Wanxiang Electric Vehicle

- Profile of Wanxiang
- Wanxiang Electrical Vehicle

Wanxiang Group

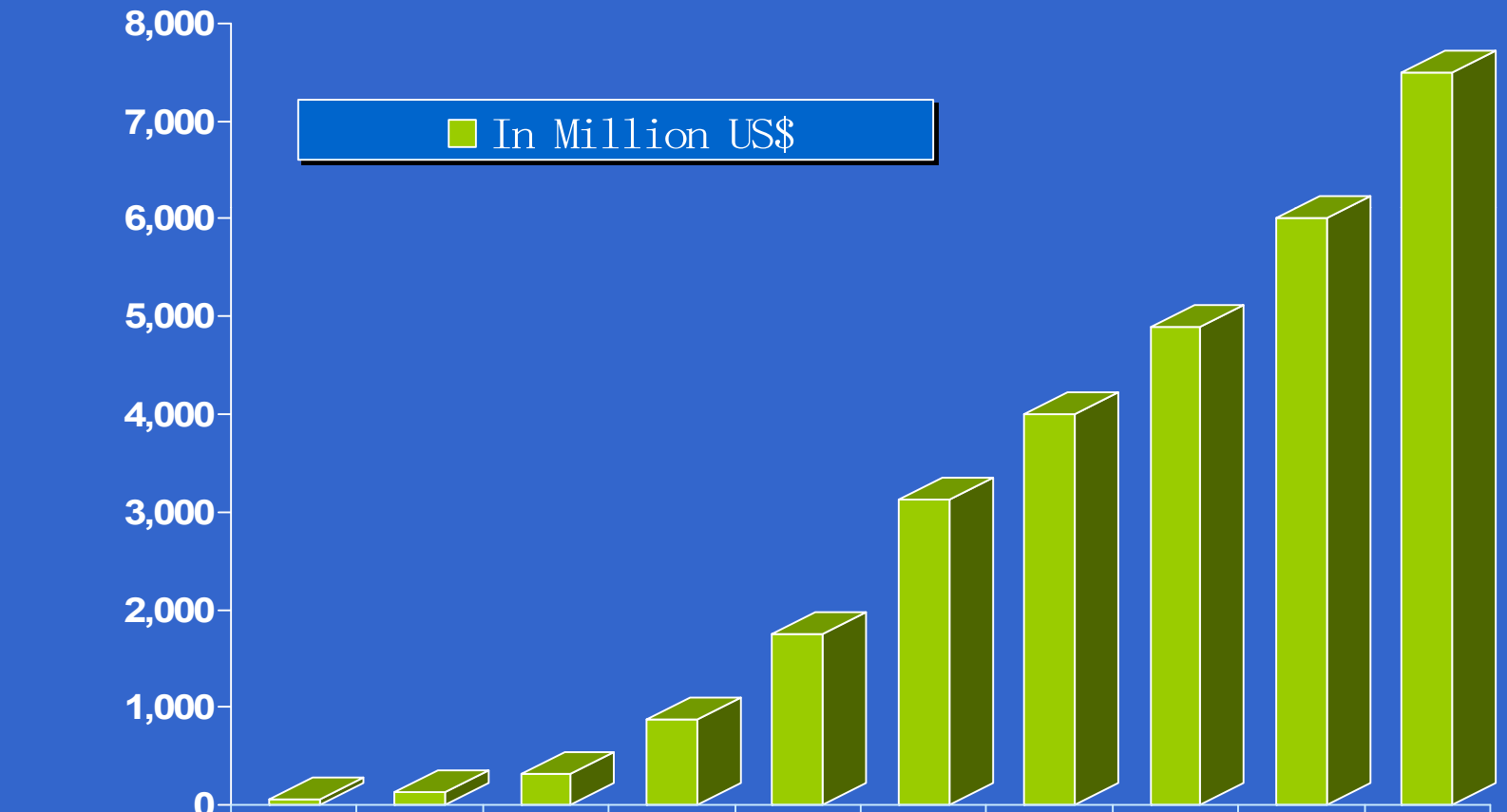
— The Second Largest Non-State-Owned Company

— Headquartered in Hangzhou, China

- **Established in 1969**
- **Approx. 45,000 employees**
- **One of the 120 Pilot Group members by the State Council**
- **No. 1 in China Automotive parts industry**
- **The most comprehensive financial services and investment company in China**

Wanxiang's Revenue Growth

(Since 1989)



	1989	1992	1996	2000	2002	2004	2005	2006	2007	2008
In Million US$	60	125	312	875	1,750	3,125	4,000	4,900	6,000	7,500

Founder of Wanxiang

- Mr. Lu Guanqiu
- Founder and Chairman of the Board of Directors
- Featured on the cover of Newsweek in May, 1991
- Elected to State Congress for several sessions
- Deputy Chairman of State Entrepreneur Association

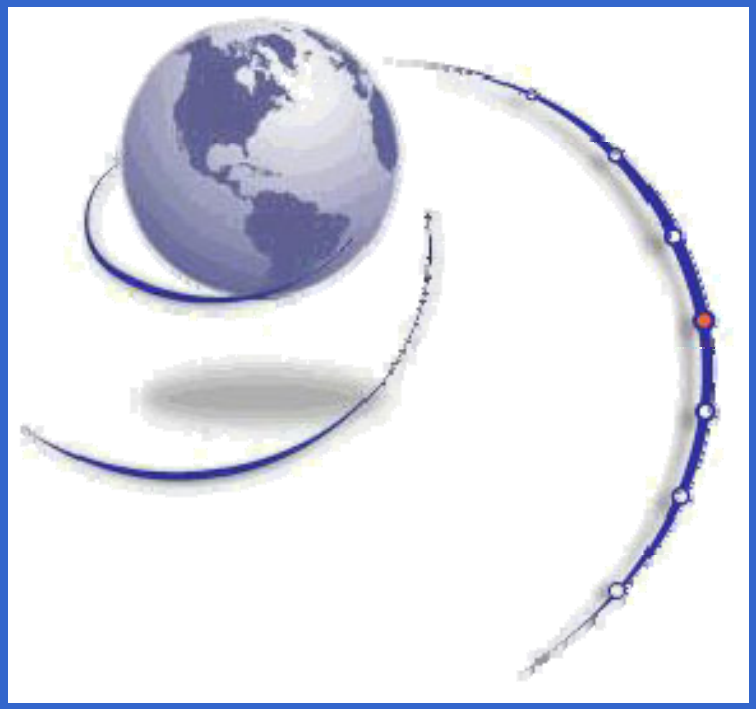
Example of Wanxiang Manufacturing

- Location: Hangzhou
- 3 Industrial Bases Covering Area of 21,500,000 Sq. Feet
- Operations: 10

Industrial Base I in Hangzhou, China

Wanxiang Worldwide

Wanxiang America Corp.



- 2007 Aggregated Revenue
  - ✓ Approx. $883 million USD
- 2008 Aggregated Revenue
  - ✓ Approx. $1,300 million USD
- 2007 Aggregated Work Force
  - ✓ Approx. 4,000 employees
- 2008 Aggregated Revenue
  - ✓ Approx. 4,500 employees

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- 7 projects Awarded by the High-Tech R&D (863) Program of China
- Produce high-power high-capacity lithium batteries
- Electric Vehicle won 23 awards in 2007 Shanghai Challenge Bibendum
- The electric buses have been working around the West Lake of Hangzhou City which is the first commercial demonstration route of lithium battery bus in China.
- Over 100 vehicles, including EV and HEV, equipped with WXEV's Electric Power Train, are running in 22 cities in China.
- Electric visiting vehicles have been distributed over China and exported abroad.

- Founded in 2002, Wholly owned by Wanxiang Group
- Focus on mastering clean-energy technology ,developing saving-energy and environment-protection vehicle
- Development Strategy: Battery-Motor-Electrical control - Electrical Vehicle

Milestones of Development

Start making Li-ion Battery

100Ah LiMnO Battery EV

Electric buses start commercial running

Production expansion

2000 2003 2006 2008

- Wanxiang Group has invested 200MM RMB in R&D of Li-ion battery, over 200 researchers and engineers are working on battery field;
- LiFePO4 started 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.

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Wanxiang Electric Vehicle

Electric 'Ford Transit' Vans applying in State Grid

Features & Strengths

Staff Team：

- 480 staffs in total
- 268 professionals in R&D team, among them 8 are doctors，26 are senior engineers，60 have master degree ，over 20 are senior technicians

Industrial Capability:

- Power battery industrialization
- Vehicle chassis system design/CAE analysis
- Conceptual design/molding/vehicle bodywork design

Won 23 awards in 2007
Shanghai Challenge Bibendum

Model	Medal item						
	Acceleration	Manipulation	Noise	Pollution	Fuel efficiency	CO2 exhaust	Rally
Electric bicycle	-	-		A	A	A	-
Electric motorcycle	-	A		A		A	A
B4	-	-	A	A	A	A	-
C1	-	-		A	A	A	-
C2	-	-		A	A	A	-
C3	A	A	A	A	-	-	A
Medal of Michelin official cooperate partner							

EV marketing platform
Electric vehicle demonstration run

Automotive engineering design

Power battery industry

Integration

Battery

Motor

Control

Power system assembly

Automobile electronic device industry

The Blood of EV –

Polymer Lithium Ion Power Battery

- ***Energy Type:*** **Cell capacity from 8AH to 100AH, gravimetric energy density 125Wh/kg ,volumetric energy density 260Wh/L, cycle life 2000 times (80% DOD)**
- ***Power Type:*** **Power density 1300W/kg, gravimetric energy density 125Wh/kg, cycle life 2000 times (80% DOD)**
- ***Safety Performance:*** **Certified by National Authority, CE Certification, UL Certification. Battery can't catch fire or explode in extreme circumstances.**
- ***Power Source Solution:*** **24V~310V/8~600Ah power sources solutions can be provided.**

Centrum Nerve of EV –

Motor and Drive System

- Develop the technology of product standardization, module and series .
- Cooperation with internal OEMs, providing OEMs with electric driving system and energy system to develop various EV.
- Develop different types of EV independently, and made business demonstration of electrical bus in Hangzhou.
- Products covering the range from 3kW to 150kW, and can be equipped with electrical car and bus.

The Brain of EV -

Electric Control System

- Focus on the building of digital communication network of EV body
- Develop new-style compositive LCD meter
- Research on the control strategies of EV
- Research on the applied technologies of battery management system and electrical wiring safety system

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 runed 350,000 miles at Y9 bus lines around West Lake, Hangzhou City, China

Electric Bus Achievements

- More than 100 Wanxiang electric buses running in major cities in China, including Shanghai, Hangzhou, Guangzhou, Zhengzhou, Nanchang, etc;
- Supplying 150 e-buses for Shanghai World Expo in 2010;
- Listed as major supplier to national EV promotion program “10 X 1000”

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Wanxiang Electric Vehicle

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

800,000 Sqr. Ft Battery Manufacturing Plant

Business Developing Plan

Year	2009	2012	2015
Plan	Build 1 billion Wh power battery manufacturing base for mass production of EV key components	Build electrical vehicle manufacturing base for mass production of EVs	Build 1250 acres EV industry park, become the largest player in China
Goal	Sell 1000 EVs	Sell 30,000 EVs	Sell 100,000 EVs

Thanks!

谢谢！