OPPORTUNITIES AND CHALLENGES FACING THE RAPIDLY GROWING EV MARKET IN SHANGHAI

The Rapidly Growing EV Market in China - Roadmap 12 Portland US
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1. The EV Market Structure in Shanghai
2. Unlocking Market Opportunities and Challenges Using Customer Data
4. Brief Introduction of the EVDATA
The number of electric vehicles is close to 260,000.

From 2013 to April 2019, a total of 256,600 electric vehicles were promoted in Shanghai.

2013-2019年4月，上海新能源汽车累计推广25.66万辆
1. THE EV MARKET STRUCTURE IN SHANGHAI

- Characteristics of EV Market Structure in Shanghai

- **Private user proportion in Shanghai EV market as of 2018**
  - 63%

- **Passenger car proportion in Shanghai EV market as of 2018**
  - 69.6%

- **PHEV proportion in Shanghai EV market as of 2018**
  - 89%

- **The penetration rate of EV vehicles was 4.2%** in Shanghai as of 2018

*1: Shanghai license + long-term nonlocal license in Shanghai*
As of 2018, the ratio of EVs to chargers was 1.13:1, the expected ratio will be 1:1 for 2020.

The charger ownership in Shanghai as of 2018:
- Private charging pile: 141786, 67%
- Special charging pile: 36233, 17%
- Public charging pile: 32631, 16%

The non-private DC/AC charger ownership in Shanghai as of April 2019:
- DC charger: 58023, 82%
- AC charger: 13128, 18%
- AC/DC charger: 1443, 0%
Oppty. 1: the formation of private purchase market, driven by continued government subsidies and license plate incentives.

As of March 2019, the central government’s subsidies had reached RMB 95.8 billion. It’s expected that by 2020,
Oppty. 2: the ratio of chargers installed in residential area for overnight charging to parking spots is 1:2, time-sharing charging solutions for residents.

Distribution of charging time of 4 types of BEVs in Shanghai

Distribution of charging time of 4 types of PHEVs in Shanghai

The average charging time for users is about 3-4 hours—1 charger can serve 2 charging spots / time-sharing charging mode.
Oppty. 3: EVCARD BEV car-sharing mode is developing rapidly

- Established in May 2016 and has been developing fast since then.
- Over 4,950,000 registered members as of May 2019.
- Over 48,000 vehicles put into operation.
- Over 11,000 pick up & return points put into operation.
- Operations in over 40 cities in China.

GEOGRAPHICAL DISTRIBUTION OF ORDERS IN SHANGHAI

<table>
<thead>
<tr>
<th>Category</th>
<th>Orders (thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>11%</td>
</tr>
<tr>
<td>CBD business units</td>
<td>17%</td>
</tr>
<tr>
<td>University</td>
<td>14%</td>
</tr>
<tr>
<td>Hotel &amp; catering</td>
<td>8%</td>
</tr>
<tr>
<td>Public service</td>
<td>17%</td>
</tr>
<tr>
<td>Government departments</td>
<td>8%</td>
</tr>
<tr>
<td>Tourist attractions</td>
<td>3%</td>
</tr>
<tr>
<td>Enterprises</td>
<td>22%</td>
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</table>

Have been put into operation in 42 cities in China.


**Challenge 1: BEV winter mileage anxiety grow**

**Actual power consumption increase index (Oct. 2018)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
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<tbody>
<tr>
<td>Model A</td>
<td>1.11</td>
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<tr>
<td>Model B</td>
<td>1.16</td>
</tr>
<tr>
<td>Model C</td>
<td>1.15</td>
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<tr>
<td>Model D</td>
<td>1.11</td>
</tr>
<tr>
<td>Model E</td>
<td>1.05</td>
</tr>
<tr>
<td>Model F</td>
<td>0.99</td>
</tr>
<tr>
<td>Model G</td>
<td>1.07</td>
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</table>

**Actual power consumption increase index (Jan. 2019)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
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<tbody>
<tr>
<td>Model A</td>
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</tr>
<tr>
<td>Model B</td>
<td>1.24</td>
</tr>
<tr>
<td>Model C</td>
<td>1.22</td>
</tr>
<tr>
<td>Model D</td>
<td>1.23</td>
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<tr>
<td>Model E</td>
<td>1.18</td>
</tr>
<tr>
<td>Model F</td>
<td>1.11</td>
</tr>
<tr>
<td>Model G</td>
<td>1.17</td>
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</tbody>
</table>

**Actual on-road power consumption increase index**

\[
\frac{\log Actual \ power \ consumption/100Km}{\log Announced \ power \ consumption/100Km}
\]
Challenger 2: The large-scale deployment of EVs has brought burden on urban grid, especially during daytime peak hours.

10 p.m.-1 a.m.: peak hours for EV charging. However, there are still a large number of EVs being charged from 9 a.m. to 11 a.m.
Challenge 3: the electric car-sharing business mode faces challenges of increasing profits of points and reducing costs and expenses.

Rapid growth leads to irrational site selection of nearly 50% points.

EVCARD OPEX makeup for a city:
- Management cost 28%
- Vehicle depreciation 26%
- Insurance fees 21%
- Rental sites Fees 20%
- Maintenance costs 3%
- Charging fees 2%

Depreciation expenses and insurance costs are hard to reduce, accounting for 47% of the total costs.
3. BRIEF INTRODUCTION OF EVDATA

- EV data has been applied in vehicles, batteries, e-motors, points, insurance and transportation etc.

- EV product planning & auto parts evaluation
- EV battery health & safety monitoring
- EV big data-enabled traffic & transportation and urban planning
- EV big data-enabled point site planning
- EV insurance & vehicle’s residual value
- Applications in multiple scenarios
- Charger habits, charging planning and power configuration prediction
3. BRIEF INTRODUCTION OF EVDATA

Partners of Bid Data Analysis & Application
Aim: to build EVDATA into an open ecosystem platform for application of EV big data

- **Data and Application demand side**
  - City/transport administration department
  - Insurers
  - Residual value evaluation service providers
  - Different app suppliers
  - Auto companies
  - Universities and research institutes

- **Open ecosystem platform for application of EV big data**
  - Good management of data
  - Labeled data
  - Different shareable algorithms

- **Data and Algorithms provider side**
  - EV data
  - Road map data
  - POI data supplier (chargers and points)
  - Battery health algorithm suppliers
  - Traffic scenario algorithm suppliers
  - Residual algorithm suppliers