Build Your Dreams

A Green Solution

for São Paulo city transport

May 2011, Rio de Janeiro

Three major environmental questions

World oil crisis

- **40%** of liquid fossil fuels are used in the transport sector.
- **20-30% growth** in the automobile industry in developing countries.

CO2 emissions

- In 2008, Brazil had a total CO2 emission of 364.4 million tons, 149.5 million tons of which - **41%** - came from the transport sector
- Fatal effects of greenhouse gases on the climate

Air pollution

- More than **53%** of oxynitride (NOX and SOX) emissions come from motor vehicles

Source: United Nations Environment Program. Green Economy Report. International Energy Agency. Report of the panel on environmental matters for presentation to the Legislative Council.

Urgent need for e-bus and e-taxi service in cities

Contrasting the impact of pollution and consumption of fuel

	Distance (km/day)	Consumption of fuel (liters)
Taxis	170-200	16-20
Private sedans	40-50	4-5
Buses	220-280	120-150

1 Taxi
≈
4 private sedans

1 Bus
≈
30 private sedans

CO2 emission in the State of São Paulo in 2008

In 2008, in the State of São Paulo, total emissions of CO2 amounted to 77.2 million tons, 42.7 million tons of which - 55% - came from the transport sector. The CO2 emissions from vehicles amounted to 36.24 million tons, that is to say 47% of the total.

	Gg CO2	%
cars	10,894	30.06%
light commercial vehicles	2,372	6.55%
motorbikes	0,798	2.20%
buses	7,459	20.58%
Trucks	13,516	37.30%
natural gas vehicle (GNV)	1,201	3.31%
Total	36,240	100.00%

Source: Government of São Paulo, Bureau of the Environment

BYD is the world's only manufacturer of e-buses, all-electric sedans and Fe batteries

BYD's "*Green City*" solution

EV Taxis

EV buses

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Outstanding power system; the E-driving solution

- **Maximum speed: 140km/h**

- **0-100km/h : <10s**

- **City distance: 300km**

E6: the recharging solution

Convenient recharging solution

- **Normal charge: totally charged in 6 hours**
- **Rapid charge: totally charged in 40 min.**

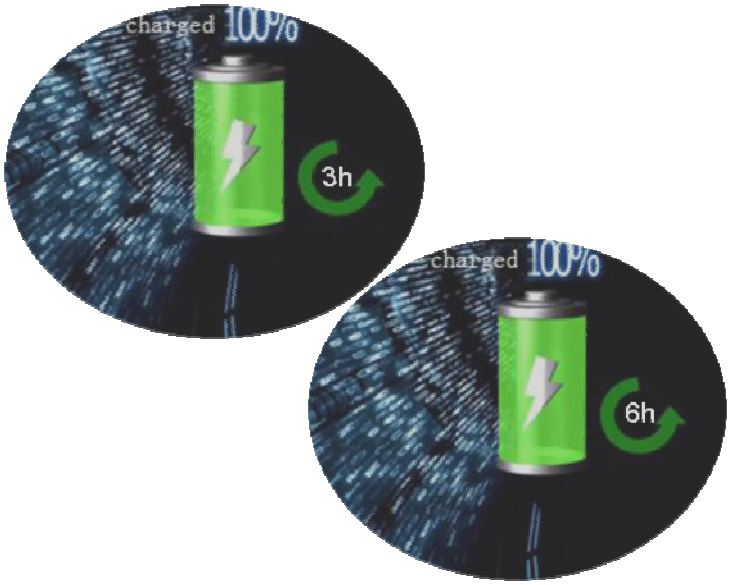
The e6 Fleet

BYD K9: general perspective

Benefits of "Electric Driving":

- Zero emissions, ecological
- Combined distance: over 250km
- Low noise level
- Savings in energy

K9 recharge system



Normal charge: totally charged in 6 hrs

Rapid charge: totally charged in 3 hrs

Sun roof

Fleet of vehicles in São Paulo city

- **Number of passenger automobiles in São Paulo city in 2008:**

  5,104,087

- **Number of taxis in São Paulo city in 2008:**

  32,150

- **Number of buses in São Paulo city in 2008:**

  42,437

Source: São Paulo State Department of Transport, DETRAN
Sao Paulo Department of Public Transport DTP/SMT

Scenario

Passenger automobiles - distance per year: 18,250 Km

Taxis – distance per year: 80,000 Km

Buses – distance per year: 84,000 Km

Type of fuel – passenger automobiles: 50% gasoline, 50% ethanol

Type of fuel - taxis: 50% gasoline , 50% ethanol

Type of fuel - buses: 100% diesel

Fuel consumption – passenger automobiles:

8L gasoline/100 Km, 10L ethanol/100Km

Fuel consumption - buses:

60L diesel/100Km

Price of electricity: US$ 0.21/KWH

Price of gasoline: US$ 1.75/L

Price of ethanol: US$ 1. 30/L

Price of diesel: US$ 1.25/L

... and what if all the taxis were ELECTRIC?

	Conventional taxis	BYD e6	Difference
Consumption of energy per 100Km	8 L gasoline, 10 L ethanol	21.5 kwh	\
Price of electricity	US$ 1.75/L gasoline, US$ 1.30/L ethanol	US$ 0.21	\
Cost/100Km	US$ 13.5	US$ 4.515	US$ 8.985
Annual operational cost	US$ 10,800	US$ 3,612	US$ 7,188
8-year operational cost	US$ 86,400	US$ 28,896	US$ 57,504

- ✓ **an annual reduction of 293,000 tons of CO2 emissions**
- ✓ **an annual reduction of 0.81% total emissions by vehicles**
- ✓ **operational savings of US$ 57,504 or R$ 92,006 over 8 years**
- ✓ **zero pollution**
- ✓ **low noise level**

... what if all the buses were ELECTRIC?

	Conventional buses	BYD K9	Difference
Consumption of energy per 100Km	60L diesel	120 kwh	\
Price of electricity	US$ 1.25/L diesel	US$ 0.21	\
Cost/100Km	US$ 75	US$ 25.2	US$ 49.8
Annual operational cost	US$ 63,000	US$ 21,168	US$ 41,832
8-year operational cost	US$ 504,000	US$ 169,344	US$ 334,656

- ✓ **annual reduction of 7,459,000 tons of CO2 emissions**
- ✓ **annual reduction of 20% of total emissions by vehicles**
- ✓ **operational savings of US$ 334,656 or R$ 535,450 over 8 years**
- ✓ **zero pollution**
- ✓ **low noise level**

Thank you!

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