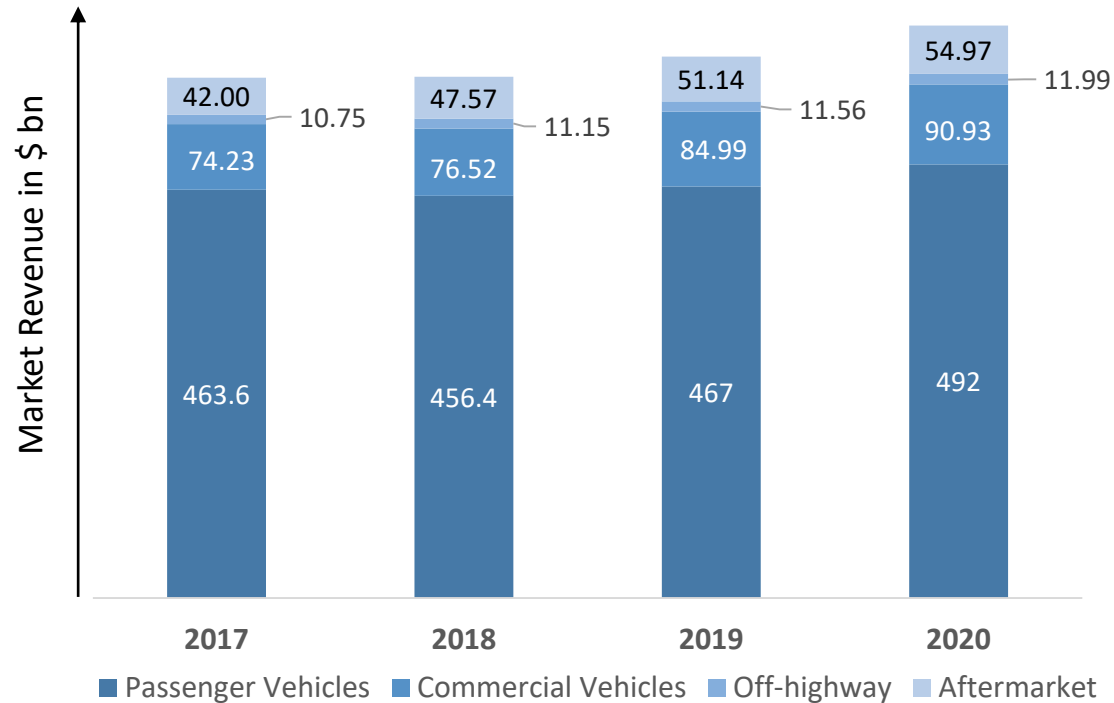


## China's Automotive Landscape

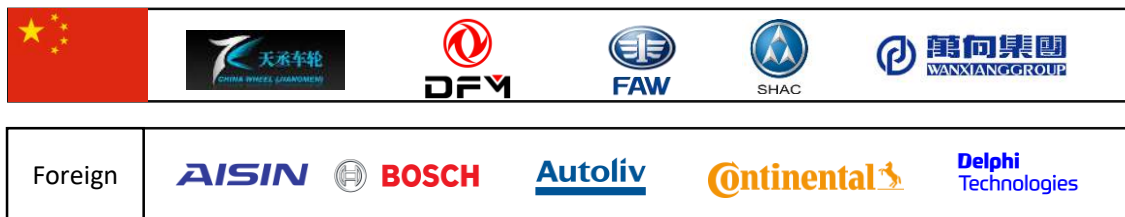
January 2019

# China Automotive Outlook: The downfall of passenger cars market in 2018 is not expected to upset the investments of auto Industry in China

## Total Automotive Market Revenue: ~\$ 590-600 Bn (2018)



## Major Automotive Suppliers



## Major players in Passenger Vehicles



## Major players in Commercial Vehicles



## Major players in Off-Highway Vehicles



**R&D Spend & Major spenders:** Foreign giants like Ford, Bosch and Volkswagen's growing investments in China signals the need for technology partners that can fasten time-to-market

Connected Cars, ADAS & Autonomous Cars, Hybrid & Electric Mobility

### Total Automotive R&D Spend in China (2018)

**\$7.8 – 8 Bn**

**~43%**

R&D spend contribution by Top 5 R&D spenders

Body Engineering, Car Electronics, Powertrain Engineering, Hybrid & Electric Mobility, Infotainment & Connected cars

**~36%**

Next 10 R&D spend contribution

**~21%**

R&D spend contribution by Rest of the Companies

Automotive Companies\* →

### R&D Spend: China vs International

Region	% of R&D Spend
China	~53%
International	~47%

### R&D Spend: OEM Vs OES

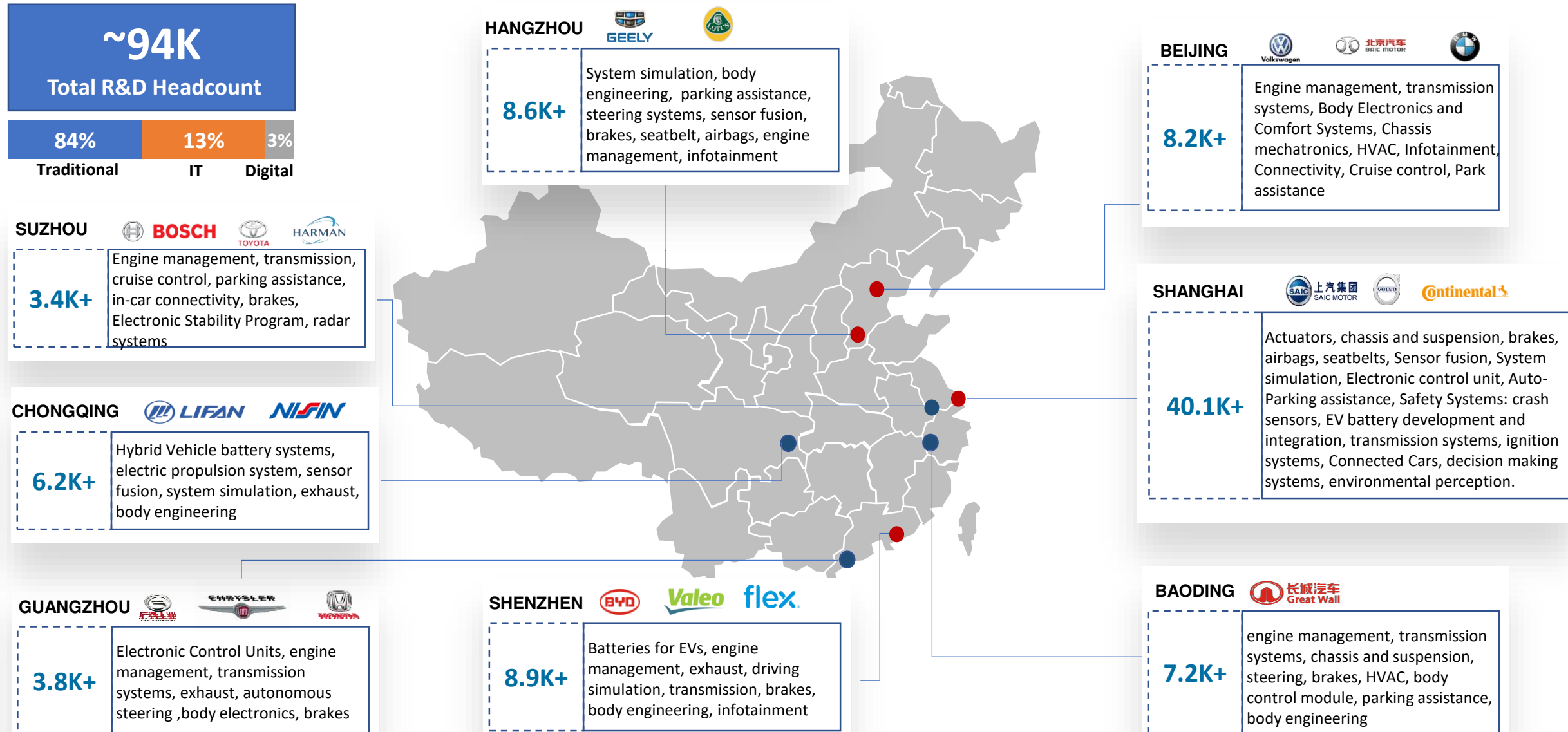
Region	% of R&D Spend
Manufacturers	~73%
Suppliers	~27%

### Top 5 R&D Spenders

SAIC MOTOR	\$1.2 – 1.4 Bn
BYD CO LTD	\$0.56 – 0.58 Bn
ROBERT BOSCH	\$0.55 – 0.57 Bn
GREAT WALL MOTOR	\$0.49 – 0.51 Bn
FORD MOTOR	\$0.47 – 0.49 Bn

\*Automotive companies include Passenger and Commercial vehicles manufacturers and Tier-I Automotive suppliers





# Major Auto Hotspots: Shanghai, Shenzhen and Beijing are the key hotspots to pursue opportunities with Domestic and international vehicle manufacturers and suppliers



Note: Analysis is based on the DRAUP's proprietary engineering database, updated in Jan 2019

\*Listed workloads are not exhaustive

## Key Hotspots Deep-dive: Shanghai and Beijing offer high opportunities in 95 R&D centres of different vehicle and component manufacturers

Shanghai, China	Shenzhen, China	Hangzhou, China	Beijing, China
<b>R&amp;D Workforce:</b> 40k+ <b># of R&amp;D Centers:</b> 108(2) <b>Key Areas of Focus:</b> <ul style="list-style-type: none"> <li>• Body Engineering</li> <li>• Powertrain</li> <li>• ADAS</li> <li>• Infotainment and connectivity</li> <li>• Safety Systems</li> </ul>	<b>R&amp;D Workforce:</b> 8.9K+ <b># of R&amp;D Centers:</b> 9(1) <b>Key Areas of Focus:</b> <ul style="list-style-type: none"> <li>• Powertrain</li> <li>• Body Electronics and Comfort Systems</li> <li>• Infotainment and Connectivity</li> <li>• ADAS</li> </ul>	<b>R&amp;D Workforce:</b> 8.5K+ <b># of R&amp;D Centers:</b> 6(1) <b>Key Areas of Focus:</b> <ul style="list-style-type: none"> <li>• ADAS</li> <li>• Powertrain</li> <li>• Safety Systems</li> <li>• Body Engineering</li> </ul>	<b>R&amp;D Workforce:</b> 7.8K+ <b># of R&amp;D Centers:</b> 27(2) <b>Key Areas of Focus:</b> <ul style="list-style-type: none"> <li>• Powertrain</li> <li>• Infotainment and Connectivity</li> <li>• Body Electronics and Comfort Systems</li> <li>• ADAS</li> </ul>
<b>Service Areas:</b> <ul style="list-style-type: none"> <li>• Manufacturing Engineering</li> <li>• Design and Development</li> <li>• Application Software and Platform Expertise</li> <li>• Fleet Monitoring</li> <li>• Value Engineering and Product Sustenance</li> </ul>	<b>Service Areas:</b> <ul style="list-style-type: none"> <li>• Design and Development</li> <li>• Manufacturing Engineering</li> <li>• Value Engineering and Product Sustenance</li> </ul>	<b>Service Areas:</b> <ul style="list-style-type: none"> <li>• Software Implementation</li> <li>• Manufacturing Engineering</li> <li>• Testing, Validation and Certification</li> </ul>	<b>Service Areas:</b> <ul style="list-style-type: none"> <li>• Design and Development</li> <li>• Software Implementation</li> <li>• Value Engineering and Product Sustenance</li> </ul>
			



## Competition Landscape: European and Indian Service Providers dominate the Chinese Automotive Services market with ~70% of overall engineering services

### Dominant Sub – Vertical

Body Engineering & Safety Restraints, Connected Cars and Infotainment & Driver Information Systems

### Automotive Deals Outsourcing (USD)

~\$450 Mn – 500 Mn

### Body Engineering

- Design and analysis of air supply units, flow chart, air supply units and regulation trains
- Development of Crash Safety and Convert real bio fidelity human body Finite Element models from LS SYNA to Pam crash
- Design, coordinate and support of Body-in-White and exterior trim in passenger cars

### Powertrain & Propulsion systems

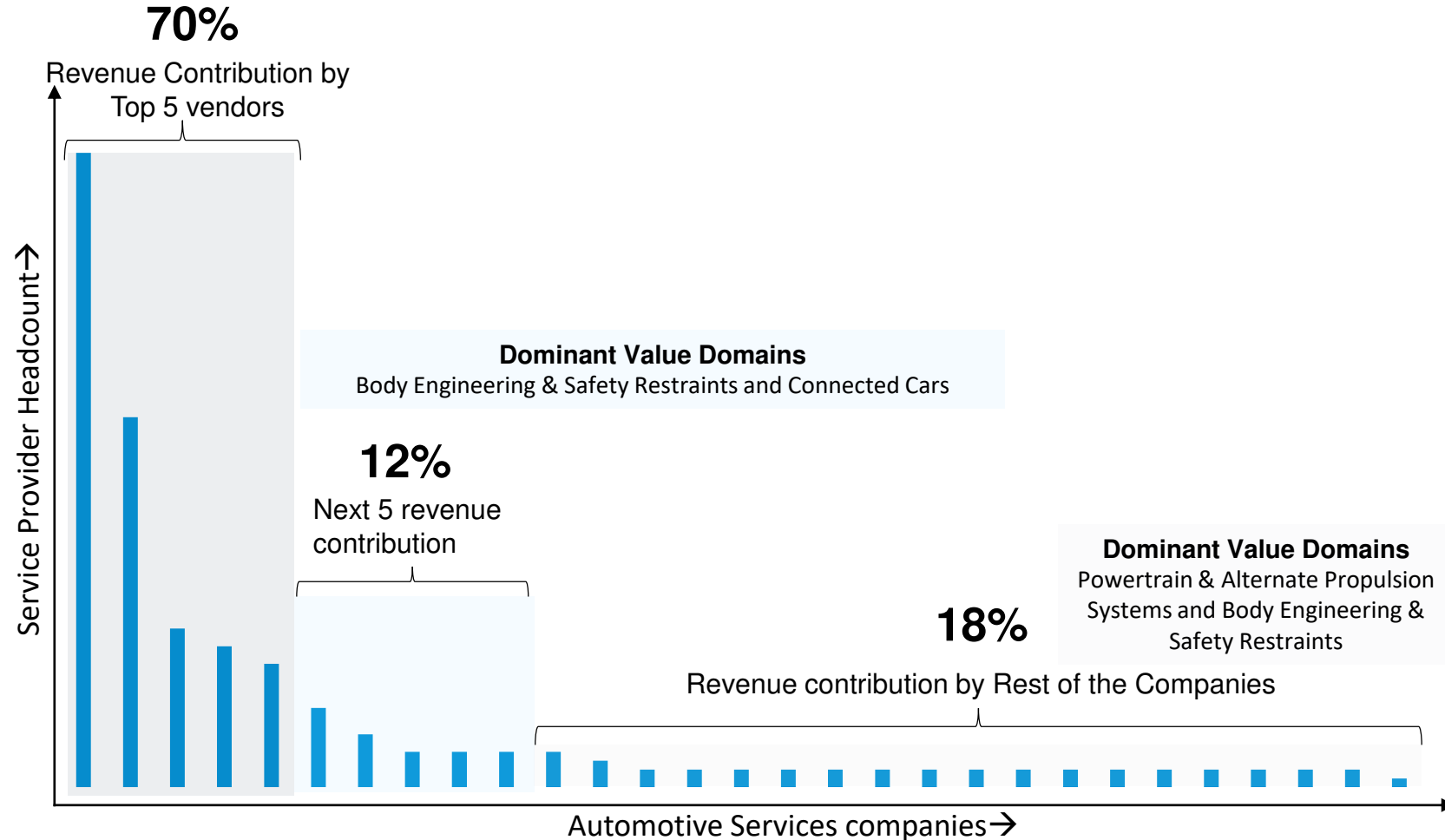
- Design, Testing, Integration of New PHEV and EV
- Engine Control Software Testing
- 3D & 2D Modelling for Engine components
- Powertrain Architecture Design
- Design of Automotive exhaust components
- EV and Hybrid Battery testing

### HMI, Connectivity & Infotainment

- Design & development of Infotainment system for passenger cars
- Development & migration of AUTOSAR modules
- Testing of On-Board Telematics applications
- HMI & application development for Instrument Clusters

### ADAS & Safety systems

- Design & development of vehicle diagnostic tools for Active safety modules, Testing and Verification of vehicle functionalities
- Design, development and testing of modules like Collision Warning, Intelligent Forward View Camera, Electronic Controller Unit (ECU)



Note: The above analysis is based on Draup's Proprietary Services module updated in January 2019.

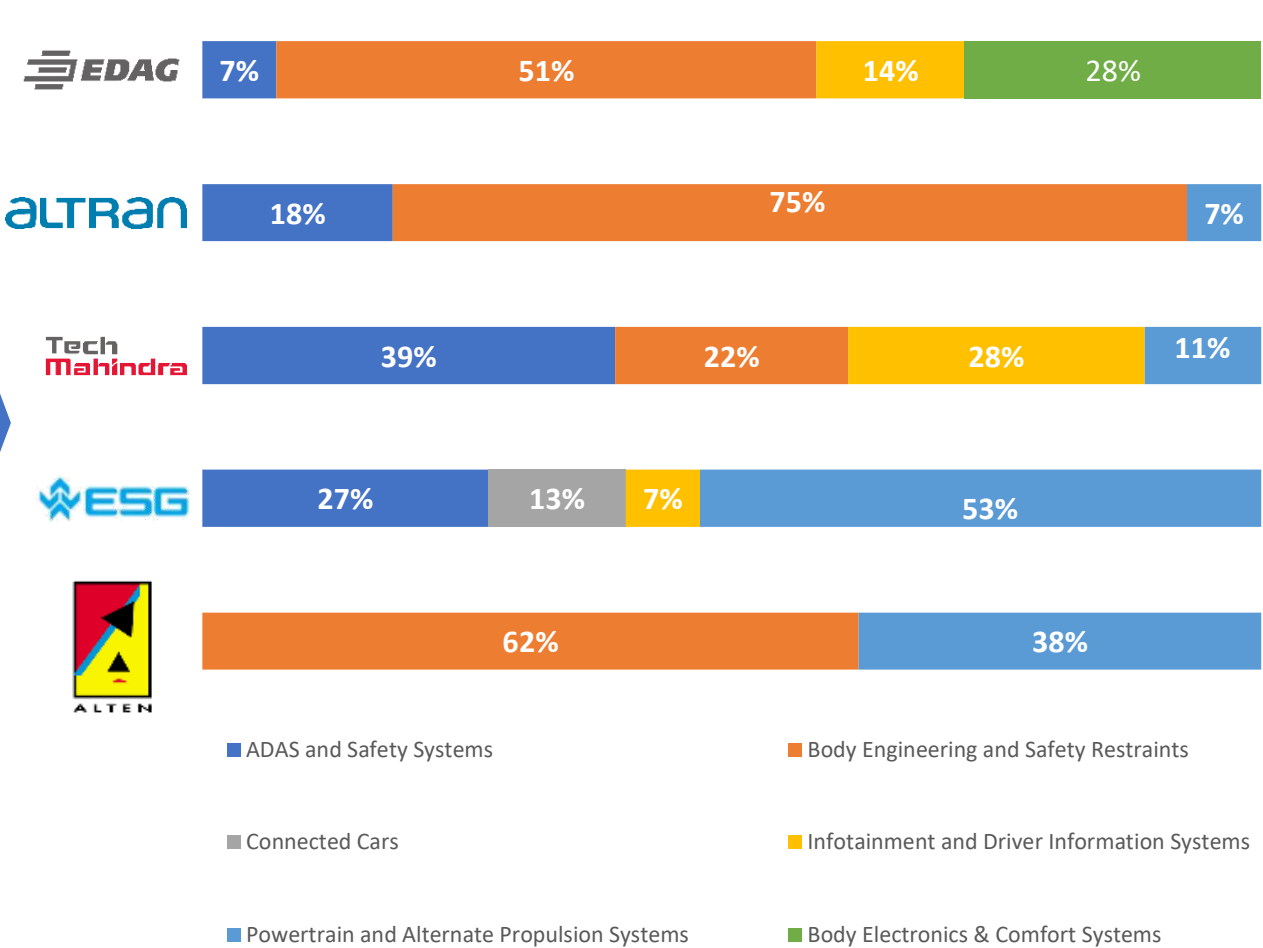
**Top 5 SPs:** Body Engineering and Safety Restraints segment contributes to ~40% of the revenue amongst Top 5 SPs

Revenue split of Top 5 Automotive SPs  
(FY 2018)

Key Clients



Total revenue share of Top 5 SPs from Body Engineering and Safety Restraints



Note: The above analysis is based on Draup's Proprietary Services module updated in January 2019.

**Opportunity Propensity:** With increasing focus on digital engineering within Automotive, OEMs are prioritizing initiatives around connected cars and infotainment

Value chain Areas	By Segments				By Players	
	Passenger	Commercial	Suppliers	Off-Highway	Chinese	International
Body Engineering & Safety Restraints	High	High	Low	Medium	Medium	High
Powertrain and Alternate Propulsion	High	Medium	Medium	Low	Low	High
Body Electronics & comfort system	Medium	Low	Medium	Low	Low	Low
ADAS & Safety systems	Medium	Medium	High	Low	Low	Medium
Connected Cars	Medium	Low	High	Low	Low	Medium
Infotainment and Driver Information Systems	Medium	Medium	Medium	Medium	Low	Medium



## Opportunities with Chinese players: Robert Bosch and Ford has high outsourcing propensity in china market

Company Name	Total China HC	R&D Spend in China \$MN	No. of R&D Centres	R&D Locations in China	Opportunity Propensity
SAIC MOTOR	4500 – 5000	1200 - 1400	3	Shanghai(2) , Nanjing	
BYD CO LTD	14000 – 15000	500 - 600	10	Shenzhen(2), Shanghai(2), Shaoguan, Guangdong area, Changsha, Guangzhou, Shaanxi area, Beijing	
GREAT WALL MOTOR	6000 – 7000	450 - 500	9	Baoding (7), Shanghai, Beijing	
BAIC	3500 - 4000	400 - 450	3	Beijing (3)	
DONGFENG MOTOR	3000 – 4000	400 - 450	3	Wuhan, Hubei area, Xianyang	
CHONGQING CHANGAN	3000 – 4000	350 - 400	4	Chongqing, Beijing, Harbin, Shanghai	
Sany	5000 – 6000	250 - 300	5	Changsha, Shanghai, Beijing, Kunshan, Huzhou	
CRRC Corp., Ltd.	500 – 1000	50 - 80	4	Beijing, Changchun, Qingdao, Hunan area	

Note: Analysis is based on the DRAUP's proprietary engineering database, updated in Dec 2018

High Medium Low

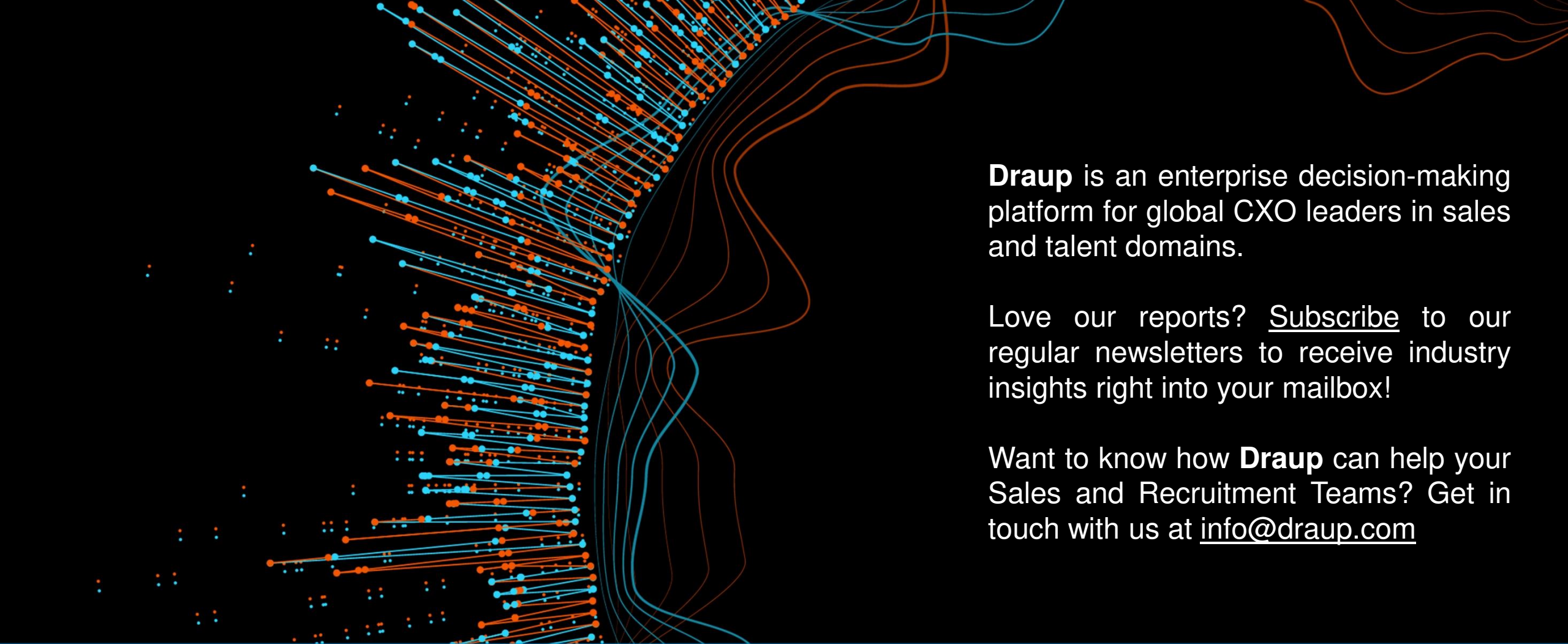
**Opportunities with International players:** Robert Bosch and Ford has high outsourcing propensity in china market

Company Name	Total China HC	R&D Spend in China \$MN	No. of R&D Centres	R&D Locations in China	Opportunity Propensity
ROBERT BOSCH	2500 - 2700	500 - 600	13	Shanghai (6), Changsa(2), Suzhou(2), Wuxi(2), Chengdu	High
FORD MOTOR	1500 - 1700	400 - 550	4	Shanghai(2), Nanjing(2)	High
DENSO	500 - 700	250 -350	2	Shanghai(2)	Medium
BMW	400 - 600	250 - 300	3	Shanghai(2), Beijing(2), Shenyang	Medium
DAIMLER	400 - 600	200 - 250	2	Beijing (2)	Medium
CONTINENTAL	1300 - 1500	200 - 250	8	Changchun(2), Hefei, Nanjing, Heilongjiang Area, Shanghai(2), Wuhu	Medium
VOLKSWAGEN	400 - 600	150 - 200	5	Shanghai(3), Beijing(2)	Low
ZF GROUP	800 - 1000	150 - 200	4	Shanghai (4)	Low
TOYOTA MOTOR	600 - 800	150 - 200	5	Suzhou, Guangzhou, Shanghai (2), Tianjin	Low
PEUGEOT (PSA)	700 - 900	150 - 200	4	Shanghai (4)	Low

● High ● Medium ● Low

**Opportunity Propensity:** Design, Embedded hardware and software and Testing and Validation are key engagement areas to target

Service Engagements	Body Engineering & Safety Restraints	Powertrain and Alternate Propulsion	Body Electronics & comfort system	ADAS & Safety systems	Connected Cars	Infotainment and Driver Information Systems
Structural Design, Analysis and Development	High	High	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Application Software and Platform development	Not Relevant	Low	Medium	Medium	High	High
Electrical Design Services	Medium	Low	Medium	Medium	Low	Low
Embedded Hardware and Software Development	Low	Low	High	High	Medium	Medium
Manufacturing Engineering	Medium	Medium	Low	Low	Not Relevant	Not Relevant
Smart services	Not Relevant	Not Relevant	Not Relevant	Not Relevant	High	Not Relevant
Testing, Validation and Certification	High	High	High	Medium	Medium	Medium
Sustenance Engineering	High	High	Low	Medium	Low	Low



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