The Development Status, Planning and Prospect of Charging Infrastructure In China

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Current Status and Planning of Charging Infrastructure in China
The Rapid Development of EV in China

- By the end of 2017, the ownership of EV in China has reached 1,729,000, an increase of 58.6% over the previous year.
- In 2017, the sales of EV reached 777,000, an increase of 53.3% over the previous year, accounting for 2.7% of the proportion of vehicle sales.
The Statistics of Charging Infrastructure

- Up to March 2018, the number of public charging piles reached 253,074, the number of private charging piles reached 268,282, and the ratio of vehicle-to-pile was about 3.4:1.
- Among the public charging pile, there are 109,584 AC charging piles, 77,437 DC charging piles, 66,053 AC and DC integrated integrated piles.

From the Charging Alliance of China
High Concentration of Public Charging Market

◆ At present, SGCC, Potevio, SAIC, TELD, and Star Charge are the 5 major operators in China, with more than 10 thousand operating piles. The total pile number of the 5 operators reached 227,843, accounting for 90% of the public charging pile market.
Main Sequences of Charging Piles in China

- **Single Phase**: 220V, 32A(max), 7kW(max)
- **Three Phase**: 380V, 63A(max), 40kW(max)

- **Voltage**: 200-500V (for passenger car), 350-700V (for commercial car)
- **Current/Power**: 0-250A/20-450kW
Charging Standard System of China

◆ China has established its own standard system, which is listed as one of the four major standard systems with USA, Japan and Europe.

◆ China Electricity Council (CEC) issued the group standard “Interactive of charging and battery swap service information for electric vehicle”, providing technical guidances for interoperability.
Planning of Charging Infrastructure in China

Planning of EV

By 2020, the amount of EV ownership will reach **5 million**.

Planning of Charging Infrastructure

By 2020, **4,300,000** special charging piles and **500,000** public charging piles will be built.
Current Status and Planning of Charging Network of SGCC
SGCC is the largest public utility enterprise in the world, ranking the 2nd on Fortune Global 500. It provides power to over 1.1 billion people in 26 provinces (autonomous regions and municipalities), covering 88% land area of China.
Since 2006, SGCC has invested more than 28 billion RMB in charging infrastructure construction, and built more than 5700 charging stations, about 56,000 charging piles.
By the end of 2017, SGCC has built more than 4,300 urban public charging stations, about 50,000 charging piles, covering 273 cities of 26 provinces.

The “5-3-1” network is formed in key cities such as Beijing and Shanghai, which means, the service radius of suburban area is not more than 5km, around the city is not more than 3km, and the city area is not more than 1km.
SGCC has built 1,409 charging stations in expressway service area, about 5,600 charging piles, covering 31,000km expressway and 150 cities in 19 provinces.
Construction of Associated Grid for Charging

- **Investment**: 6.6 billion RMB
- **Power Supply**: 90,000 households
- **Electrical Capacity**: 1.64 million kW

◆ A total investment of **6.6 billion RMB** has been applied to the construction and transformation of the associated grid for charging. Up to now, **90,000 households** have been connected to the power grid, with a capacity of **1.64 million kilowatts**.
Formulation of Charging Standards

SGCC has led the formulation and release of 22 national standards, 27 industry standards, 61 enterprise standards, and also released 3 IEC international standards, promoting China’s standards to the world.
SGCC continues to carry out R&D of key charging technologies, such as High Power Charging Pile above 350kW, AC & DC Integrated Charging Pile, Stereo Charging Garage, etc.
The charging service platform of SGCC called “Vehicle Network Platform” connects more than 240,000 piles by self-built and interconnection. The platform has more than 800,000 registered users (200,000 active users), and have provided charging services more than 24 million times and over 500 million kWh.
By 2020, SGCC will build **120,000 charging piles**, covering **202 cities** and **36,000km expressway**, making the charging as convenient as refueling.
“Vehicle Network Platform” Planning of SGCC

- By 2020, charging piles on the platform will reach **800,000**. Through the commercial mode innovation, the annual charging power of the platform will exceed **20 billion kWh**, and the annual consumption of clean energy will exceed **8 billion kWh**.
Coordination of New Energy and EV by Charging Network in Future Energy System
New Energy and EV are Natural Partners

- The new energy have natural intermittent and variability, and the electric vehicles have strong flexibility and controllability, thus the **coordination development potential** is great.

- Until 2030, the solar power plant in China will reach **1.1 billion kilowatts**, the wind power plant will reach **1.0 billion kilowatts**, and the EV ownership will reach **100 million**.
Electric vehicles will be the basic unit of future energy system.

Charging pile is the most important port of EV. It is also a coupling and key hardware to connect two trillion level market of new energy and EV.
The average **travel time** of the passenger cars is **less than 5%**, and the **idle time** parked next to the charging pile is about **22 hours and 48 minutes**.
Charge and Discharge Capacity of Vehicle Battery

- The cycle life of battery is generally more than 2000 times. The average mileage of the passenger car is usually less than 100,000km, corresponding charge and discharge times are less than 500, and the rest cycle is almost zero marginal cost storage resource.
Charging Pile Monitoring of Beijing
It is expected that by 2030, the number of electric vehicles will reach 100 million. According to 10% connection calculation, the theoretical energy storage capacity of the vehicle battery will reach 1 billion kW/8 billion kWh.
Prospect of Future Energy System

◆ Mass EVs will be a huge energy storage sponge to suppress all fluctuations of the power grid. All we need to do is to make the EV correctly charge and discharge the right quantity of electricity in the right time and the right place by intelligent energy internet.
Thanks