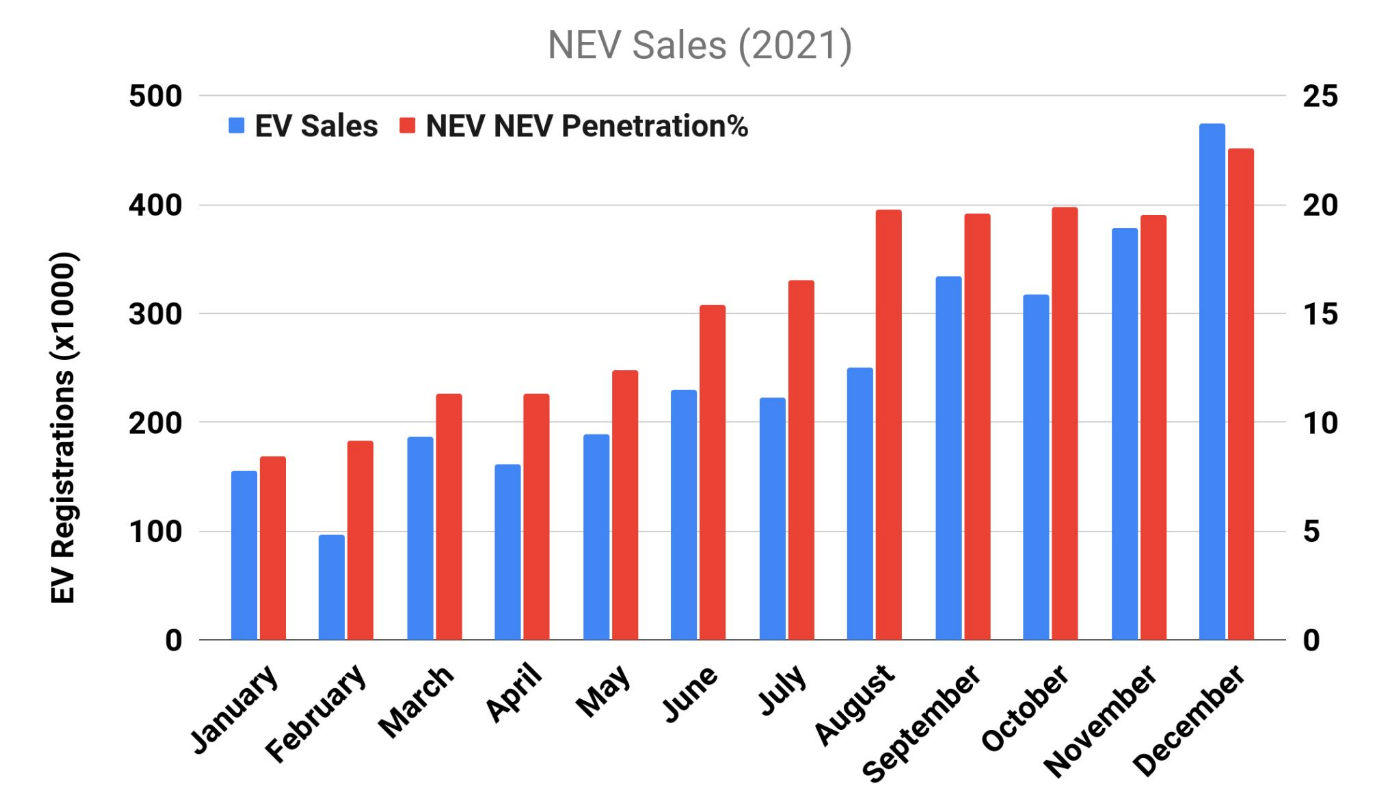
China EV Battery Headlines December 2021

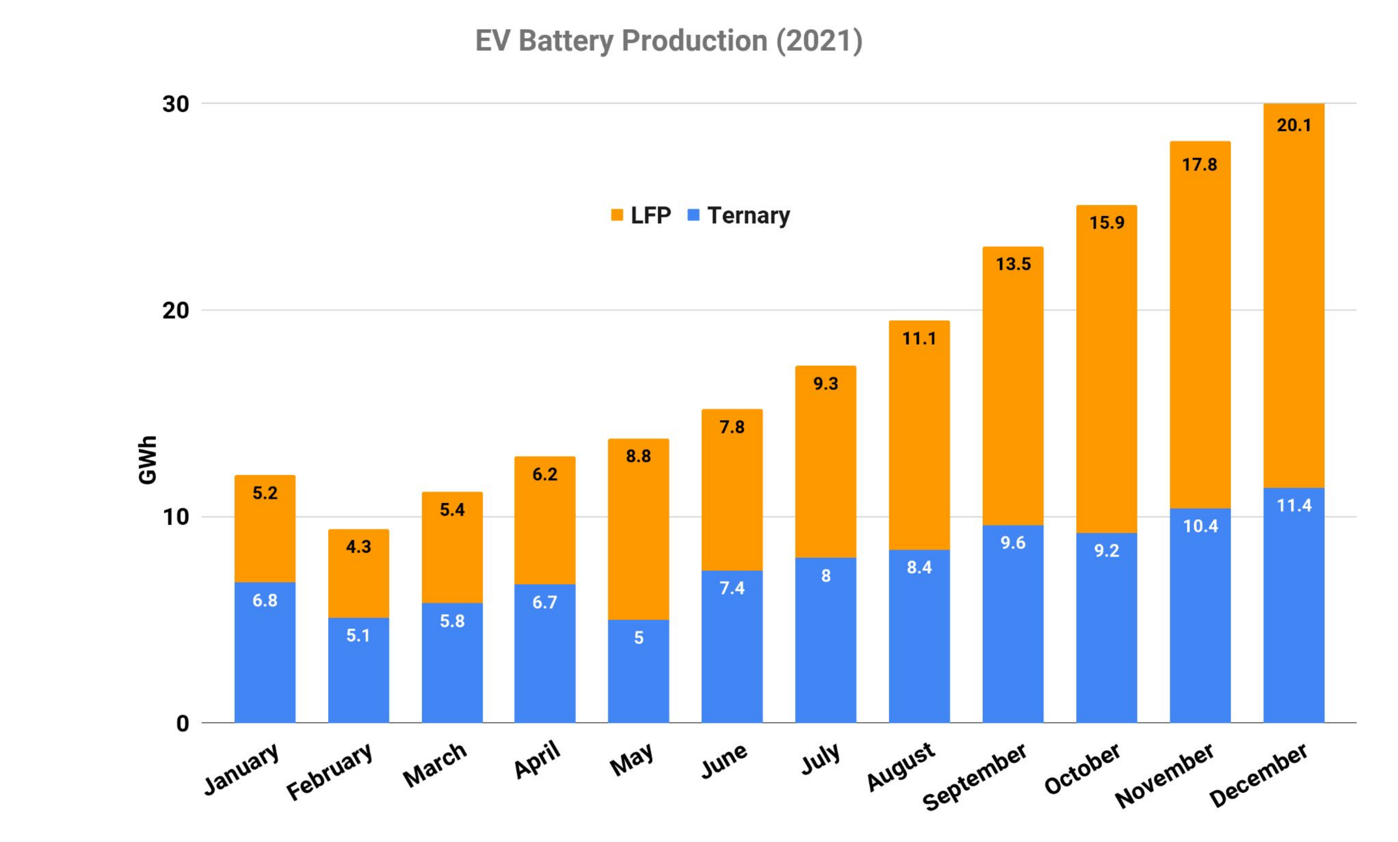
2021 China Numbers

3.312 million NEV'S produced ↑181.0% YOY
2.989 million NEV Sales ↑ 169.1% YOY
2021 Penetration rate **15.7%**

219.7GWh EVB ↑ 163.4% YOY
Ternary batteries **93.9GWh**
Lithium iron phosphate batteries **125.4GWh**

Top 10: Installed capacity 2021			
Rank	**Manufacturer**	**Volume (GWh)**	**Market share (%)**
1	CATL	80.51	52.6
2	BYD	25.06	16.2
3	AVIC	9.05	5.9
4	GUOXUAN Hi-TECH	8.02	5.2
5	LG CHEM	6.25	4
6	SVOLT	3.22	2.1
7	EVE Energy	2.92	1.9
8	Tafel New Energy	3	1.9
9	Farasis	2.45	1.6
10	Sunwoda	2.06	1.3





Raw Materials & Battery Chemicals

Battery raw materials- *DEC 31 ave* spot prices

99.5% Li_2CO_3	277k RMB/ton
56.5% $LiOH.H_2O$	231.5k RMB/ton
Spodumene 6% CIF China	2150 USD/ton
Precursors (523,622,811)	128, 1394, 149.5k RMB/ton
CAM (523,622,811)	244.5, 262, 274k RMB/ton
$LiFePO_4$ (EV)	110k RMB/ton
$LiFePO_4$ (ESS)	104k RMB/ton
Graphite (Natural/Synthetic)	57/71k RMB/ton
$LiPF_6$	550k RMB/ton
PVDF- Battery Grade	670k RMB/ton

Raw Materials

华友钴业 HUAYOU COBALT: acquire the Arcadia hard-rock lithium mine in Zimbabwe (***$422 million***)

FARASIS, 华友钴业 HUAYOU COBALT: Sign strategic cooperation agreement securing stable supply of 165kt **pCAM & CAM**, material development recycling.

BGRIMM 矿冶, 华友钴业 HUAYOU COBALT: Agree on metal & precursor supply. 2022- 2025, to purchase **300-350kt** of ternary precursors

华友钴业 HUAYOU COBALT: (***Guangxi***) Begin construction of high Nickel **pCAM (100kt)** & **CAM (50kt)** project a total investment of **6.308 billion RMB**

龙电华鑫 Londian Wason: Increase **copper** foil production to **75kt** & plan **150kt** by 2025.

BNMC: Start construction of a high-grade lithium battery **copper** foil project **200kt** . Total investment **12.15** billion RMB.

HAILIANG: Planned construction of **150kt** of high-performance copper foil materials total investment of **8.9 billion** RMB

CATL: Joint venture planning and construction of a high-performance copper foil (**100kt**) .

CATL: Sign a large aluminum foil agreement with CATL (**512kt**) . *November 1, 2021 to December 2025*

东阳光 HEC: (***Yidu City***) Dongyang Sunshine invest **6 billion in 200kt** low-carbon battery **aluminum foil** production base to become China's largest high end manufacturer.

广汽资本 GAC CAPITAL, SAIC: Co-invest 350 million RMB in Lithium lepidolite project located in Yichun City known as the "***Lithium Capital of Asia***".

璞泰来 PUTAILAI: Expand PVDF production capacity construction plan under increased market pressure from ***20kt to 45kt***.

CATL: (***Yichang, Hubei***) Break ground on 32 Billion RMB integrated new energy park. The park will integrate multiple links in cathode production.

- 360kt **$FePO_4$** & 220kt **$LiFePO_4$** & **$FePO_4$**
- 180kt of ternary **pCAM& CAM**
- 40kt of **lithium cobalt oxide**
- 300kt of **battery recycling**.
- 1st phase operation in **2023** & final phase **2025**
- Materials for more than 4 million EV's.

Anode Materials

龙佰集团股份有限公司 LB GROUP CO.,LTD.: (***Henan***) Invest 3.5 billion yuan integrated **200kt/yr** graphite production

硅宝: Chinese Silicon product manufacturer **Guibao** announce construction of **40kt silicon-carbon** anode materials & **10kt** special adhesives project in Meishan

FA 603315, BTR: (***Sichuan***) JV to build 100 kt/yr of anode plant

中科电气: (***Guizhou***) plans to build a **100kt** anode material project for 2.5 billion RMB

BAOWU: (***Lanzhou***) Invest 4.1 billion yuan, in constructing **100kt** graphite production line.

Cathode Materials

POWER: (***Zhejiang***) Ternary precursor project with a focus on single crystal medium and high nickel ternary precursors.(**40 kt/yr**)

贤丰控股 INFUND HOLDING: (***Yichang, Hubei***) 1.5 Billion RMB investment ternary high nickel precursor (**50 kt/yr**)

XTC: (***Haijing, Xiamen***) Invest 990 million RMB to expand CAM production. The company is unable to keep up with demand with current capacity. (**30 kt/yr**)

CALB: (***Meishan, Sichuan***) total investment of about 1.8 billion RMB, output of **100kt CAM** project.

Lithium Iron Phosphate

(***Anqing***) Construction begin on Fengyuan's **50 kt/yr** of **$LiFePO_4$** Anqing plant.

CHANHEN, SUNWODA 欣旺达: Joint venture investment 3.5 billion yuan, to construct of **$FePO_4$** plant (***300 kt/yr***)

CNGR 中伟: Invest 10 billion RMB to build **$LiFePO_4$** & **$FePO_4$** (***200 kt/yr***) plant

Lopal: (***Juancheng***) Invest 800 million RMB to expand the existing **$LiFePO_4$**) production capacity

CJN: (***Fangchenggang City***) Invest 3.9 billion RMB to build **$LiFePO_4$** (***150 kt/yr***) & **$FePO_4$** (***600 kt/yr***)

HUBEI XINGFA, 华友钴业 HUAYOU COBALT: (***Yichang, City***) joint venture to build a 300ktr **$FePO_4$** project

TIANYUAN GROUP, CATL: Invest 2.389 billion RMB in the construction of a **100kt $LiFePO_4$** , **$FePO_4$** & phosphoric acid **80kt**

融通高科先进材料 RT Advanced Materials: (***Hubei***) 3rd phase expansion Invest 1.6 billion RMB in the construction of a **40kt $LiFePO_4$** & 50kt **$FePO_4$**

MINMETALS: (***Hunan***) Invest 2.088 billion yuan. Invest 1.6 billion RMB in the construction of a **60kt $LiFePO_4$** plant.

Electrolyte

天际 TONZE: (***Jiangsu***) plans to invest 3 billion yuan to build projects with an annual output of **30kt $LiPF_6$** , **LiFSI, etc**

TINCI 天赐: (***Sihui City, Guangdong***) Plans to construct **200kt** lithium battery electrolyte

YONTA: Plant enters trial production 6kt **$LiPF_6$** & 400t **LiFSI,**

Separators

恒力石化 HENGLI PETROCHEMICAL: (***Yunnan***) Hengli Petrochemical enters lithium battery wet separators. annual capacity of 1.6 billion m^2

中国建材: (***Inner Mongolia***) **720 million m^2** invest 2.303 billion RMB to build wet separator production project.

Cell Manufacturing

January to December battery output totaled 219.7 GWh

SVOLT: (***Jingmen***) Target **600Gwh** by **2025** corresponding to an effective output of 450GWh. Passenger cars **340 GWh**, **37GWh** for ESS, **40GWh** for non-high-speed vehicles & **37GWh** for commercial vehicles.

LISHEN Power Your Life!: (***Chuzhou***) Begin construction of 15.2 billion RMB, **36GWh** Li-ion battery plant.

BYD Build Your Dreams: (***Fuzhou***) invest 8 billion RMB to build a EV battery plant ***(15GWh)***

SUNWODA: (***Zaozhuang, Shandong***) Invest 20 billion RMB to setup **30GWh** power battery and energy storage battery plant.

国轩高科 GOTION HIGH-TECH

Guoxuan Hi-Tech 2021 Annual Supplier Conference and 2022 Annual Strategy

2021

1) **Volkswagen China** will officially become the controlling shareholder
2) Production capacity increased by 74%
3) High-energy density 300Wh/kg battery
4) 230Wh/kg iron-lithium battery & 110Ah semi-solid battery.

2022

1) Focus 260Wh/kg LFP & 400Wh/kg ternary batteries
2) Over 50GWh capacity put online brining total production capacity to 100GWh" by end of the year.

Announce 1st generation semi-solid batteries achieve over 1000 km range cruising range in high end EV's.

BAOFENG ENERGY: Invest 96.4 billion RMB to develop Integrated lithium battery energy storage supply chain

- 200GWh battery cells and energy storage system
- Intelligent manufacturing plan, Industry 4.0
- 500,000 tons of lithium iron phosphate cathode
- 300,000 tons of graphite
- 340,000 tons of electrolyte.

Battery Technology

中科海钠 HiNa BATTERY: (***Fuyang***) build the world's first large-scale **sodium ion** production line (**5GWh**). Constructed in two phases. 1st first phase of 1GWh put into production in 2022. Future production is expected to exceed 30GWh.

Ganfeng Lithium: Ganfeng Lithium released a hybrid solid-liquid lithium-ion battery . Developing 2nd -genall-solid-state battery with an energy density of over 360Wh/kg .

Electric Vehicles

TOYOTA, BYD Build Your Dreams: Toyota will launch a small pure electric sedan for the Chinese market by the end of 2022, using BYD blade batteries.

Ford, CATL: Ford confirms CATL as battery supplier

东风汽车集团有限公司 DONGFENG MOTOR CORPORATION, Ganfeng Lithium: 1st batch of Dongfeng E70 EV equipped with Ganfeng hybrid solid-liquid (*flexible solid-state separators*) lithium-ion batteries (Packing efficiency 86%). Ganfeng built a 0.3GWh mixed solid-liquid battery mass production.

Huawei unveiled the new smart selection car, **AITO M5** equipped with the Harmony OS system on December 23.

- CLTC operating range of 1,242 km
- fast charge of 45 minutes 20% to 80%
- 0-50 km in 1.9 seconds, 0-100 km/h in 4.4 seconds