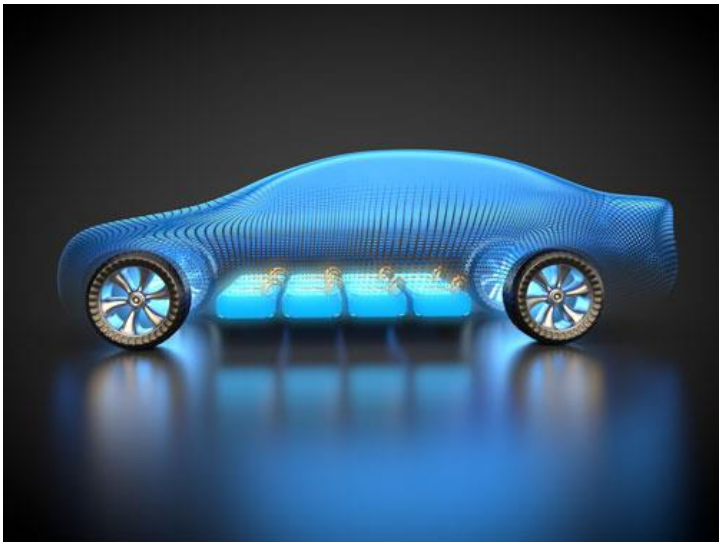
ALUMINIUM DEVELOPMENTS

Introduction

The implications of the UK government announcement to prohibit the sale of internal combustion engines by 2035 are radical!

No more global oil shipping tankers, no refineries, no petrol stations, no more combustion engine casting or manufacturing plants. Gone are the turbo, pump and EGR castings. Just comprehend the supply threats to the secondary aluminium recycling industry not only in demand for ingots but in the availability of end of vehicle life scrap resource. Consider the downsizing of automotive braking systems with the emphasis on regenerative braking.



The switch to electric propulsion is dependent on battery technology and production, neither capabilities nor technologies that exist today, industry changing opportunities for the UK. Electric vehicles necessitate redesign of crash structures, vehicle cooling systems and most significantly weight saving and weight redistribution to compensate for the heavy batteries.

Aluminium will not be an alternative for an EV, it will be mandatory to compensate battery weight. Weight savings will only be achievable only through the development of higher performance aluminium alloys.

Innovation in recyclable higher strength, higher crash resistance and more thermally stable alloys will need to be matched by developments in casting, extrusion, rolling, machining joining/welding and protective coatings.

Decarbonisation only becomes possible if the UK switches from primary aluminium and imported aluminium products to self-sufficiency in indigenous secondary recycled aluminium. Thus, designing alloys, components and indeed entire vehicles and batteries for recycling becomes a critical enabling element.

A carbon neutral society is only achievable with the total eradication of fossil fuels as realised by the UK government announcement to phase out industrial and domestic heating by natural gas and the switch to all electric. Future air conditioning and central heating will depend on ground heat pumps. Radically, achievable only with ultra-high energy efficiency buildings, that cool through radiating excess heat and conversely warm by absorbing heat from the atmosphere.

Consider the new opportunities in the electricity generation, photovoltaics, storage, distribution, wiring and charging points, for high thermal and electric conductive aluminium.

Delivering the Future

The future will only become a reality with the development of higher performance aluminium alloys that are fully recyclable at end-of-life.

Short Term (5-7 years to mass market)

- Aluminium alloys that achieve a tensile strength of more than 500MPa without compromising formability and recyclability

Medium Term (7-15 years to mass market)

- Aluminium alloys that achieve a tensile strength of more than 750MPa without compromising formability and recyclability

Long Term (10-20 years to mass market)

- Aluminium alloys that achieve a tensile strength of more than 1000MPa without compromising formability and recyclability

Recycling Aluminium

Short Term (5-7 years to mass market)

- Aluminium automotive alloys made from at least 50% process scrap and 25% end of life vehicle scrap

Medium Term (7-15 years to mass market)

- Aluminium automotive alloys made from at least 50% process scrap and 50% end of life scrap

Long Term (10-20 years to mass market)

- Fully circular economy for vehicle manufacturing
- 100% manufacturing energy from renewable or carbon neutral sources

Further information about aluminium and aluminium alloys, their production, fabrication and end use can be obtained from:

- Aluminium Federation www.alfed.org.uk
- European Aluminium Association in Brussels www.european-aluminium.eu
- International Aluminium Institute in London www.world-aluminium.org

Information specific to casting can be obtained from the Cast Metals Federation www.castmetalsfederation.com