DRIVING ELECTRIC VEHICLE INNOVATION

How to unlock the next chapter with co-creation

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THE EVOLUTION OF THE AUTOMOTIVE INDUSTRY

Across the globe, technological advancements are rapidly transforming automotive development, enabling manufacturers to create connected cars, swap fossil fuels for sustainable alternatives, and effectively chase the next “big thing”.

For almost every manufacturer, that’s electric vehicles (EV), hybrid electric vehicles (HEV) and plug-in hybrid electric vehicles (PHEV).

With an ever-increasing demand for eco-friendly transportation, automotive manufacturers are working tirelessly to bring to market innovative and valuable vehicle solutions for a green future.

According to 2018 research by J.P Morgan, by 2025, EVs and hybrid EVs will account for almost 30% of cars on sale, and the market is expected to reach nearly $1.5 trillion by that time.

But are manufacturers and suppliers keeping pace?

Image sources: Unsplash

THE EVOLUTION OF THE AUTOMOTIVE INDUSTRY

Accelerating to not be left behind

Today, the challenge is keeping up with the EV industry and not being left behind.

The pressure being applied to automotive manufacturers is forcing many to rethink how they bring products, solutions and services to the market, and how they address the new challenges of EV.

Heat management, safety, efficiency and vibrations — with the shift to EV, manufacturers now have a plethora of new issues to consider. The heat produced by batteries in electric vehicles, for example, needs to be dispersed effectively to minimise damage and maximise operational efficiency. It also ties into safety as a “hot” battery can quickly degrade and become a safety concern.

There’s also the lack of a combustion engine to consider. No engine means complete silence, but now every rattle is more prominent. Components need to be held down by more robust, yet environmentally friendly and non-conductive adhesives to minimise vibrations and noise to ensure a smooth ride.

And what about efficiency? With the premium price tag associated with many EV vehicles, they need to be just as efficient — if not more — as their diesel and petrol counterparts to encourage widespread adoption. People want sustainable solutions, but those solutions need to be just as good as what came before.

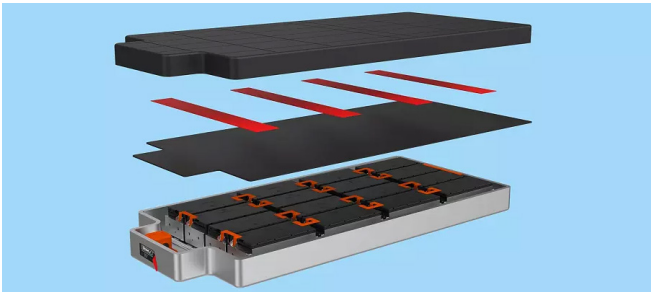


Image sources: Unsplash

THE EVOLUTION OF THE AUTOMOTIVE INDUSTRY

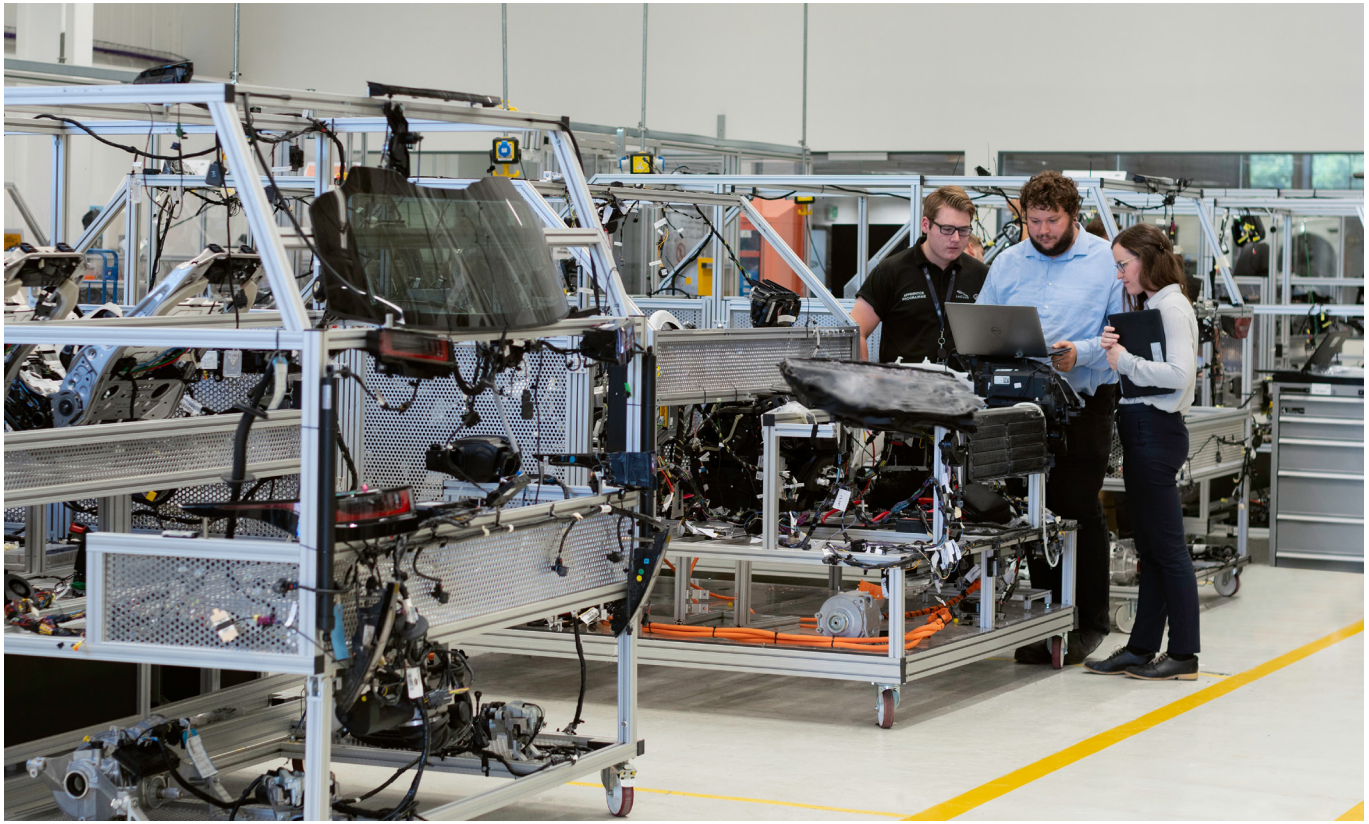
Out with the old, in with the new

The current traditional automotive production process is slowing things down. It's simply not flexible nor future-proof enough to help manufacturers and suppliers reach the next gear. Manufacturers and suppliers are accustomed to working behind the scenes, to briefs and keeping their activities a secret. This often leads to poor adoption of the final product and missed opportunities.

At the same time, many lack project leads and engineers with experience in EV, making everyone anxious about delivering. To get ahead of the competition, manufacturers and suppliers need to work together and with every stakeholder across their supply chain to deliver viable, innovative solutions.

As a result, some manufacturers have opened up their doors and released the locks on their projects, allowing customers, suppliers, stakeholders and tech experts to get involved, share their knowledge and help develop EV models, components (particularly powertrains[1]) and vehicles.

It's here where co-creation is transforming the production process and empowering manufacturers, suppliers and key stakeholders throughout.



[1] An electric vehicle's (EV) powertrain is responsible for taking the energy stored in the vehicle's battery system and supplying it to the motors. The electrification of the powertrain enables locally emission-free mobility and a much smoother driving experience. Image source: Unsplash

CHAPTER 1:
WHAT IS CO-CREATION AND WHAT ARE ITS KEY BENEFITS?

Co-creation is a collaborative form of innovation that involves working together with experts and/or stakeholders to create, improve and share new ideas.

Compared to other methods of "collaboration", co-creation is all about creating something **new and valuable** (i.e. products, services, solutions or concepts), whereas other methods often focus on ideas, products or services that already exist.

These days, more and more companies are inviting customers to help them design products — this is because as technology has progressed, customer demands and expectations have become more complex. Traditional approaches to car manufacturing cannot adequately address these challenges, so automotive companies are turning to collaboration to bring new partners into their ecosystem.

A great example of co-creation is BMW Group's 'Co-Creation Lab', a virtual community created in 2010 where consumers can offer their opinions on car designs, submit their own ideas and get involved in the creation process of new vehicles.

Another is LEGO's LEGO Ideas, which allows users to submit ideas for LEGO products to be turned into potential sets available commercially. The original designer receives 1% of the royalties.

Image source: BMW Blog

CHAPTER 1:
WHAT IS CO-CREATION AND WHAT ARE ITS KEY BENEFITS?

What are the key benefits of co-creation?

Co-creation allows OEMs, customers, distributors and suppliers to work in unison to create truly innovative and valuable products.

By leveraging the understanding of and feedback from these parties, OEMs and suppliers can enhance their products, create in-depth customer experiences and gain a competitive advantage as they're no longer just responding to demand, but predicting the next big thing.

Through co-creation, brands and businesses can:

- **Increase return on investment**

  Co-creation efforts are good for your bottom line. According to research by Hitachi, 51% of businesses say co-creation improves financial performance. Companies save huge sums on research and development (as they can bring expertise from the outside in), marketing costs and see lower customer churn (as products and solutions are closer to customer expectations).

- **Improve customer insight**

  By working closely with suppliers, customers, dealers and employees on EV models, components and vehicles, manufacturers can get a better understanding of market expectations and what people are looking for. Also, by keeping open lines of communication and encouraging co-creation, it becomes easier for manufacturers to ideate, develop and quickly bring to market new EV products.

- **Create more successful products**

  The most obvious and possibly best reason to co-create is to make something new. Every business wants to be unique — and in a marketplace where many car manufacturers are chasing the same thing (sustainable, high-performance EV), it pays to have multiple stakeholders from different stages of your supply chain involved.

  The result? Instead of pitching variations of your ideas, you can come up with completely new EV products and components. You also don't have to predict what customers or influencers want because they'll tell you themselves. Ultimately, you'll end up with products that reflect the way customers think.

Image source: HITACHI Co-creating the Future eBook

CHAPTER 1:
WHAT IS CO-CREATION AND WHAT ARE ITS KEY BENEFITS?

- **Get to market faster and instil confidence**

  Co-creation brings the best of each market player (suppliers, end users, creators, ideators and distributors) under one roof. Everyone works together to rapidly deliver a product, service or solution that is built for a specific use case. This kind of speed to market allows OEMs and suppliers that focus on co-creation to quickly develop and deploy products much faster than their competitors.

  The other benefit of co-creation is that with knowledgeable experts on your side, you can rest assured in the knowledge that your teams will deliver an outstanding product. You have trustworthy experts who understand EV design, build and development, thereby bringing calm to traditionally volatile, uncertain, complex and ambiguous (VUCA) automotive environments. The research and development is — in most cases — done before the project gets underway. This means you can tap into insights as soon as you start.

- **Break down silos**

  Co-creation breaks down silos across automotive supply chains, allowing manufacturers to work closely with suppliers, distributors, stakeholders and customers.

  In so doing, co-creation brings new perspectives and skills into the process. Suddenly, the manufacturer has a clear understanding of how their EV products are managed and used at every stage.

  For example, distributors will be uniquely aware of customer challenges and issues voiced at the point of purchase. They can tell the manufacturer what's working well (from a sales point of view) and what isn't.

  Likewise, customers can pitch in and tell the manufacturer what they would like to see from the next EV product or solution.

For EV powertrains, for instance, co-creation could lead to the development of more robust and reliable models, those that can redistribute energy to the car's motors more efficiently, or even lighter, modular powertrains that can be readily improved and enhanced, making for a more sustainable solution.

CHAPTER 2:
WHAT SHOULD YOU LOOK FOR IN A CO-CREATION PARTNER?

Customers today are smarter, more resourceful and know exactly what they want implemented into the products and services they buy. So you need a partner — or a team of partners — that can anticipate their needs.

Your co-creation partners should be at the top of their field(s) with a demonstrable history of driving and supporting innovation, especially in your sector. They should be just as committed to getting new EV ideas over the line as you are, and willing to invest in every stage of the process.

For example, a partner that has experience working with manufacturers and other suppliers to deliver solutions for EV, HEV and PHEV is invaluable; they can not only provide advice on how to implement a more agile development process, they will also have expertise in other areas alongside their specialism.

You should also look for a co-creation partner that has R&D centres to help facilitate rapid product and/or solution development, global production sites to help scale the creation of specific EV, HEV and PHEV components, and established sources for the highest quality materials.

Another thing to look for is a co-creation partner that can provide global on-site support and is IATF 16949 certified (meaning they have a quality management system which provides continual improvement, emphasising defect prevention and the reduction of variation and waste in the automotive industry supply chain and assembly process).

Of course, there's no one-size-fits-all when it comes to selecting a co-creation partner. In the case of EV and EV powertrains, it makes sense to take a market-led approach and enlist the expertise of new-entrant OEMs, research houses and universities, suppliers and distributors and end-users for the co-creation process.

Image sources: Unsplash

CHAPTER 3: CO-CREATION DONE RIGHT

Collaboration can be an excellent way to market new EV opportunities, push your branding in new directions or establish a presence in the market, but co-creation isn't always that simple.

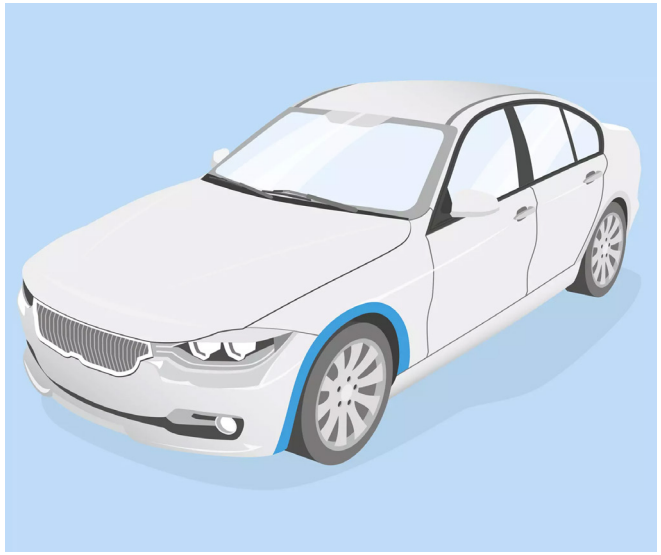
With so many automotive manufacturers pushing for new EV solutions, co-creation requires a lot of planning and strategy upfront. You need experts and partners that can help drive initiatives forward and maintain momentum, suppliers and distributors that can not only source the best materials but also come up with the ideas, and end-users that can help formulate and refine concepts.

One of the principal issues with typical OEM and supplier relationships is that the boundaries are never broken — that is, products, services and solutions are always developed to brief.

While this approach ensures that there's consistency and no margin for error, it often means that new opportunities or capabilities go unrealised. In the hyper-competitive automotive industry of today, simply "following instructions", isn't enough to generate the next big thing. Some OEMs provide rigid briefs and aren't flexible enough to think past the product — but the thing is that they need to.

Ultimately, you don't **need** a supplier that just supplies components, but one that understands the wider implications of other aspects of the EV vehicle, i.e. thermal management, safety, design and build, as well as their key specialism. You need suppliers, end-users, manufacturers and so on, that can offer insight at every stage of the process.

To give you a better idea of what co-creation done right looks like, we've compiled a few examples of successful co-creation projects.



CHAPTER 3: CO-CREATION DONE RIGHT

IKEA

In early 2018, Swedish furniture and home goods retailer IKEA launched 'Co-Create IKEA', a digital platform encouraging customers and fans to develop new products.

IKEA's co-creation platform focuses on four specific areas:

- **Asking customers for product ideas and suggestions**
- **Running IKEA boot camps to work with entrepreneurs**
- **Collaborating with university students on product solutions**
- **Connecting with innovation labs around the world**

If a suggested furniture or product design is successful, IKEA licenses it and agrees to invest in future products. For designers and technically talented engineers, this creates a strong incentive to gain exposure through the world's largest furniture retailer.

Image source: IKEA

CHAPTER 3: CO-CREATION DONE RIGHT

DeWalt

In 2015, DeWalt, one of the world's leading manufacturers of power tools, established an Insight Community for its customers to contribute product development ideas.

Through this community, DeWalt engages its customers in the product development cycle, testing packaging and design, as well as device usability. Overall, this community helps to improve DeWalt's products and create new, market-defining solutions.

It's also helped them to save a significant amount of money — almost $6 million in research costs!

DHL

Over the last decade, DHL, the world's largest courier, has hosted workshops with customers in Germany and Singapore to find and create new solutions and improve client experience.

These workshops have been formalised and are now 'DHL Innovation Centers'. At these centres employees and customers work together to come up with new initiatives to help DHL's performance.

This approach has bolstered DHL's customer satisfaction scores, causing them to rise over 80% (resulting in higher client retention) and they've been able to drastically reduce delivery times for some items thanks to crowdsourced technologies.

Image source: DeWalt

Image source: DHL

CHAPTER 3: CO-CREATION DONE RIGHT

Nissan

In 1995, Nissan's European Technology Centre (NETC) and Cranfield University undertook a 3-year, 3 million pound co-development project called 'Cogent', involving the participation of 85 of Nissan's suppliers[2].

The main objective of the project was to improve the co-creation capabilities of Nissan and their suppliers to reduce both product development times and costs by a targeted 30% and 40% respectively.

The context of the need for this improvement was set against its position as the most efficient vehicle manufacturer in Europe, and that the improvements were measured against Japanese benchmarks for performance.

With over 70% of the cost of a vehicle coming from the supply chain, Nissan knew that the majority of the improvements needed to be focused at supplier level.

[2] https://www.jstor.org/stable/44718644

The Cogent programme focused on three principles:

- **The use of workshops and a non-critical environment to increase early co-operation**
- **Workshop and improvement activities based on real problems in real time**
- **The setting of specific challenging targets for improvements that created a need to "think differently"**

As a result of the Cogent programme and working closely with suppliers, Nissan were able to meet their targets of reducing design time by 30% and cost by 40% — and overall, Cogent contributed to 2,400 man-months of reduction in vehicle design time.

Thanks to Cogent, Nissan laid the foundation for its NEXT21 (Nissan Euro eXcellence Towards 21st Century) programme, incorporating a new approach to design and development (D&D). This approach to co-creation — incorporating the supplier into the process — has now become commonplace in the automotive industry, enabling manufacturers to quickly bring new solutions to market at a fraction of the development cost.

Image source: Nissan

CHAPTER 4: HOW TO BUILD AN AGILE TEAM THAT CAN DELIVER QUALITY PRODUCTS

After assembling your team of co-creators and identifying an EV market opportunity, it's important to build the right team and take an agile approach to managing the project.

With an agile approach, you can drastically reduce the time required to bring your EV product, solution or component to market. Your teams work iteratively, more focused on action than mass documentation. It's a team that's transparent, unified and has shared responsibility for delivering outputs within short, agreed timescales.

Also, by operating in this way, your teams can reduce the volatility, uncertainty, complexity and ambiguity that is traditionally associated with automotive projects. Instead, your teams have clear objectives and milestones, and regularly communicate to ensure deadlines are met. This results in calmer, more focused teams and on-time delivery of assets.

Of course, with agile teams operating on different elements of your EV project, you have to strike the right balance between independence and organisational support and guidance. You want your co-creators to have the freedom to ideate, create, build, refine and test, but you also want them to stay aligned with your vision.

To build an agile team that can deliver, therefore, there are several key things you need to do:

1. Create clear objectives and deliverables

To ensure your teams are all moving in the same direction, clear objectives and deliverables are necessary. Plan in advance. Define how success is measured and what value you are looking for your co-creators to deliver. Spend time with them to create a unified set of objectives that you can all agree and sign off on. Once the objectives and deliverables are agreed, identify the metrics that you'll measure to monitor overall progress.

2. Get the right people on your team

For many traditional project leads and engineers, EVs are new concepts that require new thinking, approaches and training.

Leads and engineers can still deliver, after all, they have the technical know-how, but they need support and guidance to deliver exactly what's expected.

It's here where you need the right people on your team. Project sponsors, design experts who can articulate requirements, scientists, researchers and engineers who specialise in EV. It's important to pick your people carefully based on what they can bring to the workshop. Take your suppliers, for example, can they automate production processes and provide research and development? Having this kind of capability at scale will drastically improve your time-to-market.

By having the right people on your team from the get-go, you can mitigate roadblocks in the development process and increase the chances of delivering a successful outcome.

Image source: Unsplash

CHAPTER 4: HOW TO BUILD AN AGILE TEAM THAT CAN DELIVER QUALITY PRODUCTS

3. Prioritise co-creation and action

Agile project teams are designed for one specific purpose: to get work done faster. With a clear understanding of the objectives and the right skills to achieve them, you can spend more time developing and less time documenting and thinking.

With everyone working together towards a common goal, you can achieve results faster and rapidly develop EV prototypes or bring to market finalised solutions.

4. Provide adequate time and resources

While the agile methodology leads to faster delivery of agreed outputs, that doesn't mean that you should limit the amount of time or resources that you provide to your teams.

At the start of the project you will have scoped out requirements and built in contingency — add a little more buffer time to allow for any delays or complications during the EV project build. As for resources, ensure each team has a secondary team that can support them if the scope of the project changes or they need further assistance.

5. Keep your teams small

Teams of 5-8 members are considered the sweet spot for agility. Why? Well, because the key thing is maintaining clear lines of communication.

Smaller teams are inherently more streamlined, meaning communication and collaboration are much better, too. With no delays in communication, small teams can operate and deliver much faster. There are also far fewer complications.

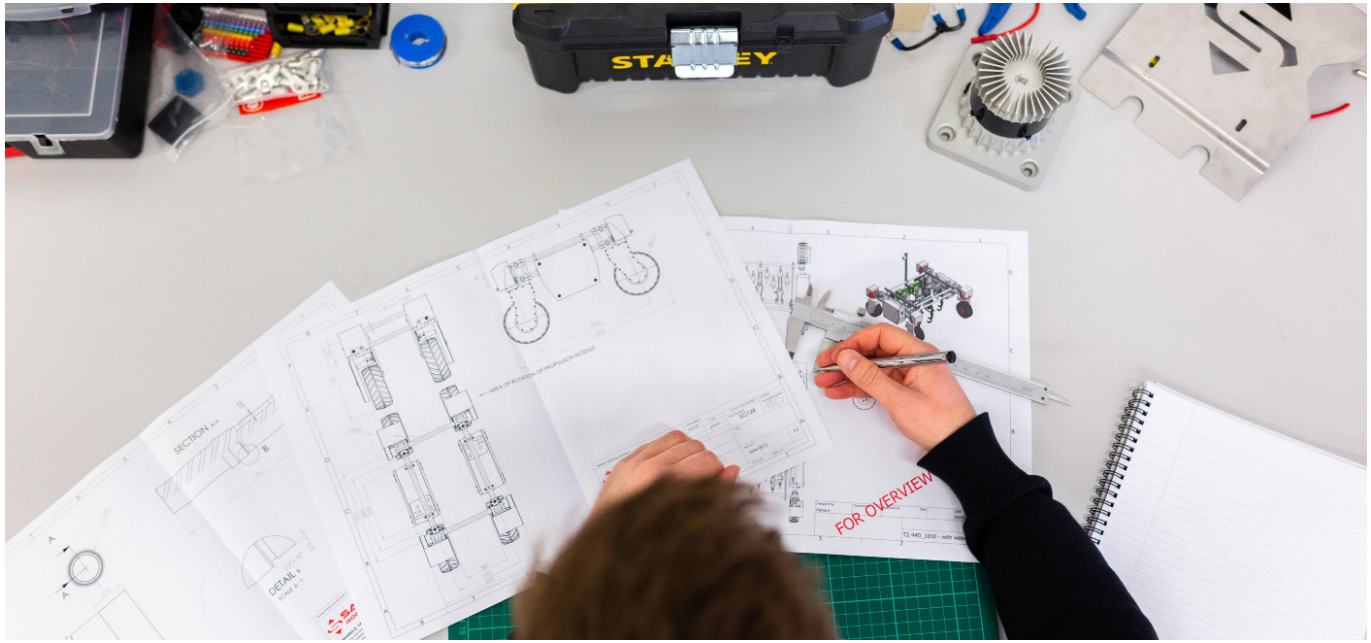


Image source: Unsplash

CHAPTER 5: HOW TO MEASURE THE SUCCESS OF A CO-CREATION INITIATIVE

The great thing about co-creation is that each stakeholder involved will have a clear idea of what "success" is for their respective area.

Here are just a few ways to measure the success of your co-creation initiative, as well as what to do when your projects aren't successful.

1. Evaluate stakeholder and customer satisfaction

By reviewing the level of satisfaction among your co-creation ensemble, you can quickly understand just how well you've delivered. If your teams are unhappy, use this as a learning opportunity and refine what you've developed.

For example, customers involved in the EV co-creation process will immediately know if what they've produced is something **other** customers would consider buying. EV engineers, on the other hand, will want to develop something sustainable, energy-efficient and better than anything else on the market: is it?

2. Determine if the project met business objectives

While your teams may be unhappy with the final result, did it meet business objectives? Ask end users or initial testers of the solution if they are happy with the outcome. If it fails to meet expectations, it's time to go back to the drawing board.

Often, failure to meet objectives stems from a poor brief or understanding of what was expected.

3. Measure end-user adoption and utilisation

Is the product being used as expected? If not, what changes can be made to make it more useful? If the project is successful, you'll find that your product has a high end-user adoption rate and is frequently used (or sold).

As co-creation projects involve the end users (customers), you should be able to routinely create EV products, components and solutions that meet requirements.

Image source: Unsplash

CHAPTER 6: EV AND POWERTRAIN CO-CREATION

At tesa, our customers are creating the next-generation of electric vehicles — but their challenges are designing reliable, safe batteries and powertrains while setting up efficient and global production processes.

To support them, we provide consulting services, research and development, collaboration and co-creation initiatives to help ideate, build and deliver innovative EV, HEV and PHEV solutions.

Here are just a few things we offer our customers — and how we've helped leaders in the automotive industry thus far.

A global partner for EV powertrains

As an IATF 16949-certified company, we have a quality management system which provides continual improvement, emphasising defect prevention and the reduction of variation and waste in the automotive industry supply chain and assembly process.

Furthermore, we have a global network of research and development houses, application process engineering experts and customer representatives to support our customers when it comes to EV powertrains.

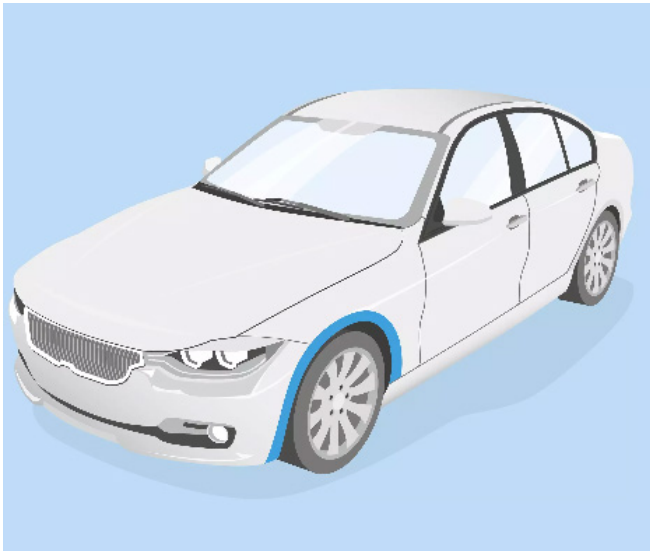
Customised EV and adhesive solutions you can trust

Our products are specifically made to fulfill demanding automotive requirements. We develop custom solutions for electric and hybrid vehicles in close cooperation with the world's leading manufacturers and suppliers.

This co-creation process is driven by customer collaboration and enhanced by agile development tools and methodologies. Our customers rely on our expertise in:

- **Adhesive solutions (production and converting to automation and process integration)**
- **Sourcing high-performance materials**
- **Insulation materials and mounting solutions**
- **Thermal management and protection against thermal propagation**
- **Our experience co-creating EV powertrains and our global network of specialists**

With our global network of customer representatives, research and development houses and production capabilities, we're always ready to help.



CHAPTER 6: EV AND POWERTRAIN CO-CREATION

Our success stories

But don't just take our word for it. At tesa, we work with some of the leading automotive brands, manufacturers and suppliers to create truly innovative EV, HEV and PHEV powertrain solutions that are reliable, scalable and sustainable.

- **Helping to develop customised solutions for prismatic battery cells**

For example, we've been working with a specialist in lithium-ion batteries (LIB) technologies and renewable energy and energy storage since late 2017, helping them with their range of EV and PHEV for production in Europe.

One of the key requirements for this client was wrapping prismatic battery cells for electrical insulation — something they needed specific expertise for. To deliver a practical solution, we worked closely with one of the client's original equipment suppliers to produce a custom adhesive solution.

The project involved several tests at the supplier's bases of operation in both Asia and Europe, with test data being supplied to the manufacturer and supplier, and the production part approval process (PPAP) being released to the equipment supplier.

As we approached the end of the project, we ramped up production in Europe alongside the supplier. This process included continuous improvement and development phases.

The result? The OES can now reliably produce more than 300 million battery cells each year in Europe, and both they and the manufacturer benefitted from our post-launch support.

- **Protecting a robust interconnect system from damage**

Then in 2020, we helped a leading EV, HEV & PHEV manufacturer to insulate a robust interconnect system composed of cylindrical cells that needed to be tethered to a central CPU.

As the interconnect system was made of aluminium, providing a solution for electrical insulation and anti-repulsion was essential — and the client needed it quickly.

We worked closely with the client and one of their key suppliers to quickly develop a robust and reliable solution to insulate electricity and prevent repulsion.

By the end of the project, we had devised a solution that could provide the level of electrical insulation and anti-repulsion the client required. These two properties, taken together, allowed the client to protect key components and drastically reduce temperatures within their interconnect system.

Image source: Unsplash

CHAPTER 7: HOW WE CAN HELP YOU

With the trend towards the reduction of emissions and fuel consumption, as well as your customers' expectation for better performance from vehicles, it's become increasingly difficult to develop EV powertrains that meet requirements.

A core part of this process is ensuring components are seamlessly integrated and bonded together without their function being affected.

With the right adhesives bonding together, your powertrains can reduce vibrations and absorb impact without transmitting it to other parts, some of which may be sensitive. They will also distribute stress across the powertrain while it's in motion, ensuring a smooth and seamless driving experience.

At tesa, we specialise in permanent bonding and wrapping solutions, creating powerful adhesive tapes for high-performance applications inside car powertrains (traditional and EV).

Our system solutions allow for:

- **Permanent bonding of friction material to clutch discs in clutches and to synchroniser rings for manual and dual-clutch transmission**
- **Permanent mounting of sensor plates for gear control in semi-automatic vehicles**
- **Mounting of brake shims for disc brakes**
- **Mounting of magnets to rotors for electric motors**
- **Permanent mounting of battery cells, insulation sheets and cables**
- **Full wrapping of battery cells and blocks**
- **Tamperproof encoding of battery blocks by high-precision laser marking**

And that's not all: we work closely with you to co-create adhesive products for powertrains and support you throughout the entire production process, from concept to delivery. We take an intelligent approach to adhesive development by using open innovation platforms and cooperation partners to develop innovative tapes and bonding products.

LET'S CREATE SOMETHING NEW TOGETHER

So why not take advantage of our expertise and co-create your next EV powertrain with us?

To find out more about our EV powertrain adhesives, in-house capabilities and full auto production, please see our attachment part mounting capabilities.

Our offerings in this area securely mount parts to the car body and provide highly reliable sealing and vibration damping. The unique tapes also compensate for thermal expansion and ensure excellent stress dissipation.

If you have any other EV requirements or simply want to learn more, please feel free to contact us using the button below.

tesa can assist you with your full auto production needs.

CONTACT US