



# **The development strategy of clean-energy vehicles in China**

Professor Jianping Wu  
Present for MOST, China



清华大学-剑桥大学-麻省理工学院 低碳能源大学联盟

## 未来交通研究中心

Tsinghua University-University of Cambridge-Massachusetts Institute of Technology  
Low Carbon Alliance Future Transport Research Center

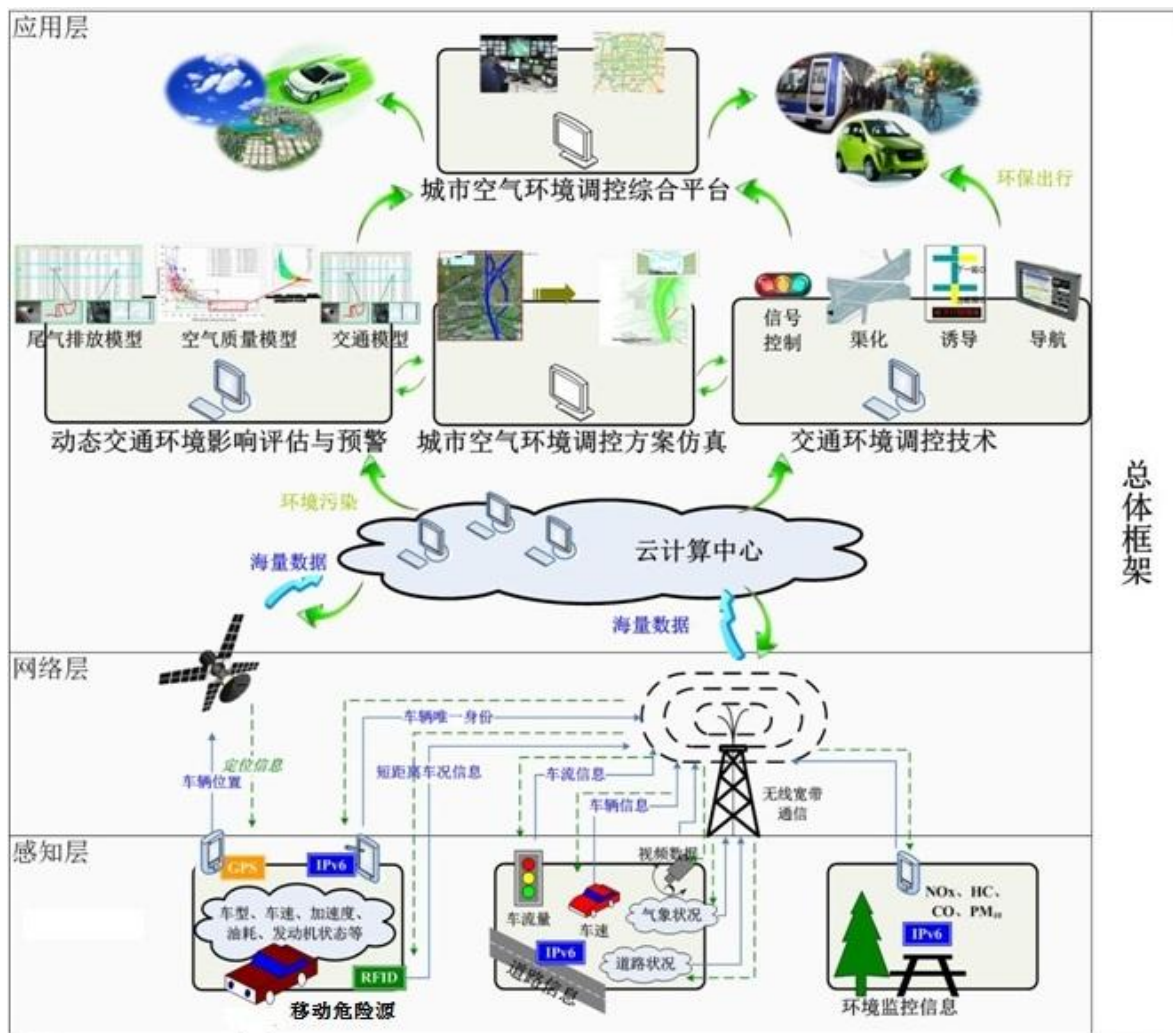
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# TCMFTC





# TCMFTC





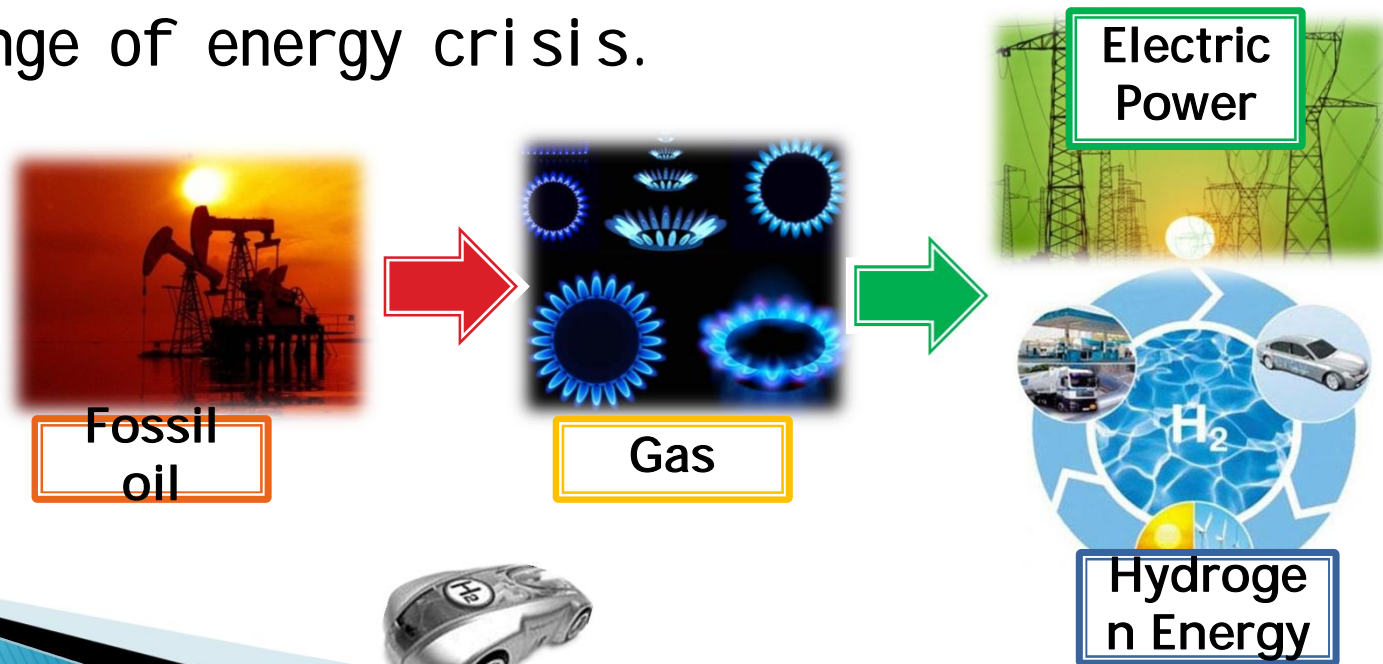
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# 1. The Current Situation

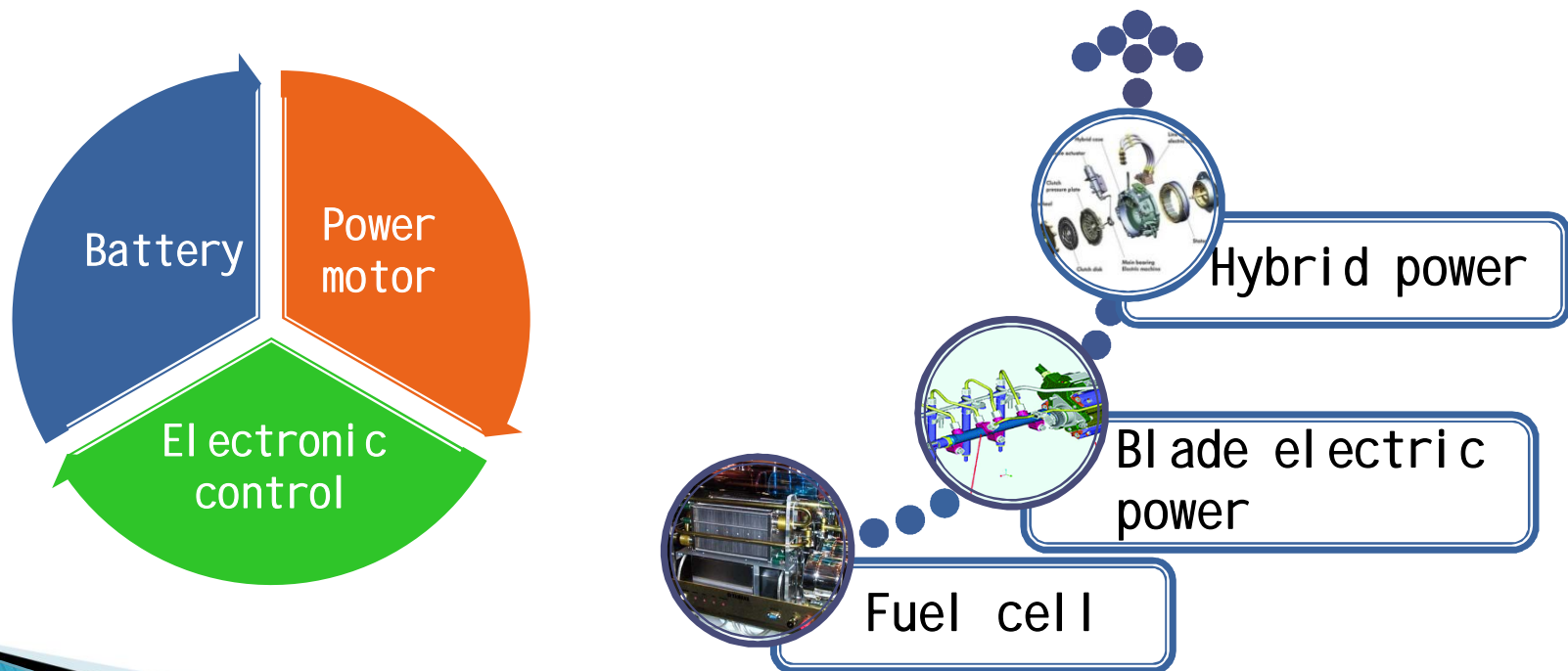
- ▶ Technical route: In the early of the century, China has studied the transportation energy policy with experts and industries to meet the challenge of energy crisis.

## ▶ Route Map



# Researches

- In 10<sup>th</sup> Five-Year Plan:
  - 880 million RMB for researches Electric Powered Vehicles
  - and other innovative technologies.



# Researches

- During the 11<sup>th</sup> Five-Year Plan:
  - 1.16 billion RMB for clean-energy and new energy automobiles research
  - Hundreds of automobile companies, components suppliers and universities involved.





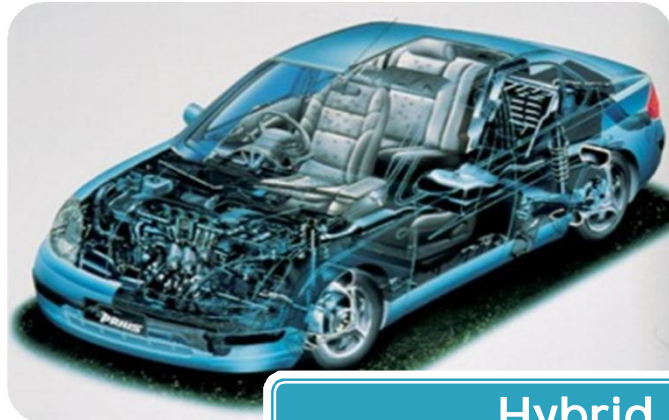
# Technology Achievements

## ➤ Patents

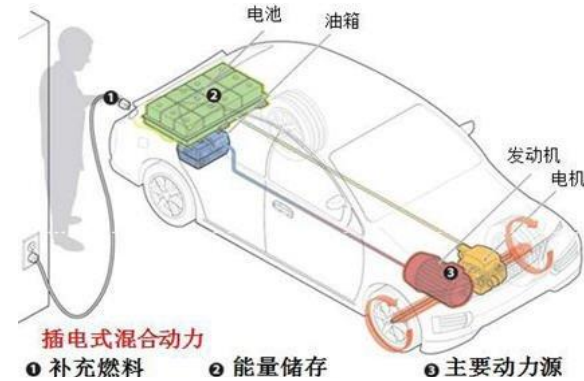
- 4,528 patents for electric vehicles
- Covering: vehicle design, battery, driving motor, key materials and battery management.



# Technological Achievements

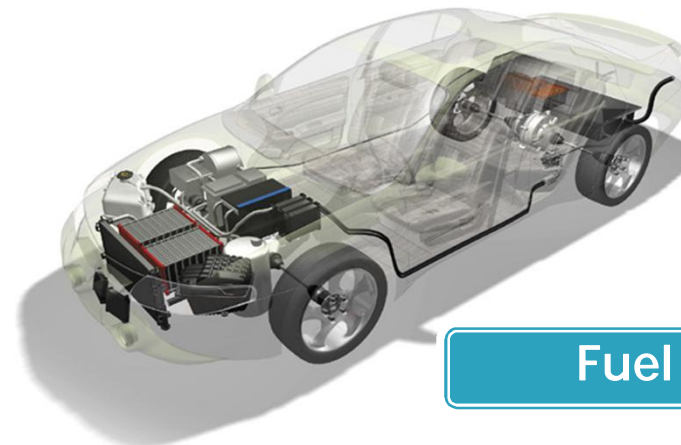


Hybrid



Plug-in Hybrid

Electric Powered



Fuel cell

# Technological Achievements

- Battery:

- Nickel-metal battery

- Lithium ion battery

- Super capacitor battery



# Technological Achievements

- Driving motor:
  - Permanent magnetic brushless motor,
  - AC asynchronous motor and
  - Switch reluctance motor





# Technological Achievements

- Fuel cell:
  - Power density
  - Reliability
  - Lifetime
  - Low-temperature performance
  - Environmental adaptation



# Development Strategy of Industrialization of electric vehicle

- 25 cities have been supported by national finance to implement pilot demonstration
  - Beijing Olympic
  - Shanghai Expo
  - .....
- Positive atmosphere for
  - industrialization
  - innovative business model



# Development Strategy of Industrialization of electric vehicle

- Pilot demonstration
  - 8.8 billion RMB investment
  - 27,432 electric vehicles in 25 cities
    - 9,834 electric cars,
    - 2,513 electric buses,
    - 3,305 hybrid electric cars,
    - 10,495 hybrid electric buses,
    - 52 fuel cell vehicles
    - 174 charging stations
    - 8,107 charging piles.



# Development Strategy of Industrialization of electric vehicle

- International cooperation
  - July 2010, China and America launched Electric Vehicles Initiative (EVI),
  - Now, 15 countries have joined the EVI, (China, America, France, Germany, Britain, Denmark, Finland, Italy, New Zealand, Portugal, Spain, Sweden, Japan, India, South Africa and IEA).





# Development Strategy of Industrialization of electric vehicle

- International Pilot Study:
  - Shanghai as the international pilot city
  - Jiading district as the international pilot zone (EVZONE)
- International collaborative study
  - Key technologies of electric vehicle in urban condition, (International Cooperation Project)
  - Validation and contrastive analysis of international electric vehicle technologies (863 Project)



# Development Strategy of Industrialization of electric vehicle

- The Jiading Pilot Zone
  - 45 types of electric vehicles
  - 17 international automobile enterprises (e.g. GE, Volvo, .....)
  - 849 AC charging piles
  - 10 DC charging piles,
  - 2 charging stations
  - 1 hydrogen refueling station
  - data collection and monitoring of 5,000 cars simultaneously



## 2. the latest policies and measures

- Targets:

- By 2015, production and sales of 500,000 electric vehicles

- By 2020:

- production and sales of 2 million electric vehicles

- fuel cell vehicle and vehicular hydrogen energy reach to the international advanced level



# Policy and measures

- Beijing

- By 2013:

- 5,000 electric vehicles

- By 2015,

- 50,000 electric vehicles

- By 2020,

- at least 50% of newly increased private cars will be electric vehicles.





# Policy and measures

- Innovation Capability Building
  - China Industry Technology Innovation Strategic Alliance (CITISA) of electric vehicle founded
  - Energy supplier - Automobile enterprise - Battery supplier alliance to support large-scale demonstration and promotion



# Policy and measures

- Technological Innovation
  - Electric Vehicle
  - new commercial modes
  - energy supply systems
  - fuel cell
  - driving motor




### 3. Suggestions to International Cooperation

1. Increase the investment in R&D
2. support cross-industry technology development.
3. Offer purchase allowance and tax reduction
4. finance supports to developments of charging facilities and battery recycling systems



# Suggestions

5. Researches on charging mode, commercial mode and standardization of PEV
  6. Policies to stimulate the use of PEV
    - No license control
    - No plate number limitation
    - Permission to use bus lane, and
    - Parking priority
- 

# Suggestions

- ▶ The Shanghai (Jiading) pilot zone is open to the world for demonstration and exhibitions
- ▶ Develop international R&D cooperated platform and strengthen cooperation between governments



*Welcome to "2013 International Forum  
on Electric Vehicle Pilot City and  
Industry Development",  
30<sup>th</sup> May to 31<sup>th</sup> May 2013, Shanghai*







**Thank you!**