



Aluminium penetration in cars

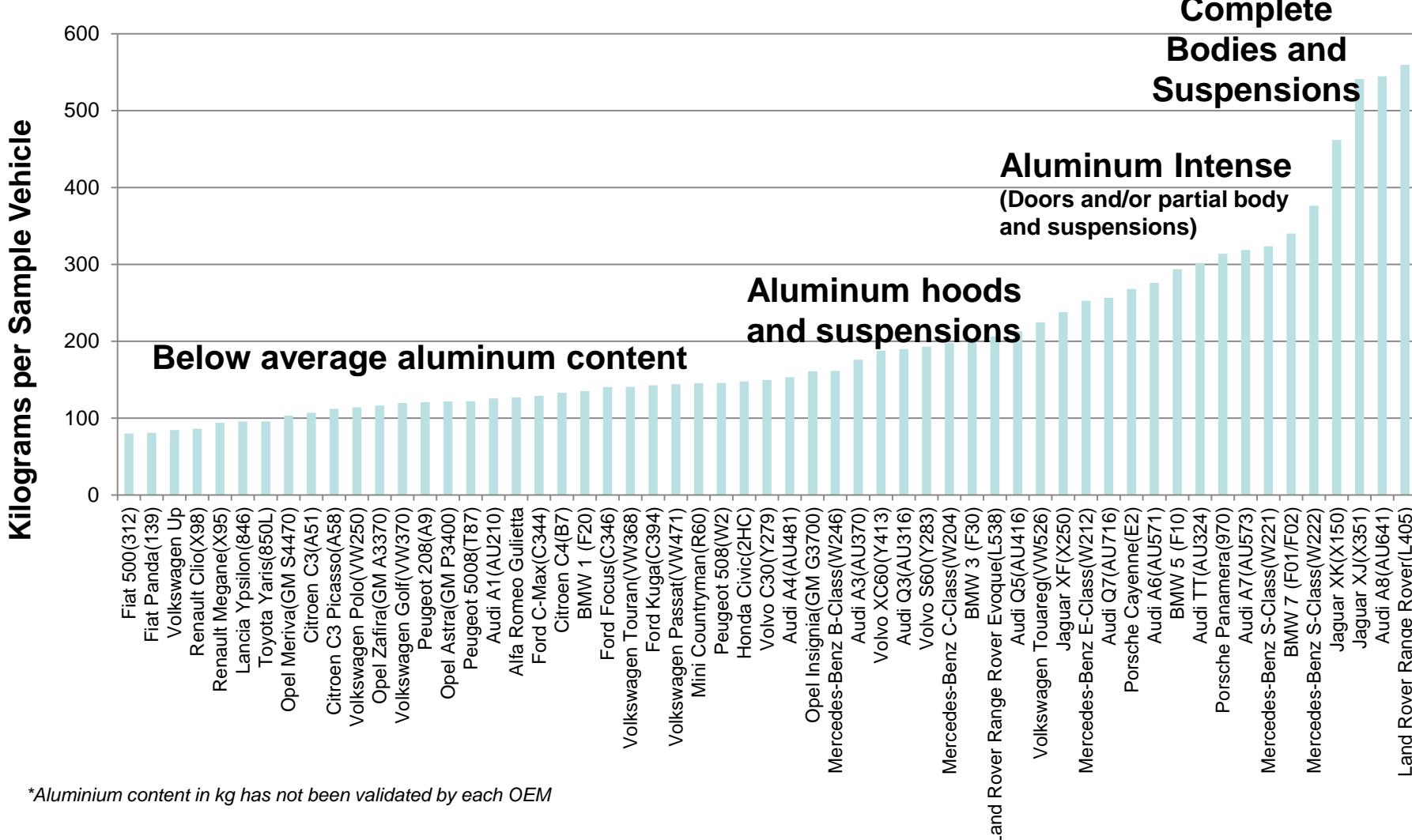
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Introduction

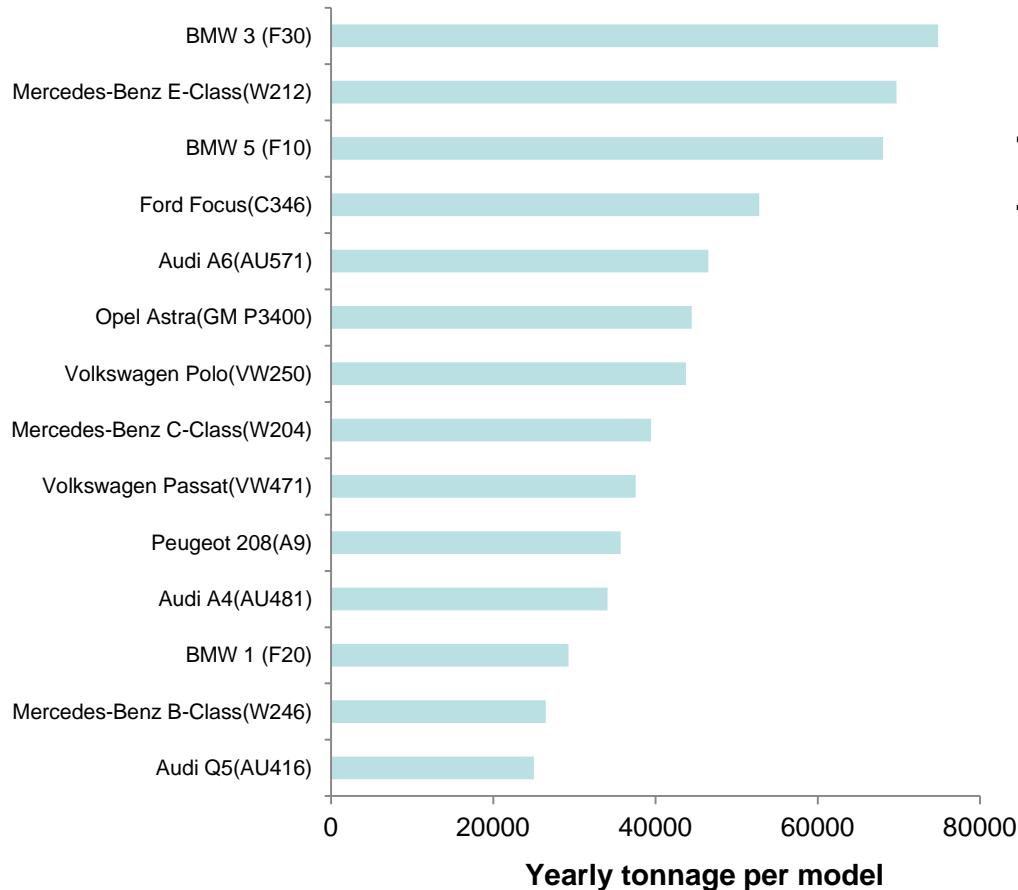
- The EAA has commissioned Ducker Worldwide to assess the aluminium content in cars produced in Europe
- Data is collected on a “bottom-up” basis, meaning the market has been analyzed on an OEM, platform-by-platform and product-by-product basis
- Primary research with OEMs, automotive suppliers, aluminium producers and other expert sources
- A sample of 57 vehicle models representing 44 % of the 2012 EU forecast production were chosen for the detailed analysis
- The sample result was then extrapolated to EU27 average content
- ***In 2012 the average car produced in EU 27 contains 140 kg Aluminium***

Aluminium content in specific models*



*Aluminium content in kg has not been validated by each OEM

Total aluminium use for specific models*

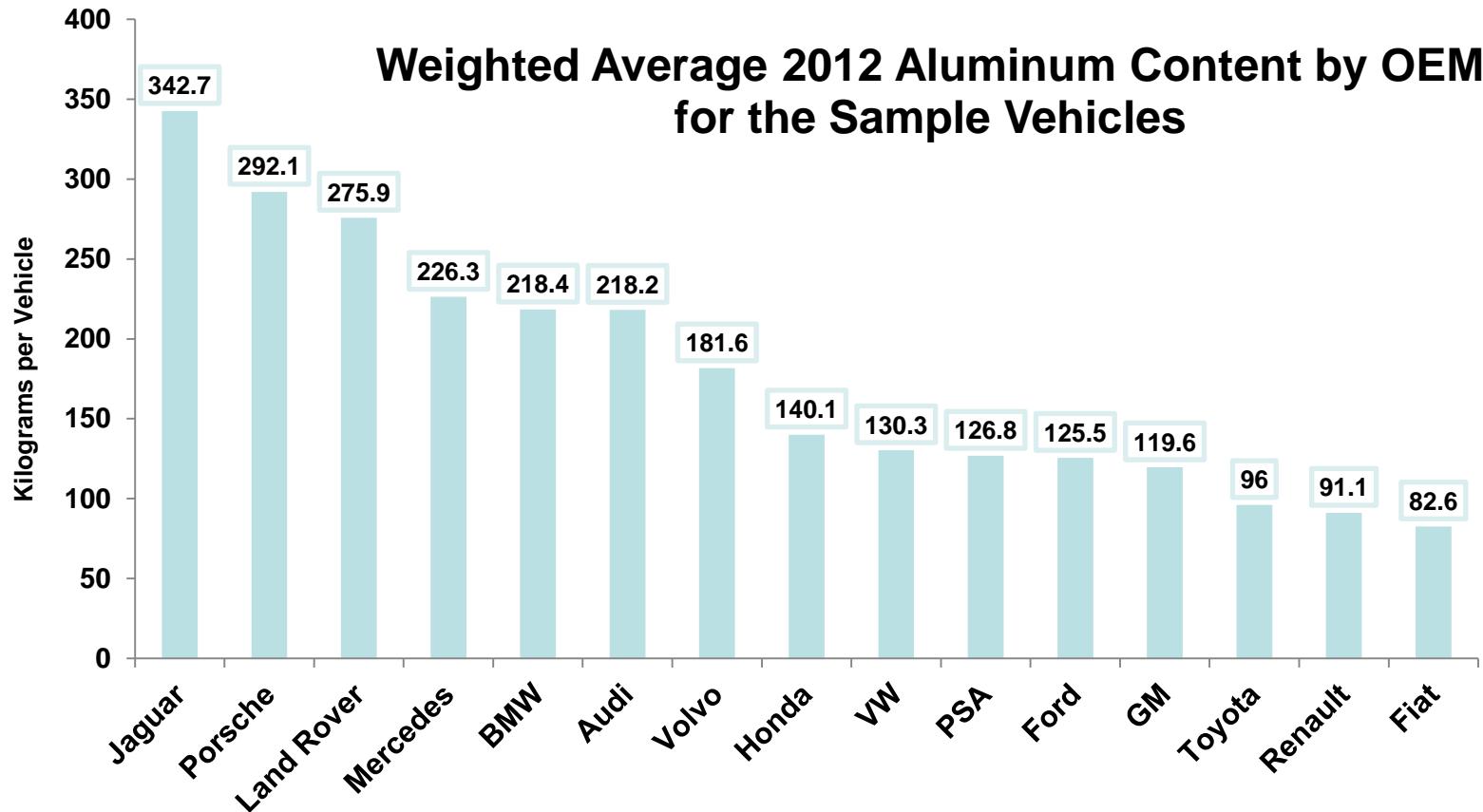


Top 15 vehicles compared with total automotive aluminium use per year in EU 27:

- **BMW 3-series, Mercedes E-class and BMW 5 series represent ~9 % of the total**
- **The 15 top vehicles represent ~25% of the total**

*Aluminium content in kg has not been validated by each OEM

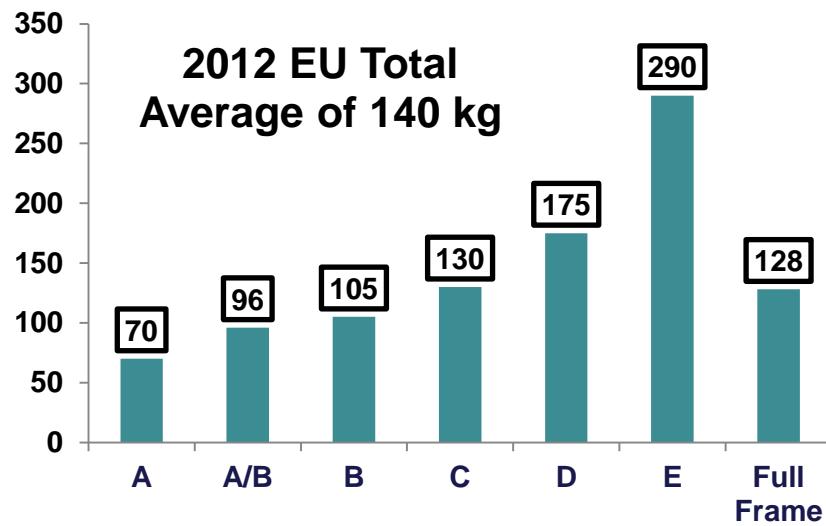
Average aluminium content per OEM*



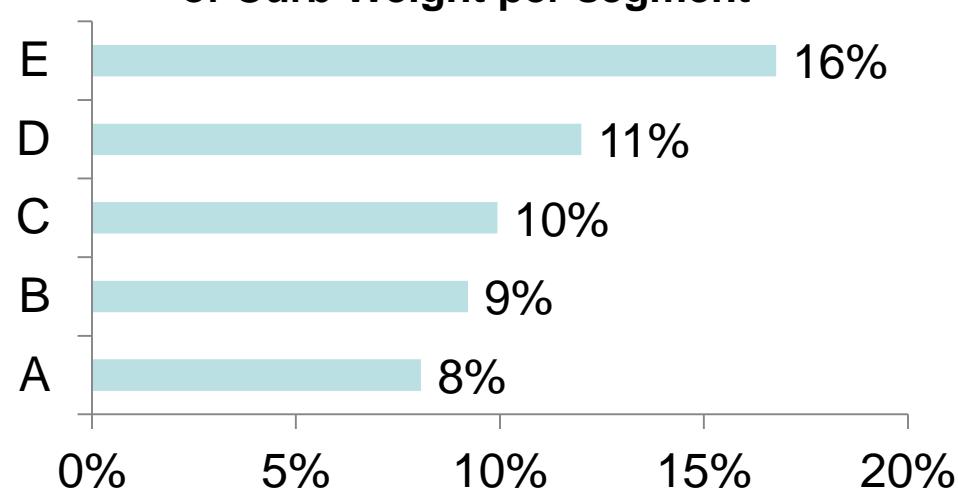
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Average aluminium content by segment



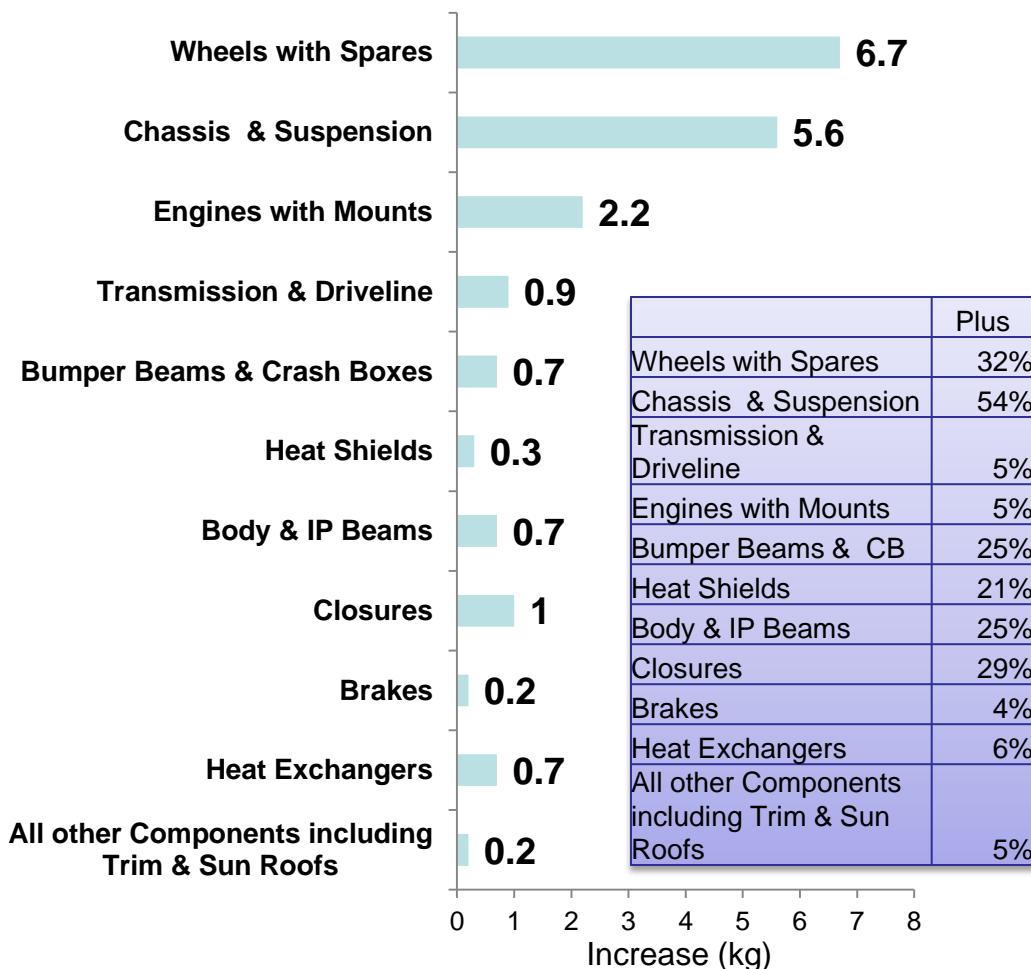
**2012 Aluminum Share
of Curb Weight per segment**



Segment	Curb Weight kg	Aluminum kg	Percent
A	930	70	8%
B	1183	105	9%
C	1358	130	10%
D	1534	175	11%
E	1795	290	16%

Main development 2006-2012

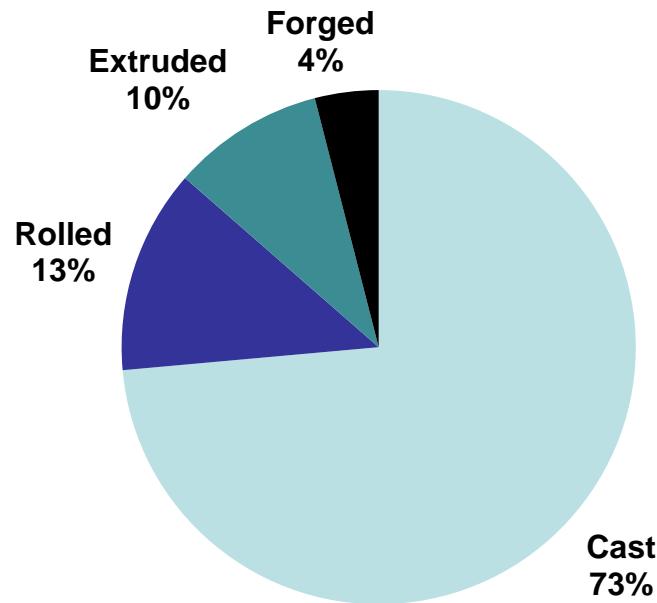
2006 - 2012 EU Aluminum (kg) Content Increase



- The total increase in EU light vehicle aluminium content from 2006 to 2012 is estimated at 19.2 kg or 16%
- The increase in aluminium content in North American cars for the same period is estimated at 13 kg or 9%
- 40% of the aluminium growth in the sample results from structural components in car body and suspension. Currently, the EU leads the world in the use of high-tech aluminum automotive components

Aluminium product forms

Total EU 2012 140 kg/vehicle

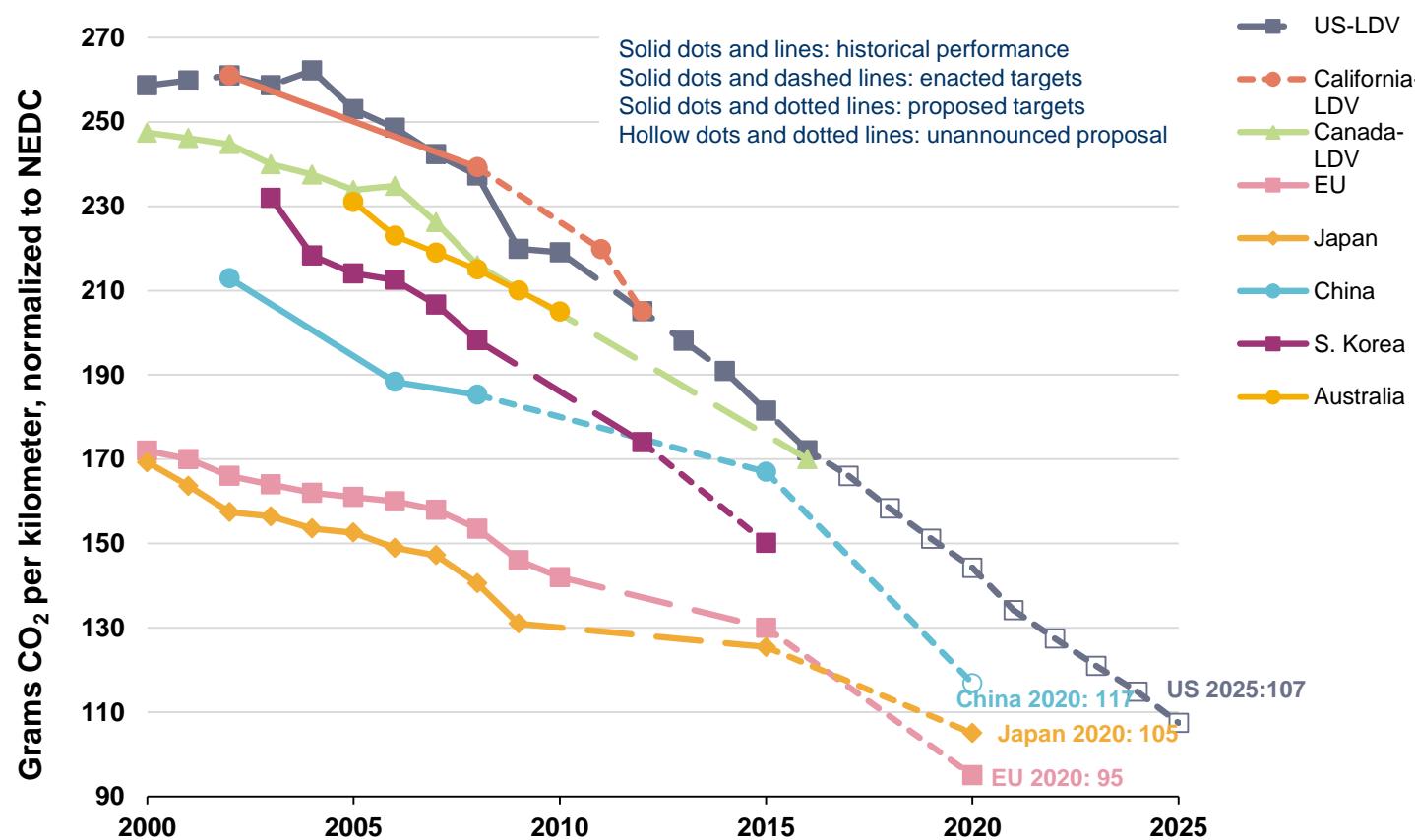


- Aluminium extruded and rolled products are expected to represent 40-45% of the mix in the longer term
- Rolled aluminium products are mainly used for heat exchangers and closures.
- Aluminium bonnets and fenders are now “state of the art”. 21% of the cars produced today in Europe have an aluminium bonnet
- Aluminium extrusions are particularly used in crash management systems (CMS). Nearly 40% of front CMS produced today are made of aluminium.

What is driving further aluminium penetration

Tough CO2 emission standards all across the world

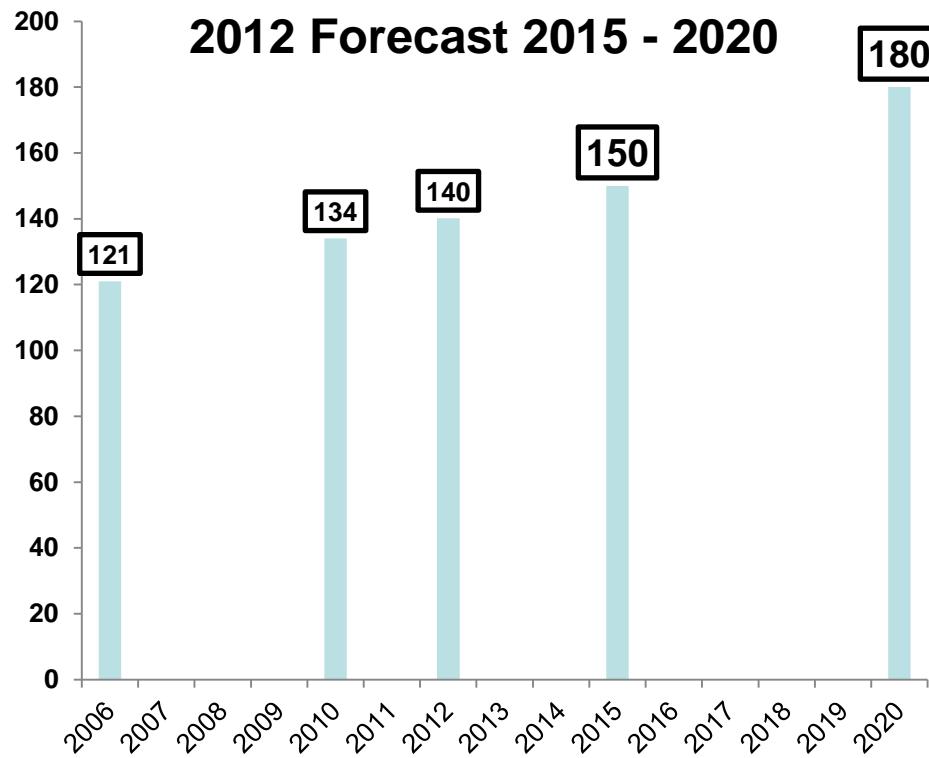
Source: www.theicct.org



[1] China's target reflects gasoline fleet scenario. If including other fuel types, the target will be lower.

[2] US and Canada light-duty vehicles include light-commercial vehicles.

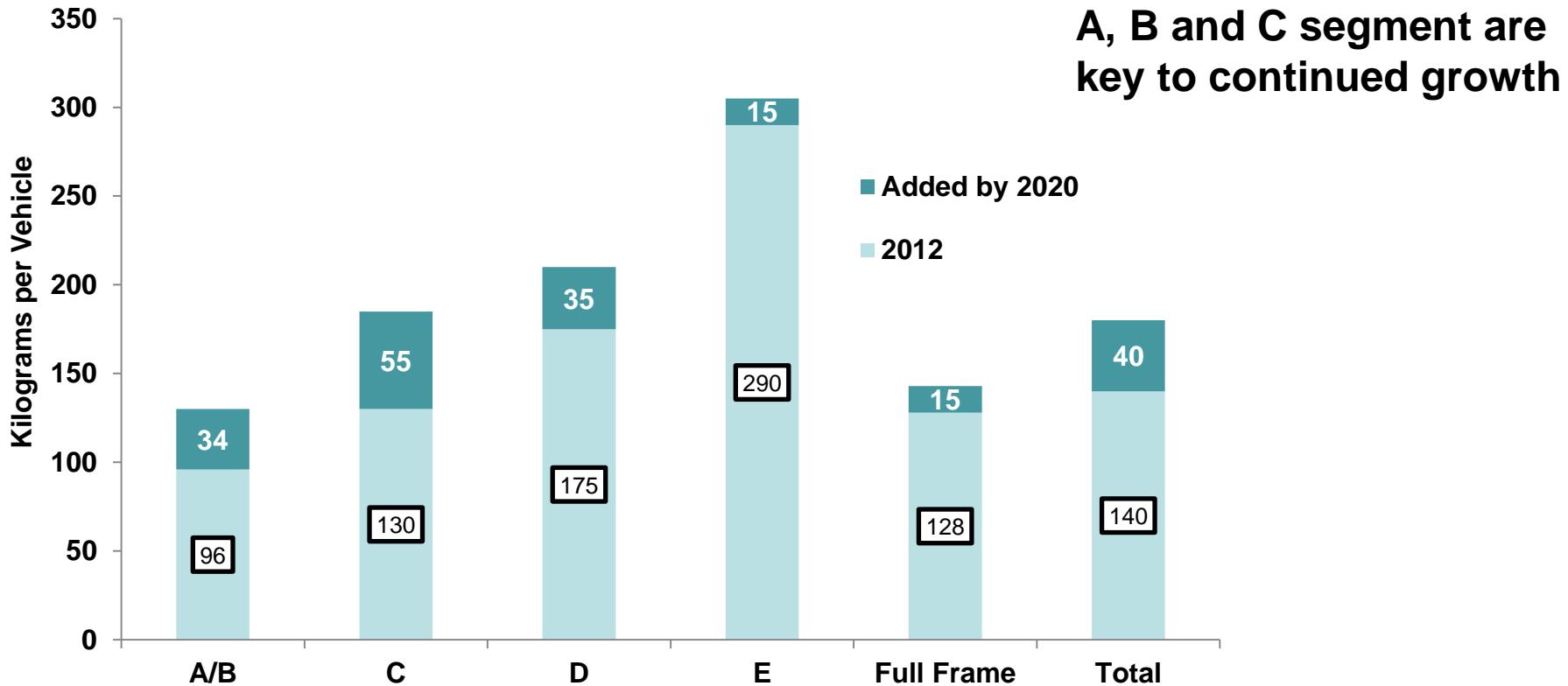
Further aluminium penetration



- Ducker forecasts that the average aluminium content could rise to 180 kg/car in 2020 if lightweighting was encouraged
- This assumes that the aluminium penetration into small and medium cars follows the evolution recorded in the upper segments

Further aluminium penetration

Required increase of aluminum content to reach an average of 180 kg / car



Conclusion

- The amount of aluminium used per car produced in Europe almost tripled between 1990 and 2012, increasing from 50kg to 140 kg
- This amount is predicted to rise to 160 kg by 2020, and could even reach as much as 180 kg if small and medium cars follow the evolution recorded in the upper segments
- The weight savings achieved thanks to todays aluminium content leads to an average annual fuel saving of 65 litres per car
- “The EU currently leads the world in the use of high tech aluminium automotive components” concludes Richard Schultz, Managing Director of Ducker Worldwide.