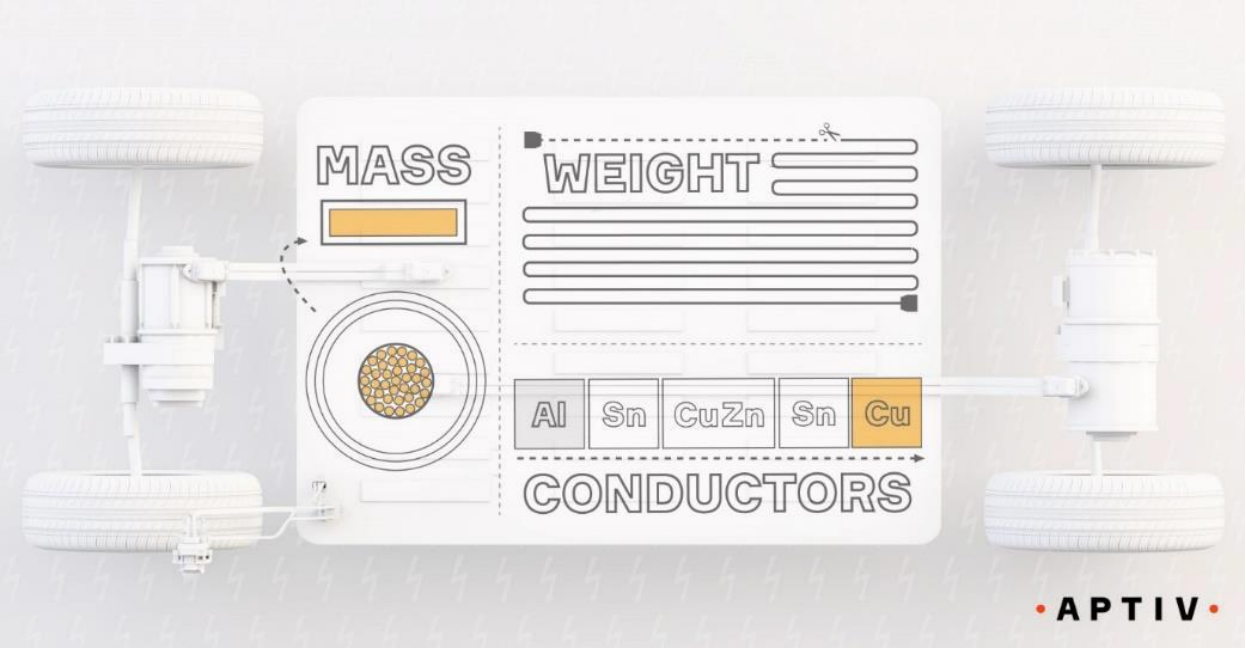
Making the Best Electric Vehicles Takes a System Level Approach

BLOG
February 06, 2020



Electric vehicles will comprise 57% of global passenger sales by 2040 — and the original equipment manufacturers (OEMs) that will emerge as the undisputed leaders in the EV sector tomorrow are the ones that can best address the EV manufacturing challenges of today.

These challenges include safety, which is always the primary consideration for both the consumers who drive EVs and the technicians who manufacture and service them. There's also the tangle of regional safety and technical standards to manage. And as consumers clamor for more range from their EVs, the constant tug-of-war between larger, more powerful battery packs and a heavier, more expensive vehicle.

APTIV

None of these challenges exists in a vacuum — so their solutions require a vertically integrated, whole-vehicle approach to problem-solving, not just from OEMs, but also from their automotive partners.

A holistic approach

While it's easy to equate electrification solely with high voltage, we at Aptiv understand electrification is about a whole lot more — including battery wiring, low-voltage wiring, electrical centers and interconnectors.

Aptiv believes that cables and components need to function as a system and that they work best when designed and validated simultaneously. That's almost impossible to do when sourcing these connectors and cables from separate suppliers. We're a single-source, system-level partner focused on delivering system-level solutions instead of component-level parts.

Take the case of EV battery packs as an example. We may not make the large, powerful batteries that are shaping the future of the electric vehicle, but our unique understanding of how to reduce mass in other parts of the car helps make that future possible.

Every gram matters

The formula is quite simple: The less space that cabling takes up inside an electric vehicle, the more room there is for everything else an electric vehicle needs, including a larger battery.

Aptiv's expertise, developed over decades of design and vertical manufacturing, allows us to create smaller and lighter conductors, lighter components, and busbars (flat conductors) that free up this space and reduce mass while still delivering all the required performance.

Every gram matters when it comes to making vehicles lighter, more efficient and greener. Because we understand what needs to happen in all areas of the EV architecture, we are continually finding better ways to shave mass without reducing performance.

With our architecture-optimization help, one leading EV company reduced wiring mass in its 2017 model by 10% and removed 150 meters of cabling. Similarly, another vehicle customer shed 11 kilograms and 400 meters of cabling from its

popular 2018 truck. And yet another customer reduced the mass of the electrical distribution system on its 2018 SUV platform by 15%, thanks to Aptiv optimization efforts that eliminated 300 meters of cabling.

Impressive numbers, for sure, but they'll only get better with the introduction of Aptiv's PACE Award-winning Selective Metal Coating (SMC) technology, now being piloted on several vehicle models worldwide. OEMs have long sought to replace heavy copper wiring harnesses with aluminum ones, but galvanic corrosion between the aluminum wiring and copper connectors has always been a deal-breaker. SMC changes all that by creating a highly engineered, lightweight coating that prevents this corrosion, allowing OEMs to swap out copper wiring with aluminum and reduce their cabling mass by as much as 50%.

The tip of the iceberg

Everything in the Aptiv electrification portfolio — from high-voltage electrical connectors and shielded HV cables to busbars to charging cord sets and inlets to solid-state electrical centers — benefits from the knowledge, experience, research and know-how that goes into everything Aptiv builds for the system.

It's always important to remember that OEMs are building vehicles, not a collection of components, and Aptiv offers a system-level approach that provides a lot more value than the sum of its many parts.