cars?

E-cars have often a considerably higher price when considering only the purchase price and not the live circle costs. Even if one considers the life-cycle costs (LCC) e-cars are only economically efficient if they are used for a large number of km per year. The Upper Austrian authority calculated that in their situation e-cars can only be economically efficient with a use of more than 15,000 km per year. The energy price of electricity is considerably lower than for fuel, but only with a high usage this compensates the higher purchase price.

Another fact to consider is that they do not have the same range (travelling distance without re-fuelling/re-charging) as petrol engine vehicles and therefor it was not clear in this case, if they can be used for every route.

The government of Upper Austria has a fleet of about 300 vehicles for immediate use. E-cars have been procured in Austria, but no real practical tests have been done to evaluate their usability and economically efficiency in a public fleet. Many cities and federal states procured

one or more electric vehicles and just use them for about 3,000 km per year, which does not lead to clear results and clear evidence about their performance.

Therefore the Upper Austrian Procurement department set the following goals and requirements for the testing of e-cars within their public fleet:

- i)** Each vehicle has to be used at least 15,000 km per year and in different seasons (wintertime, summertime);
- ii)** Test at least two different models of e-cars in different price ranges to assess their long term economic efficiency;
- iii)** The additional cost for the charging stations had to be covered via sponsoring or similar;
- iv)** Learn about practical performance;
- v)** Build 5-6 charging station at often visited district administrations, to charge during the meeting time and test a new charging concept;
- vi)** The last charging station built is an intelligent charging station to test if the data provided by the station leads to saving of administrative resources - for example, through automatically accounting of business trips;

Reasons for this procurement

For the procurement department of Upper Austria the main goal, when it comes to procure vehicles for their fleet, is not fulfilling environmental criteria but the economic efficiency, which they have to guarantee. They have a limited budget for the vehicles required for the travels. At the moment the decisive factor in fleet procurement is the financial benefit, although environmental concerns are becoming increasingly significant in fleet procurement decisions.

There are currently no requirements in Upper Austria that vehicles have to be replaced with zero-emission vehicles. This would also be very difficult to do as the department for procurement is required to guarantee the number of vehicles and the performance of the whole fleet for a limited budget. With the current project, the procurement department wanted to find out what they could do internally – like changes in the fleet management software or similar – to determine if e-vehicles can be economically efficient in practical usage.

Innovative Aspects

Although electric vehicles can still be considered as innovative and using life-cycle costing (LCC) to purchase them is quite new for many public procurers, the main innovative aspect within this purchase are the considerations behind it. The main goal was to learn how the vehicles can be economically more efficient when changing the fleet management system accordingly and what has to be done to do so.

The results of this small purchase will help Upper Austria to know which and how many vehicles of their fleet can be replaced by electric vehicles in the future and how other fleet management perspectives have to adopt to the different requirements that such vehicles have (taking the charging time into account etc.).

The setup of this procurement project was awarded with the Austrian Innovation Procurement price.

The Procurement Process

In preparation of the tender the Upper Austrian Procurement Department used LCC-Counters to assess what is needed to test economically efficiency. They also decided to use different vehicle models: two of the higher price range and one of the lower price ranges to assess if both are efficient.

Procurement Procedure

Key Reasons for using the Direct Awarding Contract

As the value of the purchase is under threshold the purchase could be done via direct awarding also called below-threshold contract. This means the purchase was not subject to competition.

Direct Award Contracts DACs in short

“Public procurement should, in the majority of cases, be subject to competition to ensure best value for money. DACs are also known as Single Tender Actions and occur when a contract is awarded to a contractor without a competition, or where there is a material change to an existing contract.”³

Considering the life-cycle costs (LCC) or total costs of ownership (TCO)

The Upper Austrian Procurement department was using the [E-Mobility-Counter of the Linz-AG](#) to count the economically efficiency and life-cycle costs. This counter was found during the first preparation and research and used because it contained all information needed. Another similar tool, the European Commission is recommending the [LCC Tool from the Clean-Fleet project](#). The following main costs have been considered:

Costs
Purchasing Costs of the Vehicle
Costs in ongoing operation
Taxes
Maintenance costs
Resale Value

The technology of e-vehicles is quite new, which makes it difficult to estimate the resale value. Since about three years, resale values are listed in the so called “EUROTAX”, which is a list that can be used by public procurers to have reliable numbers for the resale value.

Another method would be to use the total costs of ownership (total OLC) this is a method where environmental cost are also taken into account. The method is outlined in the CVD

³ <https://www.infrastructure-ni.gov.uk/articles/direct-award-contracts>

(Clean Vehicle Directive) and allows the public procurer to compare the environmental impacts of different vehicles in monetary terms.

Following costs are added to determine total OLC, compared to LCC⁴:

Costs
Lifetime energy consumption costs
Lifetime CO2 emission costs
Lifetime NOx emission costs
Lifetime NMHC emission costs
Lifetime PM emission costs

LCC and OLC can be used in different ways when procuring:

- During the needs analysis to estimate the total costs (this was done in this case)
- During the tender process as criterion to evaluate the most economic advantageous offer⁵

Key Results

The federal state government of Upper Austria and the federal state government of Carinthia decided to do this project in cooperation to learn about options and possibilities of replacing their conventional service vehicles with e-vehicles.

The main results are the learnings listed below.

It was also the first step in building a charging infrastructure in Upper Austria. In this way it also served as an example to encourage citizens to use this kind of new technologies.

⁴ Clean Fleets Project 2014, Procuring clean and efficient road vehicles, p.26, URL: http://www.clean-fleets.eu/fileadmin/files/documents/Publications/Clean_Fleets_Guide_-_Final_June_2014_.pdf

⁵ Annie Stålborg, EC Expert group, URL: <http://ec.europa.eu/environment/gpp/pdf/expertgroup.pdf>

Key Lessons Learnt

As there have not been practical test like this before in Austria, the following aspects could be learned for future procurement of electric vehicles for public fleets:

1. Using different kinds of e-cars showed that the cheaper e-vehicle (around 30,000 euros) can be economically efficient.
2. The maximum range of the cars is about 50% lower than the manufacturer specifications say. It would be very helpful for public procurers to have reliable manufacturer specifications about the maximum range in real practical use that can be used also for the tender. An option could be to use penalties in the tender when the minimum promised performance is not reached.
3. Optimising the allocation program of the fleet management system to the different requirements of e-vehicles proved to increase the efficiency.
4. Charging Stations with just 22KW proved to be sufficient for the need of the fleet.
5. The much higher energy consumption in the winter led to an even greater minus in the maximum range (km) of the cars.

References and Further Information:

1. Information on direct award contracts:

<https://www.infrastructure-ni.gov.uk/articles/direct-award-contracts>

2. LCC Counter from the LINZ AG:

[E-Mobility-Counter of the Linz-AG](#)

3. Guidelines to purchase clean vehicles:

Clean Fleets Project 2014, procuring clean and efficient road vehicles, p.26, URL:
[http://www.clean-fleets.eu/fileadmin/files/documents/Publications/Clean_Fleets_Guide -
_Final_June_2014_.pdf](http://www.clean-fleets.eu/fileadmin/files/documents/Publications/Clean_Fleets_Guide_-_Final_June_2014_.pdf)