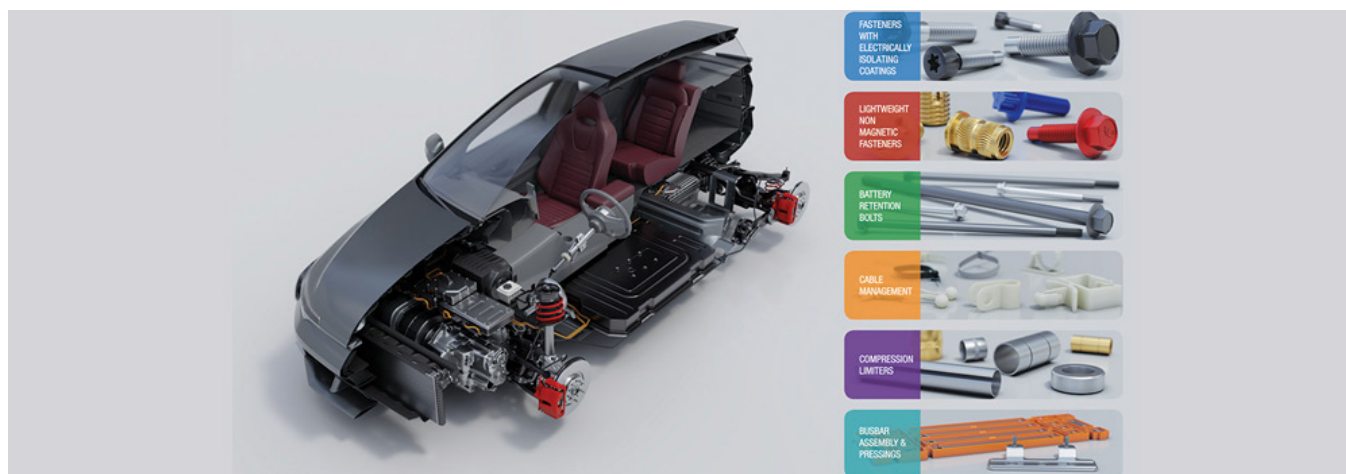


TR In the Spotlight

Powering progress: the EV battery journey and its impact on the supply chain



July 2019



As the automotive market continues to evolve and environmental and economic pressures increasingly demand a shift towards sustainable solutions and lower carbon emissions, Electric Vehicles (EV) is one of the fastest growing markets to have emerged in recent years. As this sector adapts to public and market demands, the whole supply chain is working to flex to these changes, with considerable developments being made in technology, cost-saving initiatives and lightweighting techniques.

In this article we look at the rapidly developing EV and EV Battery (EVB) sectors and how fasteners are helping to shape the future of this exciting new chapter in automotive and electronic history.

Fasteners: Securing the development of EV and EVB

The role of fasteners in this bigger picture around EV is not insignificant: not only are they needed for the vehicles themselves, but charging units, EV battery casings and general infrastructure equipment all require high quality fastenings to provide robust and secure settings for this valuable technology.

The growing consumer demand for EVs, coupled with the rapid development of EV and EVB technology has enabled TR Fastenings to combine our extensive fastener product range and breadth of knowledge into the ideal package to support and contribute to these ground-breaking sectors.

The EV and EVB markets are such exciting, fast-moving sectors and the resulting impact on global supply chains in both the automotive and electronic industries has been huge in terms of demand and opportunity. It's a real privilege to be involved in such a cutting-edge field, delivering our products and knowledge to start-ups, OEMs and Tier 1 suppliers developing transformative technology such as longer lasting batteries, lightweight solutions and connected devices.

EV: The industry landscape

According to BloombergNEF's latest Electric vehicle (EV) Outlook report, published in January 2019, 57% of all global passenger vehicle sales and 30% of the global passenger vehicle fleet will be electric by 2040.

2 million EVs were sold worldwide in 2018, and this number is expected to rise to 10m by 2025, 28m by 2030 and 56m by 2040. The growth in this sector has been rapid, rising quickly into the millions, a far cry from 2010 when only a few thousand EVs were sold across the globe.

An obvious factor in this market growth is the significant development of the technology, both in terms of the vehicles themselves and of the infrastructure and accessories needed to support the market. However, infrastructure still remains a major challenge for the sector, as the chicken and egg dilemma of supply vs demand continues to amount to far fewer charging points than needed being installed.

July 2019

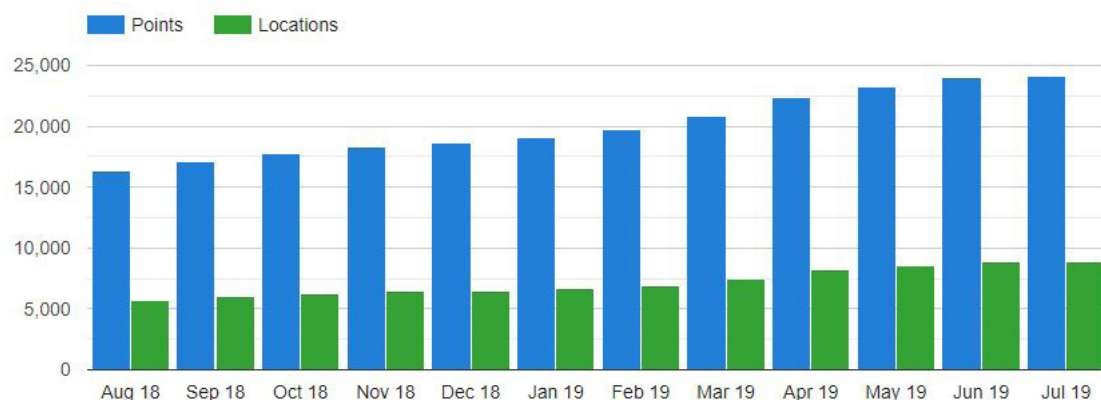
Leading the charge

For the electric car market to grow at a sustainable and profitable rate, investment must be made into growing the charging infrastructure across Europe and, crucially, awareness of the charging network.

Once consumers are satisfied that there are sufficient charging points to ease any range anxiety, we will likely see an uplift in electric vehicle adoption.

According to the UK charging point platform, Zap-map.com, there are currently (as of 31 May 2019) 23,417 charging connectors, in 13,788 devices, at 8,614 locations across the UK. The total number of connectors has increased from just over 13,000 in November 2017 to over 23,000 in May 2019, a 57% increase in just 18 months.

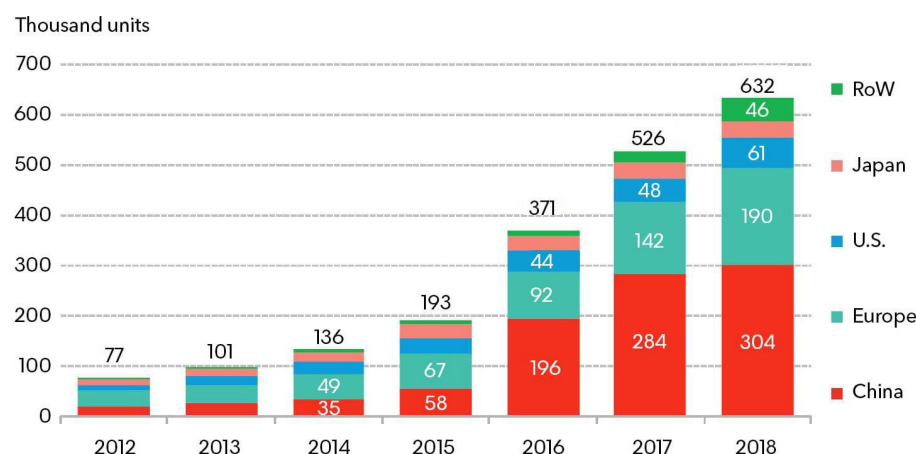
Number of UK charging locations and connectors over past 12 months: Zap-Map May 2019:



ZAP MAP®

The global charging landscape looks healthy as well. There are 630,000 public charging points installed globally, as well as commercial charging points serving the utilities, oil and gas and automotive sectors. China leads the way, followed by Europe, the US and Japan in terms of volume of charging points installed.

Public charging outlets installed globally:



Source: BloombergNEF. Note: Data current as of January 1, 2019. Data will be updated on the BNEF data hub at the end of 1H 2019.

July 2019

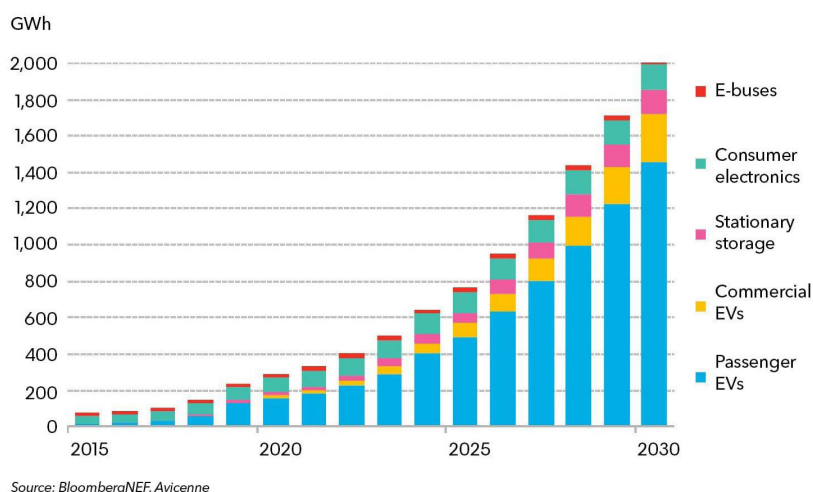
EVB: the latest growth area

Although charging infrastructure continues to grow, resources and investment are also being routed towards battery development, exploring different options in battery types, materials and longevity.

The battery sector is naturally the major focus for growth, as battery and lithium prices continue to drop and significant investment is made into new chemistry and technology, such as single state battery development.

According to Bloomberg's EV Outlook forecast, "Lithium supply looks sufficient until at least the mid-2020s, but new cobalt and nickel mining capacity will need to come online to meet growing demand. Solid state batteries are still a decade away from use in mass-produced vehicles, but steady advances in the current family of lithium-ion batteries will bring continued improvements in energy density."

Annual lithium-ion battery demand:



The global outlook

According to Bloomberg, China is expected to continue leading the market in battery manufacturing capacity for the foreseeable future, with Europe as the second largest region in this regard.

As a global market, the signs are looking good for rapid growth: it is predicted that battery cell manufacturing capacity will pass 1TWh by 2025. Further decreases in battery prices are also expected, with today's \$176/kWh per pack price projected to drop to \$87/kWh by 2025 and \$62/kWh by 2030.

In addition to lithium, high nickel chemistries are also set to emerge and start taking more market share over the next decade, widening the options for manufacturers and suppliers. In an effort to speed up the discovery and development of the ideal battery solution for the EV market, European governments are coming together to fund research and production in this area.

In early May 2019, it was announced that France and Germany were forming a consortium and launching a €multi-billion initiative into EV battery research, sourced from private European companies such as Automotive OEMs and energy businesses. With this level of European backing, the battery market is in good stead to make progress in terms of a viable and sustainable solution to meet the growing demands of the global EV industry.

July 2019

Lightweighting and the link to fastening technology

Another concern in terms of EVB is lightweighting: as one of the heaviest components in an EV, the electric battery runs the risk of negating the idea of carbon emission reductions if the vehicle's weight increases energy consumption.

As a result, fastener companies and other members of the supply chain are constantly looking at ways to achieve gains in lightweighting, looking to industries such as aerospace for inspiration.

A McKinsey report into global lightweighting trends states that: "Lightweight materials and design have always been an important topic in product design across several industries. The concept has been most important in aviation but also in industries where large rotating parts (e.g., rotor blades of wind turbines) are key elements of product design and in automotive, where driving dynamics are a major consideration. Global trends toward CO2 reduction and resource efficiency have significantly increased the importance of this topic over the last years."



As a result of this shift towards lighter materials, industries are beginning to learn from each other. In aviation, the Boeing 787 Dreamliner is constructed largely of carbon-fibre-reinforced plastics instead of the traditional aluminium, which is inspiring automotive firms such as BMW to look at carbon-fibre for its new electric vehicle, in order to reduce the vehicle's weight and enhance the driving experience.

At TR, we work with Tier 1 suppliers such as seat manufacturers to ensure

that where possible, lightweight solutions, such as the Mortorq® screw we are licensed to manufacture by Phillips Screw Company, are used throughout vehicle applications to make weight savings and counterbalance the impact made by the battery weight.

Fastening technology is crucial for EV and EVB manufacture, and our range includes a number of parts which are particularly relevant for EVB assembly, such as:

- Fasteners with electrically isolating coatings
- Lightweight non-magnetic fasteners
- Battery retention bolts
- Cable management hardware
- Compression limiters

In addition, our branded ranges comprise every component listed in a typical Bill of Materials (BOM) for EV charging units, including:

- [Sheet metal fasteners](#)
- Thread-forming screws for [plastics/metals](#)
- [Plastic hardware](#)
- [Enclosure hardware](#)

TR In the Spotlight

Powering progress: the EV battery journey and its impact on the supply chain



July 2019

- [Security fasteners](#)
- [Standard fastenings](#)
- [Cable management parts](#)
- Specials and bespoke designed fasteners

The ideal partnership

Our role in this ever-evolving market is to support and consult with our customers on the best solutions which meet the demands of the changes and developments facing their industries.

As a trusted, Full Service Provider (FSP), our engineering, design and manufacturing expertise as well as our global reach and longstanding industry experience make us the ideal partner for any firm involved in the burgeoning EV industry: from battery manufacturers to charging point manufacturers to Automotive Tier 1s and OEMs.

As a business, we constantly challenge ourselves to identify and stay on top of industry and technological trends and developments, and we do this by placing ourselves at the very heart of industry innovation. Our global technical and innovation centres in Gothenburg and the UK allow us to operate right at the centre of automotive excellence and innovation, meaning we work directly alongside the big players really making a difference in this exciting industry.

Featured articles:

[Fasteners in e-mobility and their impact on the supply chain - Government Europa - 28th June 2019](#)