

Development of Chang'An E30 Electric Vehicle

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EVS-GTR, Washinton, USA
April 2012

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Part I Chongqing Chang'An Automotive

重庆长安汽车股份有限公司

General Information

Rank

China Top 4 in sales in recent years

R & D

Rank #1 in R & D in China, more than 6000 engineers

Brand Value

Rank #9 in most valuable brand names in China
(\$ 43 Billions)



◆ 2010 Performance

Total sales: 1.9 million vehicles



2011 sales were lower, but very close to 1.9 million vehicles

Part II Chang'An NEV

重庆长安新能源汽车有限公司

Milestones of Chang'An New Energy Vehicle Inc.

- Formed in June 2008, part of Chongqing Chang'An Automotive Corp., Ltd.
- Focus on powertrain controls, motor systems, and battery systems, for EV, Plug-in and HEV's
- Today, has more than 400 employees, with more than 300 engineers
- June 2009, first Chinese domestic production mild hybrid on market



- April ~Oct. 2010, Fuel Cell Vehicle Shanghai Expo.
- Dec. 2010, compact demo. EV (many top national leaders took the ride)

Production (P) and Demo (D) Programs

Stop-Start



Natural Gas (P)



长安之星2代 (P)



S460 (P)

ISG Mild Hybrid



志翔 (P)



CX30 (P)



C Platform CVT (P)

PLUG-IN



C203 (D)

EV



奔奔love (D)



E30 (P)



Mail Truck (D)



New Platform (D)

Part III Development of E30 EV

First Debut: 2011 Shanghai International Auto Show

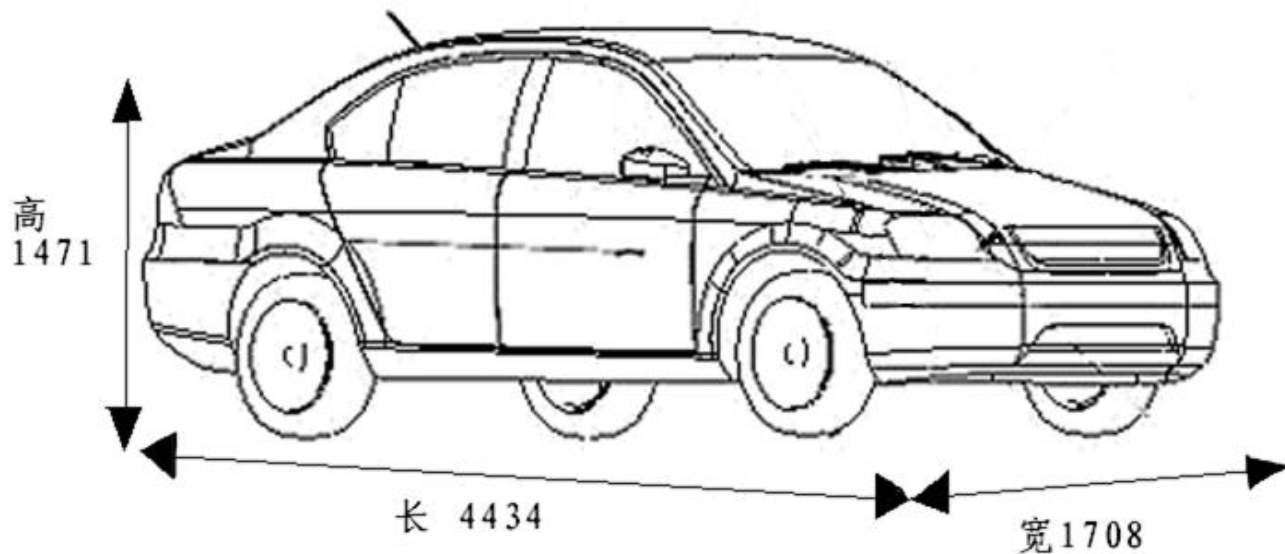


- Introduced as **CLOVER** concept EV
- All major components designed and made in China

- 100 vehicle delivered as taxi vehicles this month in southern suburb of Beijing
- Formal SOP: this summer
- Two thousand vehicles ordered, by City of Beijing and Chongqing
- Actually, City of Beijing asked for 10,000 vehicles in 2012, but the supply chain is not ready



Dimensions (Units: mm)



Vehicle Parameters

Curb Weight	1610 kg
Wheel Base	2.6 m
Number of Passengers	5
Turning Radius	10.5 m
Ground Clearance	120mm (Full Load)
Transmission	None
Final drive ratio	7.44

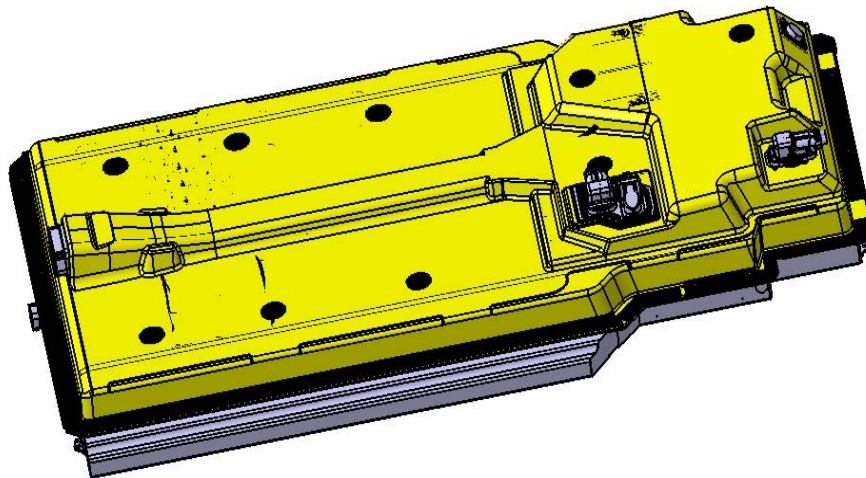
Vehicle Performance

Maximum Vehicle Speed	125km/h
Maximum Gradeability	$\geq 30\%$
0-50 km/h time	4.5 s
0-100km/h time	12.0 s
Driving Range (60km/h Steady State)(80%SOC)	166 km (16 kWh/100km)
Driving Range (NEDC Cycle)(80%SOC)	126 km

Motor Parameters

Type	PMSM, water cooled
Maximum Motor Speed	9000 rpm
Maximum Torque	280 Nm
Maximum Power	85 kW
Supplier	Broad Ocean (大洋电机)

Battery System Functions



- Dual charging modes (80%SOC in 60 min in quick charge mode)
- Under / Over voltage protection
- Over current protection
- Forced air cooling and heating / Over temperature protection
- Cell balancing
- Diagnostics / Fault management

Battery System Parameters

- Supplier: Pride Battery, Beijing (普莱德电池)
- Type: LiFePO4
- Total energy: 29.1 kWh
- Capacity: 90Ah
- Voltage range: 260V ~380V (nominal voltage 326V)
- Pack weight: 400 kg
- Power: 109 kW (Peak) / 45 kW (Rated)
- Durability: >1500 cycles (80%SOC usage)

Battery Safety Features

- IP67 protection level
- High voltage interlock
- Service safety switch
- C-NCAP five star impact rating (power on)
- 4 Air bags: frontal and side impact airbags
for driver and front passenger

C-NTAP Five Start Impact with Power On



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