European Bus Electrification and Global Insights
Interact Analysis

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Europe: Market Shares for Battery Electric City Buses

Europe Battery Electric City Bus Market Shares - 2017

- Solaris: 14%
- BYD: 13%
- VDL Bus and Coach: 12%
- ADL: 7%
- Other: 54%

Buses above 6t not including trolleybuses
Source: Interact Analysis
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Europe Battery Electric City Bus Market Shares - 2018

- VDL Bus and Coach: 15%
- Solaris: 14%
- BYD: 11%
- ADL: 9%
- Other: 51%

Buses above 6t not including trolleybuses
Source: Interact Analysis
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Europe: Battery Electric City Bus Market

Europe Battery Electric City Bus Market

Buses above 6t not including trolleybuses
Source: Interact Analysis

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Charging Infrastructure in EMEA Cities

2017 Installed Base

- Depot: 58%
- Opportunity: 35%
- Opportunity and Depot: 7%

2018 Installed Base

- Depot: 53%
- Opportunity: 40%
- Opportunity and Depot: 7%

Installed in 2018

- Depot: 40%
- Opportunity: 52%
- Opportunity and Depot: 8%
Low Emission Zones: Active vs. Proposed

For proposed emission zones, there is a significant increase in the ‘minimum’ standard versus existing zones. This is a positive, but still means many zones in Europe only ban the oldest vehicles, leaving many cities still relatively heavily polluted.
Chinese New Energy Bus Market

Recent policy changes

- China have electrified most of their easy routes and the remaining routes are difficult to electrify.

- They plan to introduce hydrogen fuel cell buses for these routes.

- Unlike the subsidy slope currently facing the electric bus market in China, hydrogen fuel cell buses have not had a reduction in the subsidies they receive.

- As a result, we will see a large number of hydrogen fuel cell buses enter service over the next few years in China.

China Fuel Cell Bus Production in 2017

(Unit Delivered)

Indian Battery Electric City Bus Market

<table>
<thead>
<tr>
<th>Year</th>
<th>Ashok Leyland</th>
<th>Olectra-BYD</th>
<th>Tata Motors</th>
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<td></td>
<td></td>
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Bangalore Case Study:

- **Feb 2014**: BMTC launch e-mobility trial run

- **Oct 2016**: DHI approves subsidies of 150 electric buses

- **Jul 2017**: BMTC decides on an OPEX operating model

- **Feb 2018**: Olectra-BYD wins tender with lowest bid

- **March 2018**: DHI refuses to subsidise the electric buses on an OPEX model

- **May 2018**: DHI agree to subsidise 80 buses on an OPEX model

- **Aug 2018**: DHI prolongs approving contract
Summary:

1. France and the UK leading the way for electric buses
2. Hybrid buses will plateau while electric buses ramp
3. More stringent emission zones to be introduced primarily focused at diesel
4. China’s NEV policies will mean an increase in the number of fuel cell buses
5. Confusion and uncertainty preventing Indian electric bus market from reaching full potential, despite strong growth
Thank you!

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