



# BYD CORPORATE PROFILE

Technological innovations for a better life



WHO IS BYD?



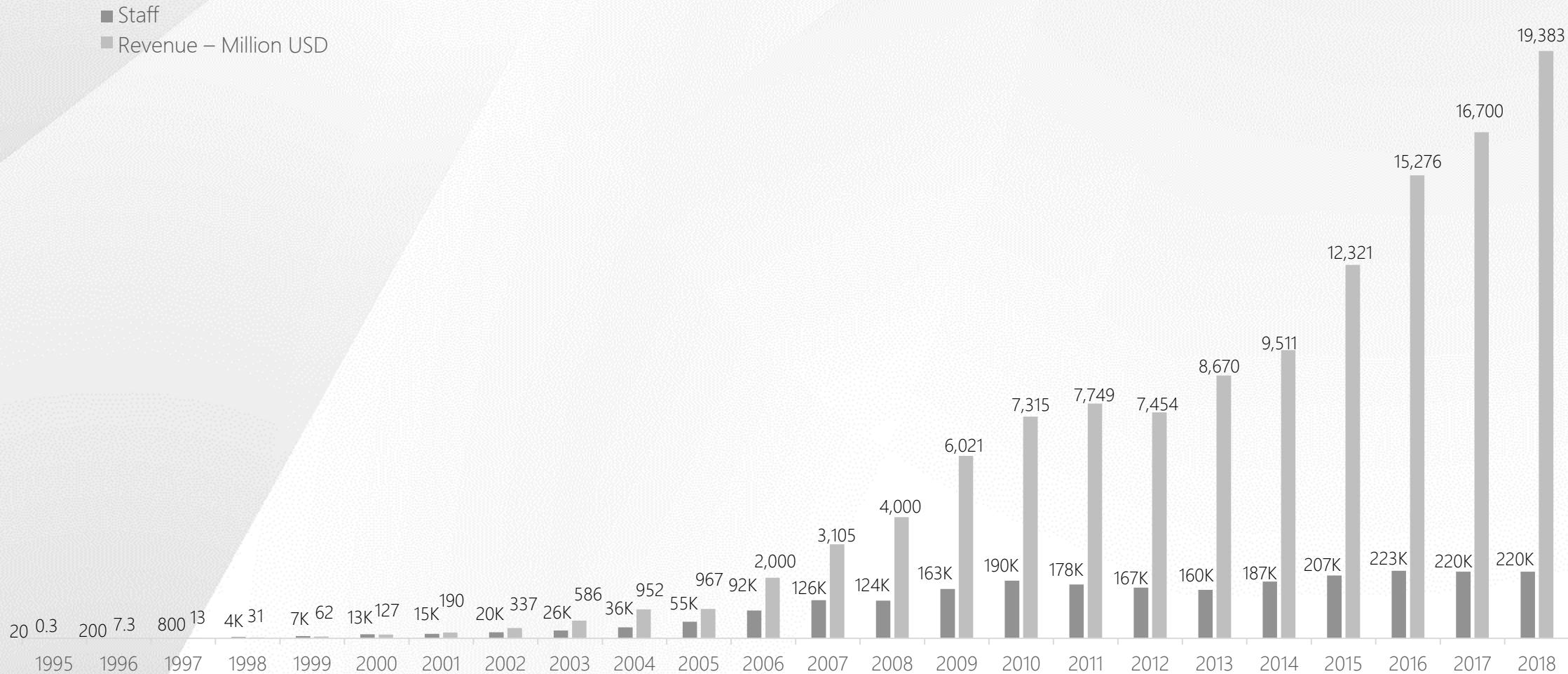
- A **pioneer** in achieving a **Zero Emission Energy Ecosystem**: affordable solar power , reliable energy storage & electrified transportation.
- A green city solution provider with a multi-level transportation strategy from ground to overhead promoter.
- A multinational company with **Global Talents, Global Supply Chain , Manufacturing & Operation.**

# BYD OVERVIEW

- Over **220,000** employees and over **30** industrial parks worldwide
- **4** industries: **Electronics, Auto, New Energy, Rail Transit**
- 2018 Group revenue: **USD 19.4 billion**
- A **pioneer** in achieving a **Zero Emission Energy Ecosystem**: affordable solar power , reliable energy storage & electrified transportation.
- Over **24 years' experience in battery** R&D and manufacturing resulting in one of the **world's largest power battery** output capacity
- World's **Top EV** sales in **4** consecutive years (2015, 2016, 2017 & 2018)
- Filed more than **24,000 patent** applications, among which **16,000** were granted.



# GROUP REVENUE





# RECOGNITION WORLDWIDE



Powering the Future  
Special Recognition

**UN AWARD**

**BLOOMBERG**

Top 10 Most  
Innovative Companies

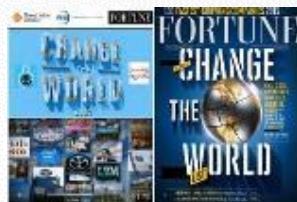


Lifetime Achievement Award  
Large Corporation Award

**ZAYED FUTURE  
ENERGY PRIZE**

**FORTUNE**

Top 15 Companies  
Changing the World



China's top 10 most admired  
companies in 2016

**FORTUNE , CHINA**



# R&D INSTITUTES

## Central Research Institute

New material development, new product design, improvement of industrial technologies and industrial incubation.

## Auto Engineering Research Institute

Engages in design and R&D for all passenger vehicle models and platforms

## Auto Product Planning and New Technology Research Institute

R&D for open intelligent platforms, new customer relations, and intelligent automotive applications.

## Electric Power Research Institute

Specializing in the research and development, production, sales and service of energy storage equipment.

## Truck Research Institute

R&D for new energy truck design, trial manufacturing and testing.

## Bus Research and Development Institute

R&D for new energy buses and chassis, from design to trial manufacturing, testing and verification.

## Product Planning and New Auto Technology Research Institute

Covers passenger & commercial vehicles, as well as urban rail transit systems and its components.



## BYD ELECTRONICS INDUSTRY

The only company in the world to provide a whole series of mechanical parts (metal, glass, ceramic and plastic ) & "one-stop" services from R&D, to design, to manufacturing, through to supply chain management Product portfolio covering handsets, tablets, notebook computers, new smart products & automobile intelligent systems. BYD's key clients includes Apple, Huawei, Google, Microsoft, Samsung, LG, Lenovo, and other global companies. Every 2 out of 10 smart phones feature BYD technologies. 12,000 Engineers, Over 6,000 Patents, More than 30,000 CNC equipment with top level scale intelligent manufacturing capability.

## DESIGN & DEVELOPMENT



Innovative and comprehensive design solutions in electronics, telecommunications, radio frequencies, acoustics, antennas, systems software, information security, software algorithms and structural parts design

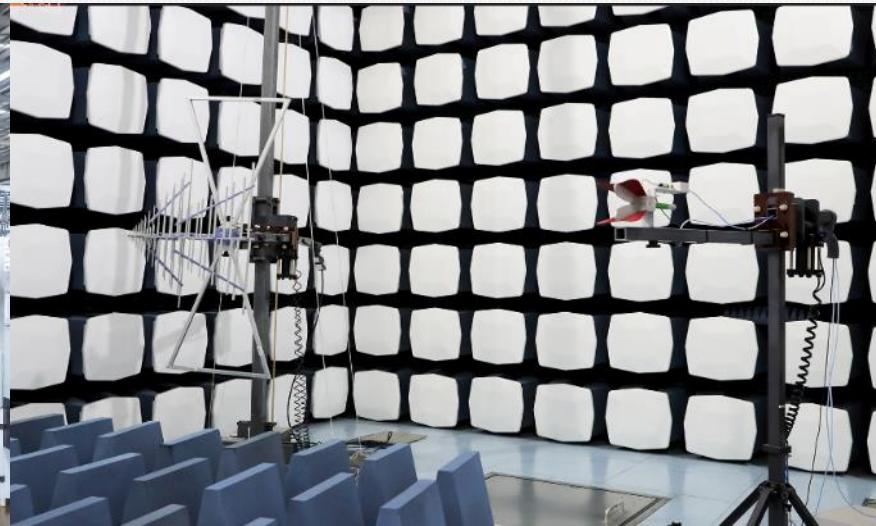
ODM, JDM and JRD modes

## PRECISION MANUFACTURING



Leading and large-scale automatic production lines covering tooling, metals, plastics, 3D glass, ceramics manufacturing, EMS and FATP.

## TESTING & CERTIFICATION



Perform accurate and efficient tests and certifications, from development to mass production, and from material supply to product roll-out; including dimension tests, material analysis, surface analysis, reliability analysis and tests of RF, EMC and electroacoustic performance.



# BYD AUTO INDUSTRY

BYD is the first and the only electric vehicle manufacturer in the world to have full expertise and self-owned integrated technology of batteries, electric motors, electronic controls and IGBT to provide full-market EV solutions from passenger cars to commercial vehicles.



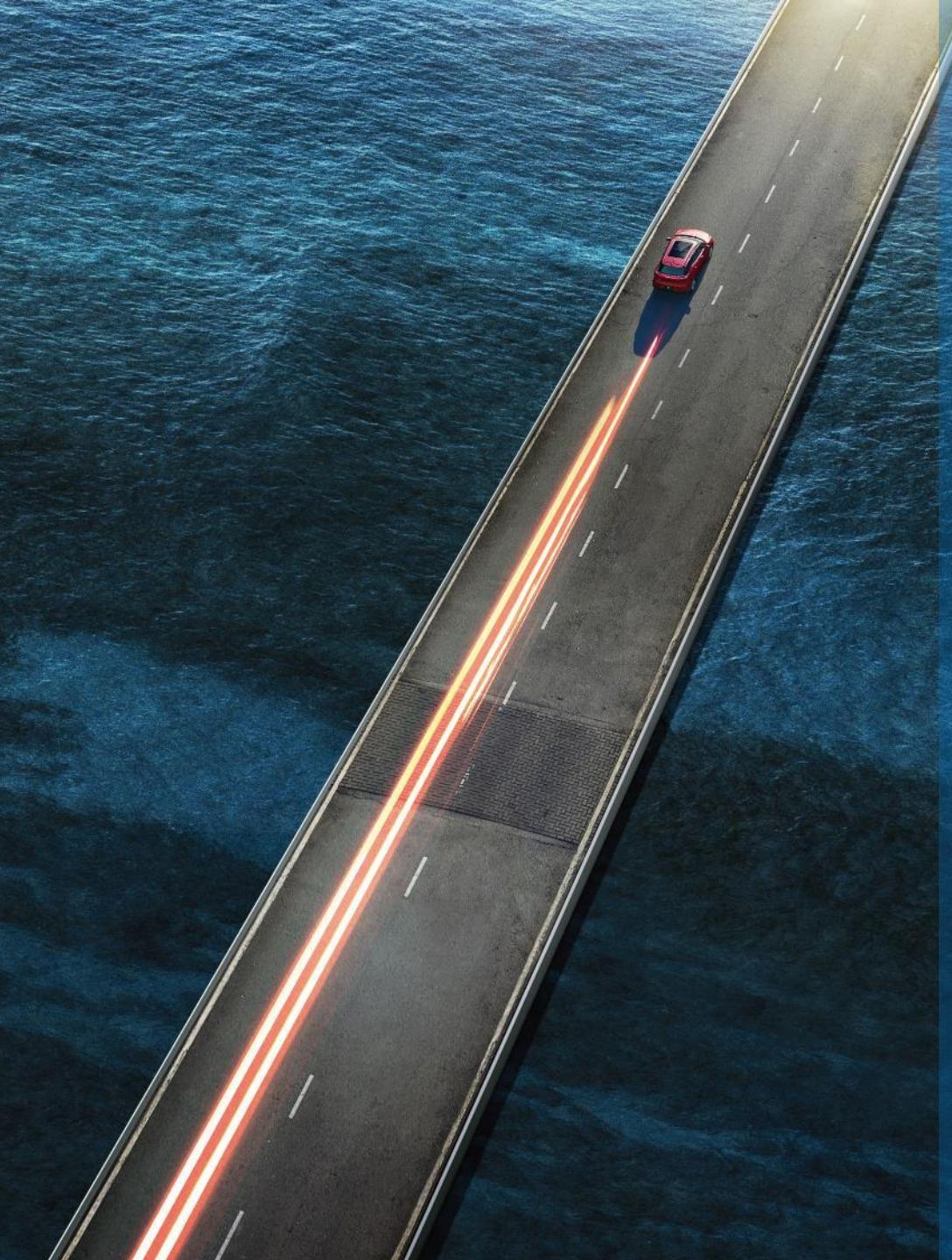


# GLOBAL POSITION

The **FIRST & ONLY** company to provide **FULL MARKET EV** solutions

A pioneer in putting forward and promoting **ELECTRIFIED PUBLIC TRANSPORTATION**, and it has become a national strategy in China.





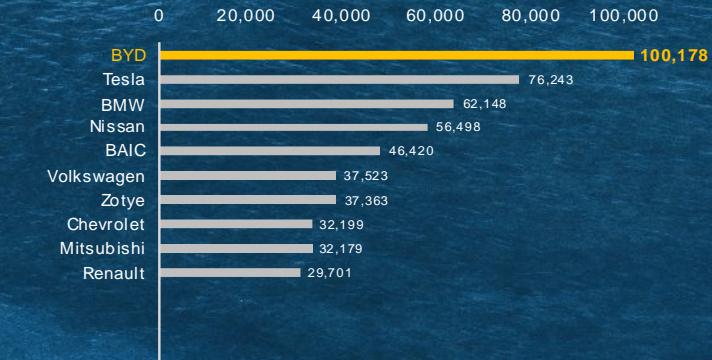
# GLOBAL RANKING

World's TOP EV sales in 4 consecutive years

## Global EV Sales 2015



## Global EV Sales 2016



## Global EV Sales 2017



## Global EV Sales 2018



① Notice: Including Commercial Vehicles



# GLOBAL DESIGN

**Michele Jauch-Paganetti**

Global Interior Design Director, BYD



**Wolfgang Egger**

Global Design Director, BYD

**JuanMa Lopez**

Global Exterior Design Director, BYD

# GLOBAL SUPPLY CHAIN

BYD has partnered with world-class suppliers including Bosch, ZF and Faurecia, integrating world-class brands to develop its products.

·Faurecia

SIEMENS

AVL



TRW

nexteer  
AUTOMOTIVE

Continental



D Dirac

chofer  
powertrain

coOPER

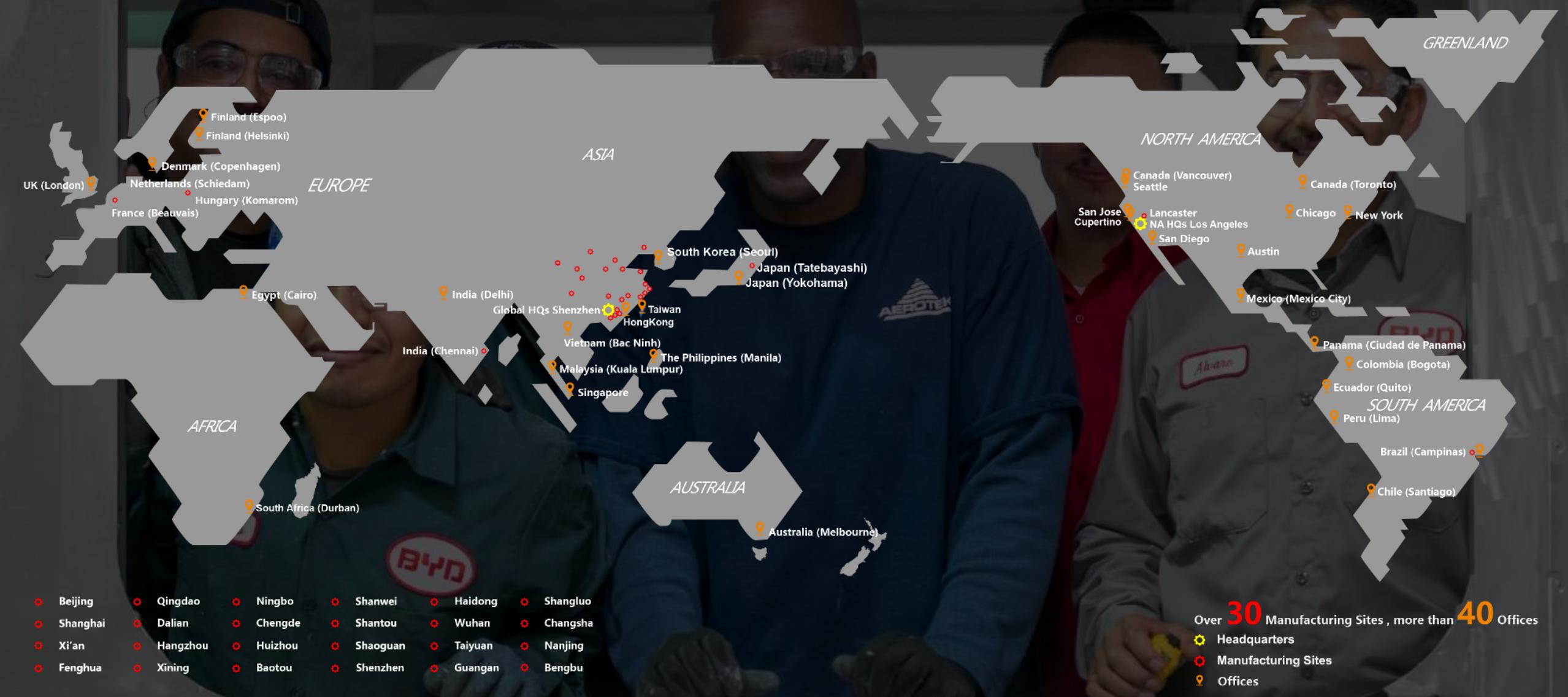
(H) BOSCH

HUTCHINSON



brembo

# GLOBAL MANUFACTURING & OPERATION





# COMMERCIAL VEHICLE





# COMMERCIAL VEHICLE

In 2010, BYD has released its **ELECTRIFIED PUBLIC TRANSPORTATION** solution which has become a national strategy in China. In 2015, BYD put forward a **7+4 Full Market EV Strategy** who has made achievements in all major product catagories.

Most PROVEN & RELIABLE electric taxi fleet in the world

the 1<sup>st</sup> auto maker to launch electric taxis with over 8 years on road experience

Most POPULAR electric bus fleet manufacturer globally

BYD battery-electric buses (>10m) have ranked No. 1 in global sales for four consecutive years.

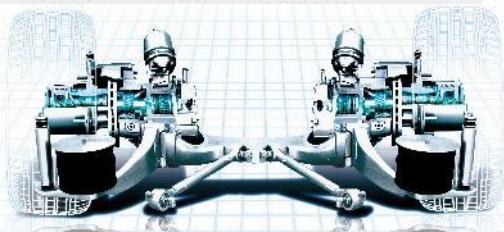
World's 1<sup>st</sup> in achieving the commercialization and large-scale operation of battery electric heavy duty trucks

World's leading green electric forklift manufacturer

# TECHNOLOGICAL INNOVATION

## In-wheel traction motor

The high-speed, high voltage, dual in-wheel traction motors used in BYD's electric buses deliver outstanding efficiency and optimized interior space.



## All -aluminum bus body

First scale application of all aluminum bus body early in 2011 ; 40% lighter than steel framework; 20% improved torsional rigidity Improved mileage and corrosion resistance



## Pioneering integrated axle system

Combining the motor, transmission and driveshaft into the rear axle, the system of BYD electric truck greatly improves energy efficiency and available space.



## Power battery heat control system

The system automatically stabilizes the battery cell temperature to ensure an optimized battery performance.



# BYD ELECTRIC BUS & TAXI GLOBAL FOOTPRINT

**6** Continents, over **50** Countries & Regions, more than **300** Cities





# PASSENGER VEHICLE

- BYD manufactures products ranging from traditional fossil fuel-powered vehicles to plug-in hybrid vehicles and electric vehicles , involving market segments from sedans, SUVs to MPVs.
- These models received market recognition, making BYD the **No. 1** in global sales of new energy vehicles for three consecutive years (2015-2017).





# PASSENGER VEHICLE

Launches the world's first mass-produced PHEV model in 2018.

Set a new standard for the auto industry with its high-performance "542" models in 2014 characterized by the Dual-Mode, Triple-Drive and full-time electrified 4WD.

World-leading innovative technologies

**542**  
TECHNOLOGY

# INNOVATIVE TECHNOLOGIES FOR PASSENGER VEHICLES

## WORLD-LEADING DM TECHNOLOGY

In 2008, BYD launched the **world's first PHEV model**, making BYD SUV models among the **world's best selling** new energy vehicles.

Awarded "**Chinese patent gold medal**"-highest award in China



## BYD 542 HIGH-PERFORMANCE MODEL SERIES

0-100km/h acceleration in **5** seconds

**4**-Wheel full time electric drive

**2** liters of fuel consumption per 100 km

## PIONEERING BI-DIRECTIONAL CHARGING AND DISCHARGING TECHNOLOGY

BYD's Bi-Directional Inverter Charging and Discharging Technology connects vehicle to vehicle, vehicle to grid and vehicle to electrical appliances



# NEW E-PLATFORM

BYD developed highly integrated and high performance e-Platform for pure electric cars with reduced weight and size and high power density.

## Innovative Intelligence

### **World's First Open Smart Network Ecosystem with BYD Intelligent Di-Link Network**

Opens its over 300 sensors and more than 60 control points of the vehicle to the industry to involve talents from different industries for intelligent development to reshape people's travel mode.

## High Integration

### **Drive System**

Electric motor + electronic control + transmission.

### **High Voltage system**

DC-DC + OBC (on-board charger) + PDU(power distribution unit )

### **10-in-1 PCB board**

High integration of meter, air conditioner, audio, smart key and other modules in one PCB board.



## BYD MULTI-LEVEL TRANSPORTATION SOLUTION

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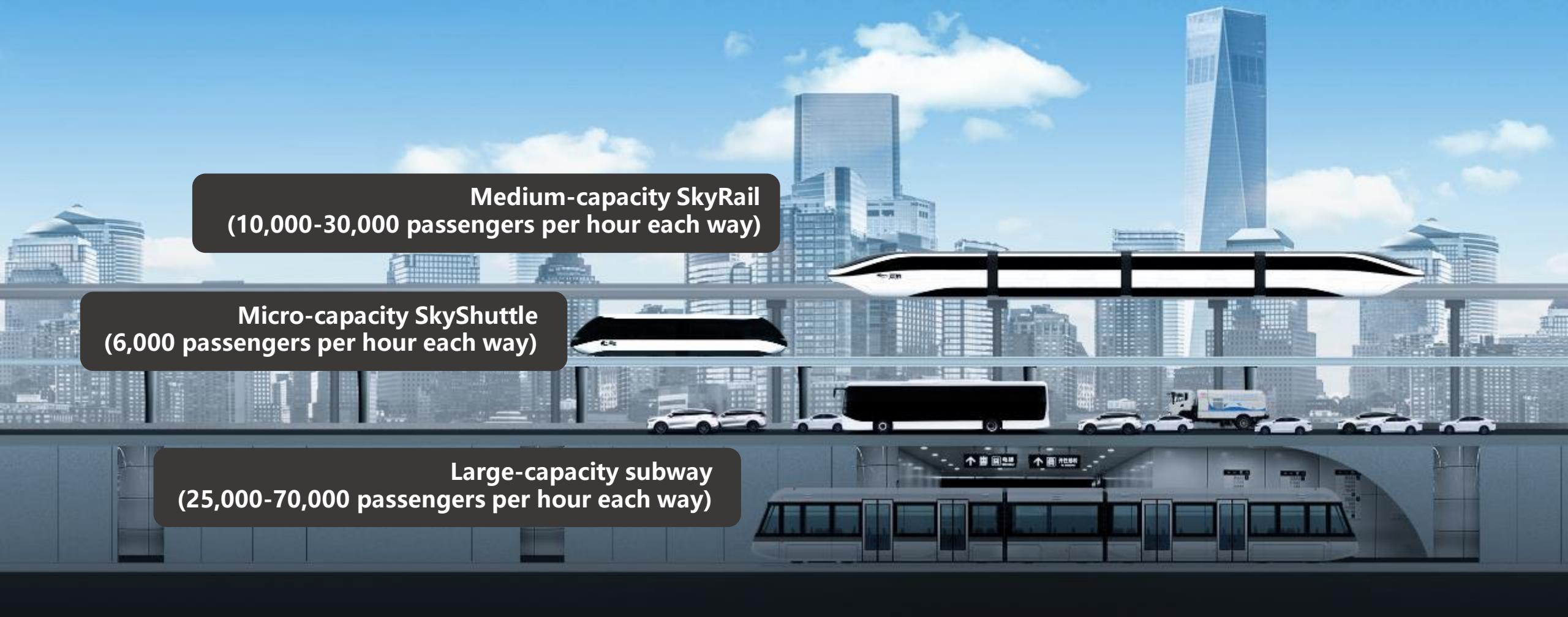
## BYD MULTI-LEVEL TRANSPORTATION SOLUTION

Our world is undergoing unprecedented **urbanization and motorization** process which have improved people's quality of life, but also brought the worst kind of

**Pollution & Traffic Congestion**

# RAIL TRANSIT

As a pioneer in new energy solutions, BYD not only provides effective electrified transportation to tackle air pollution problems, it has also developed efficient rail transit systems to help overcome urban congestion and transit challenges.



**Medium-capacity SkyRail**  
(10,000-30,000 passengers per hour each way)

**Micro-capacity SkyShuttle**  
(6,000 passengers per hour each way)

**Large-capacity subway**  
(25,000-70,000 passengers per hour each way)



## TOTAL SOLUTION PROVIDER FROM TRAIN BODY, TO TRACK BEAM AND ALL THE CONTROL AND SIGNALING SYSTEMS.

BYD rail transit systems are the result of 7 years' R&D development with an investment of over 15 billion RMB (2.2 billion USD), designed to optimize energy efficiency, safety, comfort and intelligence.

Compared with typical rail projects, BYD rail transit systems can easily integrate into existing cityscapes without significant infrastructure disruption like demolition and construction costs.

### Features

Rapid Construction with Low Construction Cost

Comprehensive Intelligent Systems

Safe Mode of Transit

Superior Urban Integration with Excellent Topographic Adaptability

# HIGH INTELLIGENCE FOR SMART AND GREEN URBAN TRANSPORTATION

## **Highest level of automated driving system and optional 4.5G eLTE broadband technology**

BYD rail transit system is equipped with the highest level of automated driving system and optional 4.5G eLTE broadband technology for an optimized operation and management efficiency.

-Automatic monitoring, power and stand-by modes; automatic track controls, screen door controls, video monitoring and communication systems etc.





# NEW ENERGY

As one of the world's largest lithium-ion phosphate battery manufacturer and with more than two decades of continuous innovations, BYD offers a variety of battery products from consumer 3C batteries, power batteries, solar cells and energy storage batteries; BYD is also a pioneer in providing a new energy ecosystem from power generation to storage to usage



# BYD BATTERY

BYD has a complete battery ecosystem (raw materials, R&D, design, manufacture, application and recovery). In addition to applications in new energy vehicles and rail transportation, BYD's batteries are widely used in solar power stations, energy storage power stations and many other new energy solutions.



## R&D Competence

**24 years** in battery production, 16 years' experience in power battery, over 1,500 patents.

## Whole **Industrial Chain** Layout

From mineral resources to upstream core raw materials, from battery manufacturing to recycling

Mega-capacity with Intelligent Manufacturing  
In 2018, BYD has achieved a **28GWh** battery capacity, an annual automation capacity of **50GWh**

## Reliability

Almost **10 year** reliable application in public transportation vehicles



# PV MODULE + ENERGY STORAGE SOLUTION

BYD has taken the lead in developing a new business model known as PV+Storage, aimed at eliminating bottlenecks in traditional photovoltaic power generation and meeting diverse market needs.



# SOLAR POWER

BYD has significantly reduced the cost of solar module production, making the total cost of solar power and coal-fired electricity equivalent. This has accelerated the popularization of solar power and made clean energy available to the general public

BYD's PV products have been exported to more [than 30 countries](#) and regions in six continents (except Antarctica).



The Largest Double Glass Module Solar Power Plant  
250MW in Brazil, Operating Time: January 2018



The Largest Single Solar Power Plant in USA  
108MW in USA, Operating Time: September 2016



Solar Power Plant On The Sea  
2MW in Japan, Operating Time: August 2016



The Largest PV+Agriculture Project in Shan Xi, China  
150MW in China, Operating Time: March 2017

# ENERGY STORAGE

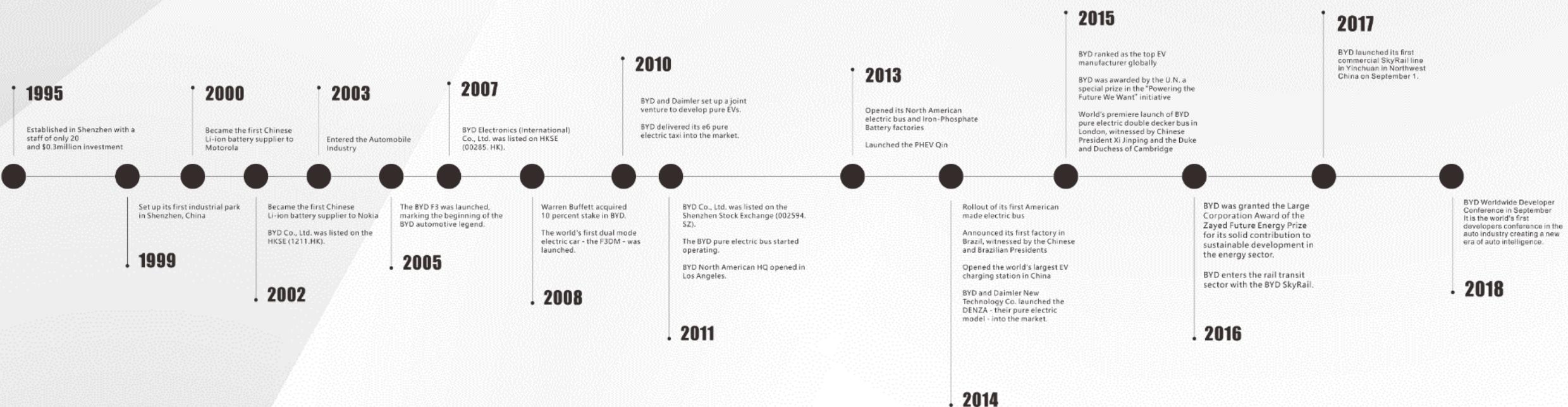
As the leading energy storage solution (ESS) provider, BYD is specialized in providing large-scale energy storage, distributed energy storage and micro-grid systems. The ESS can be deployed in a variety of applications, including alternative energy generation, frequency regulation, emergency backup, peak load shifting, and capacity reservation.

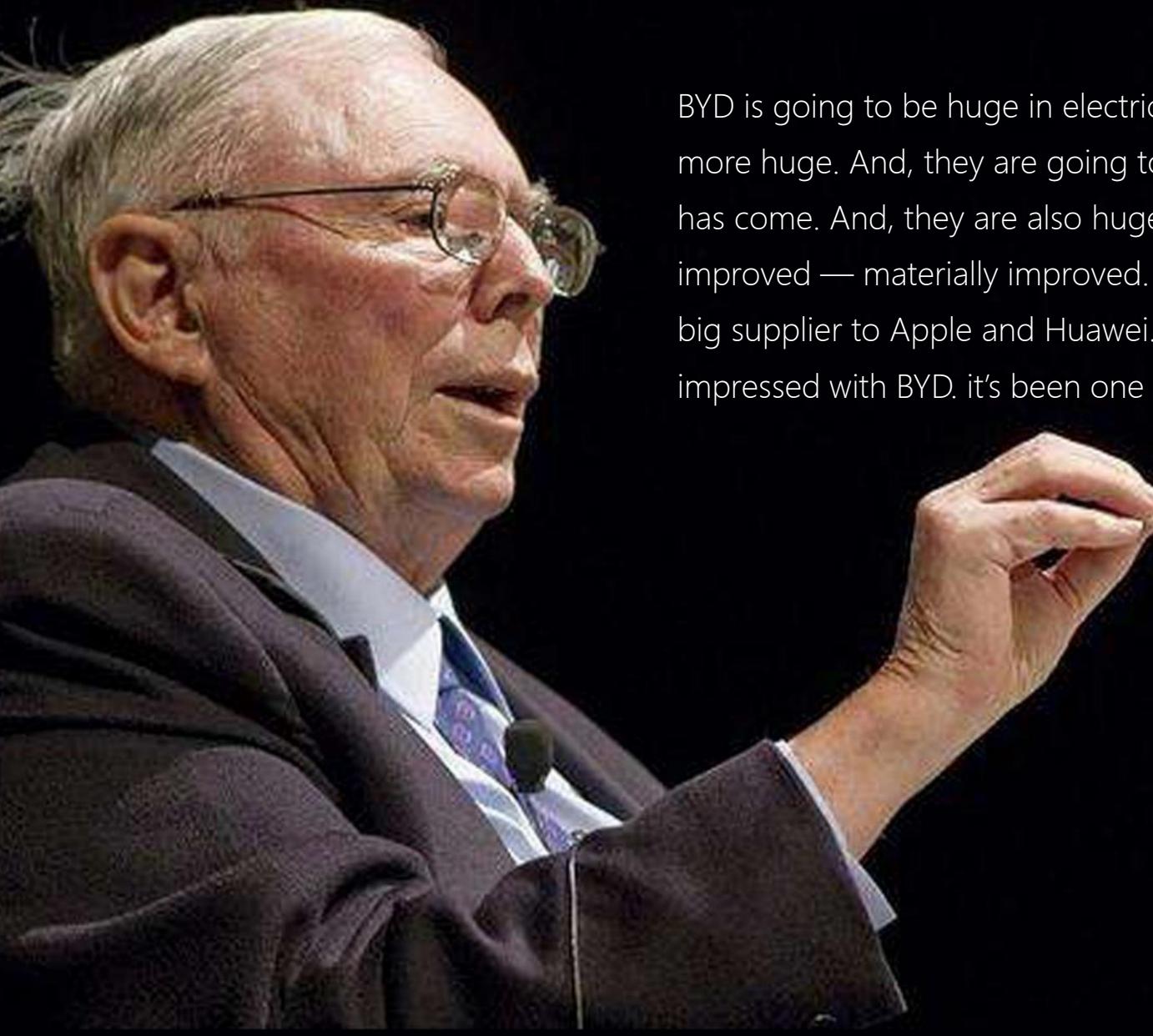
Up to now BYD energy storage products have been exported to over **20 countries and 100 cities** among them the United States, Britain, Germany, France, Japan, Switzerland, Italy, Canada, Australia, South Africa and other countries and regions.





# MILESTONES





BYD is going to be huge in electric vehicles, they are already huge, and are going to be much more huge. And, they are going to be huge in monorails, which is also a business whose time has come. And, they are also huge in these lithium batteries and lithium batteries are being improved — materially improved. And, the place is full of fanatics. And, by the way, they are a big supplier to Apple and Huawei. And, a very satisfactory supplier of those things. I'm terribly impressed with BYD. it's been one of the real pleasures of my life to watch.

--**Charlie Munger**



# BYD VISION

Technological Innovations for a Better Life.

