



**2007 SPE Automotive
Composites Conference &
Exposition**

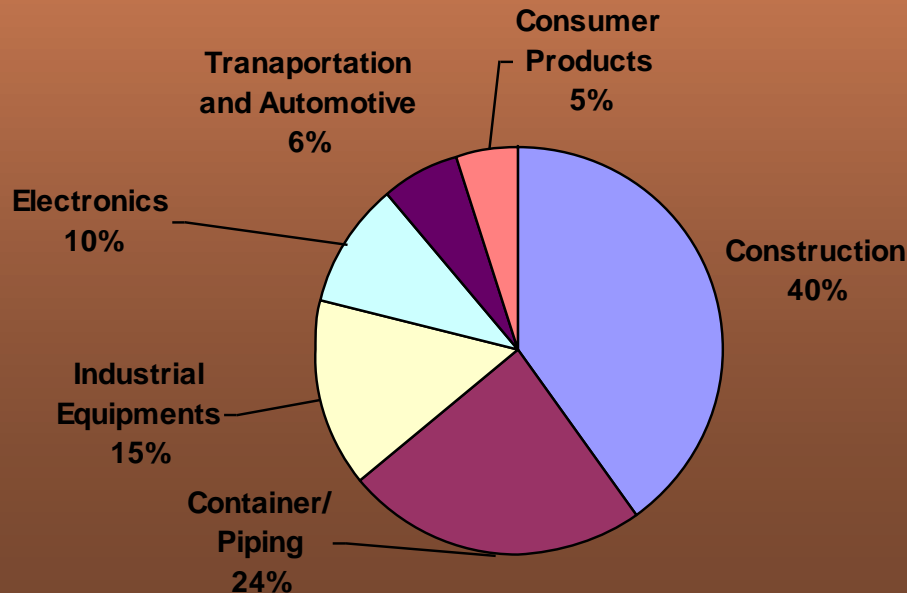


**Overview of Use of Composites
In China Automotive Industry**

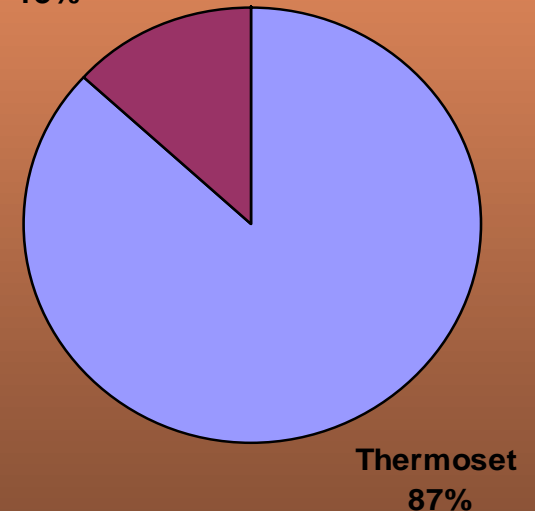
Fiber-Reinforced Plastic Composite Material in China -

Total Production of Fiber-Reinforced Plastic: 1.2 MM MT (~2.6 Billion Lbs.)

- Construction Industry;
- Container and Piping;
- Industrial Equipments;
- Transportation and Automotive;
- Electronics;
- Consumer products



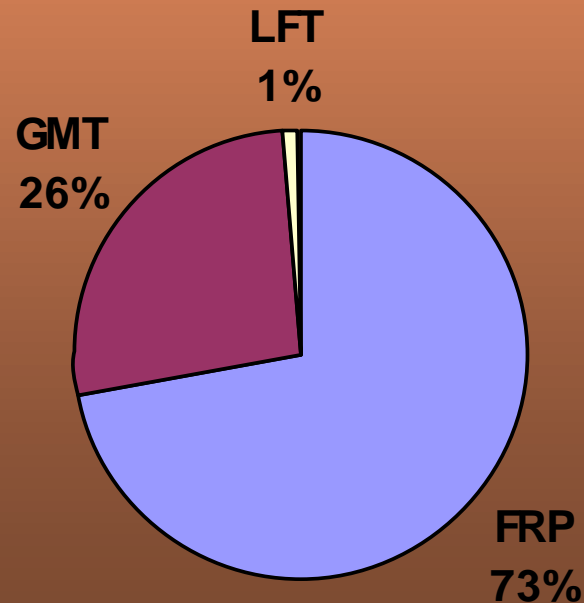
Thermoplastic
(incl. Plastic
Compound)
13%



Composite Materials in China Automotive Industry -

Exterior Applications: (~30,000 MT's)

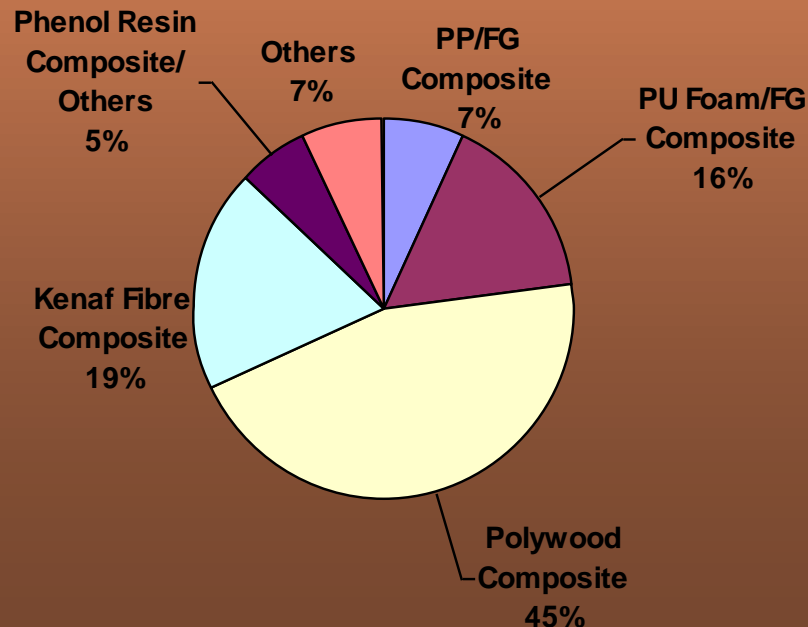
- FRP - bumper, front side, rear fender, Roof and etc.
- GMT - bumper beam, battery box, underbody shield, spare wheel tub
- LFT - front end frame, underbody shield



Composite Material in China Automotive Industry -

Interior Applications: (~31,000 MT's)

- LRT -FG Reinforced Thermoplastic - headliner, parcel shelf, sunshade
- FG Reinforced PU foam - headliner,
- Wood Grain Filled Thermoplastic - Door panel, Parcel shelf
- Natural Fiber Reinforced Thermoplastic - Headliner, Side/rear wall panel,
- Phenol Resin Composite - Headliner, parcel shelf
- PUR - Instrument panel, Sunshade



Latest trends for Interior Materials In China:

- Mechanical performance

- Cost

- Odor and VOC

- **Weight**

- **Moldability for Design & Style**



1. Natural Fiber reinforced thermoplastics are being challenged for interior applications - moisture wicking characteristics and odor
2. Wood Grain filled thermoplastics do not support part mass reduction and have lower strength/weight ratios
3. Fiber Glass Reinforced Thermoplastics are growing

Highs & Lows of Composite Material Converters in China

Highs -

- Cost Control Efficiency
- Quality Control efficiency
- Flexibility

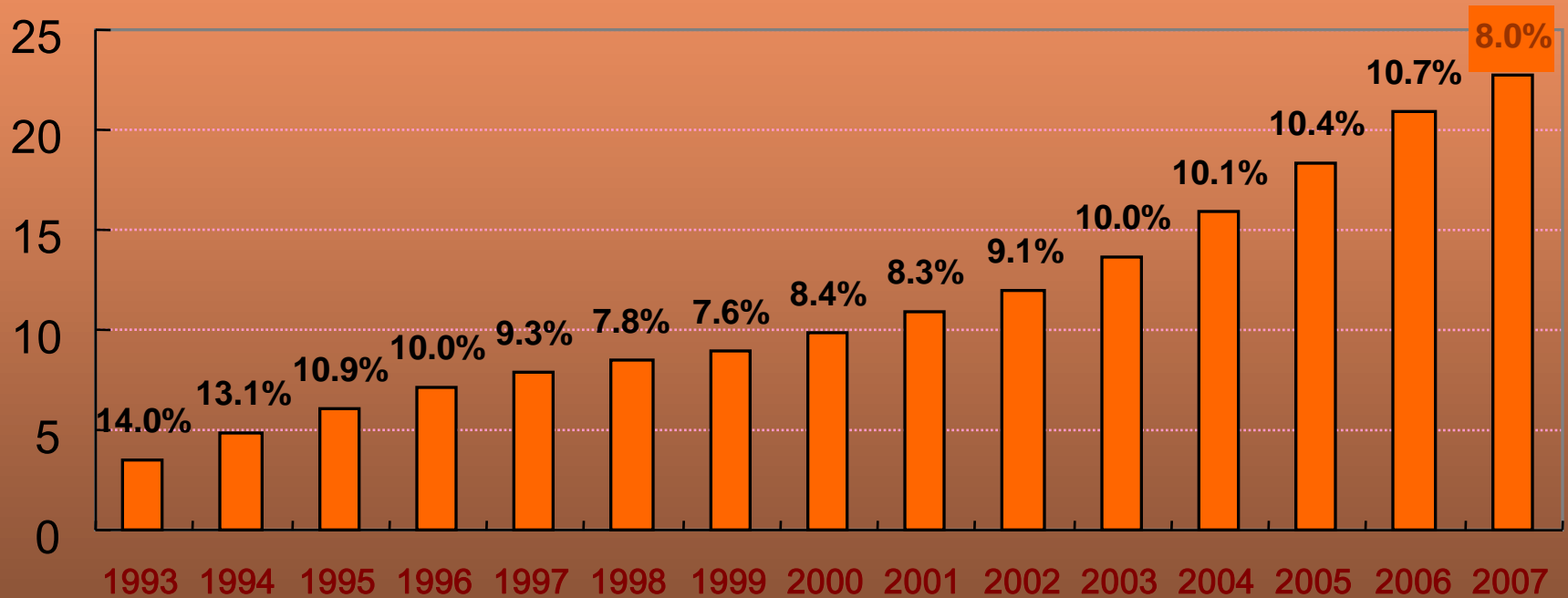
Lows -

- Product Development Capabilities
- Engineering Support Capabilities
- Technology Development



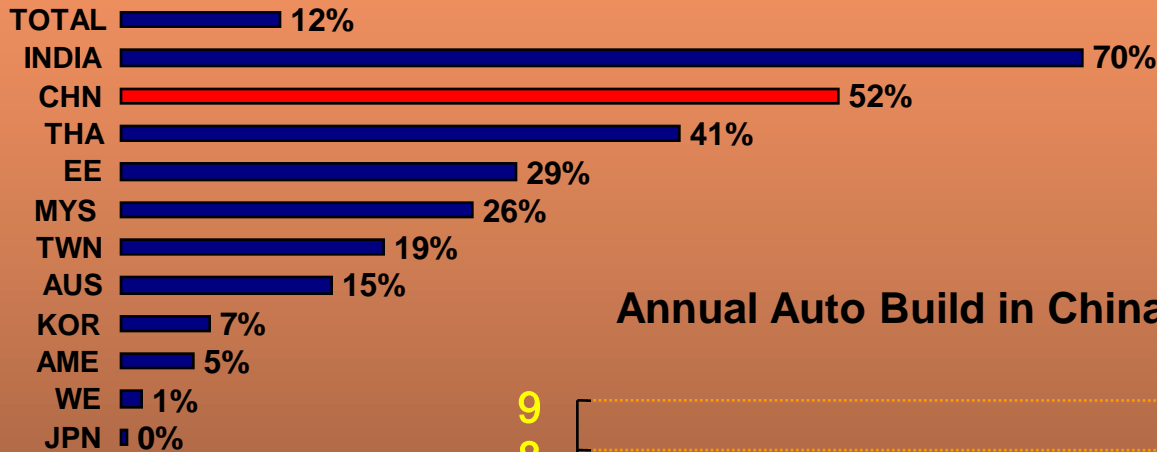
Doing Business in China

China GDP (in Trillion RMB)

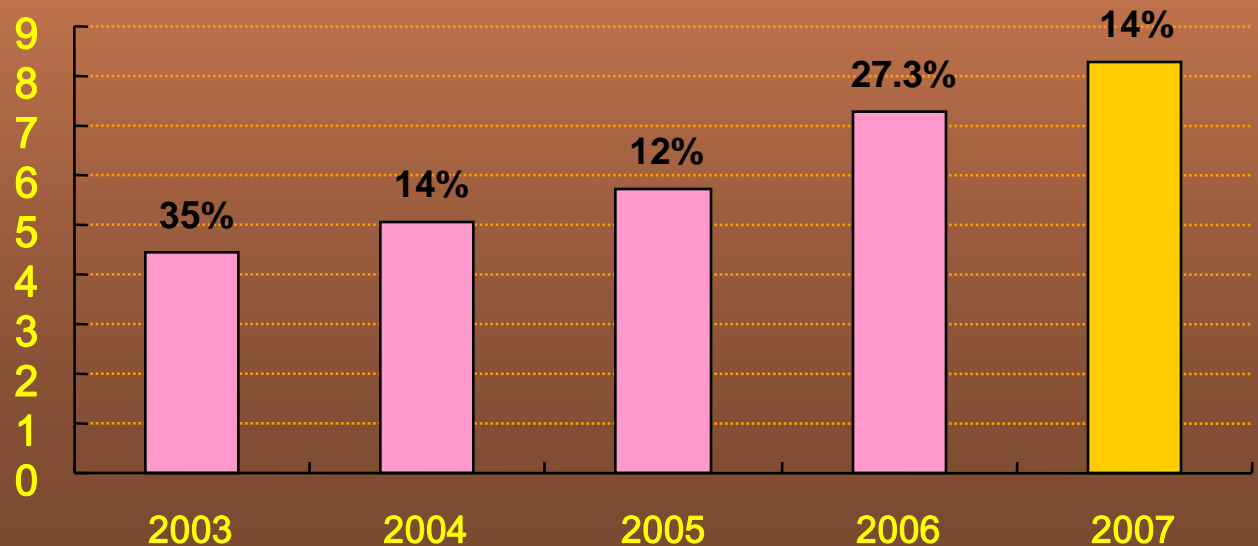


China Automotive Growth:

“Asian” Region Growth 2005 to 2009



Annual Auto Build in China (Millions)



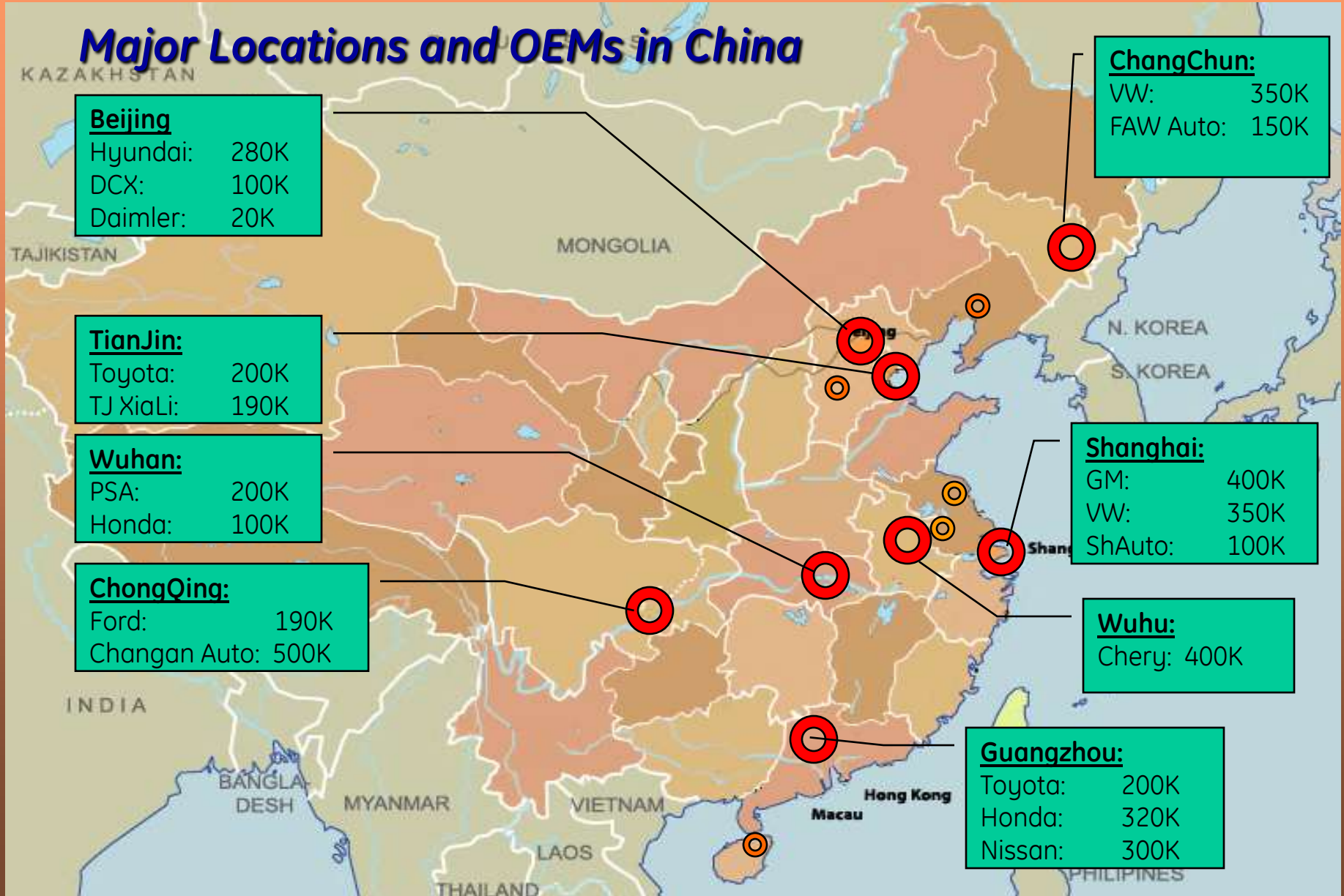
Top 10 OEMs and production in 2006: (Units x 1000)

1.	Shanghai GM	413
2.	Shanghai Volkswagen	352
3.	FAW Volkswagen	350
4.	Chery Auto	300
5.	Beijing Hyundai	280
6.	Guangzhou Honda	260
7.	Geely Auto	205
8.	DongFeng Peugeot/Citroen	200
9.	Brilliance Auto	200
10.	Changan Ford/Mazda	194

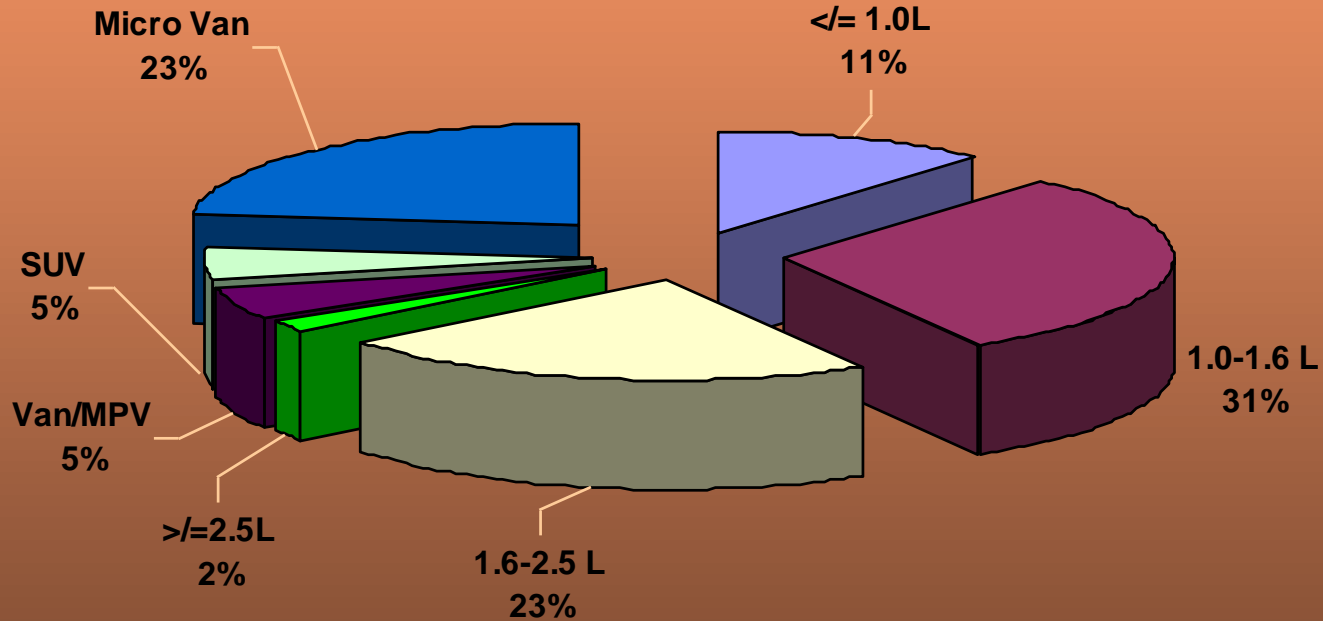


**60% Passenger
Vehicles built
in China**

Major Locations and OEMs in China



China Automotive Market -



China Auto Market Needs for Composite -

- Lower System Costs
- Lower Part Weight
- Available Locally
 - Materials
 - Converters
- Recyclable Applications
- Design Freedom

Key Elements to be successful in China

1. Technology & Local Support
2. Engineering Capability in the Region
3. “Relationship” / Partnerships with OEM’s
4. Sales & Service
5. “Flexibility”



*Thank You SPE and the Attendees of the 2007
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