



# Global Vehicle LiB Market Study

Global Study

Detroit/Munich, August 2011

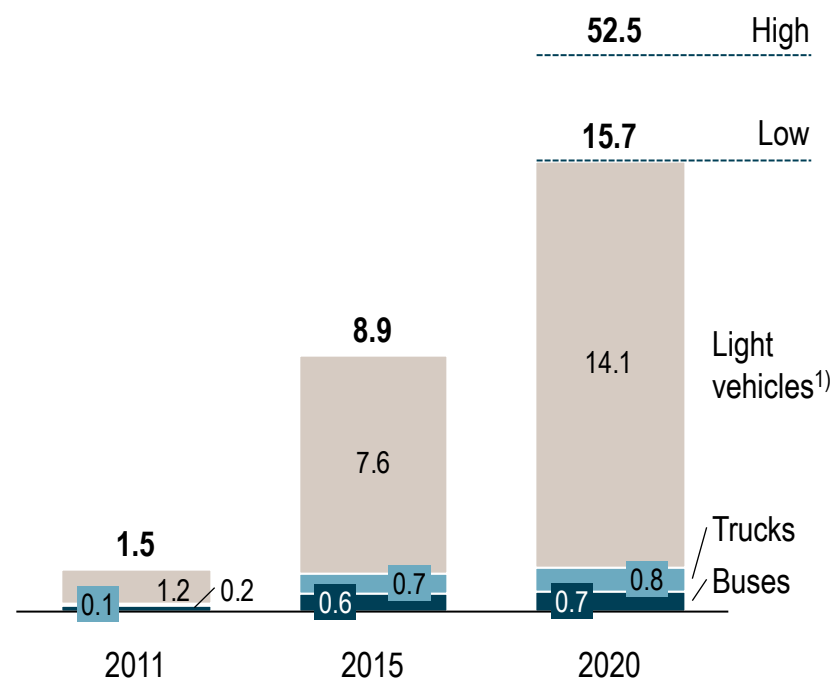
**Roland Berger**  
Strategy Consultants

# Management summary

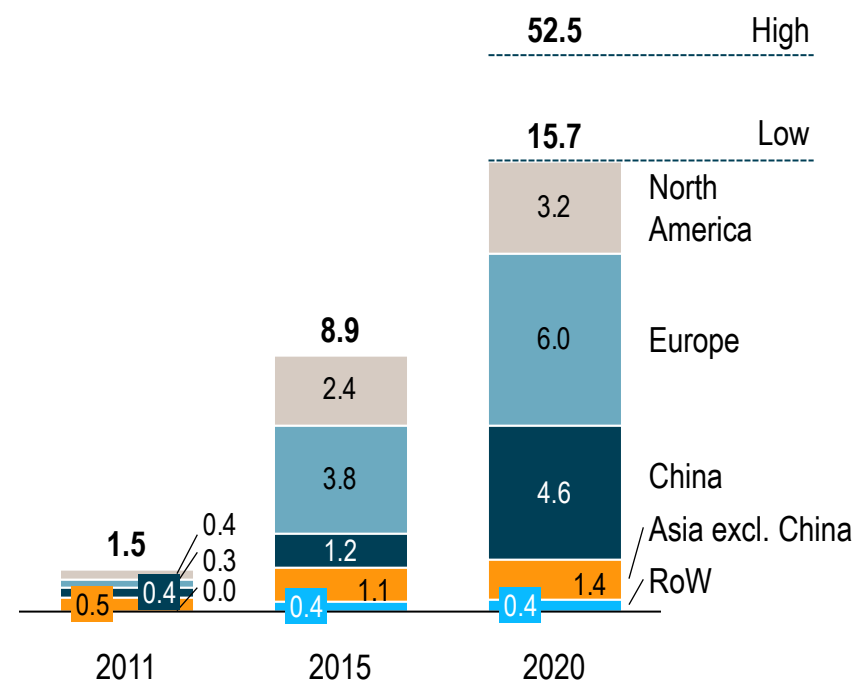
- > The **global automotive Li-Ion battery market** is forecast to grow from **USD 1.5 bn** to **USD 8.9 bn** by 2015
- > Further growth to **USD 53 bn** forecast in the **2020 high scenario**
- > **Light vehicles** will **dominate** the market development – over **80%** of total value in 2015
- > **Truck** market will be driven by electrification of **class 3** and **class 4** pickup and delivery trucks
- > **China** will account for over **80%** of the **bus** market value
- > As the market takes off, **five frontrunners** will dominate and the industry will consolidate
- > **Consolidation** was already forecasted in a 2010 Roland Berger report which concluded that **industry overcapacity** will exist in **2015**

# The global LiB market is expected to be USD 9 bn in 2015 – Light Vehicles dominate and high growth in China occurs after 2015

LiB market size – by vehicle class [USD bn]



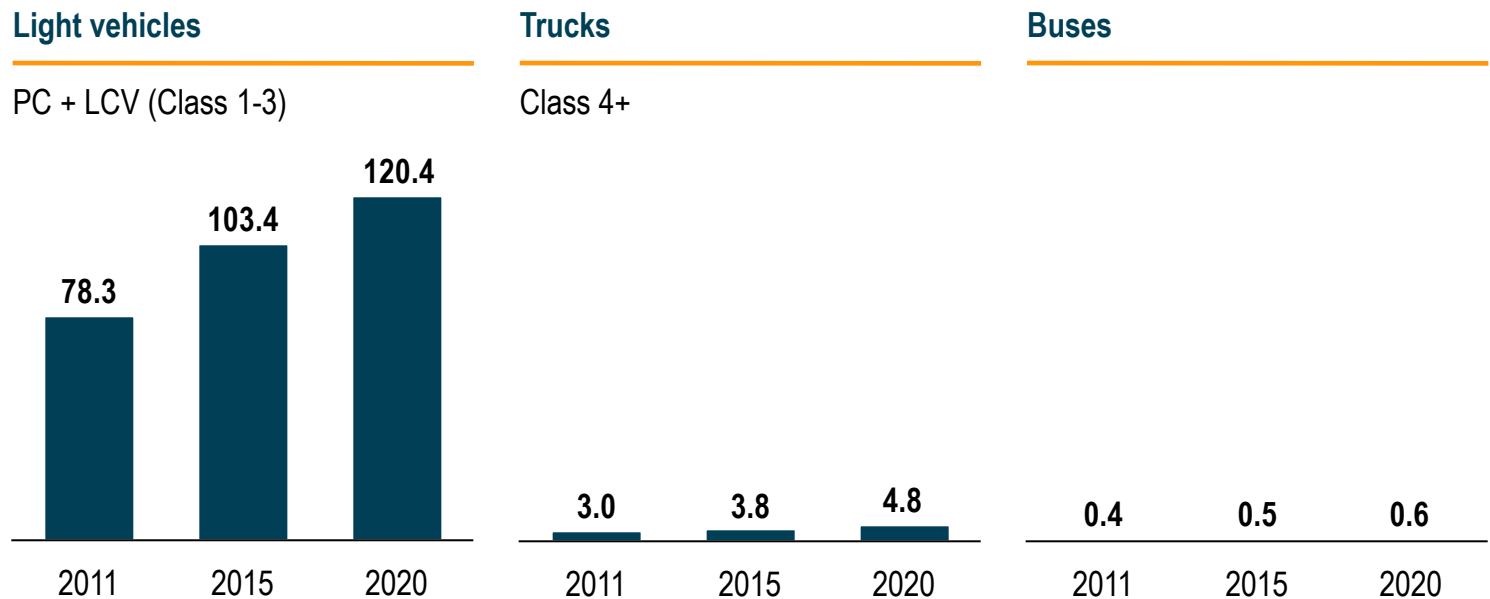
LiB market size – by region [USD bn]



1) Light vehicles = passenger cars + light commercial vehicles (class 1-3)

# Light vehicles dominate the xEV market because of the large volume base and relatively high penetration rates

## Total vehicle build and penetration rate assumptions by vehicle class [m units]



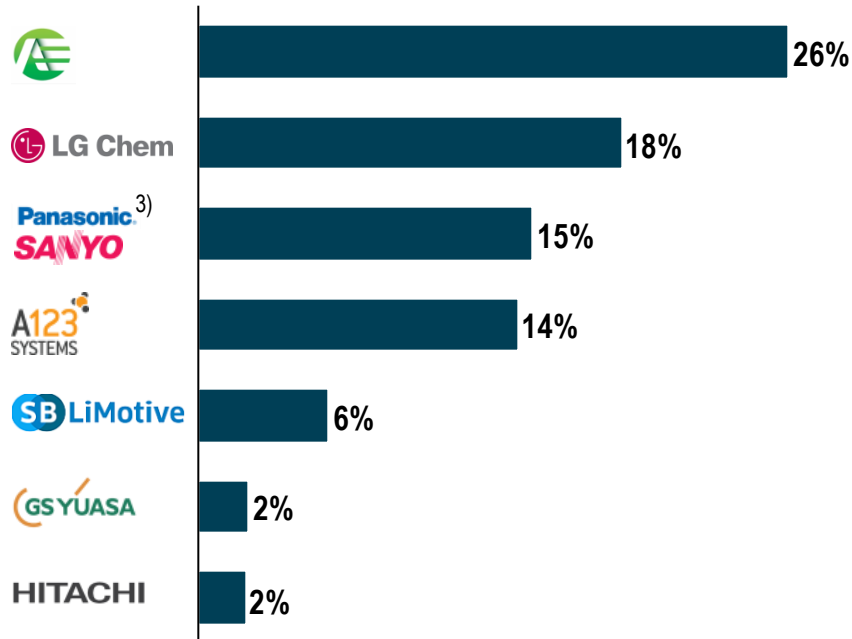
PENETRATION	Light vehicles				Trucks				Buses			
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
EV/PHEV [%]	0.1%	0.8%	2.2%	8.2%	0.1%	0.5%	0.7%	1.3%	0.4%	1.4%	2.3%	3.0%
HEV [%]	1.7%	2.6%	6.5%	9.4%	0.1%	2.3%	1.2%	4.1%	1.9%	6.2%	9.5%	14.0%

# Five players will dominate the global market by 2015 with combined market share of ~80%

## Key industry participants in 2015

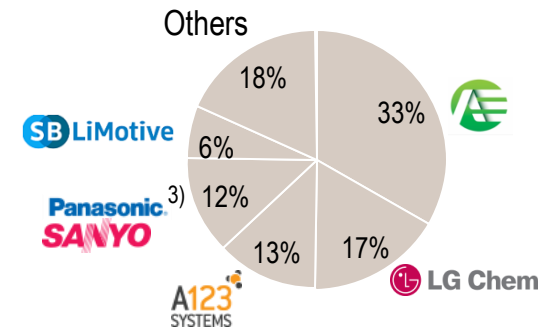
Expected 2015 global market share<sup>1)</sup> [USD based<sup>2)</sup>]

Σ = USD 8.9 bn

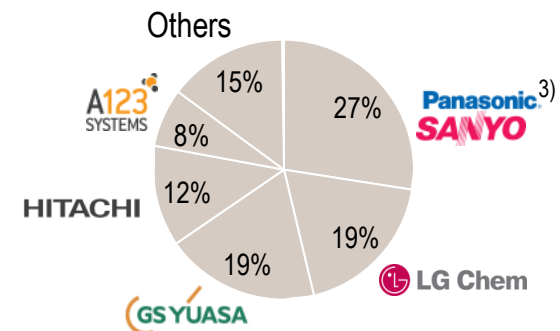


Expected 2015 global market share<sup>1)</sup> [kW, kWh based]

PHEV and EV [kWh]



HEV [kW]



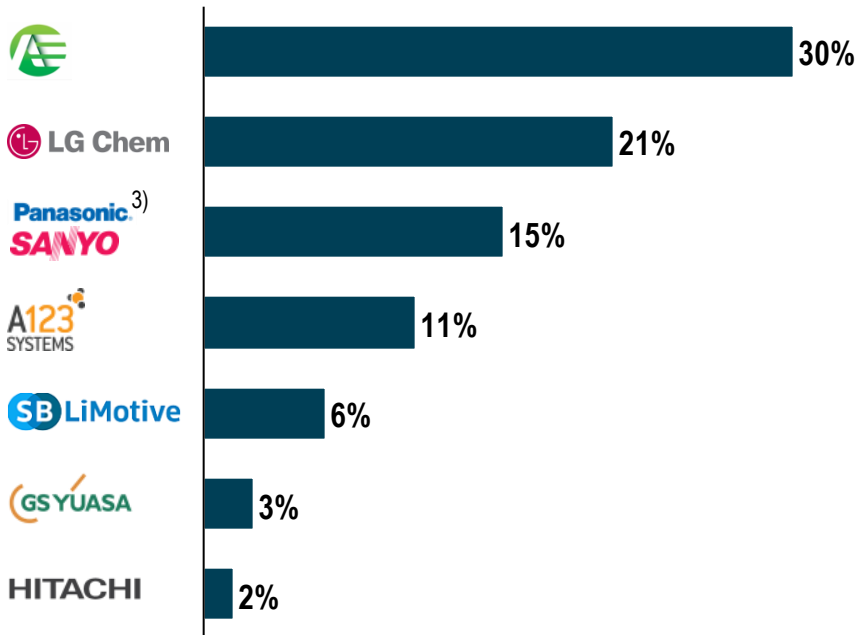
1) Accuracy level: +/- 2%; 2) Market value derived using USD 730/kWh for hybrids, USD 560/kWh for PHEV, and USD 400/kWh for EV in 2015; 3) Includes Primearth's share

# Same players dominate the light vehicle market

## Key industry participants in 2015

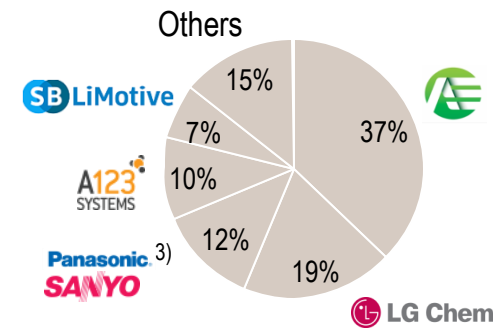
Expected 2015 global market share<sup>1)</sup> [USD based<sup>2)</sup>]

Σ = USD 7.6 bn

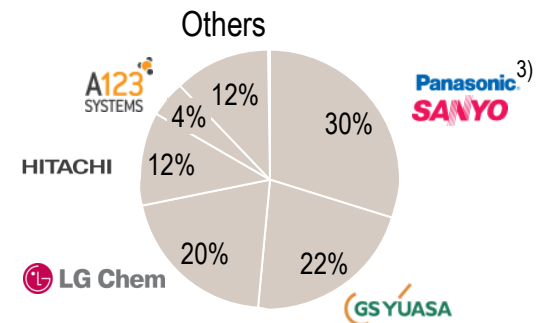


Expected 2015 global market share<sup>1)</sup> [kW, kWh based]

PHEV and EV [kWh]



HEV [kW]

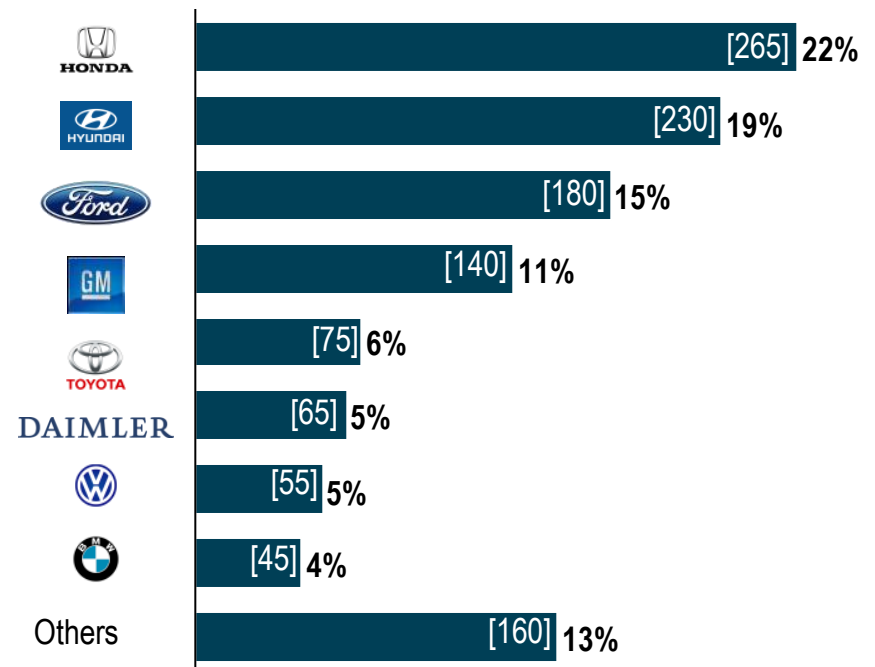
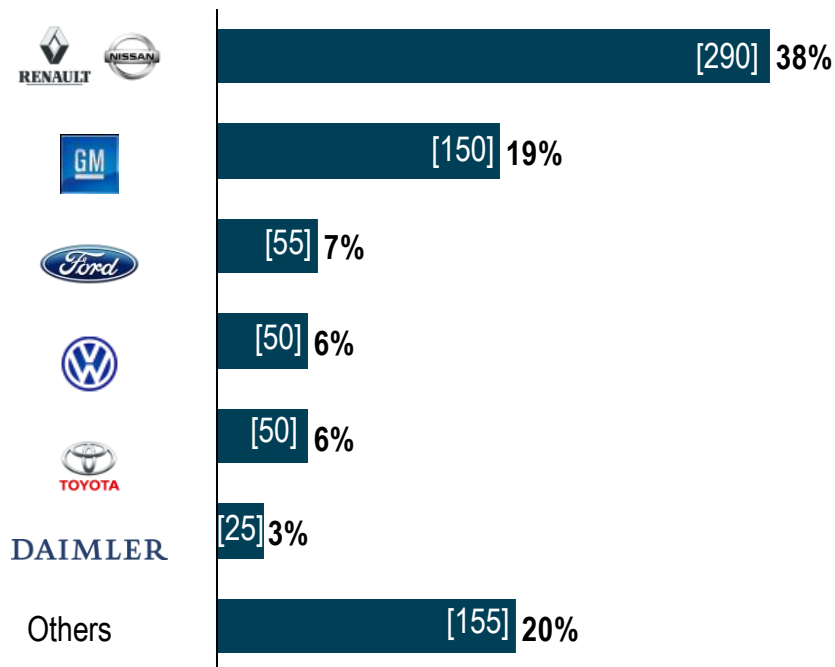


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# The market shares in light vehicles are heavily dependent on key OEMs meeting their xEV production targets

2015 expected OEM production and share – PHEV/EV<sup>1)</sup>

2015 expected OEM production and share – HEV<sup>1)</sup>



[ xx ] 2015 forecasted production volume [000s]

1) Share and forecasts are for vehicles with Li Ion batteries

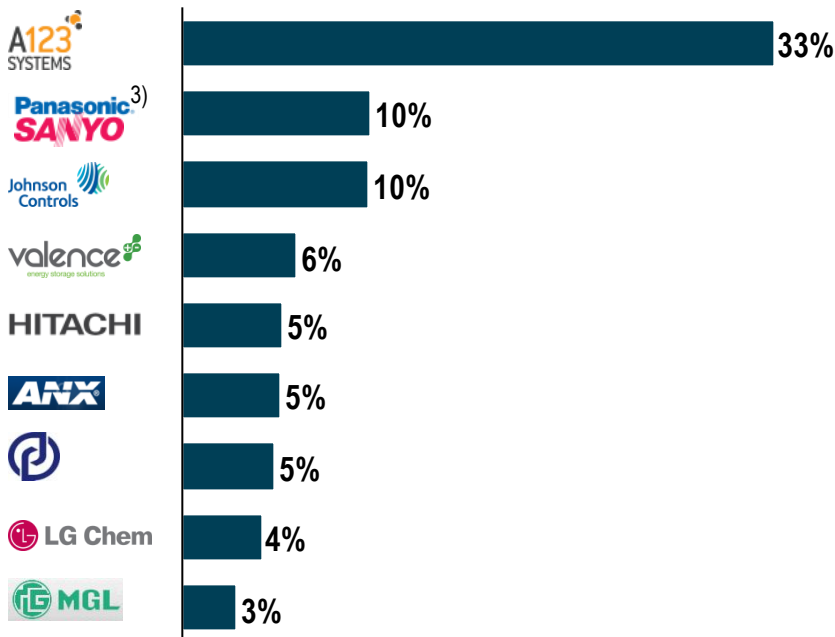
Source: Roland Berger LiB market model

In trucks and buses, A123 is expected to rank #1 with an expected 2015 market share of 33%

Key industry participants in 2015

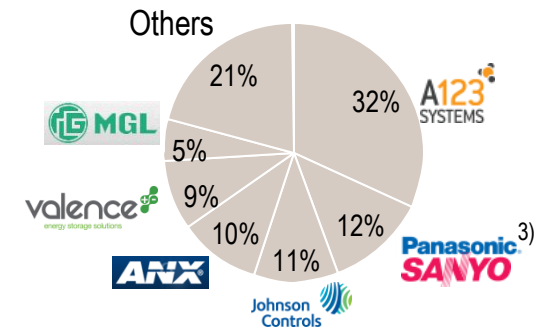
Expected 2015 global market share<sup>1)</sup> [USD based<sup>2)</sup>]

Σ = USD 1.3 bn

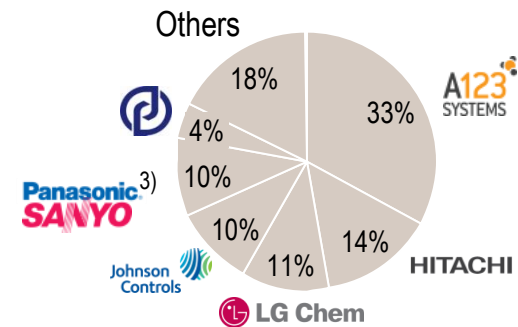


Expected 2015 global market share<sup>1)</sup> [kW, kWh based]

PHEV and EV [kWh]



HEV [kW]



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Creative  
strategies  
that  
work!

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