Wanxiang Electric Vehicle

800,000 Sqr. Ft EV Battery Manufacturing Plant

- **Wholly owned by Wanxiang Group —— the largest auto parts company in China**
- **Focus on mastering clean-energy technology ,developing saving-energy and environment-protection vehicle**
- **Development Strategy: Battery-Motor-Electrical control —— Electrical Vehicle**

Wanxiang Electric Vehicle and Power Batteries

- 7 projects Awarded by the High-Tech R&D (863) Program of China
- Electric buses start commercial running since 2006, accumulating millions of miles running experiences
- EVs and HEVs equipped with WXEV's Electric Power Train are running in 22 major cities in China.
- Electric vehicles have been distributed over the country and exported abroad.

Start making Li-ion Battery

100Ah LiMnO Battery EV

Electric buses start commercial

Production expansion

2000 2003 2006 2007 2008

- **Bought Li-ion battery company in 2000;**
- **Trial run on city bus route in China in 2003;**
- **JV with City Transit Company, mass production of LiFePO4 in 2006, hundreds of electric vehicles have been equipped with WX's batteries and have been driven millions miles.**
- **Beginning of 2009, WXEV launched into expansion of battery production, invested 1.2 Billion RMB in 1 billion Wh LiFePO4 production.**
- **WXEV holds 30 patents in battery field.**

Power Battery

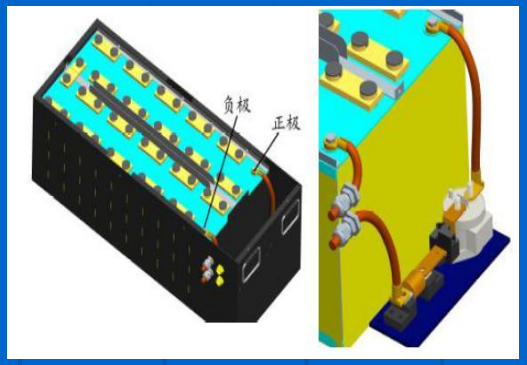
Motor and Drive System

Control System & Info Platform

EV Battery Manufacturing

Battery Module and Battery Pack System













Electric Vehicles

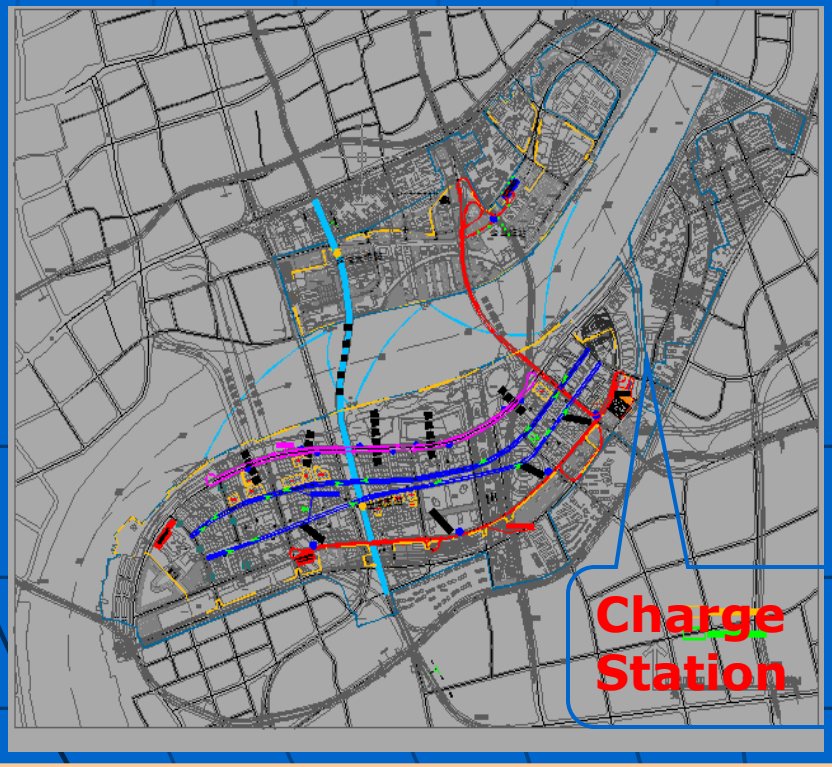
Electric Bus Achievements

- Hundreds Wanxiang electric buses running in major cities in China, including Shanghai, Hangzhou, Guangzhou, Zhengzhou, Nanchang, etc;
- Supplying 100% hybrid buses and 50% pure electric buses to Shanghai World Expo in 2010;
- Supplying 100% electric buses to the 16th Asian Games held in Guangzhou in 2010;
- Listed as major supplier to national EV promotion program "10 X 1000"

Electric Vehicles Running in Shanghai Expo

The application of EV in Shanghai Expo

- In Expo fields, pure EVs are exclusive transportation tools;
- 160 pure e-Bus and 350 other pure e-vans are running;



Electric Bus Line	
Num of vehicles	160
Num of Lines	2
Seats / vehilce	65
Range of Line	14 km
Avg. of Speed	20 km/h
Mode of energy supply	Quickly replace
Range once charged	80 km
Num of battery system	300 units

Pure electric bus

Outside measurement (mm)	11650×2490×3300
Max speed (km/h)	≥90
0～50km/h Accelerating performance	Accelerating time≤20 S
Continuous/Peak power（kw）	90 / 180
Continuous/Peak torque (N.M)	600 / 1400
Battery voltage range（V）	310 — 350
Max gradient (%)	≥18%
Range (Km)	≥250
100 KM energy consumption（road condition）(kWh)	142/98（on/off air conditioner）
Battery	6×88 pieces of 100Ah lithium battery（with BMS）
Charge mode and time	Quick change mode (3 hours) on vehicle charge mode (10 hours)

This model running 2,000,000 miles at Y9 bus lines around West Lake, Hangzhou City, China

Plug-in hybrid bus

Outside measurement (mm)	11850×2490×3340
Power joint type	Engine + ISG + Clutch + Drive motor
Max speed (km/h)	≥90
0～50km/h Accelerating performance	Accelerating time≤12 S
Continuous/Peak power （kw）	63 / 120
Continuous/Peak torque (N.M)	802 / 1900
Max gradient (%)	≥20%
Pure electrical run miles （km）	50
Fuel saved	≥ 25 %
Battery	2×84×100AH lithium battery（with BMS）
Charge mode and time	Quick change mode (3 hours) on vehicle charge mode (10 hours)

Pure electric midibus

Model standard	6m－8m coach
Max speed（km/h）	≥90
0～50km/h Accelerating performance	Accelerating time≤ 20 S
Continuous power（kw）	32 － 45
Continuous torque（N.M）	300 － 500
Battery voltage range（V）	310 － 350
Max gradient（%）	≥18%
Range（km）	≥200
100 KM energy consumption （road condition）（kWh）	30 －45
Battery	2×88 pieces of 100Ah Lithium battery（with BMS)
Charge mode and time	Quick change mode/on vehicle charge mode 2.5hours

This model has been sold to Taiwan, and has passed new model certification in Taiwan

Model standard	2- 5 seats car
Max speed (km/h)	≥80
Continuous power (kw)	5 — 18
Battery voltage range (V)	192V、312V
Range （ km ）	≥200
100 KM energy consumption （road condition） (kWh)	≤ 10
Battery energy grade （ kWh ）	12 — 40
Charge mode and time	Quick change mode/on vehicle charge mode, 2.5hours

Pure electrical car

Electrical power service vehicle

Outside measurement (mm)	5418X1974X2620
Max speed (km/h)	≥90
Accelerating performance 0~50km/h	Accelerating time≤20 S
Max gradient (%)	≥25%
Range (km)	≥250
Continuous/Peak power (kw)	30/ 60
Battery voltage range(v)	310 — 350
Battery	2×96 pieces of 100Ah lithium battery（with BMS)
100 KM energy consumption （road condition) (kWh)	≤ 35

This model has been mass produced and sold to domestic market

Electrical power engineering/ official business vehicle

Size (mm)	4975X1690X1875
Max speed （ km/h ）	≥90
Accelerating performance 0~50km/h	Accelerating time≤20 S
Max gradient （ % ）	≥20%
Range (km)	≥200
Gross Weight of Vehicle （ kg ）	2550
continuous/peak power (km)	32 / 70
Battery voltage range(v)	310－350
Battery	2×88pieces of100Ah lithium battery（with BMS)
100 KM energy consumption (kWh)	≤ 20
Function	Polling、official business、engineering

Electric power engineering service vehicle

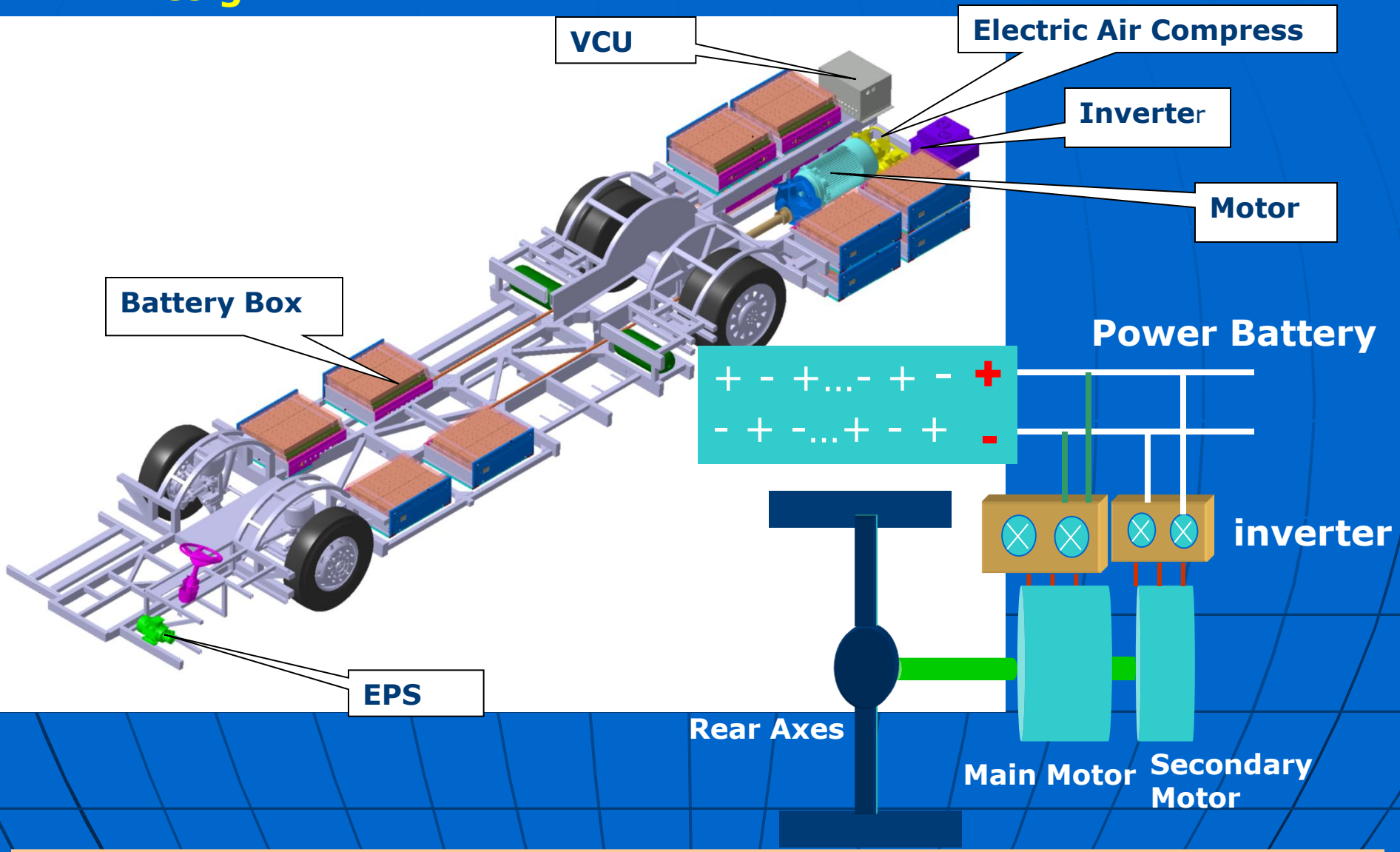
Model standard	Pick-up, SUV
Max speed (km/h)	≥90
Accelerating performance 0~50km/h	Accelerating time ≤20 S
Max gradient (%)	≥20%
Range (km)	≥200
Continuous/Peak power (km)	32 / 70
Battery voltage range(v)	310－350
Battery	2×88 pieces of 100Ah lithium battery (BMS)
100 KM energy consumption (kWh)	≤ 30
Function	Engineering service

- Mayor Daley of Chicago is very interested in applying electric bus technology to City of Chicago.

- The picture is for Mayor Daley and Dr. Lu Guanqiu the Chairman of Wanxiang Group rode on the electric bus made by Wanxiang running in Hangzhou City on March 25th , 2011.

Electric bus and City of Chicago

Design



Charge Station

Three modes:

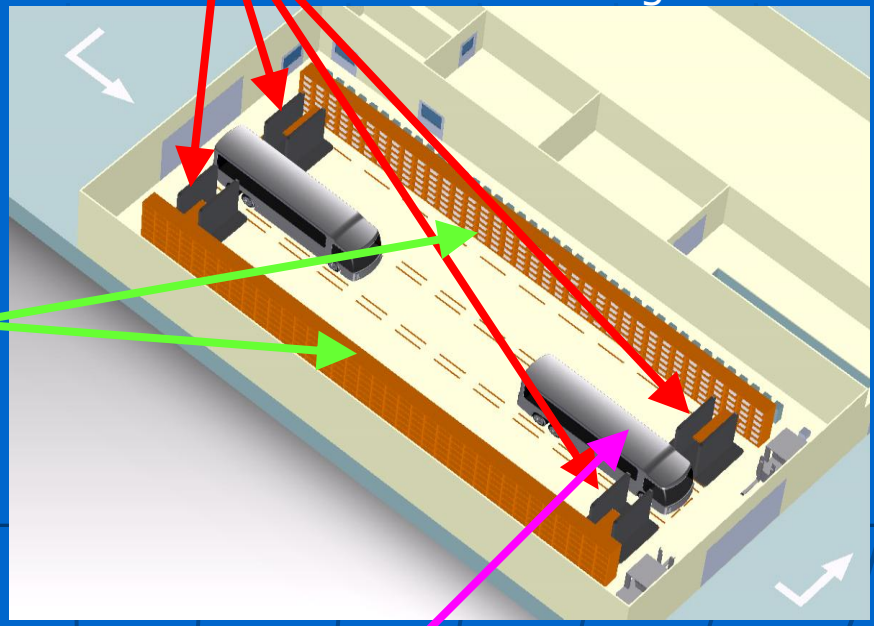
1. Charge battery modules on the stationary vehicle;
2. Charge battery module and replace module quickly;
3. Quickly charged by street charger;

The mode of replace quickly

Successfully applied in Olympic 2008

Replacing battery's Robot

Charge station



Standard shelf

Vehicle & replacing

Performance parameters of electric bus

Item	Content	Value
Range	Max Range (20MPH,AC OFF)	120 mile
	Range (20MPH, AC ON)	≥ 90 mile
	Range (UDC, Full ,AC ON)	≥ 60 mile
Performance of Power	Max Speed	55 MPH
	Max Gradient	20%
	Accelerate time	0-10mph: 4s 0-40mph: 14s
Energy Support	Time of swapping	6 min
	Time of fast charge	10min 20kwh

THANKS!