Use of electric vehicles for parcel distribution at UPS Karlsruhe

Implementation of low emission technologies, Innovative vehicles, Transport management, Fleet management, Environmental standards and policy, Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery), Innovative operational solutions

UPS is testing and analysing the use of a fleet of electric vehicles in urban traffic systems to reduce CO\textsubscript{2} emissions, noise and particular emissions. The vehicles being used are conventional diesel vehicles that have been modified into electric vehicles. These electric vehicles are being used mainly in inner city areas and on trips shorter than 80km. The vehicles return to the depot with about 20% residual charge and are then recharged at a specific loading facility by the responsible person. All vehicles are charged through the night.

What was the main problem, idea or motivation that led to the development and introduction of the new practice?

The main idea is to meet vehicle access regulations to inner city areas and agglomerations that are already strict and will become even stricter in the future. Also incentives may be given to electric delivery vehicles in the future (e.g. well-located parking spaces, longer access times in pedestrian zones, and use of bus lanes). Customers also prefer a delivery or pick-up by electric vehicles. So the image of the company can be improved.

What was the common practice before the implementation?

Before this solution, diesel or gas powered vehicles were used for distribution in urban areas.

What was the purpose and the sustainability objective of the case?

The purpose of this field test is to overcome possible future regulations and to make use of possible future incentives for electric vehicles in inner cities and agglomerations. Further, environmental impacts shall be minimized by using electric delivery vehicles. At the same time, the use of electric vehicles in the urban delivery sector has been implemented under real business conditions.

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Benefits:
- Possible future incentives by city and municipality administrations
- Reduction of CO\textsubscript{2} emissions for delivery and pick-ups
- Reduction of traffic noise and congestions and so having potential for more out of hours deliveries
- Improved customer image by using e-mobility

Success Factors:
- All the electric vehicles have been modified from diesel vehicles.
- UPS uses these electric delivery vehicles in ever-more regulated inner city areas in order to ensure successful and efficient urban deliveries in the future.
- User acceptance is constantly being monitored and shows very positive results. Both drivers and customers are interested and enthusiastic about use of these electric vehicles.

Supported Strategic Targets:
- Reduced pollutants emissions
- Reduced greenhouse gas emissions
- Conservation of resources
- Improved Image
- Ideal utilization of infrastructure and increased efficiency of routing
The project was started within the research programme “show case region for e-mobility” in Baden-Wuerttemberg for the period 2013 to 2015. The vehicles were put into operation in July 2013 at the Karlsruhe branch of UPS. However, UPS is planning to use 7 of the vehicles for a longer period.

The electric vehicles are mainly used in inner city areas. Regulations and incentives by city and municipality administrations are also being considered in the project. UPS is keen for research into incentives such as loading and unloading points especially for electric vehicles, altered access times for inner city delivery and the usage of bus lanes. Changes to existing regulations are being discussed in close cooperation with the cities the electric vehicles are being operated in.

UPS’ approach is to use as large vehicles as possible to reduce traffic and emissions because the volume of vehicles is more important than the gross vehicle weight for the parcels carried. The electric vehicles at UPS were originally conventional diesel vehicles that were modified into electric vehicles. This reduces the costs because all other parts can be reused. The conversion was done in Southern Germany by the company “Elektrofahrzeuge Schwaben GmbH” (EFA-S).

The vehicles were modified in close cooperation to make sure further developments can be easily implemented. An example of this is the “direct drive” that increases the vehicles’ efficiency. As they are equipped with a 1,200 Nm engine, these vehicles have almost 4 times the power of a conventional diesel engine.

More information:

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Main actors involved:
• UPS
• EFA-S, Elektrofahrzeuge Schwaben GmbH
• Automobile industry
• Parcel logistics service providers

Transport mode or supply chain elements:
• Road / delivery van
• Transport operations in last mile deliveries
• Fleet management
• IT support of operations with electric vehicles
• Planning and management of electric charging infrastructure

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