Electric Taxis in Shenzhen

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Example: Shenzhen

Since motor vehicles are the fastest growing contributor to global greenhouse gases (GHG), developing Electro-Mobility is a promising approach for sustainable transport. Since 2010, the southern Chinese metropolis Shenzhen is supporting the development of electric-taxis in urban transport. Combining Electro-Mobility with urban passenger transport addresses problems of GHG emissions in a more comprehensive manner.

Shenzhen is one of the first cities developing a fleet of electric taxis. On May 17th 2010, the first batch of 30 e-taxis started to serve the metropolitan area. At the moment, around 800 electric taxis are running on the streets of Shenzhen, which is already nearly three times as many as in 2011. The government expects an enormous growth in the electric taxi sector. By 2014, the number of electric taxis is expected to rise up to 2.200 vehicles.

Cheap alternative

From the perspective of passengers, electric-taxis are cheaper than conventional taxis since they do not have to pay the extra 3 RMB fuel surcharge. The electricity price in Shenzhen is RMB 1.1 per kWh. In comparison to conventional cars, not only passengers save money, taxi driver do as well.

- Electric vehicles cost 0.2 RMB per km compared to 0.8 RMB per km for conventional cars under current energy prices in China.

GIZ Transport Projects in China

How to reduce GHG emissions from urban transport is a key challenge for a sustainable development in China and globally. On behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) GIZ works on Electro-Mobility and Urban Transport. Check for further information: www.electro-mobility.cn and www.tdm-beijing.org

Cars and batteries

All electric taxis in Shenzhen are owned by *Pengcheng Electric Taxi Company*. The Company was established in 2010 and is a joint venture between Shenzhen Bus Group and BYD Automobile Co. The two companies hold a share of 55% and 45% respectively.

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The BYD e6 is the standard electric taxi model in Shenzhen. *(Picture: Daniel Bongardt, 2013, Shenzhen)*

Therefore the same car model is used for all e-taxis: the BYD e6. The BYDe6 is a medium size, modern middle class car. It is a pure electric vehicle, equipped with a 75 kW motor:

- *Li-Fe* battery with a range up to approx. 200 km on a single battery charge in urban conditions (170km with air-condition running)
- Battery takes 1 ½ hours to charge with 60 kwh at a fast charging station
- Price starts at RMB 300.000

The government provides financial support to the electric taxi owners. The price for an electric taxi vehicle is usually around RMB 300.000 including a governmental subsidy of RMB 120.000.

A combination of solar power, energy storage and electrified transportation is used to provide a "*Zero Emission Eco-System*" that connects Electro-Mobility with renewable energies. The BYD e6 is advertised to be the first emission-free vehicle, but considering the share of renewable energies in Shenzhen area of approx. 30 % the goal of zero emission has not yet been accomplished.

Charging is still a problem

The daily taxi driving distance is between 360 and 500 km. Stops for charging and waiting, as well as the distances to the different charging stations need to be taken into account.

- The infrastructure consists of 216 charging poles, which equals an average ratio of 1:4 (this means 1 pole for 4 e-taxis)
- Two or three charging stops per day are necessary since the driving range of 200 km does not cover the daily driving distance of a taxi in Shenzhen
- Waiting while charging: Considering charging at least twice a day results in a waiting time of minimum three hours.

Shenzhen provides 216 charging poles for the electric taxi fleet. *(Picture: Daniel Bongardt, 2013, Shenzhen.)*

Driving range and charging stops are not the only problems. A comprehensive charging infrastructure is still missing. Although the ratio of one charging pole per four electric-taxis sounds quite sufficient, the locations are mostly far outside of the city. The lack of charging stations in the city centre of Shenzhen creates several difficulties for taxi drivers. They are not only forced to wait while charging, they also have to make detours far away from the city centre and their potential customers.

In summary, China's first large-scale model of electric taxis in Shenzhen shows positive effects for improving sustainable urban transport. In order to make electro-mobility in China a climate friendly transport system additional renewable energy needs to be integrated into the power grid and an efficient charging infrastructure needs to be developed.

Contact

www.giz.de/china
http://www.sustainabletransport.org
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