
BYD
Build Your Dreams
IT'S NOT ONLY WHAT YOU DRIVE
IT'S THE WAY YOU LIVE
BYD's Green City Solution

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- Operation cases--Electric Bus & Electric Vehicle Taxi in Shenzhen
- Economic Benefits -- HK bus & taxi examples
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Largest All - Electric Bus Fleet >

Started:	May 2011
Fleet:	200+ BYD buses 1,000 to be delivered in 2012
Total Traveled:	Over 5.6 mil. km (3.3 mil. miles)
Single Bus:	Over 47,469 km (28,481 miles)
Battery:	Fe battery with 20 years 6,000 cycles life
BENEFITS:	Total cost of operation reduced

ZERO CO_2 emissions
Quick charge
Long range

Updated by April 2012

Battery is stable!

Largest All - Electric Vehicle Taxi Fleet >

Started:	May 2011
Fleet:	300+ BYD ev6s 1,000 taxis and 600 police cars to be delivered in 2012
Total Traveled:	Over 17.4 mil. km (10.4 mil. miles)
Single eTaxi:	Over 195,683 km (112,000 miles)
Battery:	Fe battery with 20 years, 6,000 cycles life
BENEFITS:	Saves operating cost in maintenance and fuel (About 53% of operating costs for fleet vehicles)

Updated by April 2012

Battery is stable!

Immediate Positive Steps >

(HK Bus Example)

One HK City Bus travels an average of 250 km* (155 miles) per day

Daily consumption
~120 liters* of diesel (32 gallons)

Daily emissions
~322 kg** of CO_2

HOWEVER, the average consumer vehicle travels ~50 km (31 miles) daily consuming only 4 liters***
of fuel (1.1 gallons) ~9.24 kg** of CO_2

* UITP(International Association of Public Transport)
**KMB(Kowloon Motor Bus)
***29.4 mpg average consumer vehicle

Immediate Positive Steps >

(HK Taxi Example)

One HK City Taxi travels an average of 500 km* (311 miles) per day

Daily consumption
~40 liters* of LPG (11 gallons)

Daily emissions
~60.4 kg** of CO_2

HOWEVER, the average consumer vehicle travels ~50 km (31 miles) daily consuming only 4 liters***
of fuel (1.1 gallons) ~9.24 kg** of CO_2

* UITP(International Association of Public Transport)
**24.116 lbs/gallon CO_2 emission of gasoline (Travel Matters)
***29.4 mpg average consumer vehicle

The Ratio of One Day's Driven Distance - Bus >

=

A City Bus consumes 120 liters / 33 gallons

A single car consumes 4 liters / 1.1 gallons

One Diesel Bus in a Given Day is Equivalent to 30 Gasoline Cars!

(in fuel consumption and daily emissions contribution)

1:30 Ratio

The Ratio of One Day's Driven Distance - Taxi >

A City Taxi consumes 40 liters /11 gallons

A single car consumes 4 liters / 1.1 gallons

One Gasoline Taxi in a Given Day is Equivalent to 10 Gasoline Cars!

(in fuel consumption and daily emissions contribution)

1:10 Ratio

Electric Bus - Economic Benefits >

(HK Bus Example)

Daily Economic Impact to Change a City Bus to Electric Bus (Fuel Savings)

	City Bus	Electric Bus
Daily Travel Distance	250 km (155 miles)	250 km (155 miles)
Daily Fuel Consumption	120 L (32 g)	0 L (0 g)
Fuel Price	6 HKD/L (22.7 HKD/g)	6 HKD/L (22.7 HKD/g)
kWh Consumed	0 kWh	320 kWh
Electricity Price	1.1 HKD/kWh	1.1 HKD/kWh
Daily Cost	720 HKD	352 HKD

According to diesel, Note: The price mentioned in the program is according to the current fuel and electric price in Hong Kong.

Daily Savings: 368 HKD/bus

Annual Savings: 129,904 HKD/bus

City Savings $288 M Annually!

Note: Estimating 353 days in operation per year and 17,215 buses in HK.

Electric Bus - Total Cost of Ownership Benefits >

(U.S. Bus Example)

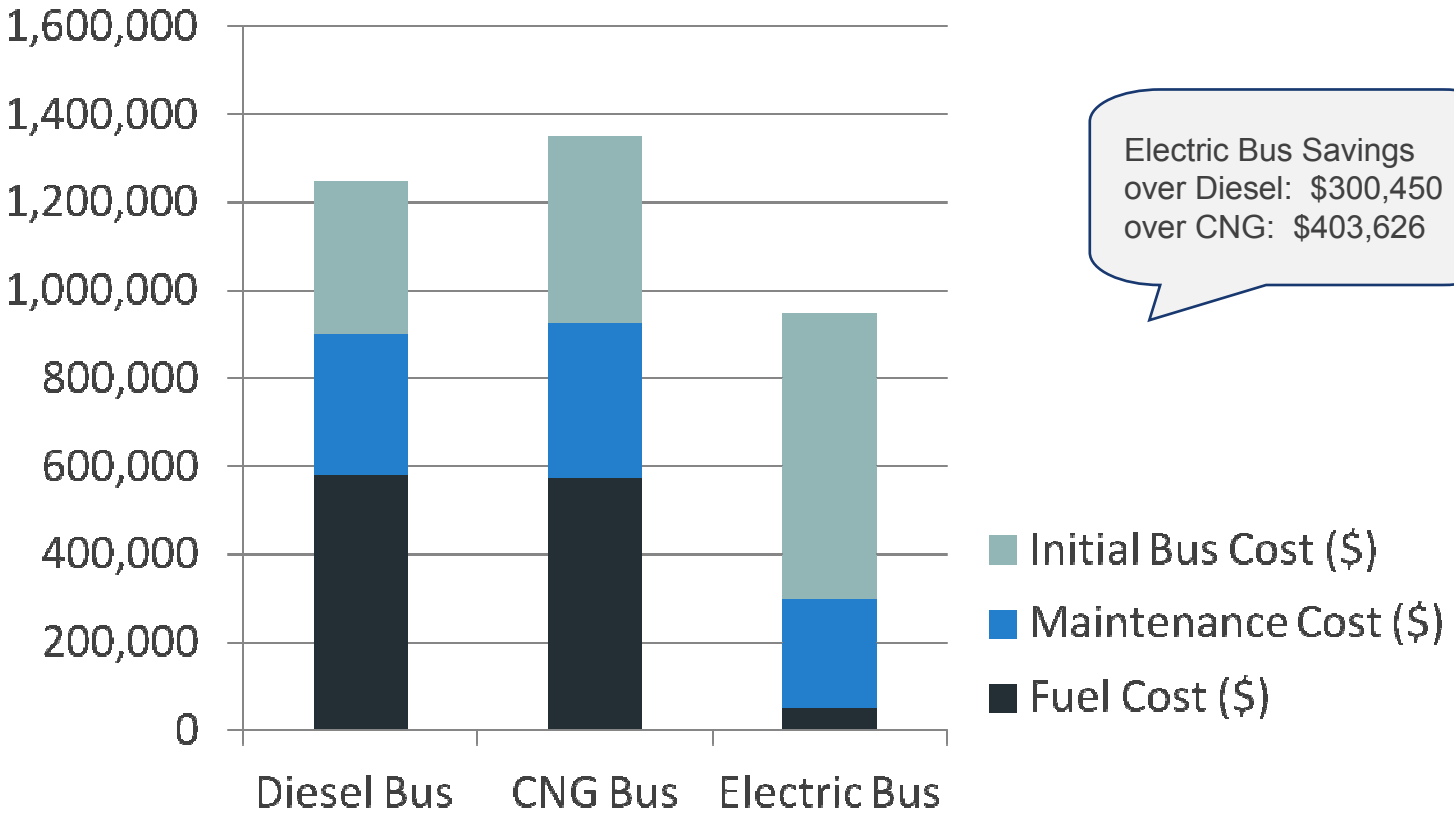
		Diesel Bus	CNG Bus	Electric Bus
Distance/day (km)	240			
Distance/day (mile)	150			
Days in Service Annually (day)	280			
Years (year)	12			
Diesel/CNG/Electricity		45 L/100 km	111.87 L/100 km	120 kWh/100 km
		5.22 miles/gallon	2.1 miles/gallon	1.92 kWh/mile
		4.17 USD/gallon	2.4 USD/gallon	0.06 USD/kWh
Fuel Cost ($)		402,621	576,000	58,061
Maintenance Cost ($)		300,000	250,000	150,000
Initial Bus Cost ($)		350,000	450,000	650,000
LIFE TIME COST ($)		1,152,621	1,326,000	858,061

Source:
http://www.shifttocng.com/

http://www.dieselnet.com/

Total Cost of Ownership of Diesel, CNG & Electric Bus >

Electric Bus is the Lowest Cost Solution!



Electric Bus Savings
over Diesel: $300,450
over CNG: $403,626

Electric Bus - Environmental Benefits >

(HK Bus Example)

Daily Environmental Impact to Change a City Bus to Electric Bus (CO_2 Emissions)

	City Bus	Electric Bus
Daily Travel Distance	250 km (155 miles)	250 km (155 miles)
Fuel Saved	0 L (0 g)	120 L (32 g)
Equivalent CO_2 Emissions	322 kg	0 kg
CO_2 Avoidance	0 kg	322 kg

According to diesel, Source: U.S. Environmental Protection Agency

Daily CO_2 Reduction : 322 kg/bus

Annual CO_2 Reduction : 113,666 kg/bus

City Avoids 2 million tons CO_2 Annually!

Note: Estimating 353 days in operation per year and 17,215 buses in HK.

Electric Bus – Health Benefit >

NOx & Particulate Matters can exacerbate asthma, impair lung function and raise the risk of cardio-respiratory death. And the NOx & SO_2 are the main source of acid rain.

London's 8,500 buses emit about ***6,000 tons*** NOx and ***13,000 tons*** Particulate Matters per year.

(Data source: Environment Report 2010, Transport for London.)

eTaxi - Economic Benefits >

(HK Taxi Example)

Daily Economic Impact to Change a City Taxi to BYD ev6 (Fuel Saving)

	City Taxi	BYD ev6
Daily Travel Distance	500 km (311 miles)	500 km (311 miles)
Daily Fuel Consumption	40 L (11 g)	0 L (0 g)
Fuel Price	3.87 HKD/L (1.02 HKD/g)	3.87HKD/L (1.02 HKD/g)
kWh Consumed	0 kWh	107.5 kWh
Electricity Price	1.1 HKD/kWh	1.1 HKD/kWh
Daily Cost	155 HKD	118 HKD

According to LPG, Note: The price mentioned in the program is according to the current fuel and electric price in Hong Kong.

Daily Savings: 37 HKD/taxi

Annual Savings: 13,061 HKD/taxi

City Savings $31 million Annually!

Note: Estimating 353 days in operation per year and 18,138 taxis in HK.

eTaxi - Environmental Benefits >

(HK Taxi Example)

Daily Environmental Impact to Change a City Taxi to BYD ev6 (CO_2 Emissions)

	City Taxi	BYD ev6
Daily Travel Distance	500 km (311 miles)	500 km (311 miles)
Fuel Saved	0 L (0 g)	40 L (11 g)
Equivalent CO_2 Emissions	60.4 kg	0 kg
CO_2 Avoidance	0 kg	60.4 kg

According to LPG, Source: U.S. Environmental Protection Agency

Daily CO_2 Reduction: 60.4 kg/taxi

Annual CO_2 Reduction: 21,321 kg/taxi

City Avoids 0.35 million tons CO_2 Annually!

Note: Estimating 353 days in operation per year and 18,138 taxis in HK.

Electrified Transportation Keeps the Fuel Expenditures Local >

Summary of Hong Kong City Savings

Bus + Taxi = $288 M + $31 M = ***$319 million***

~ 95% of the City Transportation Fuel Bill for Foreign Oil!

Summary of Pollution Avoidance

Bus + Taxi = 2 M tons + 0.35 M tons

= ***2.35 million tons CO_2***

62%

of Total City Vehicle Emissions Can Be Avoided!

Note1: Different fuel types result in different emissions. However, the overall differences in CO_2 emission-per-liter in the fuels listed above are quite small and are not considered for these calculations

Note2: Total Vehicle Emissions include only bus, taxi and private car, excluding heavy duty truck

BYD Electrified Transportation Reverse Charging Technology >

Allows for flexibility in usage.
May support hospitals, police stations and housing facilities in case of emergencies or can be used to power a special event located off the grid.

V2G
Vehicle to Grid

V2L
Vehicle to Load

V2V
Vehicle to Vehicle

STRANDED VEHICLE ASSIST

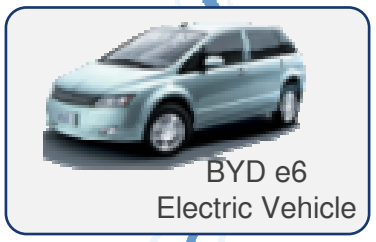
Cycle Life of BYD Iron-Phosphate Modules

Fabricated "**green**"
no caustic materials in manufacturing
no heavy metals
no toxic electrolytes
Standard pack modules
simplifies **repurposing**

Electric Bus

RANGE CRITICAL:
First 4500 Cycles (12-15 yrs)

300 eTaxis: May 2015 => **18 MWh** Battery
300 Electric Buses: 2019 => **87 MWh** Battery



BYD e6
Electric Vehicle

- - - - repurposed

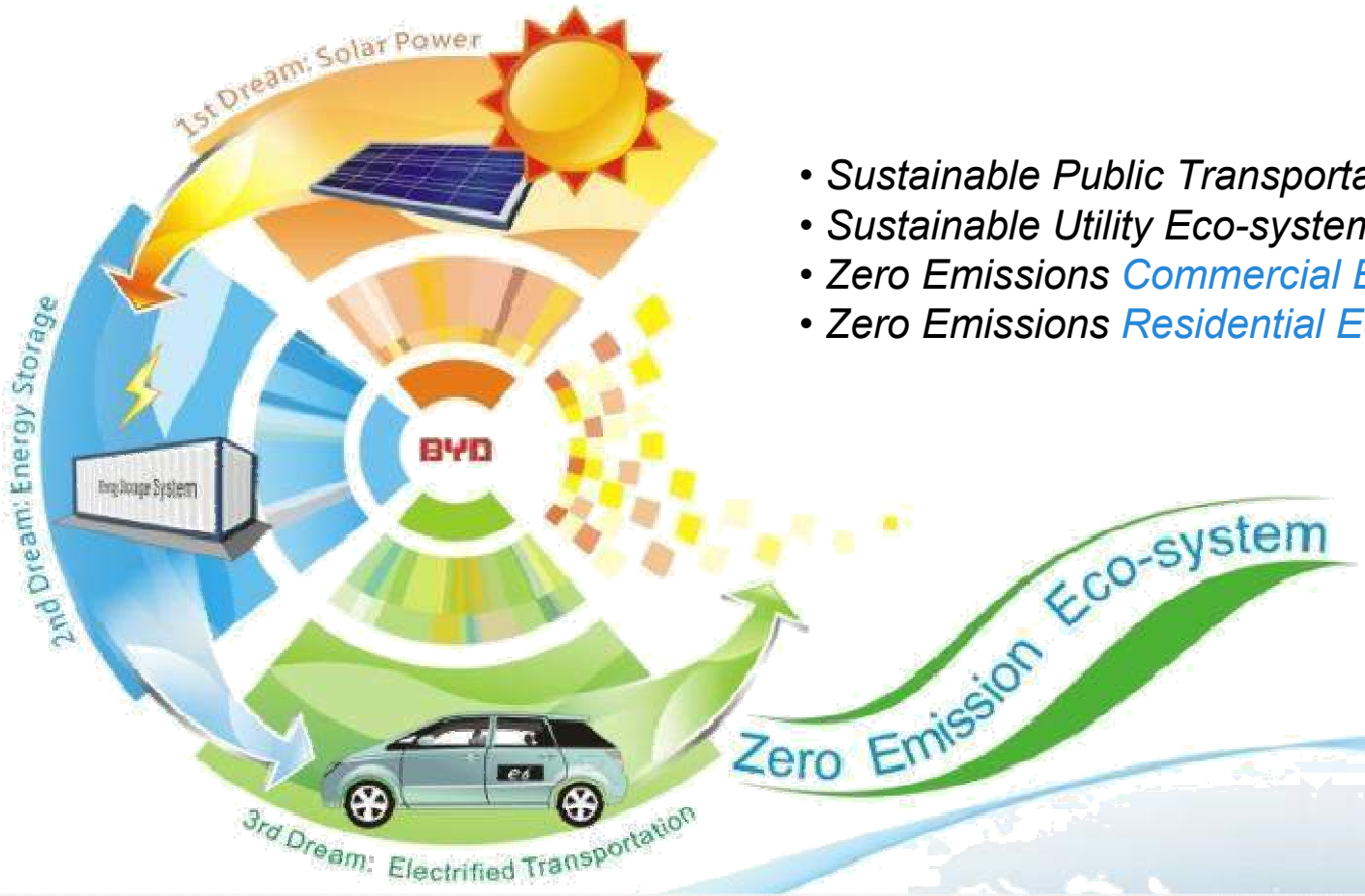
Recycled
OR
Green Disposal

Home Energy
Storage

Fixed Mega-Watt Grid
Energy Storage Stations

ENERGY STORAGE:
Next 4500 – 7200 Cycles (13-27 yrs)
10 ESS: May 2036 => 60 MWh Battery

It’s not only what you drive, it’s the way you live.



- *Sustainable Public Transportation*
- *Sustainable Utility Eco-systems*
- *Zero Emissions Commercial Eco-systems*
- *Zero Emissions Residential Eco-systems*

BYD has a master plan to repurpose electrified transportation battery modules into large-scale, grid-storage applications at a fraction of the cost, driving the economic and environmental recovery of our Nations.

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